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ABSTRACT

The objective of the study was to assess the effective of monitoring towards successful completion of road projects in Tanzania. The study employed a descriptive research design whereby 281 employees were included in the sample by simple random and purposeful sampling methods. The study population were from the Ministry of Works and Transport (MoWT), Tanzania National Roads Agency (TANROADs), Consultants, and Contractors for road projects. The sample size for the questionnaire survey was determined using a statistical method to obtain a sample size that is sufficient, reliable, and representative of the population. Structured questionnaires and an interview schedule were used to gather the data. Using the Statistical Package for Social Sciences (SPSS) as the data analysis tool, non-parametric data was descriptively examined using frequencies and percentages. The findings of the study revealed that monitoring systems were necessary for successful completion of road projects. To ensure the effective completion of the road project, the study advised close monitoring of the project execution phases. The study concluded that in addition to community involvement, proper funding, and the development of project monitoring personnel's capacity, there are other elements that contribute to road projects being completed successfully. Additionally, the current project monitoring approach should be adopted, and funding for road project monitoring should be increased.

Keywords: Road projects, Monitoring, Statistical Package for Social Sciences, Project success

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INTRODUCTION

A monitoring and evaluation is a continual information and data collection procedure (Maulana 2017) and it is also significant for successful completion of road projects (Maijo 2020). Due to greater donor engagement in the execution of road projects, the function of monitoring has considerably increased. Donors take into account the usefulness, effectiveness, outcome, and completion of the sponsored project, hence effective monitoring is crucial. Ntoyanto (2016) stated that effective monitoring procedures during the project management process result in project completion which is assessed in terms of time, cost as well as quality (Oh and Choi 2020). Road projects continue to have difficulty managing them, have inadequate M&E links, and have minimal success, effect, and completion (Leonidou et al. 2017). Since monitoring purpose is to direct implementation and gather information that enables tracking progress of projects, its influence and completion should be considered when evaluating the system's success. The outcome of the project and the successful completion of the road construction are both affected by the nature of monitoring mechanisms. According to San Cristóbal et al. (2018), road projects are crucial to the development of social activities. Treating effective monitoring is essential to fostering project maturity and efficiency. Evidence on effective monitoring throughout project execution was also identified by Valence (2018) as the essential component for project management success. They demonstrated that effective monitoring can be used to determine precisely when a project is on track and when adjustments may be necessary (Jarrin 2019). Waweru (2018) noted that a robust tracking system is necessary for the monitoring process. Monitoring procedures are essential to the success of a project because they give managers and other stakeholders feedback on the execution. Tanzania embarked in construction of roads using her own funds in early 2000's. As the number of road projects increased, there has been a public outcry regarding success of projects in terms of timely completion, high-cost overruns, poor quality of completed road projects

and low satisfaction to stakeholders. The cause of all issues of poor success of the road projects is being linked to improper monitoring of the road projects during planning and implementation stages.

By providing corrective action for deviations from the expected norm, the project monitoring practices provide value to the overall efficiency of project planning, management, and implementation. Tanzania's monitoring of projects is lacking due to lack of institutional structures. Most public organizations lack trained monitoring specialists who are capable of developing relevant tools, resulting in inadequate monitoring systems (Nyakundi, 2018). There are numerous obstacles to the success and long-term viability of road construction in Tanzania. One of the factors that contribute favorably to managing public sector affairs and influencing project success is an effective monitoring process (Otieno, 2017). Several studies have found that putting in place good monitoring practices boosts project success (Fransisko, 2016; Kissi et al., 2019). However, existing tools for monitoring the implementation of road projects make it difficult to follow the project's progress. Scholars discovered that because of ineffective monitoring, almost 60% of significant programs fail to meet their objectives (World Bank, 2016). As a result, projects are delivered over budget, behind schedule, compromising quality, cost, and the project's success (Musomba et al., 2015). According to researchers, the amount of attention paid to monitoring does not appear to be consistent throughout the project cycle. Since most organizations lack appropriate monitoring mechanisms, it is difficult to know whether planned outcomes are being achieved as intended. As a result, remedial steps must be implemented to ensure that the expected results are delivered (Tsoumpri et al., 2016).

Monitoring of road projects in Tanzania does not meet the targets established, such as completing projects within budget, time frame and quality, this demonstrates the need to close the knowledge and practice gap in Tanzanian monitoring methods. It is

with this in mind that the study assessed the need for monitoring of road projects in Tanzania.

METHODOLOGY

This study adopted qualitative paradigm with mixed methods research approach using descriptive survey design. Data were collected in two phases depending on their purposes. The first phase involved determining the effectiveness of existing monitoring practices on road projects and assessing the effect of monitoring enabling factors on road project success. The second phase was to evaluate the influence of monitoring techniques and tools on road projects and collect variables. The 281-sample size for the survey was determined using statistical methods. This was considered sufficient, reliable, and representative of the population. The main methods of data collection in this study were questionnaires

and interviews. Responses were processed using Statistical Package for Social Sciences (SPSS) version 20.0 to analyze the data.

RESULTS & DISCUSSION

Demographic Characteristics

According to Figure 1, most of the respondents in this study came from Dar Es Salaam (45%), followed by Dodoma (35%), and Mwanza (20%). Furthermore, respondents were drawn from TANROADS' Head office and regional offices, contractors, and consultants stationed in Dar Es Salaam. The replies for the Dodoma region were from the Ministry of Works and Transport (MoWT), the TANROADS regional office, consultants, and contractors whereby respondents in Mwanza region were from TANROADS regional office.

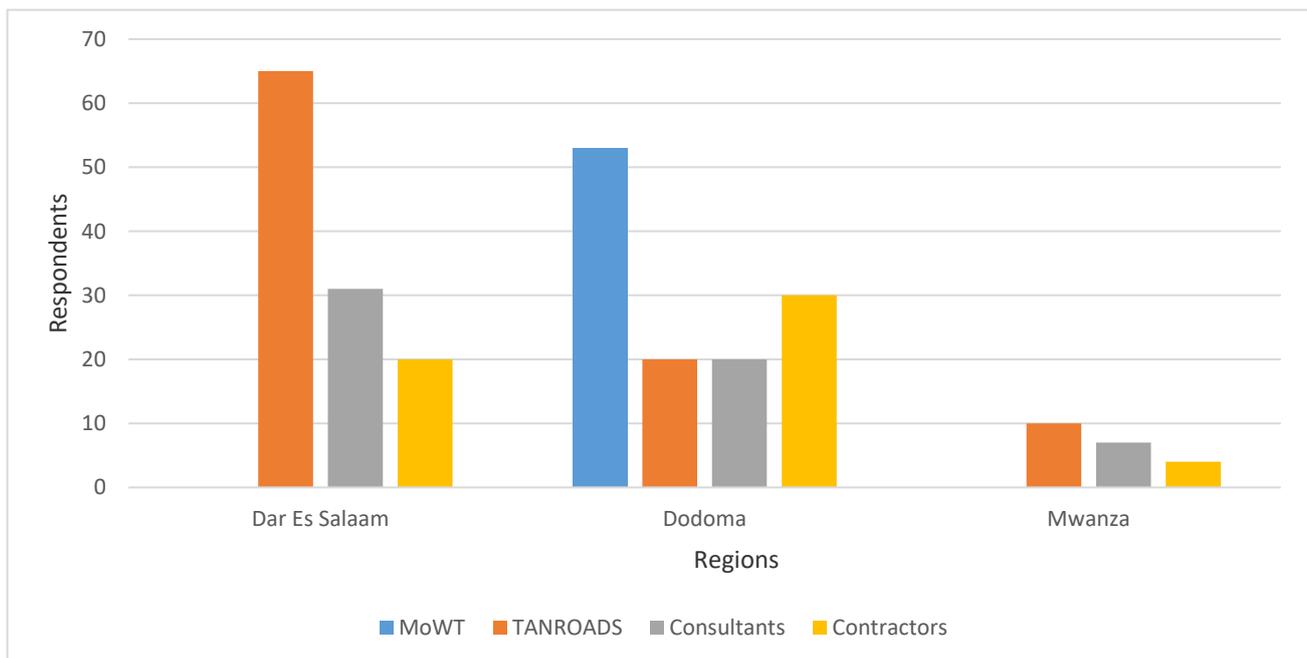


Figure 1: Regions of respondents

Figure 2 showed that many regional managers (64%) participated in the survey. In addition, project managers (12%) and contractors (24%) made up a larger percentage of the respondents, and most of the construction industry that participated in the study had between 101 and 500 people (45 % of the

respondents). However, it is assumed and inferred that having most respondents as contracting companies with more than 100 employees will provide accurate information on the monitoring techniques that lead to successful road project completion.

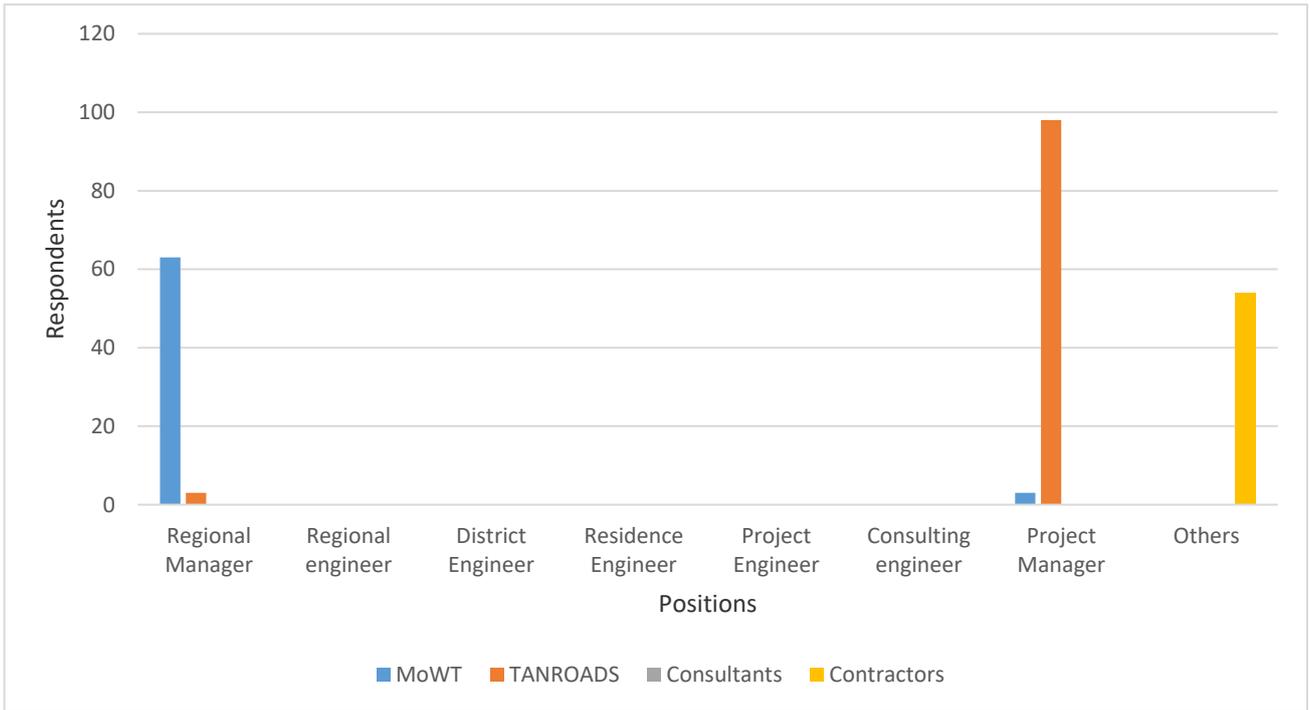


Figure 2: Position of respondents

According to Figure 3, most respondents had 5-10 years of work experience, resulting in a cumulative percentage response of 76%. The share of respondents with 0-5 years of work experience was

greater, at 37%. 18 % of all respondents had 10 to 20 years of job experience, while only 2% had more than 20 years of experience.

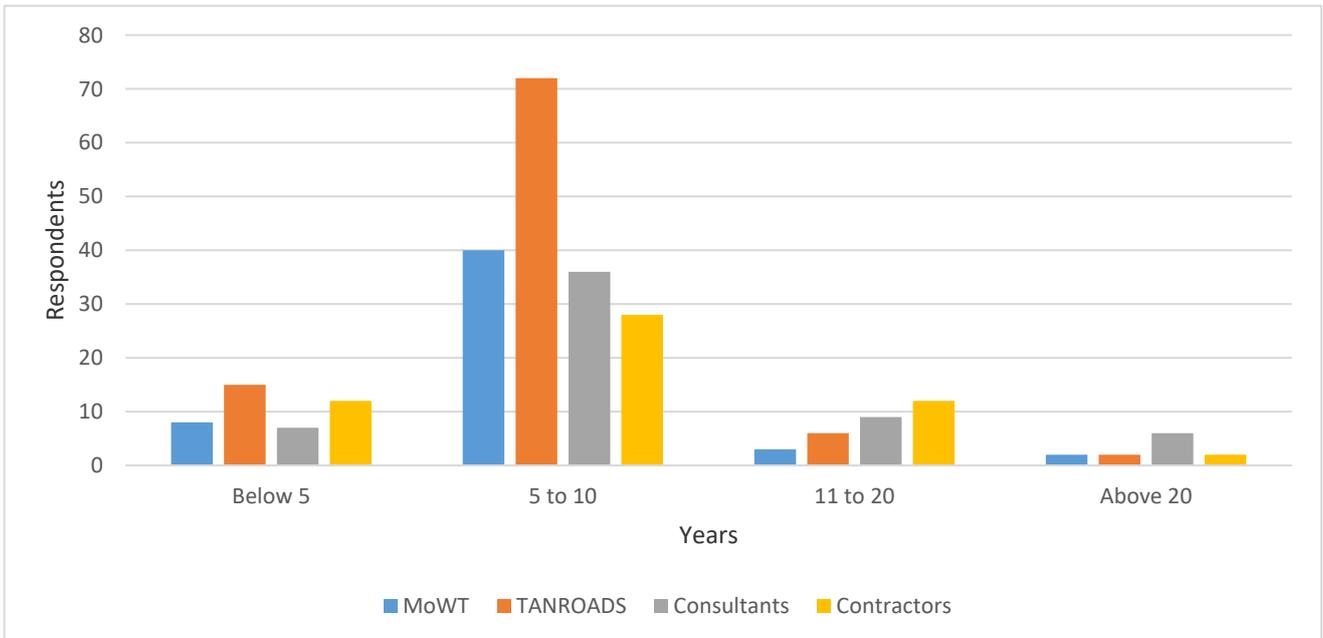


Figure 3: Service duration of respondents

Figure 4 showed that most respondents (83%) had prior experience on monitoring of road construction projects, while only 17% have no prior experience.

This also shows that respondents provided useful input because they have sufficient experience in monitoring connected issues.

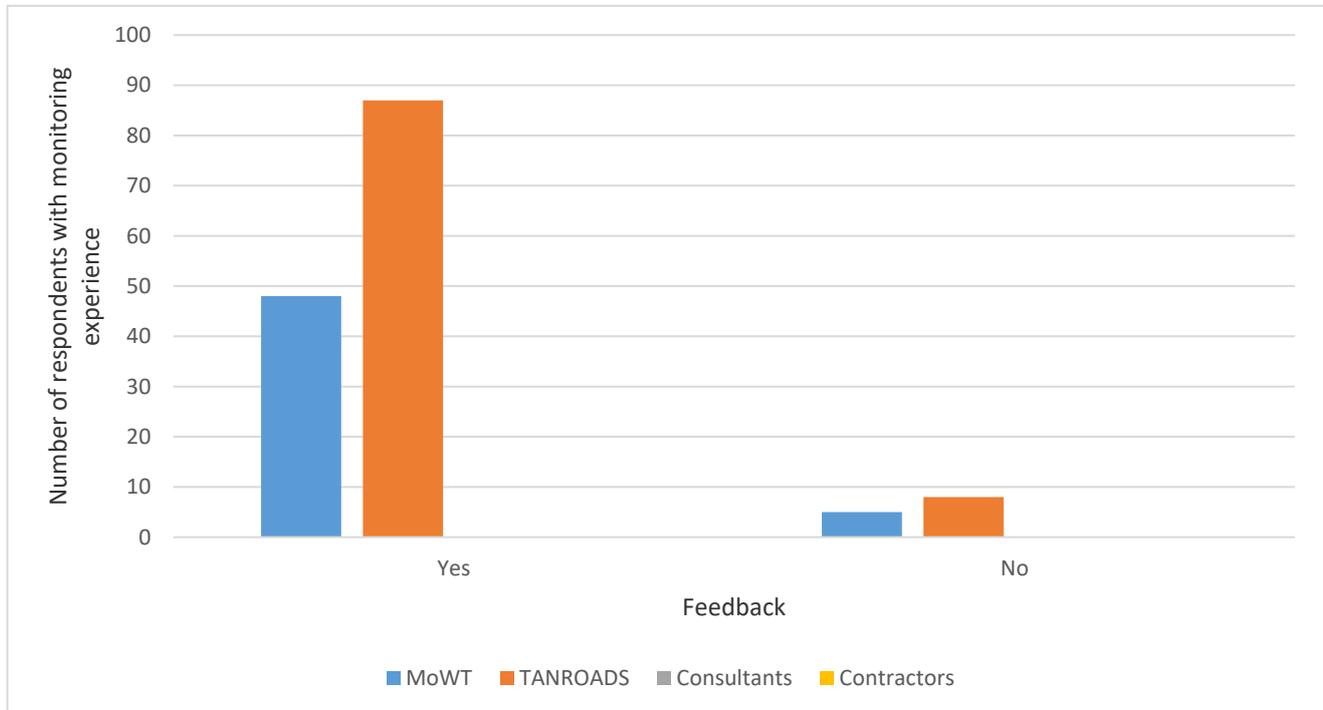


Figure 4: Monitoring experience

The need of Monitoring Systems on Road Projects Success

To assess the need for effective monitoring, a set of criteria was used to identify the study variables, including monitoring practices, monitoring enabling factors, and monitoring tools, as discussed in Tables 1 through 4.

Table 1 shows that if the monitoring techniques are to be effective during road construction, employee competence monitoring (M=4.1392, SD=1.27515), followed by construction material specification monitoring (M=3.9642, SD=1.08902), must be implemented effectively. Compliance with

specification monitoring (M=3.9761, SD=1.22370) was cited by respondents as a major factor in inadequate road project monitoring. In addition, five items scored below the criterion mean cutoff value of 3.0, as shown in Table 4.1. Time monitoring (M=2.7873, SD=1.47370), cost monitoring (M=2.5686, SD=1.19876), on-site monitoring (M=2.7058, SD=1.23564), process monitoring (M=2.7217, SD=1.48367), and technical audit (M=2.6978, SD=1.31045) are among the signs indicating ineffective monitoring practices. The findings of this study are consistent with those of other similar investigations (Gitahi, 2015; Ochieng, 2018).

Table 1: Respondents mean rating on monitoring practices for road projects

Statement	N	Mean	SD
Time monitoring	95	2.7873	1.47370
Cost monitoring	95	2.5686	1.19876
On site monitoring	95	2.7058	1.23564
Process monitoring	95	2.7217	1.48367
Equipment monitoring	95	3.5368	1.31121
Employee competence monitoring	95	4.1392	1.27515
Compliance with specification monitoring	95	3.9761	1.22370
BoQ monitoring	95	3.5030	1.36967
Technical audit	95	2.6978	1.31045
Earned value monitoring	95	3.2584	1.32280
Contract monitoring	95	3.1332	1.44768
Site meeting	95	3.6163	1.30349
Activity monitoring	95	3.5308	1.38811
Work safety monitoring	95	3.2982	1.52226
Environmental compliance monitoring	95	3.3108	1.37668
Construction material specification monitoring	95	3.9642	1.08902
Construction methods monitoring	95	3.5865	1.31645
Check list monitoring	95	3.3598	1.42953

Table 2 shows that the respondents strongly believe that political will (M=4.1312, SD=1.17013), competent monitoring personnel (M=4.0736, SD=1.23065), technical competence of the project team (M=4.0676, SD=1.18397), and availability of the project design document (M=3.8613, SD=1.16213) are all important factors to consider in order to complete the road project successfully. The respondents also indicated that the project manager's managerial competence (M=3.5274, SD=1.15046), technical competence (M=3.3776,

SD=1.13126), availability of a monitoring plan (M=3.0467, SD=1.12119) and monitoring personnel (M=3.0123, SD=1.14011), and the presence of a monitoring guide (M=3.1889, SD=1.70367) all have a minor impact on the success of road construction projects. On the other side, one element, availability of resources (M=2.9423, SD=1.27443), was evaluated below the criterion mean cut-off of 3.0, indicating that it has no bearing on the success of road construction projects.

Table 2: Respondents mean rating of monitoring enabling factors

Statement	N	Mean	SD
Availability of project design document	95	3.8613	1.16213
Political will	95	4.1312	1.17013
Competent monitoring personnel	95	4.0736	1.23065
Existence of a monitoring guide	95	3.1889	1.70367
Availability of resources	95	2.9423	1.27443
Availability of monitoring personnel	95	3.0123	1.14011
Availability of a monitoring plan	95	3.0467	1.12119
Technical competence of project manager	95	3.3776	1.13126
Managerial competence of project manager	95	3.5274	1.15046
Technical competence of project team	95	4.0676	1.18397

Table 3 demonstrates that the respondents were quite sure. The Bill of Quantities (BoQ) (M=4.2187,

SD=1.02162), the construction contract (M=4.2028, SD=1.24756), the outcome framework (M=4.0477,

SD=1.20164), and the work plan (M=4.0467, SD=1.20164) are all important monitoring instruments for the success of a road project. Other variables include time variance (M=3.8290, SD=1.16326), cost variance (M=3.7555, SD=1.19504), activity checklist (M=3.7913, SD=1.11766), activity tracking matrix (M=3.9324, SD=1.06530), indicator tracking matrix (M=3.8290,

SD=1.16326), project scope statement (M=3.2147, SD=1.42321), log frame matrix (M=3.3936, SD=1.06530), and work breakdown structure (M=3.4, SD=1.33678). The respondents, on the other hand, claimed that the project charter (M=2.8986, SD=1.18576) and the risk register (M=2.6481, SD=1.29565) do not help to the road project's success.

Table 3: Respondents mean rating of monitoring tools on road projects

Statement	N	Mean	SD
Work breakdown structure	95	3.4632	1.33678
Work plan	95	4.0467	1.20164
Risk register	95	2.6481	1.29565
Construction contract	95	4.2028	1.24756
Project charter	95	2.8986	1.18576
Activity tracking matrix	95	3.9324	1.06530
Indicator tracking matrix	95	3.8290	1.16326
Activity checklist	95	3.7913	1.11766
Log frame matrix	95	3.3936	1.45316
Result framework	95	4.0477	1.16801
Project scope statement	95	3.2147	1.42321
Cost variance	95	3.7555	1.19504
Time variance	95	3.8290	1.16326
BoQ	95	4.2187	1.02162

The result on Table 4 indicated all the factors proposed by respondents if properly considered, can enhance monitoring of road construction projects, since both were evaluated above the criterion mean cut-off of 3.0 i.e. adequate and competent of monitoring personnel (M=4.3678, SD=1.04763),

development of monitoring checklist (M=4.3360, SD=1.06765), work breakdown structure can make monitoring effective (M=4.1511, SD=1.08275), activity tracking matrix (M=4.0080, SD=1.05993), monitoring resources availability (M=3.7594, SD=1.09680) and presence of complete and clear drawings (M=3.7197, SD=1.00346).

Table 4: Respondents mean rating of monitoring tools on road projects

Statement	N	Mean	SD
Adequate and competence of monitoring personnel	95	4.3678	1.04763
Monitoring resources availability	95	3.7594	1.09680
Presence of complete and clear drawings	95	3.7197	1.00346
Development of monitoring checklist	95	4.3360	1.06765
Activity tracking matrix	95	4.0080	1.05993
Work breakdown structure can make monitoring effective	95	4.1511	1.08275

The result generally indicated that monitoring systems are necessary as they enhance road project success. This is also supported by interview response on the assessing the effectiveness of the monitoring system based on the set of criteria. One of the

respondents said. "... the successful completion of the road project largely depends on the mechanisms set during planning the project, nevertheless, this should be effective only if monitoring system lies in

the criteria set and the adequate allocation of a budget.”

The results of the study implied that the effective use of monitoring on road projects are of great importance for successful completion of the project. The results are also backed by other published articles, like Selestin (2018), who contends that monitoring is one of the key tasks that must be repeated frequently as long as a road project is in progress. It should be assumed that the project's completion will remain in doubt if the projects are created without considering the function of effective monitoring in the future. A project budget needs to be created and should include a detailed plan for monitoring activities. Due to the important role it plays in project management, Chan and Chan (2004) pointed out that the monitoring budget can be explicitly separated from the overall project budget to create an effective monitoring system. To achieve project goals and complete the project, the planning process should consider a donor's preferred method of project monitoring technique. Moreover, in order

to guarantee that projects are effectively finished, it is also crucial to carefully review all forms of monitoring that are employed because they ensure that data on the progress of the road project is actively gathered.

CONCLUSION

The study's conclusions showed that monitoring systems were essential for the success of road projects. The study recommends adopting effective monitoring practices during project execution phases to guarantee the efficient completion of the road projects. The study also identifies additional factors, such as community involvement, adequate finance, and the training of project monitoring people, that contribute to the success of road projects. These results also help establish a realistic baseline for future research on the significance of using efficient monitoring during project execution.

Conflict of Interest

There are no conflicts to declare.

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