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CRITICAL FACTORS FOR SUSTAINABLE URBAN ROADS MANAGEMENT IN NAIROBI CITY COUNTY

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Abstract: *The study at hand investigated the critical factors for sustainable urban roads management in Nairobi City County. Four specific research objectives were used; to evaluate the effect of public participation, organizational structure, public communication and availability of resources on the sustainability of urban road management in Nairobi County. The study used quantitative and qualitative research designs. The target population was all project team members within the County approximated to 952 project team members. Based on Yamane formula, the study used simple random sampling method to sample 282 respondents. Structured questionnaires and unstructured interview guide were used. Statistical Packages for Social Sciences (SPSS) version 21 was used to analyse data. The study found that public participation, organizational structure, communication and availability of resources were positively and significantly correlated with sustainability of roads management. The study concludes that public participation was important for sustainability of urban roads management as long as they are involved in planning, analysis, implementations and evaluation stages. Study concluded that organizational structure in as far as analysis, planning, implementation and evaluation is concerned is integral in the sustainability of urban roads management. The study concludes that public communication was very instrumental insofar as implementation of urban roads management in the county is concerned. It is concluded that availability of resources, both human, finances and systems was important in achieving the sustainability of urban roads management. The study recommends that all stakeholders should be identified in the planning, analysis, implementation and evaluation stages so that their views are incorporated. The study recommends that existing structure should inculcate both top-down and bottom-up approach that deeply considers junior staff views. It is recommended that public communication should be broad such that analyses of issues that lead to the needs of stakeholders are properly communicated. The study recommends that there should be adequate human and finance resources in the life cycle of projects. The resources needed should be identified before start up of project because such actions help in minimizing additional costs.*

Key words: *Sustainability, Public Participation, Organizational Structure, Public Communication, Availability of Resources*

1.1 Introduction

Sustainable management of public projects such as urban roads is instrumental in economic development due to the fact that cities such as Nairobi country act as business hub for entire republic (Onkoba, 2016). Consequently, it is in the interest of urban road project managers to make sure that strategies are laid down that supports sustainable management of urban road projects.

Due to the complex nature of urban road projects, monitoring and control and conterminous demand on the time of the project team, has led to the development of various tools for ensuring the project sustainable (Baker & Eckerberg, 2012). Unfortunately, a dependence on these tools can only yield success if from the onset the project management team is able to identify the critical success factors at every phase of the project life cycle to enhance sustainability of the projects (Clements & Gido, 2012). Therefore, the concept of sustainability of projects such as urban roads has been evidenced in both developing and developed countries.

In Sweden, the country has initiated sustainability of several projects in order to enhance economic development. One of the key projects is the urban road management (Karanja, 2014). However, the concern with the issue of urban roads' sustainability has faced mounting pressure domestically and internationally which has led to drastic reduction or halt of possible foreign aids. These pressures have made donor organization and development workers start to think about effectiveness and the value of projects being delivered (Hyvari, 2012).

In Zimbabwe, Cleaver (2019) found that the empowerment and long-term effectiveness of participation approaches in projects management across the country has rather been complex. Limitations of communities in mobilizing the necessary resources, either through collecting funds from community members or lobbying government officials, greatly affected the sustainability of urban road projects. This is because the method of addressing project management issues had adversely affected the sustainability of the project as such the public are exposed to suffering.

In Kenya, billions of shillings have been spent so as to enhance the living situation of the people. Projects such as Thika Super Highway and Outer Ring Road among others have been initiated in the recent past. However, one of the most critical obstacles is the extent to which the projects are able to remain sustainable despite the exit of donors, while the beneficiaries reap dividends, appreciate their participation and ownership role in the project (Ababa, 2013). Apparently, it is sustainability that makes the difference between success and failure of such road projects. Various factors such as technical, financial, institutional, economic, and social factors contribute to the failure to sustain the projects if not considered well in the project management cycle. Despite huge amounts of money spent on implementation of projects in Kenya, poor sustainability and management is depriving the citizens the returns expected from these projects (Oino, Towett, Kirui & Luvega, 2015). Thus it is prudent to look at the critical factors that contribute to the sustainability of urban road management.

1.2 Statement of the Problem

Despite the fact that many road projects have been conceived in the County, many of them fail to meet sustainability standards which in most cases render the projects unviable in meeting future needs of the society (Ochieng, 2016). As such road projects fall short in bringing expected returns thus exposing public to economic suffering. The failure of some road projects in the County has been attributed to poor communication, (Silvius & Schipper, 2014) inadequate consultation, unsatisfactory stakeholders' involvement, inadequate resources for maintenance, political sabotage as well as lack of cooperation between county and central government (Oino et. al., 2015). Again delay in channelling of County funds from the national government has also contributed to

unsustainable road projects. These concerns have, therefore, led to research gaps which this study intends to bridge.

Due to the aforementioned myriad of challenges facing sustainability of road management in the County as well as a lack of study on the critical factors that contributes to sustainable urban road management, the study, therefore, sought to bridge the gap by assessing the critical factors for sustainable urban road management in Nairobi County. Knowledge of the best practices would improve the quality of project management and consequently project sustainability.

1.3 Research Objectives

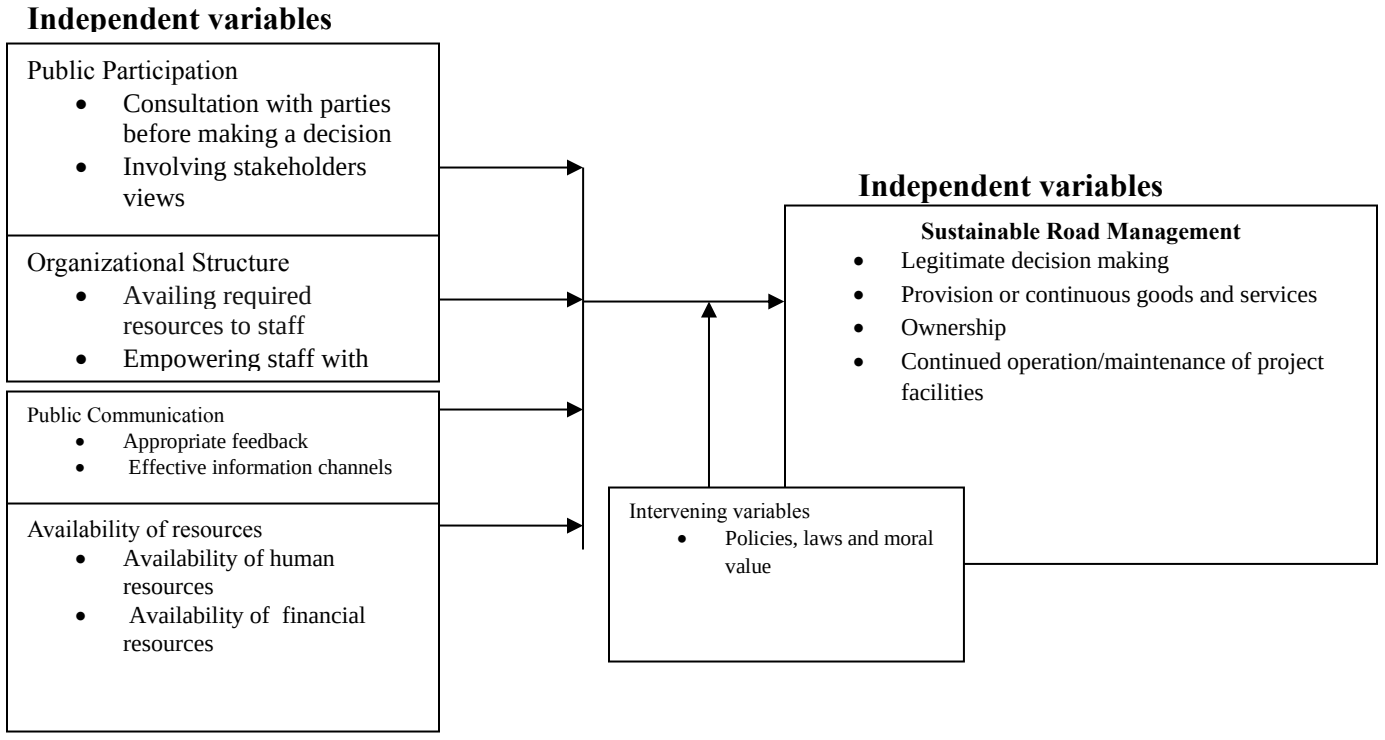
To identify the critical factors for sustainable urban road management: case of Nairobi County. The following specific objectives guided the study;

i. To evaluate the effect of public participation on the sustainability of urban road management in Nairobi County
ii. To investigate the effect of organizational structure on the sustainability of urban road management in Nairobi County
iii. To examine the effect of public communication on the sustainability of urban road management in Nairobi County
iv. To establish the effect of availability of resources on the sustainability of urban road management in Nairobi County

1.4 Conceptual Framework

The conceptual framework is shown in Figure 1.

Figure 1: Conceptual Framework



Source: Authors, 2019

1.5 Literature Review

Theoretical Framework

Sustainability Theory

The theory argues that there is need to have sufficient capacity to obtain results or process within the life cycle of a project (Jenkins, 2004). This theory is applicable to the management of urban road projects in the County as their sustainability may improve their rate of survival. The long term health of a nation depends on the sustainability of development projects that operate in the country hence sustainable roads by the County government is an indicator to an economically healthy nation (Elzen, Geels & Green, 2004). In this study, since urban roads need to be sustainable, there is need to adopt this theory since it augers with the overall sustainability of public projects. Therefore, sustainability theory is suitable for this study as it attempts to delve on measures that are needed for projects to be sustainable.

Sen's Capability Approach

The capability approach is primarily a framework of thought, a mode of thinking about normative issues (Sen, 1993). The capability approach focuses on the information that we need to make judgements about individual well-being, social policies, and consequently rejects alternative approaches that it considers normatively inadequate, for example when an evaluation is done exclusively in monetary terms. It is a perspective that can be applied to enhance efficiency in evaluations of road projects that are initiated by the County.

Narrative Approach

The theory involves helping clients to talk about their problems with respect to development as if they were a story. It helps clients view the problem as external to themselves, rather than some intrinsic part of them (Makkonen, Aarikka-Stenroos & Olkkonen, 2012). Second, it helps them see how the problem affects their lives, both in negative and positive ways, and can assist them in developing compassion for themselves and their own situations to positively impact their lives. It also presents the opportunity for the social worker and client to come up with alternate mechanisms as a way for clients to envision what their life might be like without the problem in question. This can be ascertained by deeply understanding the essence of project to be initiated. The primary benefit of the narrative approach is in helping the client gain objectivity in regards to the projects.

Review of Empirical Studies

Public Participation and Sustainability of Urban Road Management

Public participation is important as project managers can use the specialised knowledge the public possess within sustainability of projects (Økland, 2015). By means of better cooperation, this knowledge can be employed to develop sustainable solutions that cater to their diverse needs. Proactive public participation also requires consensus building amongst all stakeholders over the entire process from problem definition to monitoring and evaluating the outcomes (Goedknegt & Silvius, 2012). This can prevent misunderstandings and tension created among stakeholders hence enhancing the sustainability of urban roads.

The involvement of public is an important factor for sustainability of projects as it is the genuine involvement of local people as active participants and equal partners whose concerns and experience are intrinsic to the project's success (Achterkamp & Vos, 2016). Therefore, community awareness and involvement in project planning and implementation are important elements in the sustainability of a project.

In a rejoinder, Shediac-Rizkallah and Bone (2018) indicates that involving all relevant community leaders and agencies facilitates sustainable programs. The level of community support determines whether a project becomes established, how quickly and successfully it consolidates, and how it responds and adapts to meet changing needs. It is therefore important that involving local community starts at the identification phase, when decisions are being made about what type of project is required to address their priority need.
To gain public participation, Patterson, Russell and Stone (2014) stresses the importance of creating shared value amongst stakeholders, arguing that prioritising shareholders' short-term gains may result in the delivery of unsuccessful projects in terms of value delivered, which is unsustainable in itself.

Organizational Structure and Sustainability of Urban Road Management

Generally, the design of an organisational structure is a very difficult yet extremely important activity. A structure that has been very effective and efficient overtime may not perform to its optimum when project environment changes. Brandoni and Polonara (2012) add that the advantage of organisation vis-à-vis project structure is that the centre of attention of every project team member is on the assignment and the beneficiaries for whom the project is undertaken. In this arrangement, the project team is structured accordingly to carry out their designated assignment-sustainability of projects. It is in light of this that in a road construction projects, architects and engineers will take the vital role. To this end, it is important that project managers pay close attention to the organisational structures that they adopt. This is particularly so because the choice of an organisational structure has an outcome on the overall sustainability of projects. An effective and efficient structure enhances administration; and clarifies roles, relationships, responsibilities, levels of authority, and reporting or supervisory lines without which, no mission and goal realisation is tenable. In this study organizational structures include relevant departments, workers, and other stakeholders who deal with projects such as urban road management within the County.

Public Communication and Sustainability of Urban Road Management

In order to achieve sustainability into project management, decisions need to be made at multiple levels of the society, ranging from a private individual level to a business level and a national as well as community levels (Goedknegt & Silvius, 2012). This requires better communication amongst various stakeholders and authorities leading to improved cooperation and consequently sustainable projects. According to Bredillet, Tywoniak and Dwivedula (2015), delivering information by means of effective communication is vital to each of the parties involved in sustainable project management. The communication skills that are rated high are decision making and solving of problem, keen listening, motivation, meetings, writing, team development and capacity team building, as well as conflict management. The aforementioned communication techniques can be viewed as important skills that a project management team essentially needs to communicate effectively about project sustainability.

The success of project activity is depended widely on human's ability to timely relay information to others. Therefore, it is of significant value to identify skills required to excommunicate efficiently and effectively to enhance sustainability of urban road projects (Clements & Gido, 2012). The communication skill embraced by this research varies from one skill to another. The first one will be questioning. Questioning communication is valuable when raising queries as and when there is a discussion. The aim for raising questions in project management is to permit time

for interacting with the stakeholders on the sustainability of projects (Sweeney, 2011). The second communication skill be termed as reinforcement; this basically involves ideas which, when linked to a response could more likely result to that response being repeated. The third being verbal and or non-verbal communication that can occur in terms of facial expressions and other gestures to provide accurate information. Lastly, there is positive reinforcement that involves allowing stakeholders to know that their sustainable inputs are taken into consideration (Baker & Eckerberg, 2012).

Therefore, the head of project team is the one in charge of projects and has sole responsibility to deal with conflicting issues. The manager therefore needs skills to handle controversies effectively before it becomes toxic. This, therefore, means that negotiation may be the skill to apply in the communication process about in order to resolve and prevent conflicts that could derail projects. This shows the importance of embracing effective communication channels in order to enhance the sustainability of urban roads within Nairobi County.

Availability of Resources and Sustainability of Urban Road Management

An integral element in project sustainability is the availability of resources such as human and funds that are required (Williams, 2013). This means, selecting resources that should be available for the projected future, minimizing the possibility of project failure once it is up and running, due to inadequate essential materials and employees. In many cases, this will mean identifying secondary sources of those materials that can be pressed into action and skilled employees that will action the projects. Inadequate funding detracts a projects' ability to be sustained (Karanja, 2014). However, there are many ways that funding can be linked to a project's ability to be sustained. Sizwe and Graciana (2012) support developing local resources for enhanced sustainability emphasizing the importance of adequate local capacities to generate funds that could promote sustainability of projects. Ababa (2013) asserts that planning for future funding needs to be in place early and needs to be continually developed during the life of the project; while Teixeira, Koufteros and Peng (2012) discusses the need for longer initial funding periods to allow time for sustainability to be natured. Therefore, for project sustainability to be achieved the institutions and management involved in project implementation from the community to the national or international levels need to be empowered in terms of information, skills and resources (human and capital) for smooth running of activities for sustainability of projects.

According to Patterson, Russell and Stone (2014), good management ensures that sufficient local resources and capacity exist to continue the project in the absence of outside resources. Good management goes beyond mere skills to technical and expertise required so as to promote sustainability of project. This entails sufficient funds needed for project's sustainability. Funds may be earmarked for projects which in fact are periodic maintenance activities. Therefore, different agencies are responsible for different classes of roads; often recurrent budgets do not differentiate between road maintenance and other recurrent activities.

Allocations, particularly at the local level, are more difficult to identify. Road maintenance allocations, being part of the recurrent budget, are easily commandeered for other more pressing activities (Donnges, Edmonds & Johannessen, 2017).

Empirical Studies

Marcelino-Sádaba, González-Jaen and Pérez-Ezcurdia (2015) carried out a study on stake holder

identification and salience and sustainability of public projects in Turkey. The study collected data from project managers by use of questionnaires. The study used cross tabulation and it was found that one interesting characteristic of the stakeholder concept is the dynamics of stakeholders. The study concluded that the influence of the stakeholder participation in the project depends on the relationship attributes and may affect both timeliness, level of funding and consequently sustainability. Agarwal and Kalmár (2015) study was on sustainability in project management in India: Eight principles in practice. The study adopts a subjectivist ontological viewpoint and an interpretivist epistemological outlook. The paper deductively studies the research question and adopts a qualitative mono-method research design, with a multiple case study strategy. The data has been collected through the semi-structured interview technique and examined using a thematic analysis. The results show that organizational structure for the companies sampled had negative correlation with the sustainability of public project management.

Ofori (2013) carried out a study sought on assessing the quality of project management practices as well as the critical success factors for projects in Ghana. The study adopted an exploratory approach and utilized a survey method to collect data on project management practices of Ghanaian organizations. Purposive sampling was used in selecting the sample which comprised 200 managers from different economic sectors. Results from the study indicated that the critical factors that contribute to the success of a project include top management support, effective communication, clarity of project purpose and goals, and stakeholder involvement.
In Zimbabwe, Cleaver (2019) study sought to establish factors that influence sustainability of both private and public projects in the country. The study targeted all employees who managed project from analysis stage to evaluation. By use of interview guide and questionnaires the study collected both qualitative and quantitative data. By utilization Spearman correlation, the study found that the empowerment and long-term effectiveness of participation approaches was rather complex. Limitations of communities in mobilizing the necessary resources, either through collecting funds from community members or lobbying government officials, greatly affected project sustainability in the country.

In Isabalija, Mayoka, Rwashana and Mbarika (2011) examined factors affecting adoption, implementation and sustainability of telemedicine information systems in Uganda. The primary data was collected by means of questionnaires. The data was analyzed by means of cross tabulation as well as descriptive statistics. The study found that lack of sufficient participation by various stakeholders affected the sustainability telemedicine information projects in Uganda. The research study used case studies hence raising the question of generalization of the findings hence study is not comprehensive enough and besides the study was not exhaustive of other factors affecting sustainability of telemedicine information systems.
In Kenya, Oino et al. (2015) carried out a study based on the dilemma in sustainability of community based projects in Kenya. The target population was minority communities in Kenya. The study relied on analysis of secondary evidence from Kenya and other parts of the world. The study used factor analysis to analyse data. The paper particularly found that although many projects highlight elements of sustainability in their proposal stage, the actual implementation seems to lack emphasis on sustainability. This paper concludes that lack of stakeholder ownership and commitment leads to project failure.

Ochieng (2016) research sought to investigate the influence of organisational structures on project

sustainability. Descriptive survey research design was adopted for the study. The population of this study consisted of a total of 113 staff. In particular, key persons involved in running the projects were interviewed. The research used stratified random sampling in identifying the 80 research respondents who formed the sample size. Questionnaires with both open and close-ended questions were administered on the respondents to gain the required information. The categorised data was eventually analysed using SPSS (v20) and presented in form of tables and frequencies that are easy to interpret. The study used stratified random sampling to sample 80 respondents. From the findings, 73% of the respondents indicated that leadership influenced project sustainability to a very great extent; 48% of the respondents agreed that organisational structure influenced project sustainability to a very great extent. The study concluded that there was a significant relationship between organisational structure and sustainability of project.

1.6 Methodology

Research Design

This study employed both quantitative and qualitative research design. Quantitative research was preferred because it allowed the researcher to measure and analyse data (Spangler, 2012). The design is advantageous because the researcher is more objective about the findings of the research whereas qualitative was used because it aided the researcher in gaining more detailed and rich data in the form of comprehensive written descriptions or visual evidence.

Target Population

The target population was managers and employees in the Public, Works, Roads and Transport Ministry. There are approximately 952 project team members based across all the 17 Sub Counties in Nairobi City County.

Sample and Sampling Techniques

The study used simple random sampling method. This was preferred due to the fact that it needed only a minimum knowledge of the study group of population in advance as well as the fact that it is free from errors in classification. This method made sure all individuals had similar chance of being included in the study (Dul & Hak, 2015). So as to achieve appropriate sample size, the study used Yamane (1967) scientific formula.

Using Yamane (1967) formula; $n=N/1+N(e)^2$

Where N is the population size;

n is the sample size; and

e is the level of precision (Yamane, 1967).

$n=952/1+952(0.05)^2$

Therefore, n= 282 respondents

Methods and Instruments af Data Collection

The study used structured questionnaires and unstructured interview guide to gather data from the junior employees and the managers of urban roads respectively. The questionnaires were used since it had the potential of reaching out to a large group of respondents within shortest time (Donald & Delno, 2016), they also offers sense of security as respondents did not have to reveal their identity. The questionnaires for the respondents were quantitative in nature. The method for data collection was drop and pick for questionnaires. The interview guide unstructured and this was used to get in-depth relevant urban road information from the project managers. In order to

enhance data collection procedures, the researcher first obtained a consent letter from the University. The consent letter was then used to seek research permit from NACOSTI. The permit was then used to collect data from Public works, Roads and Transport Ministry offices across Nairobi County. Upon being granted permission the researcher resorted to data gathering.

Reliability and Validity

The main objective of reliability was to neutralize errors, inconsistencies and biasness of the research instruments (Yin, 2013). Reliability in quantitative research is based on trustworthiness. With regard to reliability of questionnaire, Cronbach's Alpha reliability coefficient method was calculated using SPSS version 21. George and Mallerly (2013) argue that if the statistical Alpha is equal or greater than 0.5 the questionnaire scale is considered reliable hence can be used for the analytical procedures. The results for reliability showed that the Cronbach's Alpha coefficient was more than 0.5 actually it was 0.68 hence the data was reliable.

Additionally, in order to achieve validity of research instruments, the researcher enhanced the process by possibly asking research experts such as the University supervisors to read, judge, and determine the representation of the variables in the set questions. The feedback by experts was then used by the researcher to modify the instruments to ensure validity during the main data collection process.

Data Analysis Procedures

Returned data was then coded and entered into SPSS version 21. The quantitative data was then analyzed descriptively and by use Pearson correlation moment. Meanwhile qualitative data from the interview guide was analyzed through content analysis. In this process, the qualitative data was organized into themes in the form of comprehensive written descriptions.

Descriptive Analysis

Descriptive statistics was analyzed into table formats to show frequencies and percentiles. This method was considered in this study due to the fact that it helps in discovering the basic features of the data in the study.

Pearson Correlation

The method was applicable to this study because it allowed the researcher to determine the strength and direction of a relationship so that later studies can narrow the findings down and, if possible, determine causation experimentally. The correlation coefficient was denoted as *r*, and had a range of values from -1 to +1. A value of 0 showed that there was no positive relationship between the two variables. A value equal to +1 indicated a perfectly positive association between the variables, that is, as the value of one variable increased so does the value of the other variables. A value of r equal to -1 indicated a perfect negative association, that is, as the value of one variable increased the value of the other variable decreased (Cooper & Schindler, 2013).

1.7 Data analysis, presentation and discussions

Results for Research Objectives

Effect of Public Participation on the Sustainability of Urban Road Management

The respondents were asked to respond to statements regarding effect of public participation on the sustainability of road projects in Nairobi County (1 = Planning, 2 = Analysis, 3 = Implementation 4= Evaluation). The results are shown in Table 1.

Table 1: Public Participation and Sustainability of Urban Road Management

	Planning (%)	Analysis (%)	Implementation (%)	Evaluation (%)	Total (%)
Presence of sufficient involvement of various key stakeholders	23	40	24	14	100
Management team has always adhered to addressing stakeholders' needs and concerns	12	18	29	41	100
Management team has always adhered to full involvement of public in all stages	19	29	28	25	100
Relationship between project team and citizens is cordial	18	33	32	17	100
Project management team has always provided forums for dialogue before setting up project	15	29	30	26	100

Source: Filed data, 2019

The results presented in Table 1 shows that there is sufficient involvement of various key stakeholders in the planning stage (23%), analysis stage at 40%, implementation stage at 24% and also during evaluation phase at 14%. This means that stakeholders were mostly engaged in the analysis stage. Results show that the management team always adhered to addressing stakeholders' needs and concerns during planning, analysis, implementations and evaluation stages as reported by 12%, 18%, 29% and 41% respectively. This means that stakeholders' needs and concerns were mostly addressed during evaluation stage. It was found that there was a cordial relationship between project team and citizens during planning, analysis, implementations and evaluation stages as represented by 18%, 33% 32% and 17% respectively. The cordial linkage was as a result of involving the public views. Data found that project management team always provided forums for dialogue before setting up any project as reported by 15% who said dialogue was in the planning stage, 29% indicated dialogue was witnessed in the analysis stage and 30% reported that forums for dialogue was found in the implementation stage while 26% said dialogue was common in the evaluation.

The interview guide found that most respondents indicated that they always make sure that all relevant key stakeholders are involved in all stages of planning, analysis, implementation and evaluations. Furthermore, the inclusive participation was found to have contributed to the cordial relationship witnessed between project team and the public. Some reported that stakeholders' needs and concerns were equally so as to enhance their ownership of the road projects initiated by the county government.

Effect of Organizational Structure on Sustainability of Urban Road Management

The respondents were asked to respond to the statements regarding effect of organizational structure on the sustainability of road projects in Nairobi County. The results are shown in Table 2.

Table 2: Organizational Structure and Sustainability of Urban Road Management

	Planning (%)	Analysis (%)	Implementation (%)	Evaluation (%)	Total (%)
Structure based on beneficiaries whom the project is intended for	19	28	31	22	100
Choice of effective structure has led to improved sustainability of projects	23	27	28	22	100
Existing structure has enhanced administration promoting sustainability	24	28	25	23	100
Existing structure has enhanced role clarity among project team	20	22	33	24	100
Reporting/supervision lines relating with sustainability clearly indicated in the structure	18	24	34	23	100

Source: Field data, 2019

Results in Table 2 established that existing structures on planning at 19%, on analysis at 28%, on implementation at 31% and on evaluation at 22% were based on the beneficiaries whom the project is intended for. This means that most respondents argued that the urban road management structure was leaning towards the implementation phase. It was established that choice of effective structure on the planning at 23%, on the analysis at 27%, on the implementation at 28% and on the evaluation at 22% has led to improved sustainability of public projects. This could imply that effective structures in the road department leaned towards implementation stage. Again it was established that existing organizational structure has enhanced role clarity among project team as reported by 20% who said it has enhanced role clarity in the planning stage, 22% said it had enhanced role clarity in the analysis stage, 33% admitted it had enhanced role clarity in the implementation stage while 24% indicated it had improved role clarity during the evaluations of projects hence improved sustainability of road projects.

The interview guides found that majority of respondents indicated that indeed organizational structures adhered to public expectations. The respondents argued that the structure had parallel communication mechanisms whereby top to bottom and down to top communication were the order of the day. Further some respondents said that existing organizational structure had role clarity for every project team and also enhanced room for reporting and monitoring of sustainability related issues.

Effect of Public Communication on Sustainability of Urban Road Management

The respondents were asked to respond to the statements regarding effect of public communication on the sustainability of road projects in Nairobi County. Results are shown in Table 3.

Table 3: Public Communication and Sustainability of Urban Road Management

	Planning (%)	Analysis (%)	Implementation (%)	Evaluation (%)	Total (%)
Project team made sure information on project shared effectively	15	28	35	21	100
Management has created communication platforms whereby the public views are incorporated	19	29	28	24	100
Management team believes effective flow of information from offices to public is key for sustainable projects	20	30	30	21	100
Management has in place effective mechanisms that helps in solving conflicts that could arise	27	35	23	15	100
Management has always communicated using manual/hand books about projects to be initiated	16	34	26	24	100

Source: Field data, 2019

Results in Table 3 indicates that project team has made sure that information about a given project is shared effectively during the planning stage at 15%, during analysis stage at 28%, during implementation at 35% and consequently during evaluation at 21%. The results are an indication that information sharing was mostly in the implementation stage. It shows that management has created communication platforms during project planning (19%), analysis (29%), implementation (28%) and evaluation (24%). The platforms helped in airing of public views. The results could mean that project analysis stage was given much attention because it is basically the initial phase requires intense consultation. The study found that management has in place effective mechanisms in the planning stage (27%), analysis (35%), implementation (23%) and in the evaluation phase (15%) that helps in solving conflicts that arises. From the findings it can be said that mechanisms were mostly effective during analysis stage.

Through interview guides, results show that use of manual and hand books or dissemination of messages on projects to be initiated was evident, the management also made sure that communication platforms were created and this helped in proving opportunities for the public to air their views.

Effect of Availability of Resources on Sustainability of Urban Road Management

Respondents were asked to respond to the statements regarding effect of availability of resources on the sustainability of road projects in Nairobi County. Results are shown in Table 4.

Table 4: Availability of Resources on Sustainability of Urban Road Management

	Planning (%)	Analysis (%)	Implementation (%)	Evaluation (%)	Total (%)
Presence of adequate project team hence improved sustainability	22	27	30	21	100
Financial resources for sustainability of urban road projects sufficient	16	31	33	19	100
Project team are well equipped with skills and knowledge	28	33	29	11	100
Presence of regular and timely training has promoted the sustainability of roads	20	28	33	20	100
Management made sure funds for sustainable road are always incorporated in the annual budget	16	33	31	20	100

Source: Field data, 2019

Results in Table 4 shows that there was presence of adequate staff for planning, analysis, implementation and evaluation as represented by 22%, 27%, 30% and 21% respectively. The adequacy of staff helped in improving sustainability of urban roads. Further, it was established that financial resources in the planning (16%), analysis (31%), implementation (33%) and evaluation (19%) for the sustainability of urban road projects were sufficient. However, the adequacy of finance was mostly in the implementation phase. Again it was established that project team are well equipped with skills and knowledge during the planning, analysis, implementation and evaluation stages as reported by 28%, 33%, 29% and 11% respectively. It was also established that management has made sure that funds in the planning stage (16%), analysis stage (33%), implementation stage (31%) and evaluation stage (20%) meant for sustainable road projects are always incorporated in the annual budget. This helped in promoting the sustainability of urban road projects within the county.

Regarding the interview guide, respondents indicated that indeed there was adequate staff in the project team section and this has helped in improving the sustainability of urban roads in the county. Again respondents specifically noted that financial resources were adequate in all stages including for planning, environment analysis, implementation as well as evaluation of the progress of projects.

Table 5: Pearson Correlation

The results for correlation are presented in Table 5.

Independent Variables		Sustainability of urban roads (Dependent variable)
Public participation	Pearson Correlation	.466*
	Sig. (2-tailed)	0.012
Organizational structure	Pearson Correlation	.590**
	Sig. (2-tailed)	0.000
Public communication	Pearson Correlation	.596*
	Sig. (2-tailed)	0.030
Resources availability	Pearson Correlation	.613**
	Sig. (2-tailed)	0.008

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Field Data, 2019

The study established that public participation has a positive Pearson correlation of 0.466* with the sustainability of urban road management in the County and they are also significantly associated at the 5% level. It is also evident that organizational structure has a positive Pearson correlation of 0.590** with sustainability of urban roads in the county. Organizational structure also has significant association with sustainable urban road management at the 1% level. Further public communication has a Pearson correlation of 0.596*with sustainability of urban roads in the county and also statistically significant with each other at the 5% level. Availability of resources is found to have a positive Pearson correlation of 0.613** with sustainable urban road management. Availability of resources is also significantly related with sustainable urban road management at then 1% (0.01) level. From the findings it can be said that all the independent variables have got positive association with dependent variables and, therefore, an increase in all of them could lead to an increase in the sustainability of urban roads in Nairobi County.

1.8 Discussion of Results

On public participation, the correlation results established that public participation has a positive Pearson correlation of with the sustainability of urban road management in the County and they are also significantly associated. This means that an increase in public participation could lead to increase in the sustainability of urban road projects. The results oppose a study by De Brucker, Macharis and Verbeke (2013) that found negative relationship between public participation and sustainability of projects.

Concerning organizational structure, correlation results established that organizational structure has a positive Pearson correlation of with sustainability of urban roads in the county and also has significant association with sustainable urban road management. This could be interpreted to infer that an improvement in the organizational structure by any value could lead to increase in the sustainability of urban road management. Findings auger with another study by Galetic, Nacinovic and Klindzic (2012) that found that organizational structure has linear relationship with sustainable projects in Turkey.

Regarding public communication, the correlation results show that public communication has positive correlation with sustainability of urban roads and also statistically significant with each other. This is an indication that increase in the form of public communication could lead to increase

in the sustainability of urban roads management. In yet another study, Sweeney (2011) realized that increased involvement of various shareholders in public communication led to sustainability of projects.

Availability of resources is established to have a positive Pearson correlation with sustainable urban road management and the variables were also significantly related. Inference could be that if resources are increased by any factor, sustainability of urban roads could be achieved. The results are in agreement with a study by Shediac-Rizkallah and Bone (2018) that found that increased resources enhances the sustainability of projects in Ireland.

1.9 Conclusions

The study concludes that public participation was important for the sustainability of urban roads management in Nairobi. This was supported by the correlation that found that an increase in public participations leads to an improvement in the sustainability of urban roads project. It is concluded that organizational structure is integral in the sustainability of urban roads management in the County of Nairobi. The conclusion is supported by correlation results that found that organizational structure has positive significant relationship with sustainability of urban roads.

The study concludes that public communication was very instrumental insofar as implementation of urban roads management in the county is concerned. The conclusion is supported by the correlation findings that showed that communication was positively and significant related with sustainability of urban roads management in the county. It is concluded that availability of resources, both human, finances and systems was important in achieving the sustainability of urban roads management. Correlations affirm this conclusion because of the positive association among availability of resources and sustainability that was established.

1.10 Recommendations

The study recommends that all stakeholders should be identified in all stages of urban road management planning, analysis, implementation and evaluation stages so that their views are incorporated at all times so as to enhance the sustainability of roads management in the County of Nairobi. The study recommends that the existing structure should inculcate the 'top-notch' decision-making approach that deeply considers junior staff views. By embracing both top-down and bottom-up approaches in the making of decisions, sustainability on roads management could be enhanced.

It is recommends that public communication should be broad such that the needs, analysis of issues that lead to the needs are properly communicated so that prompt community public action plans are fully implemented. Enhancing public communication by use forums manual and hand books for the urban roads projects increases the public ownership. The study recommends that there should be adequate resources in the life cycle of the projects. The resources needed should be identified before the start up of the project because such actions helps in minimizing cost that relates with redesigning, mid-stage evaluations and stoppage that could lead to delays and extra costs. Employees should also be regularly trained on sustainability measures so as to sharpen their skills and expertise.

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