

**INFLUENCE OF COMMUNITY ENGAGEMENT IN PROJECT MAINTENANCE ON
PERFORMANCE OF ROAD CONSTRUCTION PROJECTS IN JUBA COUNTY, SOUTH SUDAN.
A CROSS-SECTIONAL STUDY.**

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Page | 1 **Abstract**

Background:

South Sudan has made significant efforts to improve community engagement and performance of road construction project particularly at the county level. The aim of the study is to assess the influence of community engagement in project maintenance on the performance of road construction projects in Juba County, South Sudan.

Methodology:

A cross-sectional study employing quantitative data collection methods. The study used a combination of both random and non-random sampling techniques. Simple random sampling was used because of its simplicity and the ability to allow all respondents an equal chance of being included in a sample.

Results:

86% of the respondents were O-level school leavers, with 3% having a degree level of education. Community Participation in maintenance Stage has a Mean average of 0.7619 on a 5-point Likert scale, which is 15%, and a Std. Deviation of 0.429, which is below 1.00, reflecting a common opinion on the influence of Community Participation in Maintenance Stage on the sustainability of community-based road construction projects. 35.4% changes in the performance of road construction projects in Juba can be explained by community engagement in project maintenance. The 64.6% changes in explained by other factors. Furthermore, a unit increment in sound community engagement in project maintenance leads to an increment in the performance of road construction projects in Juba by .414 units. The coefficient is significant at 5% significance level since the P value ($0.00 < 0.05$).

Conclusion:

Community engagement in the maintenance stage of the community road construction project has no significant influence on the performance of community-based road construction Projects.

Recommendations:

Community road construction projects should explore other approaches of community engagement in the maintenance stage, other than sharing of maintenance costs, provision of maintenance labour, and sharing of maintenance resources.

Keywords: Project maintenance, Community engagement, Performance of road construction projects in Juba

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Background

In recent years, South Sudan has made significant efforts to improve community engagement and performance of road construction project particularly at the county levels (World Bank, 2010). Midgley (1986) argues that participation is advocated for not only because it facilitates performance by lowering costs and smoothing implementation, but also fosters a sense of belonging and the integration of stakeholders, which in turn helps to contribute positively to national development. For the stakeholder's participation to have an effect on the service quality, it should go through an underlying policy that is implemented by the central government. In particular, there has been a shift towards understanding participation in terms of the empowerment of individuals and communities. This has stemmed from the growing prominence of the idea of the citizen as consumer, where choice among alternatives is seen as a means of access to power (Burton, 2003). Under this model, people are expected to be responsible for themselves and should, therefore, be active in public service decision-making. In

this context, Burns (1994) modified Arnstein's ladder of participation and proposed a ladder of citizen power.

Aronstein's theory has been criticized on the basis that each of the steps represents a very broad category, within which there are likely to be a wide range of experiences and competencies. For example, at the level of informing, there could be significant differences in the type and quality of the information being conveyed. Realistically, therefore, levels of participation in community engagement and performance of road construction projects are likely to reflect a more complex continuum than a simple series of steps. The use of a ladder also implies that more control is always better than less control to streamline the road construction. However, increased control may not always be desired by the community engagement and performance of road construction projects; increased control without the necessary support may result in failure (Stoker 1997). Construction projects in the public sector are often affected by different challenges with regard to project ownership by stakeholders, particularly with the cooperation of local

communities (Rathenam, 2017). Local community participation is a requirement for various development initiatives, with various government policies and regulations existing to support them (Rathenam, 2017). In Nigeria, significant variations in engagement practices showed high engagement levels, leading to greater community acceptance and better environmental outcomes, in which key success factors included strong leadership, adequate funding, and effective communication (Unegbu et al, 2024). The aim of the study is to assess the influence of community engagement in project maintenance on the performance of road construction projects in Juba County, South Sudan.

Methodology

Research Design

A research design is regarded as the conceptual structure within which research is conducted. The study used a cross-sectional research design. It adopted quantitative approaches; the quantitative approach was used to quantify and analyze the data gathered from the study sample. The cross-sectional survey research design was preferred for this study because it was quick to conduct, data is only collected once, and it takes a snapshot of on-going situation, and because it allows analysis or mapping out of the relationship between two or more educational variables. Quantitative data were used in the study. Quantitative method was selected because most phenomena were described in numbers and measures.

Study population

This study was conducted in Juba County. The target population for the study was 42,589 respondents according to the South Sudan Bureau of Statistics census (2008). The population entailed the executive members of the leadership of Juba County, the technocrats, politicians, and the local community of Juba County.

Determination of the Sample Size

Sample size referred to the maximum number of respondents that was representative of an entire population. In other words, it is a subset of a population. From the above identified accessible population of 42,589 respondents, a sample size of 396 respondents was determined based on the Sloven's formula as calculated below;

$$n = \frac{N}{1 + N(e)^2}$$

$$1 + N(e)^2$$

Where **n** is the sample size, **N** is the population, and at the same time **e** is the error term, which will be 0.05; therefore, the sample size will be: $n = \frac{42,589}{1 + 42,589(0.05)^2} = 396$

$$1 + 42,589(0.05)^2$$

The sample of the study consisted of 396 respondents; 05 Counties and town councils.

Executives, 05 Counties and Town Council Top Administrative leadership, 02 Counties Local Road Contractors, 05 Town Councils & Chiefs, Road User Committees, and 379 local community members as shown in the table below.

Table 1: Accessible population, Sample size, and Sampling Techniques

Category	Accessible Population	Sample Size	Sampling Techniques
Counties and Town Council Executives.	18	05	Purposive Sampling
Counties and Town Council Administrative leadership	16	05	Purposive Sampling
County residence	10	02	Census
Town Councils, chiefs, and Road User Committees	42	05	Simple Random Sampling
Town Council community members and town council counsellors	42,503	397	Simple Random Sampling
TOTAL	42,589	396	

Source: Juba County Five-Year Development Plan (2012/17 and determined based on the Krejcie & Morgan Mathematical Table (1970).

Sampling Techniques and Procedure

Sampling is used to get information about a population. That is because it is often too expensive, time-consuming,

practically impossible, or simply unnecessary to canvass the whole population. The study used a combination of both random and non-random sampling techniques.

Simple random sampling was used because of its simplicity and the ability to allow all respondents an equal chance of being included in a sample. This technique was applied on identification of the local chiefs together with Road User Committees, and the community in the Town Council area to whom the questionnaires were administered. On the other hand, the purposive sampling method was used to select key informants for interviews. The purposive method was considered appropriate because it enabled the researcher to select the exact people who were involved in community projects in the area under study.

Data Collection Methods

Data collection is a process of collecting information from all the relevant sources in order to find answers to the research problem, test the hypothesis, and evaluate the outcomes. They were divided into two: primary and Secondary data collection.

Questionnaire

A questionnaire could be referred to as a predetermined written list of questions that may be answered by a respondent without supervision or explanation. It was developed in line with the objectives of the study, pretested for consistency, as it allowed the respondents to give free and independent opinions. The questionnaire involved a series of direct, closed, and open-ended questions designed to get answers from the respondents with responses of yes or no. Questionnaires were distributed to collect quantitative data from the determined sample of 02 members of Counties Local Road users, 05 members of Town Councils Local chiefs and Road User Committees, 379 members of Town Council community members, and Town Council counsellors. In case of non-response, the study will make a call up on respondents on whether they filled the questionnaire. A call-up enabled respondents to prioritize the study.

Interview

This is a method of data collection where the investigator gathers data through direct verbal interaction with the participant. It was adjusted by the researcher to meet many diverse situations. The researcher played a critical role in probing to acquire in-depth information about the key research questions of the study. An interview guide was used to collect data from key informants who included 05 members of the county and town council executive, 05 members of the chosen county and town council administrative leadership. The interviews involved face-to-face discussions on issues pertaining to community engagement and performance of the road construction project in Juba County, located in South Sudan. The choice of the method enabled the researcher to gain a relationship with the respondents, in addition to aiding the researcher to probe for in-depth information and obtain clarity on any unclear issues.

Data Collection Instruments

Four main research instruments were used in the study, including the key information interview checklist, questionnaire, and documentary review checklist, as detailed below.

Interview guide/ Key informant Interview Checklist

The key information interview checklist or interview guide was used to collect data from key informants that included 05 members of the chosen counties and town council executive, 05 members of the Juba county and town council administrative leadership. The interviews involved face-to-face discussions on issues pertaining to community engagement and performance of the road construction project in South Sudan, specifically Juba County local government. The choice of the method was to enable the researcher to gain a relationship with the respondents, in addition to aiding the researcher to probe for in-depth information and obtain clarity on any unclear issues.

Questionnaire survey

A composite of questionnaires was designed to capture information about community engagement and performance of the road construction project in South Sudan, and especially in Juba County. The questionnaire was structured, with items that were easily interpreted by the respondents. Some items contained a list of alternatives from which respondents chose answers of their choice. In addition, the study used a five (5) Likert scale ranging from one (1) for strongly disagree to five (5) for strongly agree to mean that the higher the number, the greater the influence of community engagement and performance of the road construction project in Juba County, South Sudan. This was useful in the study as it helped in determining the relationship among the variables under investigation. The questionnaires were administered to two (02) members of Juba county locals, five (05) members of the town Councils, County chiefs and Road User Committees, three hundred and nine (379) members of the town council community members, and town council counsellors.

The choice of this instrument was made because it helped collect opinions, views, and beliefs from a large number of respondents in a relatively short time, as the generally literate respondents answered the questions in private without being affected by the researcher's presence. The advantage of a questionnaire was that it was looked at as a single most suitable tool for collecting independent opinions, feelings, attitudes, perceptions, and views from a large number of different categories of relatively literate respondents within a short time.

Documentary Review Checklist

This instrument contained the use of a list of documents that were reviewed by the researcher to acquire more

secondary data required for the study. Some of the documents that were included on the review list were: Juba County Budget Performance Report (2019/2014), South Sudan National Budget (2019/2024), and Juba County Financial Report (2018/19).

Validity and Reliability

To ensure quality instruments, validity and reliability checks were conducted as explained below;

Validity of the Instrument

Validity refers to the degree to which results obtained from the analysis of the data represent the phenomenon understudy. Content validity index (CVI) was computed to ensure that the measure included was adequate and a representative set of items that tap into the community engagement and performance of the road construction project in Juba County local government, South Sudan. In the study, content validity of the questionnaire was obtained by identifying three people who were well versed with the measurement of the study attributes to rate the items for relevance to the study variables. Each of them was asked to rate each question as relevant, quite relevant, irrelevant, or quite irrelevant. The CVI for the whole instrument was then obtained by calculating the number of items declared relevant by all three judges divided by the total number of items in the questionnaire. $CVI = \frac{\text{No. of items declared relevant}}{\text{total number of items in the questionnaire}}$. If the $CVI \geq 0.70$, then the item is accepted as valid for the research purpose.

Reliability of the Instrument

Reliability is the degree to which an assessment tool produces stable and consistent results. The closer Cronbach's alpha is to 1 (one), the higher the internal consistency reliability. To ensure reliability, the research instruments were pre-tested, and data were collected and analyzed. A micro field research exercise was carried out to enable the researcher to select the key questions that would enable him to obtain the relevant data for the topic under study. In addition, the reliability measure was established by testing for both consistency and reliability. Consistency indicated how well the items measuring a concept hung together as a set. Qualitative responses obtained from the group of 10 respondents and pretested using the Cronbach's alpha reliability coefficient, a feature embedded in SPSS, revealed whether the items were positively correlated to one another or not.

Data Analysis

Data was managed and analyzed by using quantitative methods.

Quantitative Data Analysis

There are three objectives of data analysis, which include: getting a feel for the data, testing the goodness of the data, and testing the hypotheses developed for the research. Statistical Package for Social Sciences (SPSS) version

was used to enter and analyze the numerical data collected from the questionnaires. After data collection, the researcher organized the data by counting the responses from the questionnaires, coding and tabulating them, and then the results were presented in groups according to the three research questions. Inferentially, data was presented using the simple linear regression - specifically model summary to determine the effect and variation in the dependent variable and independent variables under the study. Data was summarized descriptively in terms of frequencies, means, standard deviation, and percentages. In addition, the data were presented in tabular and graphical formats for discussion and interpretation.

Measurement of Variables

The study variables were categorized into the core independent variable and dependent variables. In this case, community engagement formed the independent variable while the performance of the road construction project represented the dependent variable. The variable measurement will be based on a five-point Likert scale of: 5 = Strongly Agree (SA); 4 = Agree (A); 3 = Undecided (UD); 2 = Disagree (D); 1 = Strongly Disagree (SD), and was measured based on the ordinal measure since the items were ranked or numerical data. On the other hand, nominal measurements were used on background variables, such as age, gender, and experience, among others.

Ethical considerations

The ethical issues for consideration in this study included confidentiality, anonymity, privacy, and informed consent, which were required in all studies and research using human participants. In seeking consent from the respondents, the researcher explained the purpose of the study, expected duration, procedures of the study, and what the information gathered was to be used for, ensuring informed consent. The researcher ensured that privacy matters were addressed from the inception of the research to the publication of the results. There were safety nets put in place to guarantee confidentiality. The instruments for collecting data guaranteed anonymity for all the respondents. The only amount of personal data that was collected for the research had minimal amount needed to ensure a proper sampling of the population. Personal identifiable information was not collected or maintained unless necessary and consented to by the respondents. The participants remained anonymous throughout the study, even to the researcher himself. All the instruments, questionnaires, and interview schedules clearly explained the intention of the study to respondents. Respondents received full disclosure of the nature of the research, the benefits and risks involved, and an opportunity to ask questions. The researcher also explained to respondents the major objective of the research as being purely for academic purposes. The researcher thereafter requested respondents to give their opinions on the problem under study.

Results

Respondents Background Information

Table 2. Demographic Information

Gender	Frequency	Percent
male	198	50
female	198	50
Total	396	100
Age		
Under 20	23	6
21-30	28	7
31-40	113	28
41-50	68	17
Over 51 yrs.	164	41
Total	396	100
Marital status		
single	91	23
married	305	77
Total	396	100
Academic qualifications		
'O' level	339	86
Diploma	45	11
Degree	12	3
Total	396	100.0

Table:2, present the demographic information and shows that the gender of the respondents was 50% male and 50% female, while on Age 41% were over 51 yrs. with 6% being Under 20yrs. Marital status of respondents shows that 77% were married, with 23% being single, and finally, on Academic qualifications, 86% were O-level

school leavers, with 3% having a degree level of education.

Community Participation in the Maintenance of Road Construction Projects

Table 3: Community Participation in Maintenance of Road Construction Projects

How would you rate the flow of maintenance information between the management and the community?		
	Frequency	Percent
very good	198	50
good	198	50
Total	396	100
Does the maintenance of the road construction project ensure uninterrupted road transport?		
yes	317	80
No	79	20
Total	396	100
In what ways are the stakeholders of the road construction projects involved in the maintenance of the road works?		
provision of the maintenance resources	153	37
availing maintenance cost	62	16
involvement in the maintenance process	181	46
Total	396	100
How would you rate the maintenance of the plans made to ensure sustainable technical sustainability of the services?		
very good	74	19
good	272	60
neutral	51	13
Total	396	100

Table 3 presents the Community Participation in Maintenance Stage on how they rate the flow of maintenance information between the management and the community, 50% said very good, and 50% said good. On whether maintenance of road construction projects ensure uninterrupted supply of clean water, 80% said yes, while 20% said no. On the question of what ways are the stakeholders of the water project are involved in the

maintenance of the road construction projects, provision of the maintenance resources, 37% said by availing maintenance cost 16%, while 46% said through involvement in the maintenance process. On how they would rate the maintenance of the plans made to ensure sustainable technical sustainability of the services, 19% said this was very good, while 60% saying it was good, and 13% were neutral.

Table 4: Descriptive Statistics on Community engagement in Maintenance of road construction projects

	Likert scale					N	Mean	Std. Deviation
	Very much (5)	Much (4)	Not sure (3)	Not much (2)	Not at all (1)			
To what extent does the sharing of maintenance costs influence the sustainability of the community road construction projects?	22	38	2	6	2	70	1.9714	0.97760
To what extent does the Provision of maintenance labour influence the sustainability of the community road construction project	32	26	12	0	0	70	1.8857	1.07059
To what extent does the sharing of maintenance resources influence the sustainability of the community road construction projects?	25	23	1	19	2	70	2.2857	1.28698
Average							0.7619	0.429

Table 4 presents descriptive statistics on the influence of Community Participation in the maintenance Stage and has a Mean average of 0.7619 on a 5-point Likert scale, which is 15% and a Std. Deviation of 0.429, which is below 1.00, reflecting a common opinion on the influence of Community Participation in Maintenance Stage on the

sustainability of community-based road construction projects.

The effect of community engagement in project maintenance on the performance of road construction projects

Table 5: A regression analysis on the effect of Community engagement in project maintenance on the performance of road construction projects

	Unstandardized coefficients		Standardized coefficient	T value	Sig
	B	Std. Error	Beta		
Constant	.626			3.128	.000
Project maintenance	.395		.414	4.721	.000
Dependent variable: performance of road construction projects					
R squared	.366				
Adjusted R-squared	.354			Sig	0.000

Source: field data (2024)

Table 5, it was established that 35.4% changes in the performance of road construction projects in Juba can be explained by community engagement in project

maintenance. The 64.6% changes in explained by other factors. Furthermore, a unit increment in sound community engagement in project maintenance leads to

an increment in the performance of road construction projects in Juba by .414 units. The coefficient is significant at 5% significance level since the P value ($0.00 < 0.05$). This gives evidence that community engagement in project maintenance significantly affects the performance of road construction projects.

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DISCUSSION

Community engagement in project maintenance and performance of road construction projects in Juba

The study revealed that there is a positive correlation between community engagement in project maintenance and the performance of road construction projects in Juba City. The study revealed that community members in Juba hold meetings to discuss the gaps involved in road construction. They are dedicated to giving road specifications to be implemented by a contractor; they are also engaged in community sensitization when a road is being launched, and they forecast the consequences of a given road project to be implemented in Juba. The findings of the study are similar to the literature by Jurian Edelenbos (2005), who studied the Management of Stakeholder Participation in Decision Making in municipal councils in the Netherlands whose findings revealed that greater input in decision making from a variety of parties generated a variety of ideas and potentially enriched the process substance. Therefore, the more stakeholders involved in decision-making, it helps in the identification of gaps in the roads sector, which in turn leads to an improvement in service quality of road construction projects.

Conclusion.

Community engagement in the maintenance stage of the community road construction project has no significant influence on the performance of community-based road construction Projects. Sharing of maintenance costs, provision of maintenance labour, and sharing of maintenance resources may not be the appropriate approach to community engagement during the maintenance stage of a community road construction project.

Recommendations

Community road construction projects should explore other approaches of community engagement in the maintenance stage, other than sharing of maintenance costs, provision of maintenance labour, and sharing of maintenance resources.

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Conflict of interest

The author did not declare any conflict of interest.

Author contributions

Modi John Molla designed the study proposal, collected and analyzed the data, and drafted the manuscript.

Dr. Mwesigwa Simon supervised all the stages of the project to drafting the manuscript.

Dr. Ssembajjwe Ben was an external supervisor of the research project.

Ethical approval

The study was undertaken in an ethical manner by seeking permission before conducting the research in the form of a formal letter of request elaborating reasons for undertaking the study and the study's purpose. The researcher also assured the respondents that any information submitted was treated with utmost confidentiality.

Informed consent

The purpose of the study was well explained to the respondents, and consent was obtained from the respondents before data collection.

Availability of data

Use of published data from this study is subject to the copyright laws of Team University. Authorization to use this data may be sought from the School of Graduate Studies and Research.

Author biography

Modi John Molla is a student of the Master's Degree in Educational Planning and Management at Team University, Kampala, Uganda.

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