

Does Citizen Monitoring Save Public Money?

The case of monitoring infrastructure
projects in Northern Ghana

Research Report, September 2023

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This research was commissioned by Integrity Action, in partnership with SEND Ghana. It was led and written by Albert Arhin and Kenneth Donkor-Hyiaman from Kumasi University of Science and Technology (KNUST), and Catherine Allen from INTRAC. Other contributors include Dr Michael Addy, and three students from KNUST - Mumuni Sungsumah Adeline, Fosuaa Hikmat Agyeman and Lydia Amissah. It was overseen by Daniel Burwood from Integrity Action.

Acknowledgements

The research team from INTRAC/KNUST would like to thank Integrity Action and SEND Ghana for their unfailing support throughout the process. In particular, we would like to thank Daniel Burwood, Emmanuel Ayifah, Jonathan Dery and Mumuni Muhammed. We would also like to offer our appreciation to the Research Steering Group: Esther Ofei-Aboagye, Courtney Tolmie and Abdul-Gafaru Abdulai for their oversight, guidance, and feedback.

Finally, and most importantly, we would like to express our immense gratitude to all the Citizen Monitors and community members who gave up their time to speak with us as part of this research. Their contribution has enriched our understanding of the role that citizen monitoring can play in delivering much-needed infrastructure development.



Integrity Action is an independent non-governmental organisation.

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Acronyms and Abbreviations

ACWP	Actual cost of work performed
BCWP	Budget cost of work performed
CBA	Cost-benefit analysis
CIT	Critical incident technique
CM	Citizen monitoring
CPI	Cost performance index
CR	Critical ratio
CV	Cost variance
ETC	Estimate to complete
EVA	Earned Value Analysis
FGD	Focus group discussion
GHS	Ghana Cedis
GSS	Ghana Statistical Services
IRR	Internal rate of return
LGSS	Local Government Service Secretariat
M&E	Monitoring and evaluation
MMDA	Metropolitan, municipal and district assemblies
M4FSP	Monitoring for Financial Savings Programme
NDPC	National Development Planning Commission
NPV	Net present value
PM&E	Participatory monitoring and evaluation
SPI	Schedule performance index
SSI	Semi-structured interview
SV	Schedule variance

Executive Summary

Citizen engagement is increasingly acknowledged for its role in achieving development and governance objectives, using approaches such as Community Score Cards, Citizen Juries, and Social Accounting. Integrity Action and SEND Ghana have developed their own [Citizen Monitoring \(CM\)](#) approach, which integrates community monitoring, social accountability, and problem-solving.

Weak accountability and oversight are perhaps the single most important factors that prevent many community-level infrastructure projects from being completed on time and to budget. The way contractors, politicians, public officials, and communities interact and collaborate can determine the effectiveness and quality of delivery.

Extensive documentation exists regarding the advantages of citizen monitoring for funders, communities, and politicians. Yet, the viewpoint of public officials, especially concerning aspects like value for money and cost savings, has received minimal attention or exploration to date. Being able to demonstrate how citizen monitors can tangibly enhance the efficient utilization of public funds could elevate their status to that of collaborators in local infrastructure delivery. This, in turn, could empower public officials to act as more potent catalysts for change.

Between 2021 and 2023, SEND Ghana, in partnership with Integrity Action, implemented the [‘Monitoring for Financial Savings’ Programme](#) (M4FSP) in Northern Ghana. As part of this programme, a research study was carried out by [Kwame Nkrumah University of Science & Technology](#) and [INTRAC](#), to test the hypothesis that engaging citizens as active participants in monitoring and oversight activities can help governments to save money and achieve better outcomes for infrastructure projects. The research team tested the utility and validity of different assessment methods. As this was, to the best knowledge of Integrity Action, SEND and the research team, the first study of its kind, the aim was to learn from the process in order to support future assessments. The findings are intended to inform policymakers, government agencies, civil society organizations, and development practitioners.

Northern Ghana is characterized by limited resources, underdeveloped infrastructure, and high levels of poverty and inequality. Government-funded construction projects play a crucial role in addressing these challenges and promoting socio-economic development in the region. According to the Ghana Statistical Service (GSS), the construction sector is a significant contributor to the country’s GDP (18%, or \$8 billion in 2018). It also provides employment opportunities.

In the context of Ghana's decentralized governance system, local government plays a crucial role in infrastructure development. District Assemblies, as the primary units of local government, are responsible for coordinating and implementing development projects, including roads, schools, health centres, and more (Local Government Act of 1993). District Assemblies and other parastatal organisations invest significantly in infrastructure to improve access to vital services and enhancing economic opportunities. However, there have been concerns about the efficiency and effectiveness of government-funded projects at the local level where delays, non-completion, and abandonment of construction sites are not uncommon.

Fifteen M4FSP-monitored infrastructure and construction projects were selected for inclusion in the research study. They were located in five districts of Northern Ghana – Yendi, West Gonja, Tolon, Savelugu, and Tamale – and included classrooms, toilet blocks, vocational schools, market stalls, staff quarters, and Community-based Health Planning and Services (CHPS) compounds. In addition, five un-monitored projects were chosen from the same districts to act as counterfactuals. However, due to a limited pool of ongoing projects in the area, these were not an exact match and were non-randomly selected based on proximity rather than comparability.

The following research questions were used to guide the study:

Research Question 1: What are the different mechanisms or pathways by which monitoring of projects or services could deliver better value for public money?

Research Question 2: By what methodologies can the delivery of better value from public money be assessed?

Research Question 3: What tangible improvements are observed to the monitored projects during the project construction, and to which of these did the monitoring approach make an important contribution?

Research Question 4: Has the citizen monitoring delivered better value for public money, and how does this compare with the amount of money spent on implementing the monitoring approach?

The research study operated on the premise that citizen monitoring was an investment, and so it analyzed the returns in terms of public savings made through improvements in the process of project delivery and decrease in potential cost escalations. Multiple sources of evidence and techniques were used for data gathering. These included reviewing project documentation (bills of quantities, plans, etc), data from the DevelopmentCheck ([‘DevCheck’](#)) application used by M4FSP Citizen Monitors, and semi-structured interviews and focus group discussions with key informants at district and community level.

Through a review of literature and insights from industry practice, the research study identified a number of promising methods for determining value and public savings. Those selected were: **Earned Value Analysis** (utilized when economic data on benefits and savings are accessible), **Stories of Change** (narrative perceptions of project value and efficiency), **Regression Analysis** (for estimating the influence of citizen monitoring on improved value and public savings) and **Net Present Value** (to ascertain the value of investments or projects).

The research also planned to use **Cost-Benefit Analysis** (for comparing the overall costs and benefits of a citizen monitoring project) and **Contingent Valuation** (for benefits without established economic or market values). However, during the course of the study it was found that factors such as variation in project start dates, the timing of monitoring initiation, pre-existing and unexpected project challenges, plus issues with data availability and quality had a significant impact on the assessment

process. It became necessary to adopt alternative strategies to supplement missing data, and it was not possible to apply all the assessment methodologies identified.

What are the different mechanisms or pathways by which monitoring of projects or services could deliver better value for public money?

To address this question, qualitative narrative stories and cases were collected from citizen monitors, community members, district project officials and community leaders. Overall, key informants considered timely completion by contractors to be essential in maximising benefits and efficiency of public investments. Analysis of the narrative feedback identified five ways in which citizen monitoring contributed to achieving better value for money:

Early detection of problems: By identifying problems and bringing them to the attention of the contractor and public officials, citizen monitoring was perceived as helping to mitigate risks and avoid unnecessary expenditure, ultimately saving costs and ensuring better value for money.

Identification and prevention of thefts: Construction sites are vulnerable due to the presence of valuable materials, equipment, and machinery. Findings showed that the presence and vigilance of citizen monitors had contributed to reducing the risk of thefts, vandalism, and misappropriation of construction materials and equipment.

Increased transparency and accountability: The presence of citizen monitors enabled community level stakeholders to access project information that would have otherwise remained undisclosed. They also had a positive influence on the behaviour of the contractors and workers involved in monitored projects, who were observed to be more accountable and open in sharing project updates and responding to reported issues or faults.

Better project design: The value of public money was perceived by research communities to be lost when project initiators failed to adequately assess the technical and financial viability of a contractor. The research found that the community members and stakeholders were more involved in the design phase of a project as a result of the monitors. This in turn helped to identify potential design flaws, inefficiencies, or unnecessary expenses that could then be addressed early in the process.

Enhanced public participation and support: The citizen monitors actively engaged with community leaders during the course of M4FSP. In some locations they also helped facilitate the involvement of local residents. Through meetings, consultations, and information-sharing sessions, citizen monitors created opportunities for the wider community to voice their opinions, concerns, and preferences. The increased public participation and support, in turn, strengthened the community's sense of ownership and responsibility towards the projects.

What tangible improvements were observed to the monitored projects during construction, and what contribution did the monitoring approach make?

Due to the timescale of the research study, it was not possible to assess the contribution that monitored projects made to community well-being and livelihoods. At the time of writing this report, many were still ongoing or had only very recently been completed. Instead, analysis focused on the

actions of the monitors themselves, and the response of government and contractors as reported by key informants.

On finding a problem or issue, Citizen Monitors most frequently reported: (i) engaging directly with contractors, either individually or as a group, to resolve the problem, (ii) reporting issues to the chief and/or assembly member (iii) making a complaint or report to a district official or (iv) uploading the issue onto the DevCheck app. Other less common actions included (v) making a report to a media outlet and (vi) engaging with other community members. These actions were verified by community members during key informant interviews. On the whole, contractors were considered to have been very responsive when a problem was reported. Twenty-five out of the 30 citizen monitors engaged during the research study confirmed that contractors or their agents had responded positively each time they raised an issue.

Citizen monitoring was found to have contributed most notably to improvements in the processes of construction, commissioning, and maintaining the quality of materials used. Key informants reported citizen monitoring had succeeded in reducing delays in construction, bringing previously-absent contractors back to site to complete abandoned work, and in some cases, had even managed to positively influence the design. Key informants also cited examples where the monitors had been able to advocate for infrastructure to be brought into use, rather than lying empty on completion.

However, the research found that not all communities had been able to achieve tangible improvements or had had positive experiences. For example, the construction of one school was found to have stalled, some projects were abandoned, and others remained at the foundation stage throughout the research study. This was often due to external factors beyond the control of citizen monitors, or issues such as high rainfall and waterlogging. Some communities reported they had experienced difficulties in contacting and communicating with contractors, which had prevented them from correcting issues and ultimately leading to delays and uncertainty about the status of construction.

Key informants argued that community monitors were not solely responsible for bringing about the improvements they had observed. The key trigger for improvements lay in the actions taken by the district assembly or government agencies after receiving the monitoring reports. Citizen monitors were intermediaries, observing and reporting issues to the district assembly. The timely release of funds to contractors, the political will to sanction non-performing contractors, and intensified oversight by the authorities responsible for awarding the contracts were beyond the control of the monitors. Therefore, it was collaboration and coordination between all stakeholders involved that was necessary to ensure that the projects progressed smoothly and delivered better value for public money.

Has the citizen monitoring delivered better value for public money, and how does this compare with the amount of money spent on implementing the monitoring approach?

In addition to the insights provided by key informants, a quantitative assessment was used to address this component of the research. The methodology required the analysis of data related to project costs, cost savings, project performance indicators, and the implementation costs of citizen monitoring. However, it proved difficult to access key data and project documentation, along with

other factors that had to be taken into consideration when interpreting the calculations. As a result, the research study was unable to provide a definitive answer to this question but notwithstanding, has surfaced valuable learning to inform and improve future approaches to its calculation.

Due to these challenges, the research was unable to apply the contingent valuation method to quantify the tangible and intangible benefits of citizen monitoring and express them in monetary terms. Consequently, the measurement of savings was restricted to cost savings only, rather than a full cost-benefit analysis. This limitation has resulted in an undervaluation or non-accounting of certain benefits arising from the monitoring activities, resulting in only a partial depiction of the overall viability of the approach. Additionally, there was very little photographic evidence recording the nature of the defects identified by citizen monitors, or of the improvements or ‘fixes’ for most of the reported problems. Where construction was complete (as was the case for some of the counterfactual projects), defects and substandard materials were hidden from inspection. The absence of all this visual evidence further complicated the quantification of benefits and the data analysis process.

The research explored whether monitored projects were more likely to be completed, and less likely to be delayed or abandoned in comparison to those in unmonitored communities. The results of the assessment were found to have been influenced by factors beyond the presence of citizen monitoring. It proved difficult to compare projects effectively, due to the different start dates and levels of complexity. Several predated M4FSP and were already facing delays even before the monitoring had started. Other unique factors such as funding source, political expediency, funding availability and release to contractors, and other external influences also affected their performance. Thus, while some monitored projects were found to have achieved better completion rates, so too had the unmonitored projects. The research study concluded that the extent to which citizen monitoring was likely to have contributed to this picture was being masked by very project-specific circumstances, and this had to be taken into consideration when interpreting the results of the analysis.

The research study used cost savings as a proxy for the value obtained from citizen monitoring. Cost overruns are a common cause of financial losses for the government during the execution of infrastructure projects. Through the Earned Value Analysis (EVA) technique it was possible to assess the financial performance of the projects and compare across different projects and monitoring initiatives. Out of 12 monitored projects for which completion data was available, only five had been completed by the end of the research period. Two further projects were nearing completion, with a progress level of 95% or greater. The remaining five projects were still below 50% completion. The study then used regression analysis to examine the relationship between citizen monitoring and two key dependent variables – cost savings and project completion rate – in order to assess the effect of the monitoring activity.

The measurement of cost savings or overruns relies heavily on the availability and accuracy of project budgets, actual expenditures, and any cost adjustments or variations that may have occurred during the project implementation. Incomplete or inaccurate data will compromise the validity and reliability of the cost measurements, potentially leading to misleading conclusions. The omission of indirect or non-financial factors, although difficult to quantify, are important for understanding the holistic impact of citizen monitoring and assessing its effectiveness in achieving better value for money. Key informant interviews clearly evidenced the role that citizen monitoring had played in identifying and addressing

issues and generally improving contractor-community relations; for example, in one community in Tolon, they had even succeeded in bringing the contractor back to site.

The approach could also not adequately consider the influence of external factors on cost savings or overruns. Construction projects are subject to various external factors, such as changes in market conditions, inflation rates, and government policies, which can significantly impact project costs. Failure to account for these factors in the cost measurements may lead to an incomplete understanding of the true drivers of cost performance. For example, the study calculated the estimated Cost Variance (CV) across all projects to have resulted in an overall cost escalation valued at approximately GHS1,800,344.20. However, inflation (standing at 54.1% in December 2022) will have contributed to this value being so high. It is therefore crucial to consider the wider contextual factors and external influences that can affect project costs and compare them across monitored and non-monitored projects to ensure a comprehensive analysis.

The results of the regression analysis found no statistically-significant relationship between the presence of citizen monitoring and cost savings, preventing the study from evidencing a definitive conclusion on the relationship between citizen monitoring and cost savings. The lack of statistical significance may suggest that other factors such as the above, which could not be accounted for in the regression model, were influencing cost savings. F-statistics and the overall goodness-of-fit measures, as depicted by the relatively low R-squared and Adjusted R-squared values in all models (ranging from 9.1% to 25.9%), further suggest that the models may not fully capture all the factors that influence cost savings.

Additionally, the research study was not able to assess the long-term benefits, sustainability and durability of the cost efficiencies achieved through citizen monitoring. Focusing solely on short-term cost measurements will overlook the potential cost implications that could arise in the future.

To determine the financial viability of citizen monitoring of projects, a Net Present Value (NPV) analysis was conducted. Net Present Value (NPV) analysis is a financial viability assessment method that compares the present value of future cash inflows to the present value of future cash outflows, considering the time value of money. For M4FSP, the investment outflows were the costs of citizen monitoring (set up, transportation allowances, phone, training, etc) and inflows were the calculated cost savings and better value for money.

The calculations suggested that, in monetary terms, the investment in citizen monitoring outweighed the cost savings that had been accrued (at least in the short term) at the time of writing the report. However, the main driver for this was the non-completion of several of the projects and the resultant cost overruns, plus cost escalations due to inflation and recent price hikes in building materials. The key informant interviews demonstrate that citizen monitoring has secured other benefits which have not been monetised; for example, transparency, accountability, and community involvement in project delivery.

In conclusion, the research methodology was unable to provide a definitive inference about the relationship between citizen monitoring and cost savings in the projects under consideration. The lack of a statistically-significant relationship and the limited explanatory power of the model suggest that

citizen monitoring alone was not a significant determinant of cost savings in government construction projects. However, the evidence gained through this research demonstrates that citizen monitoring can play a valuable role in promoting better value for public money in construction projects, which requires further exploration. It will be important to consider other factors in future research to better understand the drivers of cost savings. Some suggestions to increase the explanatory power of the model in future studies include the following:

- A larger sample size.
- Collecting additional project information, which was not available to this research study.
- A longitudinal analysis that tracks projects over a longer timeframe.

One of the key findings was that citizen monitoring can play a valuable role in promoting higher standards of public infrastructure. By closely monitoring the quality of materials used in construction, citizen monitors can prevent the use of substandard materials that might compromise the integrity and longevity of the infrastructure. This not only ensures the safety of the structure but also saves public money by avoiding costly repairs or reconstruction in the future. Increased transparency and accountability were other significant benefits identified through the study. The presence of monitors created a culture of accountability among contractors and project initiators. Furthermore, the research has demonstrated the potential of citizen monitoring to improve project management and efficiency. By keeping constant pressure on contractors, monitors can help ensure that projects are completed on time, that delays are kept to a minimum as are associated economic and social losses.

Policy makers and public officials can draw valuable lessons from the findings of this report. To maximize the benefits of citizen monitoring, policymakers and organizations promoting the approach should ensure adequate training, resources, and support are available. Training programs should focus on areas such as project evaluation, construction standards, and corruption detection, empowering citizen monitors to identify potential issues and advocate for necessary improvements.

Furthermore, collaboration and cooperation between citizen monitors, project initiators, contractors, and relevant authorities are essential for successful project outcomes. Effective communication channels should be established to facilitate the reporting and resolution of issues identified by citizen monitors. Regular meetings and consultations can promote dialogue and understanding between all stakeholders, ensuring that the concerns and recommendations of citizen monitors are acted upon in a timely manner.

Policy frameworks and guidelines should be developed to encourage and support citizen monitoring initiatives, ensuring that they are integrated into project planning, implementation, and evaluation processes. This can be achieved through the establishment of legal frameworks, provision of resources, and recognition of the role of citizen monitors in project governance.

However, it is important to recognize that citizen monitoring is not a panacea for all challenges in construction projects, and should instead be viewed as part of a broader framework of project governance and oversight. Other mechanisms, such as robust procurement processes, independent audits, and professional project management, should also be in place to ensure the successful delivery of projects and the protection of public funds. By incorporating citizen monitoring into project

governance frameworks, providing necessary support and resources, and fostering collaboration between stakeholders, the benefits of citizen monitoring can be maximized, leading to improved project outcomes and increased public trust in the construction sector.

By involving citizens as watchdogs, governments can tap into local knowledge and networks, fostering a culture of accountability and transparency. Citizens bring valuable contextual knowledge and on-the-ground experience, identifying cost-saving measures and innovative solutions. Leveraging digital platforms and data analytics can help to streamline monitoring processes and reduce administrative costs. Moreover, citizen monitoring has the potential to yield long-term benefits, by promoting social capital and civic participation for sustainable communities. Overall, citizen monitoring is a valuable approach that can contribute to better value for public money in construction projects.

1. Introduction

Citizen engagement is increasingly recognized as a vital tool for achieving various development and governance objectives, including enhancing the performance of public infrastructure projects and services. This engagement can range from citizen monitoring of project performance at the local level to influencing project decisions and even participating in project design and delivery. Different approaches, such as Community Score Cards, Citizen Juries, and Social Accounting, have been developed to facilitate community participation in accountability processes.

Integrity Action and SEND Ghana have developed Citizen Monitoring (CM) approaches that integrate community monitoring, social accountability, and problem-solving. By engaging citizens as active participants in monitoring and oversight activities, citizen monitoring initiatives hold the promise of helping government to save money and achieve better value for infrastructure projects. As such, monitoring empowers communities to hold public officials accountable, detect irregularities, and ensure optimal resource allocation.

To understand citizen engagement in the context of delivering construction projects, it is useful to consider the roles of the three main actors involved - citizens, politicians and public officials. The way they interact and collaborate can determine the effectiveness and quality of delivery. Lack of accountability is perhaps the single most important factor for failures in delivering projects on time and to budget. The benefits of citizen monitoring, from the perspective of funders, communities and politicians, has been well documented. However, the usefulness of citizen engagement from the perspective of public officials (particularly in relation to value for money and cost savings) has rarely been considered or explored. Being able to evidence the contribution of citizen monitors to achieving better value for money in relation to the interests and motivations of public officials, could help them to become more effective agents of change.

This research was designed to test the hypothesis that citizen monitoring of infrastructure projects can contribute to public savings or better value of a project. Specifically, it explored and tested different methodological approaches that can aid an understanding of the extent to which having active citizen monitors, complementing traditional monitoring channels of District Officials, can achieve (or not) more effective infrastructure delivery. The findings of this research are intended to inform policymakers, government agencies, civil society organizations, and development practitioners on the potential of citizen monitoring as a cost-effective strategy for promoting public savings in Ghana.

1.1. Background: Why the need to explore the extent to which citizen monitoring can offer public savings to government in northern Ghana?

Ghana has a long-term development ambition to achieve sustainable and inclusive economic growth, reduce poverty, and improve the well-being of its citizens. The government of Ghana, along with its development partners, has set various goals and targets to drive the country's progress in various sectors, including education, health, infrastructure, agriculture, and governance. One of the key components of Ghana's development strategy is to invest in infrastructure development to support economic growth and improve the quality of life for its citizens. The need to explore the extent to

which citizen monitoring can offer public savings to the government in Ghana, especially Northern Ghana, arises from various factors and challenges faced in the region. Northern Ghana is characterized by limited resources, underdeveloped infrastructure, and high levels of poverty and inequality. As a result, government-funded construction projects play a crucial role in addressing these challenges and promoting socio-economic development in the region. According to the Ghana Statistical Service (GSS), in 2018 the Ghanaian construction sector accounted for \$8 billion, or 18.8 percent of the nation's annual GDP. Figures released by the GSS indicate that the construction industry recorded a growth rate of 18.3 percent year-on-year for the third quarter of 2018. The industry provided employment for approximately 420,000 people and an estimated 2,500 active building and construction contractors operated in the Ghanaian market that year. Players range from indigenous micro-enterprises and individual contractors to foreign multinational civil engineering and construction giants¹. The construction sector in Ghana, thus, holds significant economic importance, contributing to the country's GDP and providing employment opportunities.

Thus, infrastructure development is essential for poverty reduction efforts, both at the local and national levels. In the context of Ghana's decentralized governance system, local government plays a crucial role in infrastructure development. District assemblies, as the primary units of local government, are responsible for coordinating and implementing development projects, including roads, schools, health centres, and more (Local Government Act of 1993). District Assemblies and other parastatal organisations invest significantly in infrastructure to improve access to vital services such as education, healthcare, clean water, and electricity, which are fundamental for enhancing the quality of life and reducing poverty. Additionally, infrastructure projects enhance economic opportunities by improving connectivity and market access, promoting trade, job creation, and income generation in rural areas.

However, there have been concerns about the efficiency and effectiveness of government-funded projects across the country. This is because the implementation of infrastructure projects at the local level can face several challenges including delays, non-completion, and abandonment of projects, leading to wasted resources and hindered development. Although typical duration of infrastructure depends on the type of infrastructure, projects at district levels are usually planned to be completed within 6-12 months. However, in practice, only few projects are completed during this timeline (Williams, 2018). For example, Williams (2015; 2016; 2018) found that nearly a third of projects started by Metropolitan Municipal and District Assemblies (MMDAs) are never finished. While the average project should have a 6-month duration of those that are finished, most take up to 3 years to complete. Williams (2018) reported that annual spending on projects abandoned mid-construction in Ghana is approximately USD 26.6 million.

Effective monitoring is, therefore, crucial to ensure that projects adhere to delivery agreements and are completed within the planned timeframe. The Government of Ghana, through the National Development Planning Commission (NDPC) and the Local Government Service Secretariat (LGSS), mandates the preparation of monitoring and evaluation (M&E) plans to guide state institutions and local government in monitoring and evaluating policies, programs, and projects. Participatory Monitoring and Evaluation (PM&E) is recognized as a valuable tool to capture community perceptions

¹ <https://www.trade.gov/country-commercial-guides/ghana-construction-and-infrastructure>

and assess the success of interventions. The LGSS recommends involving community members in selecting key indicators and directly involving them in monitoring activities. This participatory approach fosters community ownership, enhances accountability, and ensures that projects meet the expectations of local communities. Citizen monitoring of infrastructure projects is crucial as it holds promise to promote accountability, quality control, efficient resource utilization, local ownership, social cohesion, and community empowerment. It also holds government officials and project implementers accountable, deterring corruption and promoting transparency. Overall, the literature review confirms the following as generally accepted areas where citizen monitoring has added value and created benefits:

- Developing trust and communication between the state and citizens
- Focusing delivery on achieving actual development results or outcomes
- Promoting efficiency and effectiveness in delivery processes
- Complimenting official data gathering / monitoring processes
- Strengthening accountability

This research formed one component of the ‘Monitoring for Financial Savings’ programme (M4FSP) implemented by SEND Ghana, in partnership with Integrity Action, in Northern Ghana between 2021 and 2023. The question of whether citizen monitoring can lead to cost savings has been a significant aspect of the debate around the role of social accountability initiatives. It is crucial to determine if the investment in establishing monitoring systems can not only result in tangible improvements in local projects but also lead to financial benefits for communities.

In M4FSP, SEND Ghana, Integrity Action and project partners sought to explore the potential value that citizen-centred accountability programs can offer to service providers in northern Ghana. The primary inquiry revolved around understanding the extent to which monitoring conducted by citizens could effectively save public funds. Through this programme, 41 community monitors were trained to monitor 15 infrastructure projects in five districts in two regions of Ghana. Monitors undertook monthly monitoring of projects to track their progress and made observations that were reported on the smartphone application ‘DevCheck’ (see section 2.3 below). Their observations were also shared with authorities as a prompt for action. Part of the monitoring activities of the monitors involved asking community members about their satisfaction about the project. Approximately 10,000 such surveys were conducted in the course of monitoring the projects, engaging over 3000 unique community members.

1.2. Research Questions

The following research questions were developed at the beginning of the assignment and were used to design the study:

- **Research Question 1:** What are the different mechanisms or pathways by which monitoring of projects or services could deliver better value for public money?
- **Research Question 2:** By what methodologies can the delivery of better value from public money be assessed?

- **Research Question 3:** What tangible improvements are observed to the monitored projects during the project construction, and to which of these did the monitoring approach make an important contribution?
- **Research Question 4:** Has the citizen monitoring delivered better value for public money, and how does this compare with the amount of money spent on implementing the monitoring approach?

In addition to the above research questions, the study offered the opportunity to evaluate the utility and validity of the methods chosen to assess better value from public money. As this was, to the best knowledge of Integrity Action, SEND and the research team, the first study of its kind, the aim was to learn from the process in order to support future assessments.

2. Research Model and Methodology

The research approach was designed as a mixed method study, which emphasises the interaction and integration of quantitative and qualitative data, methodologies, and paradigms². The concept of multiple validities legitimation³ therefore applies⁴. Multiple sources of evidence and techniques were used to provide and validate evidence against the key research questions. The research operated on the premise that citizen monitoring is an investment, and the research analyzed the returns in terms of public savings made through improvement in the process of project delivery and decrease in potential cost escalations (arising from the completion time of the monitored projects). The key phases of the research included:

- i) Selection of Projects (and counter-factual) to be monitored.
- ii) Obtaining baseline values and Project Information (of costs, location, scope, expected duration of completion, etc.)
- iii) Data Collection and stakeholder engagements

2.1. Sampling of Projects for Monitoring

As part of the implementation of M4FSP, a total of 15 infrastructural and construction projects were chosen for monitoring in 10 communities across five districts in Northern Ghana. These districts were: Yendi, West Gonja, Tolon, Savelugu and Tamale. The projects being monitored exhibited several key characteristics that provided insights into their nature and progress. These characteristics included the types of projects, consistency in start and completion dates, and the occurrence of projects that started before monitoring. The monitored projects encompassed various types of infrastructure developments, such as the construction of classroom blocks, toilet blocks, vocational schools, market

² (Creamer, 2017)

³ Multiple validities legitimation "refers to the extent to which the mixed methods researcher successfully addresses and resolves all relevant validity types, including the quantitative and qualitative validity types as well as the mixed validity dimensions. In other words, the researcher must identify and address all of the relevant validity issues facing a particular research study. Successfully addressing the pertinent validity issues will help researchers produce the kinds of inferences and meta-inferences that should be made in mixed research"(Johnson and Christensen, 2014: 311).

⁴ (Johnson and Christensen, 2014; Onwuegbuzie and Johnson, 2006)

stalls, staff quarters rehabilitation, and CHPS compounds. These projects reflected the diverse needs of the communities, ranging from educational facilities to healthcare infrastructure and market infrastructure. It must be emphasised that although the District Assemblies have several lists of infrastructure projects in their Medium Term Development Plans that were supposed to either start or in progress during the MFS project intervention period, a lot of these listed projects had not started due to funding issues. As such, more than half of the fifteen projects that were monitored were projects that were already ongoing at various stages of completion.

In addition, five ongoing projects at different stages of planning and construction were also considered as counterfactuals. The selection of these counterfactual projects aimed to find comparable projects with similar characteristics to the monitored ones. However, due to a limited pool of ongoing infrastructure projects during the research period, it was challenging to achieve an exact match. Therefore, project characteristics such as type of infrastructure being constructed, stage of construction and commencement date that were intended to inform the selection of such counterfactuals could not be used. The project team ensured that at least one project from each intervention district was selected as a counterfactual to enable a comparison of its progress with the monitored projects. It is important to note that these counterfactual projects in neighbouring communities did not have the presence of monitors actively involved in the communities.

Table 1: List of Projects Selected for Inclusion in the Research Study

ID	Project name	Monitored?	Funder	(Planned) start date	(Expected) completion date	Remarks
P1	Construction and furnishing of 3-unit classroom block - Zohe, Yendi	Yes	DACF	11/01/2022	11/06/2022	
P2	Construction of 3-unit classroom block - Nabori, West Gonja	Yes	MPCF	17/01/2022	17/09/2022	Project construction started before monitoring
P3	Construction of 10unit market stalls - Nyankpala	Yes	DACF	03/02/2020	22/03/2022	Project construction started before monitoring
P4	Construction of 3-unit classroom block - Zakoli, Yendi	Yes	IPEP	11/01/2022	11/06/2022	
P5	Construction of 6-seater toilet block at L/A primary school - Yag-yili	Yes	GETFUND	16/12/2021	16/06/2022	
P6	Construction of 6-unit classroom block - Tolon, Tolon	Yes	IPEP	15/03/2020	15/03/2022	Project construction started before monitoring
P7	Construction of 6-unit classroom block - Tootenyili, Savelugu	Yes	GETFUND	20/08/2019	20/02/2020	Project construction started before monitoring
P8	Construction of 6-unit classroom block at Nuri-Imaam primary school - Tuutingli, Tamale	Yes	GETFUND	10/06/2020	10/12/2020	Project construction started before monitoring
P9	Construction of 6-unit classroom block at L/A primary school - Yag-yili	Yes	GETFUND	16/12/2021	16/06/2022	
P10	Construction of fence wall, and tiling & furnishing of CHPS Compound - Wari-Yapala	Yes	DACF	11/01/2022	11/04/2022	
P11	Construction of NHIS office - Damongo, West Gonja	Yes	DACF	03/04/2020	03/04/2022	
P12	Construction of vocational school - Damongo, West Gonja	Yes		08/09/2022	05/05/2023	
P13	Rehabilitation of 3 staff quarters - Savelugu Municipal Assembly, Savelugu	Yes	DACF	10/08/2020	08/12/2020	Project started before monitoring
P14	Renovation of 3-unit classroom block - Mempeasem, West Gonja	Yes	DACF	14/08/2021	14/12/2021	Not started before monitoring
P15	Renovation of 3-unit classroom block - Gbambaya, Yendi	Yes	MPCF	15/07/2021	15/12/2021	Project construction started before monitoring

Sources: SEND Ghana; Interviews with communities and stakeholders during fieldwork. Illustrative photos of some projects are provided in the Annex

Table 1: List of Projects Selected for Inclusion in the Research Study (continued from previous page)

ID	Project name	Monitored?	Funder	(Planned) start date	(Expected) Completion date	Remarks
C1	Construction and furnishing of 6-Unit JHS girls model with ancillary facilities - Nanton	No, counterfactual	DDF-RFG	07/01/2022	07/06/2022	
C2	Construction of CHPS compound with accommodation - Kanshegu	No, counterfactual	DPAT-4	11/11/2021	09/05/2022	
C3	Construction of CHPS compound and semi-detached staff bungalow - Mempeasem	No, counterfactual	Data not available	Data not available	Data not available	
C4	Construction of 3-unit classroom and 1-unit office block - Sugashie	No, counterfactual	DACF- RFG	19/01/2022	19/05/2022	
C5	Construction of CHPS compound and semi-detached staff bungalow - Gumo	No, counterfactual	DACF	05/11/2020	05/05/2021	

Sources: SEND Ghana; Interviews with communities and stakeholders during fieldwork. Illustrative photos of some projects are provided in the Annex

The selection of counterfactuals was intended to allow for an analysis of the effectiveness and value-added contributions of the monitoring process. Achieving a perfect match between the monitored projects and counterfactuals was not feasible due to limited infrastructure projects with similar characteristics. As such, the counterfactuals were non-randomly selected based on availability or convenience. Although the selection of counterfactual projects based on proximity rather than identical characteristics may have introduced some limitations, it still offered a valuable opportunity to learn about the value of citizen monitoring.

While valuable insights were gained through monitoring efforts, certain factors such as variations in project start dates, the timing of monitoring initiation, pre-existing project challenges, and data limitations were encountered. These factors will have introduced biases or limitations in the analysis, and as such, it is crucial to approach the findings of this report with caution. Below, these issues are explained in detail to provide a some understanding of their potential impact on the research outcomes.

- **Variation in Project Start Dates:** The 15 monitored projects under review did not all commence at the same time as the monitoring period. This variation in project start dates can influence the interpretation of the findings, as projects at different stages of completion may have different performance characteristics.
- **Timing Misalignment:** The start date for some projects predates the establishment and commencement of work by the monitors. Monitoring activities were initiated after the projects had already begun, potentially limiting the direct influence of monitoring on early project implementation and decision-making processes.
- **Pre-Existing Project Challenges:** Some selected projects were already facing challenges such as delays and potential abandonment before the monitoring period. These pre-existing issues may have influenced project outcomes, irrespective of the presence of monitors.
- **Data Availability and Quality:** The limitations associated with data availability and quality should be considered. The research relied on some data collected by the monitors to reach some of its conclusions. However, some of the expected data needed were incomplete which had the effect of restricting aspects of the analysis and insights that could be drawn from the study. The accuracy and reliability of the data collected during the monitoring process can significantly impact the findings and conclusions drawn in this report.

2.2. Obtaining Projects Information and baseline assessment

This phase of the research methodology focused on establishing a foundation for the study by gathering essential project-related data. Baseline values, including costs, location, scope, and expected duration of completion, were collected for both monitored projects and counterfactual projects. At the baseline, the research also engaged stakeholders to explore questions related to how monitoring of projects is traditionally conducted, the expected role of citizen monitors, 'why and how money is lost during infrastructure projects', qualitative understanding and interpretation of 'value'

or ‘better value of infrastructure development’, public savings among others. The baseline and project information phases, however, encountered noteworthy challenges. These challenges included:

- **Limited Access to Project Documents:** Obtaining project documents such as contracts, bill of quantities, and detailed cost estimates proved to be a hurdle. The lack of access to these critical documents affected the accuracy of baseline values and hindered the ability to compare project costs and savings effectively.
- **Data Availability:** In some instances, essential project data required for baseline calculations was not readily available. Missing or incomplete data posed a challenge in accurately establishing the initial project conditions and estimating potential cost savings.
- **Lack of Transparency:** Some project-related information was not readily shared by relevant authorities or project implementers. This lack of transparency impeded the research team's efforts to collect comprehensive and accurate data for analysis.

To address these challenges, the research team employed a combination of strategies. These strategies included engaging with project stakeholders to gather available data, cross-referencing information from multiple sources, and leveraging alternative data collection methods to supplement missing data. The research team also employed the services of a Cost Consultant to support determination of progress of work done, how much may have been spent and estimates required to complete projects—which aided the earned value analysis undertaken for this study (see below).

2.3. Data Collection

Three main data collection approaches were used for this study:

1. **A comprehensive review of available project documents.** The research team reviewed available documentation related to some of the projects. As highlighted earlier, although it was planned that documents such as procurement/contract documents, budgets, projects appraisal report, inception report and progress report of all the projects to be monitored could provide important insights, several of these documents could not be obtained during the research. The Research Team mitigated this limitation by employing a cost consultant/quantity surveyor who estimated cost of the projects at the various levels of completion. Because several of the projects also come from related sources of funds, documents of projects with similar design and features as those monitored were further reviewed and used as a guide in the analysis of the reports.
2. **Data from DevelopmentCheck**, which includes questionnaires and checklists captured by the Citizen Monitors. DevelopmentCheck (‘DevCheck’) is a mobile app developed by Integrity Action for use by citizen monitors. Monitors use the app to record their findings while they are monitoring, including problems they find, solutions to those problems, and what the community thinks about the project or service being monitored. When they record information in the app, it is immediately displayed on the DevCheck [website](#) to create an incentive for problems to be fixed efficiently and to make sure that citizens’ voices are the most important voices in the implementation of projects and services.

3. **Semi-structured interviews (SSIs) and focus group discussions (FGDs)** with a range of actors at the community and District level. A purposive sampling technique was used to select specific units or respondents⁵. Key actors engaged during the research are CMs, community elders, community groups, local government officials, SEND Ghana officials and other representatives of community interest groups. This approach helped us to understand diverse perspectives on project progress and the extent to which the specific projects being monitored were leading to public savings.

Table 2: Overview of stakeholders engaged by the research team

	Monitored projects	Unmonitored projects
Communities visited	10	5
Citizen monitors	30	0
Key informants/ Community leaders	50	30
Randomly selected participants in communities	160	100
Total	240	130

2.4. Analysis methods

The analytical methods employed for this study have been elaborated on under section 3 (RQ2). In this section, a brief overview has been given.

2.4.1. Earned Value Analysis

Earned Value Analysis was selected as being appropriate for the calculation of better value realised and public money saved through the citizen monitoring processes. Earned value analysis (EVA) is a project management tool that integrates the project scope of work with cost, schedule, and performance elements. EVA helps to measure project's progress at any time, a forecast of the completion date and the final cost. It also helps to determine variances in project's schedule and budget. EVA offers the project manager a tool to timely evaluate the general health of a project along the life of the project. Particularly, EVA has been used to: (1) estimate cost and time to complete; (2) identify cost and schedule impacts of known problems; (3) accurately portray the cost status of a project; (4) trace problems to their sources; (5) portray the schedule status of a project; (6) provide timely information on projects, and (7) identify problem areas not previously recognized⁶.

2.4.2. Story of change to identify stakeholder perceptions of improvements realised through citizen monitoring

Stories of change was employed as a tool to gather qualitative evidence of the perspectives of stakeholders on the tangible and intangible benefits or improvement associated with citizen monitoring, which included perceptions of improved project outcomes, early issue detection, and enhanced accountability. Through these analytical methods, the research team linked instances through which the role of the citizen monitoring contributed to detection of errors, prevention of

⁵ (Tashakkori and Teddlie, 2010; Patton, 2005; LeCompte and Schensul, 1999; Miles and Huberman, 1994; Kuzel, 1992).

⁶ (Kim et al., 2003)

thefts on site, deviation of agreed quantity and quality of materials, responsiveness of contractors to problems requiring fixing, attention to health and safety issues and inclusion of disability-friendly and accessibility considerations in project implementation. Engagement with key informants to collate these story of change, therefore, offers an opportunity to explore particular cases and incidents, which can describe the change that has taken place due to the programme, from the perspective of the communities and other stakeholders, and describe their perspective of the value of citizen engagement

2.4.3. Regression Analysis

Regression analysis is a statistical process that helps to estimate the relationships between a dependent variable and one or more independent variables. In this research, multiple regression analysis was used to explore the relationships between independent variables, such as citizen monitoring, and dependent variables, such as cost savings and project completion rates.

2.4.4. Calculating value for public money

The research utilised investment appraisal techniques to determine whether the amount of money spent on implementing the monitoring approach is viable. This was intended to provide robust evidence about whether investing in citizen monitoring was viable and lead to improvements in infrastructure provision and public savings. The Net Present Value method was chosen for this purpose.

Net Present Value: Net present value is calculated to determine how much an investment or project is worth. The net present value (NPV) indicator is defined as the sum that results when the expected costs of the investment are deducted from the discounted value of the expected benefits (revenues). In this case, the expected costs would be the cost involved in the monitoring process while the benefits would be the cost savings (i.e. $CF_1 - CF_t$) to be made. Whenever $NPV > 0$, the project is considered worthwhile or profitable. Among mutually exclusive projects, the one with the highest NPV should be chosen.

3. Results

This section of the report presents findings against the following research questions:

- **Research Question 1:** What are the different mechanisms or pathways by which monitoring of projects or services could deliver better value for public money?
- **Research Question 2:** By what methodologies can the delivery of better value from public money be assessed?
- **Research Question 3:** What tangible improvements are observed to the monitored projects during the project construction, and to which of these did the monitoring approach make an important contribution?
- **Research Question 4:** Has the citizen monitoring delivered better value for public money, and how does this compare with the amount of money spent on implementing the monitoring approach?

3.1. Different mechanisms and pathways by which monitoring delivers value.

The research used the story of change approach to collect and capture real-life narratives and cases of citizen monitors, community members, district project officials and community leaders to map out the different mechanisms and pathways by which monitoring delivers value for public infrastructure projects. The concept of achieving better value for public infrastructure projects was discussed by stakeholders mainly in relation to contractors delivering high-quality infrastructure as planned, and adhering to project timelines to minimize cost overruns, excessive delays, possible projects abandonment and wastage of public resources. This is because for most stakeholders, the timely completion and quality of projects are essential factors in maximizing the planned benefits and efficiency of public investments in infrastructure. The findings revealed that citizen monitoring contributes to better value for money through at least five ways. These include:

- Early Detection of Problems and course corrections on aspects of the projects
- Prevention of thefts on sites
- Increased Transparency and Accountability
- Better Project Design
- Enhanced Public Participation and Support

Early Detection of Problems and course corrections on aspects of the projects: One of the consistent pathways shared by the citizen monitors and stakeholders engaged in relation to the primary ways that the citizen monitoring added better value to public money and potential financial savings to the government was through early detection of problems. This can be caused inadvertently or through deliberate failure of contractors to comply with agreed standard of work. It was gathered that by regularly visiting project sites and monitoring progress, the monitors were able to identify design flaws, construction deviations, or inadequate resource allocation earlier. For example, across some of the different projects monitored, the citizen monitors noticed design or construction issues that were found to have the likelihood of causing cost overruns, as well as detecting errors that had the potential of causing delays or other problems. This early detection enabled prompt intervention and course corrections, preventing further complications and costly rework.

Early detection of problems can, therefore, help governments take corrective action before it is too late, potentially saving significant amounts of money. For example, if citizens identify a design flaw early in a project, the government can work with the contractor to make necessary changes before construction begins, avoiding costly delays and rework. Similarly, when citizens identify problems with a project's budget or timeline, the government can take corrective action to prevent cost overruns or schedule delays. Narratives of examples that demonstrate how citizen monitoring helped early detection of problems are highlighted in the examples below:

“The team was tasked to monitor a six-unit classroom block and a six-seater toilet block. For the group monitoring, we visit the site every week. Then, we also go there randomly on individual basis. I know the contractor, so I visited the site more often. Because of our frequent visits to the project site, we detected some problems at the early stage of the project. When the project started, we [monitoring team] realized that the blocks the

contractor was going to use for the foundation of the building were not of good quality. We got to know this very early through the training we received on how to observe the strength and thickness of a block. So, we alerted the contractor and the necessary changes were made. So instead of using inferior blocks for the foundation, our monitoring made him use quality ones. If the inferior blocks have been used, nobody knew what may have happen in the future.”

~ Citizen monitors FGD

“Through our monitoring, we got to know that each classroom is supposed to have four fans. However, we discovered earlier on that the contractor’s agents were fixing two per classroom. When we noticed, we quickly drew attention of the Engineer to the issue, and he worked with the contractor to fix all the four fans instead in each classroom. Due to the conditions of the weather here and the sizes of the rooms, the four fans appear more appropriate to me. Fixing these provides better value to the infrastructure than would have happened if only two fans were fixed. I am sure we would never know that but for the fact that there were citizen monitors”

~ Citizen Monitor

By addressing problems at an early stage, citizen monitoring helps to mitigate risks and avoid unnecessary expenditure, ultimately saving costs and ensuring better value for money.

Prevention of thefts on sites: Thefts of materials on-site pose a significant risk to public savings in construction projects. Construction sites are vulnerable to theft due to the presence of valuable materials, equipment, and machinery. When materials are stolen, project costs increase as replacements must be procured, leading to additional expenses and cost. Furthermore, the delay in the project caused by thefts disrupts the construction timeline, contributing to cost overruns.

Findings from the research showed that another way that citizen monitoring helped governments to save money or obtained better value for its construction investment was by helping to minimize thefts of building materials. Interviews showed that citizen monitors acted as additional eyes and ears on the construction sites, deterring potential thefts and ensuring the security of project assets. Their presence and vigilance contributed to reducing the risk of thefts, vandalism, and misappropriation of construction materials and equipment, as demonstrated in the following example:

“There was the issue of theft of the building materials during the construction of the six-unit classroom block. There were some blocks that were moulded by the roadside and later we found out that people were stealing them, so through collaboration with the contractor we moved the blocks to a safer location and the theft stopped. It helped to minimise a case where newer blocks may have been moulded.”

~ Citizen Monitor

When monitors promptly report suspicious or potential thievery and collaborate with project authorities, they are able to help implement effective security measures. This prevention of thefts not only protects public resources but also avoids financial losses associated with replacement or repair of stolen items, resulting in cost savings.

Increased Transparency and Accountability: The findings from the research highlight that citizen monitoring played a significant role in enhancing transparency in construction projects. While community stakeholders faced challenges in accessing written project documents like contracts and bill of quantities, the presence of citizen monitors enabled them to gain access to project information that would have otherwise remained undisclosed to the communities. The introduction of citizen monitors also had a positive impact on the behaviour of contractors and workers involved in the project. They became more accountable and open in sharing project updates, knowing that any issues or faults observed by the monitors would be reported, as shared through the following narratives:

“... when we introduced ourselves, the contractor and the workers stepped up because they knew we were watching and would report them if there was any problem. The contractor became very open and shared updates and progress with us. They became conscious that the appropriate authorities would be alerted anytime a fault was detected.”

“One thing we have observed is that our presence and active engagement create a sense of responsibility among project stakeholders, as they are aware that their actions and decisions are under constant scrutiny. This increased accountability fostered by the citizen monitoring acts as a deterrent against unethical practices, that I believe ultimately safeguard the public's interests and ensuring the optimal use of public funds.”

“With the vocational school that I mentioned, the beam which connects a pillar to the roof shifted slightly. This was done before we started monitoring and so that problem was not detected until they had finished the roofing and then we started monitoring. So, after we identified that fault, we alerted our head who then contacted the Engineer for them to correct that fault.”

“Their work is very important because it will help the community in the end. You can imagine if they give a contractor work to come and build a school and he doesn't finish it and leaves, nobody can say anything. But because the monitors are there watching him to work, he will not be able to run away or even do any shoddy work.”

~ Key informant interviews

Thus, the presence and engagement of citizen monitors created a sense of responsibility among project stakeholders and held them accountable for their actions, which promoted transparency in project implementation. Stakeholders, especially contractors, were aware that their actions and decisions were constantly monitored, which acted as a deterrent against unethical practices.

Better Project Design: Poor project design and failure to adequately assess the technical and financial viability of a contractor are significant pathways through which public money can be lost during construction projects. The value of public money was perceived by research communities to be lost when project initiators fail to adequately assess the technical and financial viability of a contractor. This failure can lead to various negative outcomes and financial losses. When project initiators do not conduct a thorough assessment of a contractor's technical capabilities and financial standing, they risk allocating resources to an incompetent or ill-equipped contractor, who may cause projects to

experience delays, cost overruns, and poor-quality work, leading to a waste of public funds. Inadequate assessment of a contractor's technical and financial viability also raises the risk of project failure. If the contractor lacks the necessary skills, experience, or resources to execute the project successfully, it can result in substandard work, construction delays, and even project abandonment. The associated costs of rectifying the situation or engaging a new contractor can significantly inflate project expenses, resulting in a loss of public money.

Narratives from the research showed that citizen monitoring contributed to better value and cost savings by promoting better project design. The research noted that the active involvement of community members and stakeholders in the monitoring process allows for their valuable input and feedback during the design phase of a project. This involvement helped to identify potential design flaws, inefficiencies, or unnecessary expenses that can be addressed early on, leading to cost savings.

“The citizen monitoring has been instrumental as it has helped us to design some of our projects better. During the construction of the TVET school block at Nabori, there was no access route for persons with disabilities (PWDs) and this would have caused a serious problem for such persons in the future when the project has been completed and is in use. But through the citizen monitoring exercise, the monitors were able to identify this potential problem and got it addressed before the completion of the project”.

Furthermore, the participation of the monitors helped to contribute to better quality outcomes of the projects that reduced the likelihood of costly rework or maintenance in the future.

“Initially the Assembly would award a contract and later the contractor will abandon the project and the community members will be wondering where to get the contractor, but because of the presence of monitors in the community, it has really helped a lot because any time the community members want information concerning the project they ask and see to it that the contractor speeds up the process. And mostly when we see that there is a defect, maybe the contractor is doing it and suddenly he stops, we try to find out if really the problem is from the Assembly then we find out from the Assembly.”

~ Citizen Monitor, Yendi

“Our contribution as Citizen Monitors is really great. Because of our work, the school building has been completed on time and was built with quality materials.”

~ Citizen Monitor

“The work of the Citizen Monitors put contractors on their feet. From what we have found, if the monitors had not contacted the contractor, he would have just left the school building like that and it would have just wasted away. But now, the contractor is going to get back and finish what he started.”

~ Key informant, traditional authority

“If we, the monitors, had not diligently checked the quality of blocks used in the construction process, there is a high probability that the building would collapse one day. Our vigilance and commitment to ensuring the highest standards of construction have played a crucial role

in safeguarding the integrity and safety of the infrastructure. By closely monitoring the materials being used, we have prevented the use of substandard blocks that could compromise the structural stability of the building. This not only protects the lives and well-being of the community members who will utilize the facility but also saves the government from the potential financial burden of costly repairs or even reconstruction in the future.”

~ Citizen Monitor

“The contractor nearly reduced the amount of cement used for the lintel if it weren't for our diligent monitoring work. Our presence and scrutiny prevented the contractor from compromising the structural integrity of the building by cutting corners. By ensuring that the appropriate amount of cement was used, we have safeguarded the long-term durability and safety of the infrastructure. Our role as citizen monitors is crucial in preserving the value of public money invested in construction projects and upholding the highest standards of quality”.

~ Citizen Monitor

Enhanced Public Participation and Support: Findings from the research further shows that citizen monitoring inspires wider community engagement, which amplifies the value of public money invested in construction projects. As the citizen monitors actively engaged with the community leadership for updates and reporting of their observations, they encouraged and facilitated interests and involvement of the local residents in some of the projects. Thus, through meetings, consultations, and information-sharing sessions, citizen monitors created opportunities for the larger community members to voice their opinions, concerns, and preferences, which ensured that their needs and priorities were integrated in the construction projects. The increased public participation and support, in turn, strengthened the community's sense of ownership and responsibility towards the projects, as shown in the quote below:

“Before the monitors came into the picture, we often felt disconnected and uninformed about the projects happening in our area. Now, with their active involvement and open communication, we feel more connected and engaged in the decision-making process. The impact of citizen monitors in our community has been truly remarkable. They provide us with regular updates on the progress of the projects, ensuring that everyone is well-informed and aware of what is happening. Thanks to their work, any issues or concerns related to the projects that are observed by any member of this community are quickly reported to them, the Assemblyman, or even the local authorities. Their presence has motivated all of us to take a keen interest in the development of our community”

~ Key informant, Savelugu district

The research also highlighted that citizen monitoring inspired wider community engagement beyond the specific construction projects. As residents became more involved and invested in the development of their neighborhoods, they also showed a greater interest in other community initiatives and social programs. This ripple effect of increased community engagement had a broader positive impact on the overall well-being and social cohesion of the community.

The various focus group discussions further showed that the citizen monitoring concept enabled better acceptance of a public project, which made them to be more willing to contribute their time and resources to help make the project a success, which ultimately could reduce the overall cost to the government.

“Some years ago people used to fight those who ensure that the right things were done with regards to community projects, but now the situation is different. Everyone sees it as civic duty to monitor projects”.

~ FGD participants, Tolon

“In the past we used to have contractors who will start work and not finish, just like this our school. The building would be left standing and wasting away. But with the monitors now, they will supervise to make sure the contractor completes the work, and that way government will definitely save some money that can go into other projects.”

~ Stakeholder, West Gonja

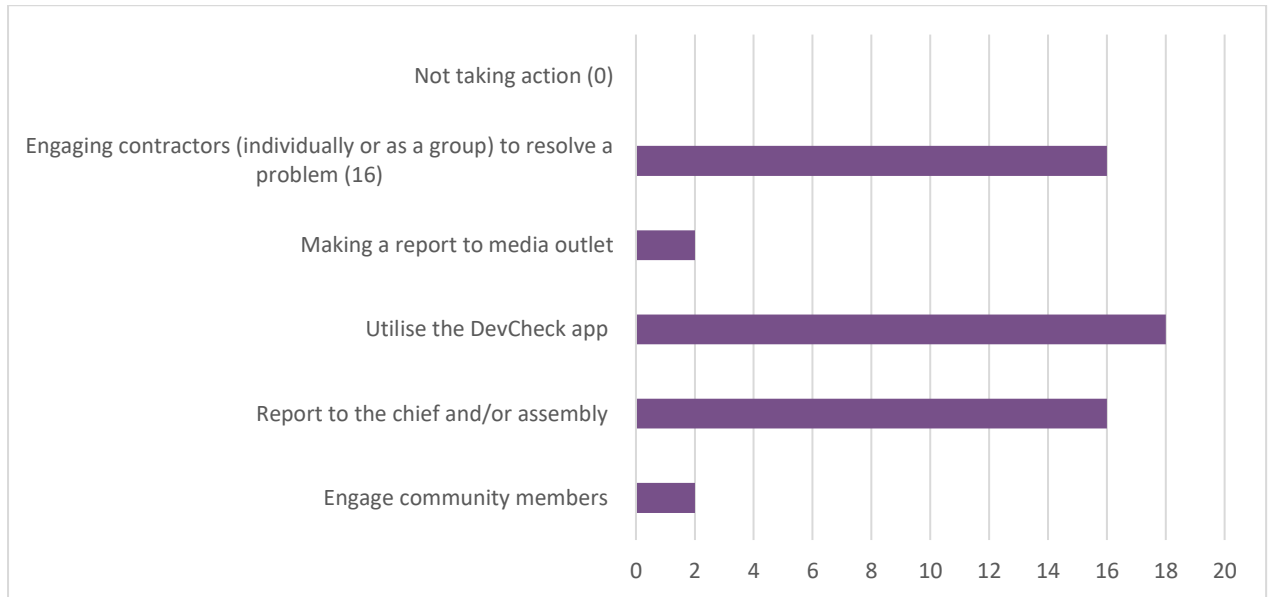
3.2. Observed tangible improvements and the contribution made by citizen monitoring.

The infrastructure projects that were monitored were still ongoing or have just been completed at the time of writing this report. Because of that, it was difficult to assess extent of usage or value that the project has added or contributed to livelihoods. The research, therefore, asked three main questions throughout the research process to understand the improvements that may be associated with the actions of the monitors: What actions did monitors take after monitoring or detecting a problem? how contractors or government reacted/responded to the issues reported, and whether the reactions contributed to some improvements, and forms the improvement took.

3.2.1. Actions taken by citizen monitors when a problem is detected.

When citizen monitors were asked what actions they took when a problem had been detected during their monitoring, three main actions were highlighted. These include engaging contractors, individually or as a group, to resolve the problem, reporting to the chief and/or assembly member and making a complaint or report to a district official to help resolve the problem. Other less emphasised actions undertaken by some monitors include making a report to a media outlet, making it known to SEND or utilize the DevCheck functions. These actions were confirmed by other community members during key informant interviews.

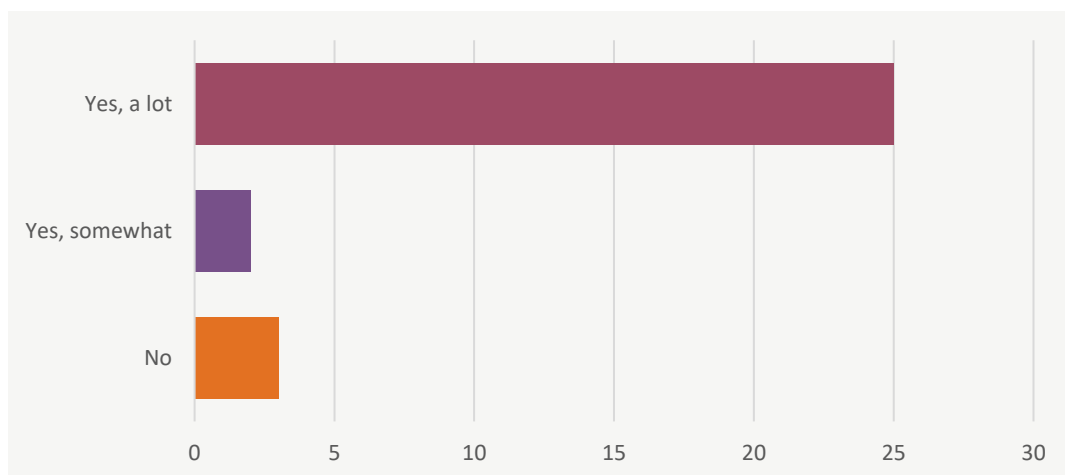
Figure 1: Actions taken by Citizen Monitors on Detection of an Issue



3.2.2. Response of contractors when reports are made.

Citizen monitors shared the view that contractors respond to their concerns 'a lot' when they report on problems that they have observed during monitoring. For example, 25 out of the 30 citizen monitors engaged during the research mentioned that contractors or their agents responded a lot and positively to them, each time they raised an issue.

Figure 2: Reflections of Citizen Monitors on Contractor's Response to Issues Being Raised



3.2.3. Tangible improvements associated with the work of the monitors.

The research gathered from among the stakeholders indicates that the citizen monitors and their actions have contributed to some notable improvements in the infrastructure projects. In some communities, the participants suggested that thanks to the CMs, contractors were brought back to complete projects that had been abandoned. The tangible improvement was the "fast execution of

the project” and the absence of delays. Key informants from West Gonja, mentioned that the CMs helped ensure the project would “*help everyone in the community and be disability friendly*”. In Yagyli, the focus group discussion established that the Yagyli project, which was under monitoring, commenced in 2022. The monitors had already been actively involved in their duties, conducting regular site visits to observe the progress of the project. The construction work progressed steadily, and within a year, the project was successfully completed and handed over to the local assembly.

During their monitoring activities, the citizen monitors noticed a significant issue at the very foundation of the project. When the blocks were being laid for the foundation, it became evident that the quality of the blocks did not meet the required standards. Recognizing the critical importance of a strong foundation for the structural integrity of the building, the monitors promptly raised their concerns with the project engineer. As a result of their intervention, the engineer took the complaint seriously and engaged the contractor responsible for the foundation work. The contractor was directed to rectify the issue and ensure that the foundation was constructed with blocks that met the required standards. This proactive approach by the citizen monitors helped to address potential risk and ensure the long-term stability and safety of the infrastructure. Throughout the construction process, the citizen monitors did not uncover any major defects or significant deviations from the project plans and specifications. The project progressed smoothly under their watchful eyes. However, even after the completion of the project, the citizen monitors continued to fulfil their role by conducting post-completion inspections. However, despite the completion of the project, the infrastructure has remained idle for some time and not in use at the time of the field assessment.

Similar observation was also made in Wari- Yalpala where a project was initiated in 2022, and by the time the citizen monitors began their oversight, the building was almost completed. Their monitoring efforts were primarily focused on the construction of the fence wall, as well as the tiling and furnishing of the CHPS Compound, which was a health facility. The original plan was for the project to be completed within one month, and the monitors observed that this timeline was met. However, after the project was completed, there was a delay in putting the facility to use. Recognizing this issue, the monitors took proactive measures by engaging various stakeholders, including the Assemblymen and the District Health Directorate. They shared their monitoring findings and concerns, highlighting the importance of opening and utilizing the health facility promptly.

As a result of their engagement and advocacy, the monitors were successful in influencing the relevant authorities to take action. The stakeholders, including the Assemblymen and the District Health Directorate, responded positively to the monitors' efforts, recognizing the value of their monitoring work. Consequently, the facility was opened and made accessible for the community to benefit from its services at an earlier stage than it would have been without their intervention. This narrative demonstrates the significant impact that citizen monitoring can have in ensuring that projects are not only completed according to plan but also put to use in a timely manner.

It emerges from the research that the overall perception among citizen monitors is that their monitoring efforts have contributed to some improvements in the projects. One notable outcome is the successful completion of projects that were previously abandoned, thanks to the intervention of the monitors. This has resulted in faster project execution and the absence of delays, which are tangible improvements. However, it is important to note that some communities, like Savelugu, have

not observed significant tangible improvements even after a year of monitoring. In these cases, the construction of a school has stalled, some projects have been abandoned, and others have only reached the foundation stage due to external factors such as rainfall and waterlogging.

Thus improvements were observed in two main forms: improvement to the construction work and enhancements in the materials being used for the projects; as well as negative experiences.

- **Improvement to Construction Work:** Citizen monitors played a crucial role in ensuring that construction work was carried out effectively. They actively observed and reported any issues or faults in the construction process, which led to timely corrections and improvements. For instance, the monitors detected cracks in the project and promptly informed the contractor, resulting in the necessary corrections being made. Similarly, when problems were identified with the foundation of a building, the monitors alerted the relevant parties, leading to corrective actions being taken. Additionally, the monitors ensured that drainage systems were appropriately constructed to prevent flooding and other potential issues.
- **Enhancements in Materials Used:** The citizen monitors were vigilant in monitoring materials being used in the construction projects. They identified instances where substandard materials were initially being utilized, such as blocks of lower quality for the foundation level. By reporting these findings to the contractor and other stakeholders, the monitors influenced the decision to replace the faulty materials with higher-quality ones. Furthermore, they collaborated with the contractor to safeguard building materials from theft, ensuring that they were stored in secure locations.
- **Negative experiences:** Negative experiences reported by citizen monitors during their monitoring activities included difficulties in contacting and communicating with the contractors, which resulted in delays and lack of progress in some projects. In one instance, the monitors expressed frustration that the contractor could not be reached, and his whereabouts were unknown, leading to uncertainties about the project's status and potential abandonment. Another negative experience highlighted by the monitors was the location of a building on a waterway, which posed a significant risk and violation of construction regulations. Unfortunately, the contractor had left the site without addressing this critical issue, leaving the project in an incomplete and potentially hazardous state.

Reflecting on their work, stakeholders argued that community monitoring alone is not solely responsible for bringing about tangible improvements. They see their role as intermediaries, observing and reporting issues to the district assembly. The key trigger for improvements lies in the actions taken by the district assembly or government agencies after receiving the monitoring reports. These actions can include timely release of funds to contractors, political will to sanction non-performing contractors, and intensified oversight by the authorities responsible for awarding the contracts.

Figure 3: Examples of improvements made to M4FSP projects because of citizen monitoring

(Source: DevCheck records and field interviews)

Corrections and improvements made to construction work
<ul style="list-style-type: none">- “The culvert work was corrected.”- “The contractor corrected the cracks we identify on the project.”- “When he corrected the foundation problem.”- “Correction on the layering of blocks for the school project.”- “Facial boards were initially not properly done, but this has been corrected.”- “With the beam problem, once they were alerted the correction was made.”- “Construction of drain.”- “Wall to fence the project from flooding.”- “The foundation work was done very well because we cautioned about runoff.”- “The contractor came back to work after several contact with him.”
Corrections and improvements made to materials
<ul style="list-style-type: none">- “Corrected the building materials they used to mould the blocks.”- “Correction to store the building materials in a safe place.”- “Use quality sand from to build.”- “Yes. He corrected the blocks to be used to build a 6 unit classroom into that of higher quality.”- “With the theft of the building materials, through collaborating with the contractor we were able to move them to a safer location.”- “Certain materials like wood originally intended to be used by contractor were identified to be faulty by monitors and this was reported, so they were later changed by the contractor, especially the facial boards.”
Negative experiences of contractors
<ul style="list-style-type: none">- “The contractor cannot be contacted and we don’t know where he is.”- “The building is situated on a water way. Unfortunately the contractor has left it and not returned.”- “Difficult to meet the contractors because of his busy schedule

In conclusion, citizen monitoring is an important component in the pursuit of tangible improvements in monitored projects. While monitors play a crucial role in identifying issues and reporting them, it is the combination of their efforts with timely action by the district assembly, political will, and intensified oversight that can lead to significant improvements. Collaboration and coordination among all stakeholders involved are necessary to ensure that the projects progress smoothly and deliver better value for public money. By addressing factors such as timely funding, contractor performance, and strong governmental support, citizen monitoring can have a more substantial impact on project outcomes and contribute to the overall success of public infrastructure initiatives.

3.3. By what methodologies can the delivery of better value from public money be assessed?

This research explored different methodologies by which the delivery of better value from public money can be assessed. At the onset of the research, different methodologies and analytical methods were mapped based on the review of literature and insights from industry practices. The identified methodologies encompassed diverse techniques such as Earned Value Analysis (utilized when economic data on benefits and savings are accessible), Contingent Valuation (for benefits without established economic or market values), Stories of Change, Regression Analysis (for estimating the influence of citizen monitoring on improved value and public savings), Net Present Value (to ascertain the value of investments or projects), and Cost-Benefit Analysis (for comparing the overall costs and benefits of a citizen monitoring project).

This section provides an overview of the main features and steps followed for the main methodological and analytical tools used to examine the extent to which citizen monitoring contributes to public savings and better value of public resources. Due to data availability constraints, the research team focused on employing four methodologies from the initially identified set. They include:

- i) Stories of Change
- ii) Earned Value Analysis
- iii) Regression Analysis
- iv) Net Present Value

i) Stories of Change:

Stories of Change is a qualitative method that captures narratives and experiences to understand how interventions, such as citizen monitoring, lead to outcomes and impacts. It focuses on personal stories and real-life accounts to illustrate the influence of interventions on individuals, communities, and systems.

Key Methodological Features: Stories of Change emphasize qualitative insights over quantitative data. They provide context-rich information, offering a deeper understanding of the process and pathways through which citizen monitoring contributes to public savings. The method values subjective experiences, empowering stakeholders to share their perspectives.

Overview of Steps and approaches used:

- Selection: The research team identified stakeholders who have been engaged in citizen monitoring and can provide meaningful stories.
- Interviews/Focus Groups: Conducted interviews or focus group discussions to gather stories about how citizen monitoring led to positive changes, including cost savings.
- Narrative Collection: Collected narratives that highlight specific instances of cost savings, improved project efficiency, and other relevant impacts.
- Analysis: Analyzed the collected stories to identify common themes, patterns, and causal relationships between citizen monitoring and public savings.

- **Synthesis:** Developed a narrative report that presents the stories of change, emphasizing the role of citizen monitoring in achieving cost savings and better value for public money.

ii) Earned Value Analysis:

Earned Value Analysis (EVA) is a project management technique that assesses project performance by comparing the budget or planned value (PV) of work to the earned value (EV) of work completed and actual costs (AC) incurred. It helps quantify the value delivered for the resources expended.

Key Methodological Features:

EVA integrates cost, schedule, and performance data to assess the efficiency of project execution. It requires establishing a baseline plan, tracking progress, and analyzing deviations from the plan. EVA provides a quantitative measure of project performance and cost efficiency.

Overview of Steps:

- *Baseline Project Information:* Research team collected and estimated some project details, especially the scope, schedule, and budget for the project. This was received at different times and was not available for all projects monitored.
- *Measurement:* Due to difficulties of obtaining project documents, the actual work completed (EV) and the costs incurred (AC) against the planned values (PV) were estimated as part of visual assessment on the level of work done.
- *Calculations:* Researchers undertook calculations on performance metrics such as Cost Variance (CV) and Schedule Variance (SV) to determine if the project is on track or over/under budget or likely to receive cost overruns, escalations etc.
- *Analysis:* Assessed the calculated metrics to identify trends, anomalies, and areas of concern where cost savings could be achieved.

iii) Regression Analysis

Regression Analysis is a statistical technique that explores relationships between dependent and independent variables. It can help quantify the extent to which citizen monitoring influences public savings, considering various control variables.

Key Methodological Features: Regression models quantify the strength and direction of relationships between variables. Multiple regression analysis allows the incorporation of multiple independent variables, including citizen monitoring, to determine their collective impact on the dependent variable (e.g., public savings).

Overview of Steps used in the research:

- **Data Collection:** The research gathered data on the dependent variable (e.g., cost savings) and independent variables (e.g., citizen monitoring, project value).

- Model Specification: Defined the regression model by selecting appropriate independent variables and specifying the functional form of the model.
- Estimation: Use statistical software to estimate the regression coefficients and their significance.
- Interpretation: Analyzed the coefficients to understand the extent to which citizen monitoring contributes to public savings while considering the impact of other variables.
- Conclusion: Based on the analysis, draw conclusions about the relationship between citizen monitoring and public savings, accounting for other relevant factors.

In this study, we employed a regression analysis to examine the influence of citizen monitoring on public savings in construction projects. The original conception was to use linear and quadratic monthly time trends in the regression model. These time trends were to help capture any systematic changes in cost savings over the monitoring period. However, due to data availability, the time series data/panel could not be used.

Multiple regression analysis with cross-sectional data collected over the monitoring period was therefore used in this study.

Equation (1) represents the base model for both cost savings and project completion rate regression models, where the dependent variable (y_i) is regressed solely on the control variable, project value. The equation is written as:

$$y_i = \beta_0 + \beta_1(\text{project value}) + \mu_i \dots\dots\dots \text{equation (1)}$$

Equation (2) represents the final model for both cost savings and project completion rate regression models, where the dependent variable (y_i) is regressed on both the control variable, project value, and the variable of interest, citizen monitoring. The equation is written as:

$$y_i = \beta_0 + \beta_1(\text{project value}) + \beta_2(\text{citizen monitoring}) + \mu_i \dots\dots\dots \text{equation (2)}$$

It should be mentioned that due to the setup of the project, the data collected was not a time series data with observations across time (as originally planned). The focus of the analysis is on the differences between monitored projects and counterfactuals using a dummy variable. Monitored projects were assigned a value of 1, while counterfactuals were assigned a value of 0.

The stepwise approach to the regression is used to assess the effect of the monitoring activity on both cost savings and project completion rate. Models (1) and (3) represent the baseline models without the monitoring variable, showing the results before considering the effect of citizen monitoring. Models (2) and (4) represent the final models that include the monitoring variable, allowing for an assessment of the impact of citizen monitoring on cost savings and project completion rate

By using this regression approach, the study aims to determine if there is a statistically significant relationship between citizen monitoring, project value, and the dependent variables of interest. The analysis will provide insights into whether citizen monitoring contributes to cost savings and improved project completion rates in the monitored projects compared to the counterfactuals.

iv) Net Present Value (NPV):

Net Present Value (NPV) is a financial method that assesses the profitability or viability of an investment by comparing the present value of cash inflows to the present value of cash outflows. It accounts for the time value of money.

Key Methodological Features: NPV evaluates the value of a project over time, considering the timing of costs and benefits. It helps determine if an investment, such as citizen monitoring, generates positive returns and contributes to better value or public savings.

Overview of Steps:

- *Cash Flows:* The research team estimated the expected costs and benefits associated with citizen monitoring over a specified time frame.
- *Discounting:* Applied a discount rate to future cash flows to account for the time value of money.
- *Calculation:* Calculated the present value of future cash inflows and outflows, then subtracted the total outflows from the total inflows to obtain the NPV.
- *Interpretation:* A positive NPV indicates that the investment generates more value and vice versa.
- *Comparison:* Compare the calculated NPV with the initial investment in citizen monitoring to assess whether the approach has delivered better value for public money.

Each of these methodologies offered a unique perspective on how citizen monitoring contributes to public savings and better value for money. Combining qualitative insights from Stories of Change with quantitative analysis from Earned Value Analysis, Regression Analysis, and Net Present Value provided some important understanding and insights of the extent to which citizen monitoring influences cost savings and contributes to better value for public money.

3.4. Has citizen monitoring delivered better value for public money?

This section focuses on a quantitative assessment of the relationship between, and possible influence of, citizen monitoring on financial savings and better value for public money. It further examines how these outcomes compare with the costs associated with implementing and maintaining the monitoring approach. The methodology involves collecting and analyzing data related to project costs, cost savings, project performance indicators, and the implementation costs of citizen monitoring. The analysis in this chapter focused on the following:

- Visual assessment of the projects to evaluate their health.
- Calculating the completion rates for each project
- Calculating cost savings for the projects monitored
- Comparing cost savings (if any) with the costs associated with implementing the monitoring approach itself

Brief Comment on Methodological Challenges:

Before presenting the results, it must be emphasised that the effectiveness of our approach was influenced by certain limitations, including:

- i) Challenges with access to all project documents (e.g. contracts, Bill of Quantities). These factors posed difficulties in obtaining key data and hindered the precise execution of the initially planned methodology. The basis or benchmark against which citizen monitors evaluated project quality also remained unclear due to the limited access to Bill of Quantities, required standards etc.
- ii) Inability to use contingent valuation methods to quantify the tangible and intangible benefits of citizen monitoring and express them in monetary terms. This is because the problems or observations identified and reported by the monitors were often very vague and imprecise. For example, descriptions such as “safety issues”, “low quality or incorrect resources”, “project is delayed”, “not enough resources or capacity”, “poor maintenance”, “low quality or incorrect resources” and positive benefits such as “improved transparency” etc had little specificity which constrained the assessment. Additionally, the photographs documenting defects identified or the improvements or ‘problem-fixes” resulting from citizen monitoring were most of the times missing for most of the reported problems and solutions. The absence of this visual evidence further complicated the quantification of benefits and the data analysis process.

As a result, the research team had to adapt the available data to the proposed methodology, which introduced its own set of complications. Consequently, the measurement of savings as used in this report was restricted to cost savings only, disregarding potential additional public savings resulting from the monitoring exercise. This limitation led to an undervaluation or non-accounting of certain (less tangible) benefits arising from the monitoring activities, resulting in a partial depiction of the overall viability of the monitoring approach. It is essential to acknowledge that the results presented in this section are influenced by the aforementioned challenges. However, despite these limitations, we believe that the insights gained from these results offer valuable lessons for future research in this area.

3.4.1. Assessing the health of the projects considered in this study.

Visual assessment of quality and health projects is crucial because it provides an on-the-ground evaluation of the physical conditions and overall state of the projects. Even in the absence of access to detailed information like the bill of quantities or specific quality indicators, visual assessment could allow for direct observation and identification of key aspects that contribute to the overall quality and

health standards of the projects. The visual assessment focused on identifying possible signs of structural weaknesses, such as cracks in walls, uneven flooring, or misaligned elements. These observations indicate potential construction flaws or compromised structural stability, which can impact the longevity and safety of the project. Other focus of the visual assessment includes observation of functional systems within the project, such as electrical wiring, plumbing, and environmental surroundings of the project.

Visual assessment was made of the projects, using three main categories: "Poor," "Good," and "Very Good," to represent the health and quality of the projects. We evaluated the physical structures to understand whether projects monitored had better quality physical features than those in the unmonitored communities. Table 3 (below) provides the main criteria for the classification.

Table 3: Classification criteria used for visual assessment of projects in DevCheck

Classification	Criteria
Poor	Neglected maintenance and signs of significant deterioration
	Visible signs of poor workmanship/craftsmanship
	The need for rework of some works previously executed
	Visible signs of use of substandard materials
	Visible signs of structural problems (cracks, unevenness, sagging, porous concrete resulting from inadequate wet vibration during construction etc)
Good	Generally sound structure with minimal or easily fixable issues
	Acceptable workmanship with attention to basic details
	Visible signs of use of good quality materials
	Absence of growth (plants, fungi) on the structure
	Minimal signs of deterioration of executed works
Very Good	Signs of high-quality workmanship
	Signs of meticulous attention to detail
	Visible signs of use of good quality materials
	Absence of growth (plants, fungi) on the structure
	No visible signs of deterioration of executed works

The visual assessment found no differences between the monitored projects and those that were not monitored, as the majority of the projects (in both cases) exhibited good or very good quality features. Among the 13 monitored projects that were visited for the visual assessments (at 12 different locations), three projects, accounting for 23% of the total, were classified as "Poor." Additionally, two projects, representing 15% of the total, were categorized as "Good." The majority of the monitored projects, comprising eight projects or 62% of the total, were classified as "Very Good." This indicates that a significant portion of the monitored projects demonstrated satisfactory health and quality.

In contrast, the small number of unmonitored projects did not have any projects categorized as "Poor." One project, representing 25% of the total, was classified as "Good," while the remaining 3 projects, accounting for 75% of the total, were deemed "Very Good." Overall, the data suggests that the majority of the projects, both monitored and unmonitored, exhibited good or very good health. Examples of the main problems identified during the assessment include the presence of weeds growing within the substructure of abandoned projects, weeds growing inside built floors, and inadequate casting, vibration, and compaction of concrete. These deficiencies have the tendency to cause exposure of iron rods to adverse weather conditions, compromising the structural integrity of the projects.

Table 4: Project Health Status

ID	Project	Health		
		Poor	Good	Very Good
Monitored projects				
P1	Construction and furnishing of 3-unit classroom block - Zohe, Yendi			*
P2	Construction of 3-unit classroom block - Nabori, West Gonja			*
P3	Construction of 10unit market stalls - Nyankpala			*
P4	Construction of 3-unit classroom block - Zakoli, Yendi			*
P5	Construction of 6-seater toilet block at L/A primary school - Yag-yili			*
P6	Construction of 6-unit classroom block - Tolon, Tolon			*
P7	Construction of 6-unit classroom block - Tootenyili, Savelugu		*	
P8	Construction of 6-unit classroom block at Nuri-Imaam primary school - Tuutingli, Tamale	*		
P9	Construction of 6-unit classroom block at L/A primary school - Yag-yili			*
P10	Construction of fence wall, and tiling & furnishing of CHPS Compound - Wari-Yapala			*
P12	Construction of vocational school - Damongo, West Gonja		*	
P13	Rehabilitation of 3 staff quarters - Savelugu Municipal Assembly, Savelugu	*		
P15	Renovation of 3-unit classroom block - Gbambaya, Yendi	*		
Unmonitored projects				
C1	Construction and furnishing of 6-Unit JHS girls model with ancillary facilities - Nanton			*
C2	Construction of CHPS compound with accommodation - Kanshegu			*
C4	Construction of 3-unit classroom and 1-unit office block - Sugashie		*	
C5	Construction of CHPS compound and semi-detached staff bungalow - Gumo			*

Summary			
Monitored projects	3 (23%)	2 (15%)	8 (62%)
Unmonitored projects	0 (-)	1 (25%)	3 (75%)

The visual assessment needs to be interpreted with caution, however. As highlighted earlier, some of the values associated with citizen monitoring, such as early detection of problems, course corrections, and prevention of thefts which characterized some of the monitored projects, may not be directly reflected in the physical structure or features of the facilities visited during the visual assessment. These values are more related to the process and implementation of the projects, rather than the final physical outcome. In the qualitative interviews in the communities without citizen monitors, participants shared the view that because most of the unmonitored projects were completed (and some even painted) at the time of the visual assessment, issues such as the use of substandard materials, or minor construction defects may not be readily visible during the visual assessment. As such, while visual assessment primarily focuses on the observable aspects of the project, it does not capture the entire scope of citizen monitoring and its impact.

3.4.2. Comparison of completion rates

Completion rate refers to the proportion or percentage of a project that has been successfully finished or accomplished within a specified period or according to a set schedule. The completion level of a project is an important indicator of its progress and can reflect the efficiency and effectiveness of project implementation. For example, if a construction project to build a school was initially planned to take one year and by the end of eight months, only 50% of the construction work has been completed, then the completion rate would be 50%. This indicates that the project maybe progressing at a slower pace than initially anticipated. A higher completion level suggests that a greater portion of the project tasks and activities have been accomplished, potentially leading to the realization of project benefits and outcomes.

The research explored whether projects monitored have the tendency to be completed, and unlikely to be abandoned, compared to those in the unmonitored communities. From the data obtained, some projects have achieved high completion levels, indicating successful implementation and delivery. These include the construction of 10-unit market stalls, renovation of a 3-unit classroom block in Gbambaya, the construction of a fence wall, tiling, and furnishing of a CHPS Compound in Wari-Yapala, and the construction of a 1 No. 3-unit classroom block at Nabori. However, there are also projects that are still at relatively low completion levels, such as the construction of 6-unit classroom blocks in Nuri-Imaam Primary School (Tuutingli), Tolon, and Tootenyili, as well as the construction of a vocational school in Damongo. These projects may require additional efforts and resources to reach their intended completion. Comparing the monitored projects to the counterfactual projects, the counterfactual projects generally have higher completion levels (averaging 96%, compared to 72% among those monitored).

Once again, it is important to interpret these findings with caution, considering that the completion levels of the monitored projects and counterfactual projects were influenced by various factors beyond just citizen monitoring. These factors can vary depending on the specific circumstances of each project. In this research, some of the contextual factors that accounted for the differences include:

- **Project complexities:** The difference in start dates between the projects and the complexities of the projects were crucial factors. Several of the projects selected for monitoring appear to have higher complexity or components or may require more time and resources to complete,

compared to those selected as counter-factual for the purposes of this research (e.g. construction of 10-unit market stalls versus construction of CHPS compound/clinic; Construction of 6-unit classroom block; or rehabilitation of 3no. staff quarters in Savelugu compared to the construction of 1No. CHPS compound in Tootenyili) Construction of a 6-unit classroom block in Tootenyili as compared to the construction of 1No. CHPS compound in Kanshegu).

- **Projects history:** The history of the projects being monitored might have also influenced the outcomes. Several of the monitored projects predate the establishment of the citizen monitoring activities and these projects were already facing delays even before the citizen monitors started their work.
- **Funding and political factors:** Other unique factors such as funding source, funding availability and release to contractors, political expediency, and external influences impacted the differences in completion levels of the projects.

Thus, while some monitored projects have achieved better completion rates, the extent to which citizen monitoring contributes to improved completion rates can vary based on project-specific circumstances.

Table 5: Project Completion Rates in Monitored Projects versus Counterfactual Projects

ID	Project	Completion Level
Monitored projects		
P1	Construction and furnishing of 3-unit classroom block - Zohe, Yendi	100%
P2	Construction of 3-unit classroom block - Nabori, West Gonja	100%
P3	Construction of 10unit market stalls - Nyankpala	100%
P5	Construction of 6-seater toilet block at L/A primary school - Yag-yili	95%
P6	Construction of 6-unit classroom block - Tolon, Tolon	41%
P7	Construction of 6-unit classroom block - Tootenyili, Savelugu	41%
P8	Construction of 6-unit classroom block at Nuri-Imaam primary school - Tuutingli, Tamale	16%
P9	Construction of 6-unit classroom block at L/A primary school - Yag-yili	97%
P10	Construction of fence wall, and tiling & furnishing of CHPS Compound - Wari-Yapala	100%
P12	Construction of vocational school - Damongo, West Gonja	25%
P13	Rehabilitation of 3 staff quarters - Savelugu Municipal Assembly, Savelugu	47%
P15	Renovation of 3-unit classroom block - Gbambaya, Yendi	100%
Unmonitored projects		
C1	Construction and furnishing of 6-Unit JHS girls model with ancillary facilities - Nanton	100%
C2	Construction of CHPS compound with accommodation - Kanshegu	100%

C3	Construction of CHPS compound and semi-detached staff bungalow - Mempeasem	100%
C4	Construction of 3-unit classroom and 1-unit office block - Sugashie	100%
C5	Construction of CHPS compound and semi-detached staff bungalow - Gumo	79%

3.4.3. Measuring cost savings or escalations

Cost overruns represent a significant pathway through which public money is lost during the construction of projects. Cost overruns occur when the actual costs of a project exceed the budgeted or planned costs. This can happen due to various reasons, including inflation, delays, and inefficiencies in project execution. When cost overruns occur, it directly impacts the budget allocated for the project, leading to a financial shortfall. This means that more funds would be needed to complete the project than initially anticipated. The additional funds required to cover the cost overruns often result in financial strain on the public sector.

Typically, when cost overruns or escalations occur in construction projects, contractors often seek to negotiate cost variations with the project owners or government entities. These negotiations aim to secure additional funding or resources to cover the increased costs and ensure project completion. However, the outcome of these negotiations can vary.

In some cases, negotiations for cost variations may be successful, resulting in additional funds being allocated to the project. This allows the contractor to continue the work and complete the project as planned. However, the additional costs incurred through cost variations can place a financial burden on the project owner or government, reducing potential savings and impacting the project's overall budget.

On the other hand, if negotiations for cost variations fail or if contractors are unable to secure the necessary additional resources, projects may face non-completion, excessive delays or abandonment. Non-completion of projects results in a loss of value as the intended benefits and services associated with the infrastructure are not realized. In terms of financial savings, when projects experience cost overruns and contractors are unable to find extra resources, it can negate the expected savings or cost efficiencies initially anticipated.

In our assessment, we used the lack of cost overruns as a proxy for the value obtained from citizen monitoring. As such, the research focused on analyzing whether the projects that were monitored were successful in preventing possible cost overruns, which are a common cause of financial losses for the government during the execution of infrastructure projects. To measure cost savings, we employed the Earned Value Analysis (EVA) technique, which is widely recognized for assessing project performance in terms of cost savings, project completion rates, and time to completion, among other factors.

Table 5 provides an overview of the progress of the citizen-monitored projects at different stages of completion. Out of the monitored projects, five projects have reached 100% completion, indicating that they have been finished according to the planned scope, and two further projects are nearing

completion with a progress level of 95% or greater. However, the remaining five projects are still less than 50% completed.

Key terms associated with the Earned Value Analysis

BCWS (Budgeted Cost of Work Scheduled) or PV (Planned Value): BCWS, also known as Planned Value (PV), represents the estimated cost of the work that was planned to be completed up to a specific point in time in the project schedule. It is the budgeted amount for the work scheduled to be accomplished.

ACWP (Actual Cost of Work Performed): ACWP represents the actual costs incurred for the work that has been completed up to a specific point in time. It reflects the actual expenses associated with the work performed in the project. This amount was estimated based on confidential information provided by district engineers (for some projects) and standard procurement tranches payment practices within the government sector.⁷

BCWP (Budgeted Cost of Work Performed) or EV (Earned Value): BCWP, also known as Earned Value (EV), represents the estimated value of the work that has actually been completed up to a specific point in time. It provides a measure of the budgeted value of the work that has been accomplished.

CV (Cost Variance): CV indicates the difference between the earned value (BCWP or EV) and the actual cost (ACWP). A positive CV indicates that the project is under budget, while a negative CV indicates that the project is over budget.

SV (Schedule Variance): SV is the difference between the earned value (BCWP or EV) and the planned value (BCWS or PV). A positive SV indicates that the project is ahead of schedule, while a negative SV indicates that the project is behind schedule.

CPI (Cost Performance Index): CPI is the ratio of the earned value (BCWP or EV) to the actual cost (ACWP). It provides insight into the cost efficiency of the project. A CPI greater than 1 indicates that the project is under budget, while a CPI less than 1 indicates that the project is over budget.

SPI (Schedule Performance Index): SPI is the ratio of the earned value (BCWP or EV) to the planned value (BCWS or PV). It indicates how well the project is adhering to the planned schedule. An SPI greater than 1 indicates that the project is ahead of schedule, while an SPI less than 1 indicates that the project is behind schedule.

ETC (Estimate to Complete): ETC represents the estimated cost required to complete the remaining work in the project based on the performance so far. It is used to forecast the total project cost based on current trends.

EAC (Estimate at Completion): EAC represents the projected total cost of the project when completed. It can be calculated using different methods, such as using the original budget, current performance, or a combination of both.

VC (Variance at Completion): VC indicates the projected difference between the original budget and the estimated cost at completion (EAC). It provides an estimate of the final cost variance for the entire project.

These terms are commonly used in project management to assess the progress, performance, and cost effectiveness of projects. They provide valuable insights into whether a project is on track, within budget, and meeting its scheduled milestones.

⁷ The gathering of confidential information on actual payments made was hampered by the news of procurement scandals at the Northern Development Authority of Ghana, as key contact persons suddenly remained tight-lipped on procurement and payment-related issues. News on the scandal can be found here: <https://ghananewsonline.com.gh/corruption-hits-northern-development-authority-as-ceo-allegedly-inflates-payment-figures/> Cost consultant obtained actual cost for some projects and estimated actual payments/cost of work performed for other projects based on standard scheduled tranche payments of work done that are common in the public sector. The estimation was established based on available information during computation, incorporating bills of quantities, field measurements, and investigations. Field investigations revealed that for ongoing projects, multiple partial payments were reported, typically correlating with raised payment certificates. Field findings showed consistent payments for work completed, indicating no variations as at time of data collection. Consequently, the actual cost of work performed aligned with the budgeted cost. To further assess the situation, the cost consultant calculated the Estimated Cost at Completion (EAC), which showed significant variances (Variance at Completion – VC) due to the rising building materials.

Upon analyzing the data presented in Table 6, it is observed that the budgeted cost of work performed (BCWP) matches the actual cost of work performed (ACWP) for all eleven project sites, at the time the research undertook the assessment. This alignment between BCWP and ACWP results in a cost variance (CV) of zero, indicating no deviation from the budgeted costs for each project in line with the level that has been completed. Similarly, the cost performance index (CPI) is calculated as 1 for each project, indicating that the projects are performing in line with the planned budget.

The implication of the data presented in Tables 5 and 6 is that the completed citizen-monitored projects progressed according to the planned schedule and budget. The fact that four projects have already reached 100% completion suggests that they have been successfully executed without any significant delays or cost overruns. Additionally, the projects that are nearing completion or have made substantial progress indicate that the implementation process is on track. The absence of cost variance (CV) and the cost performance index (CPI) values of 1 for each project further reinforce the notion that the projects are meeting the budgeted costs and performing as expected. This implies that the financial resources allocated for these projects might have been utilized effectively, resulting in no significant deviations from the planned expenditures, potentially given indications of the effectiveness of citizen monitoring in ensuring better value for public money.

However, the projects that remain incomplete are experiencing delays and are operating at varying levels of efficiency, with completion rates below 100%, as indicated by the schedule performance indices (SPI). The SPI values for all the monitored projects are less than one, indicating that they are behind schedule. Among the incomplete projects, the construction of the 6-unit classroom block at Nuri-Imaam Primary School in Tuutingli is the least efficient, with a completion rate of approximately 20%. This means that there is a significant improvement needed to bring the project back on schedule.

The analysis is further supported by the schedule variance (SV), which is negative for all projects. This indicates that the projects are not progressing as planned and cannot be completed within the expected timeframes. The long break or delay has likely contributed to the challenges in meeting the project timelines.

Table 6: Earned Value Analysis – Variance Analysis

ID	Project	BCWS (PV) (GHS)	ACWP (GHS)	BCWP (EV) (GHS)	CV	SV (GHS)	Actual completion
P5	Construction of 6-seater toilet block at L/A primary school - Yag-yili	129,120.00	117,120.00	117,120.00	0	-12,000	95%
P6	Construction of 6-unit classroom block - Tolon, Tolon	453,272.00	246,159.00	246,159.00	0	-207,112.5	41%
P7	Construction of 6-unit classroom block - Tootenyili, Savelugu	453,272.00	217,338.00	217,338.00	0	-235,933.5	41%
P8	Construction of 6-unit classroom block at Nuri-lmaam primary school - Tuutingli, Tamale	453,272.00	89,762.00	89,762.00	0	-363,509.5	16%
P9	Construction of 6-unit classroom block at L/A primary school - Yag-yili	585,000.00	556,658.00	556,658.00	0	-28,342	97%
P10	Construction of fence wall, and tiling & furnishing of CHPS Compound - Wari-Yapala	141,581.00	141,581.00	141,581.00	0	0	100%
P12	Construction of vocational school - Damongo, West Gonja	284,878.00	101,018.00	101,018.00	0	-183,860	25%
P13	Rehabilitation of 3 staff quarters - Savelugu Municipal Assembly, Savelugu	195,250.00	69,550.00	69,550.00	0	-125,700	47%
C5	Construction of CHPS compound and semi-detached staff bungalow - Gumo	238,145.00	227,394.00	227,394.00	0	-10,751.3	79%

Table 7: Earned Value Analysis - Performance Indices

ID	Project	CPI (BCWP/ACWP)	SPI (BCWP/BCWS)	ETC (GHS)	EAC (GHS)	Variance at Completion
P5	Construction of 6-seater toilet block at L/A primary school - Yag-yili	1	0.907063	22,000	139,120	-10,000
P6	Construction of 6-unit classroom block - Tolon, Tolon	1	0.543072	627,546	873,705	-420,433.5
P7	Construction of 6-unit classroom block - Tootenyili, Savelugu	1	0.479487	626,226	843,564	-390,292.5
P8	Construction of 6-unit classroom block at Nuri-Imaam primary school - Tuutingli, Tamale	1	0.198031	1,038,859	112,8621	-675,349.5
P9	Construction of 6-unit classroom block at L/A primary school - Yag-yili	1	0.951552	42,455	599,113	-14,113
P10	Construction of fence wall, and tiling & furnishing of CHPS Compound - Wari-Yapala	1	1	-	-	0
P12	Construction of vocational school - Damongo, West Gonja	1	0.354601	308,017	409,035	-124,157
P13	Rehabilitation of 3 staff quarters - Savelugu Municipal Assembly, Savelugu	1	0.35621	144,130	213,680	-18,430
C5	Construction of CHPS compound and semi-detached staff bungalow - Gumo	1	0.954854	158,320	385,714	-147,568.7

The data allows us to assess the cost and schedule performance of the monitored projects, identify potential cost overruns, and evaluate the efficiency of project completion. However, a complete analysis and interpretation of the data require considering additional factors and conducting further investigations to understand the overall project performance.

As shown in Table 7, the delay in completion and the inefficiency in project performance has consequences on the estimate to complete (ETC) and the estimate at completion (EAC). More funds than budgeted are required to complete the projects according to the CV estimates, which leads to cost escalations to the tune of about GHS1.8 million across this selection of projects. The hike in inflation (54.1% as at December 2022) has contributed to the huge increase in the cost of the yet to be completed projects. When these cost escalations are correlated with the level of project delivery efficiency. The projects that are lagging significantly behind require significant amounts of funds to complete, and vice versa. This is logical and consistent with practice. The data, therefore, reveals that the uncompleted projects are facing delays and efficiency issues, with completion percentages below 100%. The schedule performance indices (SPI) and schedule variance (SV) indicate that these projects are not on track to meet their scheduled completion dates.

Based on the information it is observed that these projects are behind schedule and experiencing efficiency issues suggests that there may have been challenges or limitations in the monitoring process. However, it is important to note that while the uncompleted projects may not have achieved their intended objectives within the expected timeframe, the interviews showed that the citizen monitoring proved crucial in identifying issues or potential problems early on that were addressed, able to bring some contractors who had left site back on site to continue their work up to a certain level (e.g. Tootenyili, Tolon) and generally improved contractor-community relations for some projects.

3.4.4. Reflections on the methodological process of using cost savings to assess value.

The approach used in measuring cost savings or overruns in the context of citizen monitoring has several strengths but also presents some limitations that should be critically evaluated. While the aim of measuring cost savings and overruns is to assess the effectiveness of citizen monitoring in achieving better value for money in construction projects, it is important to consider the methodology employed, the data sources utilized, and the potential biases and limitations associated with the approach.

One strength of the approach is its focus on comparing the planned costs with the actual costs incurred, to provide a quantitative assessment of cost savings or overruns. This approach offers a clear and tangible measure of the financial performance of the projects and allows for straightforward comparisons across different projects and monitoring initiatives. It enables stakeholders to assess the extent to which citizen monitoring has contributed to cost efficiencies in construction projects.

However, there are certain limitations to this approach that need to be acknowledged. First, the measurement of cost savings or overruns relies heavily on the availability and accuracy of data. It is essential to have reliable and comprehensive data on project budgets, actual expenditures, and any cost adjustments or variations that may have occurred during the project implementation. Sufficient data were obtained for only 9 projects to enable the estimates and assessments made in this section. In some cases, accessing such data can be challenging, particularly when there are transparency and accountability issues within the project management and reporting systems. Incomplete or inaccurate data can compromise the validity and reliability of the cost measurements, potentially leading to misleading conclusions.

Another limitation is the omission of indirect or non-financial factors that could also contribute to the overall value of citizen monitoring. While cost savings are a crucial aspect, the Research Team was not able to capture the broader benefits that citizen monitoring can bring to construction projects, such as improved quality, enhanced community engagement, and increased social accountability due to data

access limitations which prevented the use of Contingent Valuation and Stated Preference methods (see Section 3.4). These non-financial factors, although difficult to quantify, are important for understanding the holistic impact of citizen monitoring and assessing its effectiveness in achieving better value for money.

Furthermore, the approach may not adequately consider the influence of external factors on cost savings or overruns. Construction projects are subject to various external factors, such as changes in market conditions, inflation rates, and government policies, which can significantly impact project costs. Failure to account for these external factors in the cost measurements may lead to an incomplete understanding of the true drivers of cost performance. It is crucial to consider the contextual factors and external influences that can affect project costs and compare them across monitored and non-monitored projects to ensure a comprehensive analysis.

Additionally, the approach used in measuring cost savings or overruns may not sufficiently capture the long-term financial implications of citizen monitoring. While the immediate cost savings or overruns are important indicators, it is equally essential to assess the long-term sustainability and durability of the cost efficiencies achieved through citizen monitoring. This requires considering factors such as maintenance costs, lifecycle costs, and the overall performance and longevity of the constructed infrastructure. Focusing solely on short-term cost measurements may overlook the potential cost implications that could arise in the future.

In conclusion, while the approach used in measuring cost savings or overruns provides a quantitative assessment of the financial performance of construction projects under citizen monitoring, it has certain limitations that need to be critically evaluated.

3.4.5. Exploring the statistical relationship between citizen monitoring and cost savings

The research further used regression analysis to examine the relationship between citizen monitoring and two key dependent variables: cost savings and project completion rate. The methodology used for the regression model in this study is a multiple regression analysis with cross-sectional data collected that was collected over the monitoring period. The study aims to examine the relationship between the dependent variables, which are cost savings and project completion rate, and the independent variables, namely citizen monitoring and project planned value.

Equation (1) represents the base model for both cost savings and project completion rate regression models, where the dependent variable (y_i) is regressed solely on the control variable, project value. The equation is written as:

$$y_i = \beta_0 + \beta_1(\text{project value})$$

Equation (2) represents the final model for both cost savings and project completion rate regression models, where the dependent variable (y_i) is regressed on both the control variable, project value, and the variable of interest, citizen monitoring. The equation is written as:

$$y_i = \beta_0 + \beta_1(\text{project value}) + \beta_2(\text{citizen monitoring}) + \mu_i$$

It should be mentioned that due to the setup of the project, the data collected was not a time series data with observations across time (as originally planned). The focus of the analysis is on the differences

between monitored projects and counterfactuals using a dummy variable. Monitored projects were assigned a value of 1, while counterfactuals were assigned a value of 0.

The stepwise approach to the regression is used to assess the effect of the monitoring activity on both cost savings and project completion rate. Models (1) and (3) represent the baseline models without the monitoring variable, showing the results before considering the effect of citizen monitoring. Models (2) and (4) represent the final models that include the monitoring variable, allowing for an assessment of the impact of citizen monitoring on cost savings and project completion rate. The findings of the regression analysis is shown in Table 8.

Table 8: Regression Results

Independent Variables	Dependent Variable			
	Cost Savings		Project Completion Rate	
	(1)	(2)	(3)	(4)
Project Value	-0.412 (0.267)	-0.392 (0.261)	0.000 (0.000)	0.000 (0.000)
Citizen Monitoring		-91,279.34 (70,582.60)		-0.438 (0.266)
Intercept	53,498.33 (95,251.45)	101,619.24 (100,055.99)	4.686*** (0.373)	4.917*** (0.377)
Observation	15	15	15	15
R Squared	20.6%	25.9%	9.1%	25.8%
Adjusted R Squared	14%	13.5%	2.1%	13.4%
F-Statistic	0.103	0.166	0.276	0.167

Based on the result, the presence of citizen monitoring is associated with a decrease in cost savings. However, this coefficient is not statistically significant (p-value = 0.266), indicating that there is not enough evidence to conclude that citizen monitoring has a significant impact on cost savings. It can be inferred from the table that there is not sufficient statistical evidence to conclude that citizen monitoring has a significant impact on generating cost savings in the 15 analyzed projects. Two other inferences can be made from the analysis.

- First, the lack of statistical significance suggests that there may be other factors at play influencing cost savings in the projects that were not accounted for in the regression model. These factors include funding constraints, (un)timely release of funds to contractors and external economic factors, among others.
- Second, the F-statistics and the overall goodness-of-fit measures as depicted by the relatively low R-squared and Adjusted R-squared values in all models (ranging from 9.1% to 25.9%) further suggest that the models may not fully capture the variability in cost savings, further emphasising the fact that there are other factors that influence cost savings than citizen monitoring that are not captured by the model.

In conclusion, based on the results of the analysis, we cannot make a strong inference about the relationship between citizen monitoring and cost savings in the projects under consideration. The lack of statistical significance and the limited explanatory power of the model suggest that citizen monitoring alone may not be a significant determinant of cost savings in government construction

projects. It is, therefore, important to consider other factors in future research to better understand the drivers of cost savings in infrastructure projects. Some suggestions to increase the explanatory power of the model in future studies include the following:

- **Larger Sample Size:** The regression model used only 15 observations. A larger sample size can increase the statistical power of the analysis. Future studies can expand the sample to include more projects. A larger sample size provides a broader range of observations, potentially leading to more accurate estimates and improved model performance.
- **Collecting Detailed Project Characteristics:** There are several characteristics of projects that were not considered in this model due to data challenges, including project scope, design features, construction methods, contractor responses, funding release dates etc. This information can provide additional insights into the factors that contribute to cost savings and may be considered in future studies.
- **Longitudinal Analysis:** If possible, future studies can consider a longitudinal analysis that tracks the same projects over time. Longitudinal data can provide a more comprehensive understanding of the relationship between citizen monitoring and cost savings by accounting for changes that occur over the project lifecycle.

3.4.6. Financial viability of Citizen Monitoring (Net Present Value Analysis)

To determine the financial viability of citizen monitoring of projects, a Net Present Value (NPV) analysis was conducted. Net Present Value (NPV) analysis is a financial viability assessment method that compares the present value of future cash inflows to the present value of future cash outflows, considering the time value of money. In other words, NPV analysis evaluates the profitability of an investment by calculating the present value of expected cash flows and comparing it to the initial investment. If the NPV is positive, it indicates that the investment is financially viable and has the potential to generate returns while a negative NPV indicates that the project is not financially viable.

For this project, the investment outflows are the citizen monitoring costs (set up, transportation allowances, phone, training etc) while the investment inflows are the cost savings and better value for money expected through the work of the citizen monitors (if any).

When a project is delivered according to budget, the actual project cost is equal to the planned value, i.e., $A = X$. This situation results in a cost saving in relative terms compared to alternative project bids during procurement. This **expected case or scenario** assumes that the citizen monitoring activity is viable and there are no cost escalations or negative cost savings. In this context, the Net Present Value (NPV) of the expected case represents the sum of the present values of the monitoring costs. The viability of the investment is calculated by comparing it with the **observed case** (i.e., what actually happens) when the citizen monitoring activity has taken place. If there are cost escalations, the NPV of the observed case will be greater (in cost) than the NPV of the expected case.

The research estimated total variance for the monitored projects with available data at GHS - 1,094,746.43. The research compared this total variance recorded with the amount of money spent on implementing the monitoring project. However, since several of the projects are incomplete and likely to result in cost escalations if they were to be completed, the results of the NPV analysis showed a greater loss of resources.

In monetary terms, the expected/planned NPV for all projects was -88,168.11 GHS, while the observed NPV was -1,099,752.78 GHS, resulting in a large negative variance of -1,094,746.43 GHS. Thus, the analysis indicates that the NPVs for the observed projects were significantly lower than the expected/planned NPVs.

This suggests that, in monetary terms, the cost spent in setting up, resourcing and supporting the work of the monitors (in this short term) far outweighs cost savings that may have been accrued at the time of writing the report. The main driver has been the non-completion of several of the projects and the tendency to spend a lot of resources to complete them due to inflation and recent price hikes in building materials. The greatest loss was incurred on the construction of the 6-unit classroom block at Nuri-Imaam Primary school at Tuutingli (i.e. NPV = -GHS443,704.73) and that least loss (i.e. NPV = -GHS8,490.02) at Yag-Yili for the construction of a 6-seater toilet block at L/A primary school.

Table 9: Net Present Value Analysis (GHS)

ID	Project	Expected Case	Observed Case	Variance
P5	Construction of 6-seater toilet block at L/A primary school - Yag-yili	(14,694.68)	(23,184.70)	(8,490.02)
P6	Construction of 6-unit classroom block - Tolon, Tolon	(14,694.68)	(28,698.89)	(14,004.20)
P7	Construction of 6-unit classroom block - Tootenyili, Savelugu	(14,694.68)	(271,939.52)	(257,244.83)
P8	Construction of 6-unit classroom block at Nuri-Imaam primary school - Tuutingli, Tamale	(14,694.68)	(458,399.42)	(443,704.73)
P9	Construction of 6-unit classroom block at L/A primary school - Yag-yili	(14,694.68)	(25,875.07)	(11,180.39)
P12	Construction of vocational school - Damongo, West Gonja	(14,694.68)	(97,856.44)	(83,161.76)
P13	Rehabilitation of 3 staff quarters - Savelugu Municipal Assembly, Savelugu	(14,694.68)	(291,655.18)	(276,960.50)
All projects:		(88,168.11)	(1,099,752.78)	(1,094,746.43)

What it emerges is that the investment in citizen monitoring outweighs the cost savings that have been made from the combined projects that have sufficient data (at least in the short term), although it may have been effective at securing other benefits – transparency, accountability, and community involvement in project delivery. The NPV analysis should, therefore, be interpreted in conjunction with other factors such as social benefits, community impact, and project objectives to have a comprehensive understanding of the projects' overall value and effectiveness as the results are influenced by various factors, including the non-completion of projects, cost escalations due to inflation and price hikes in building materials, less quantification of errors detected and associated course corrections, thefts avoided and other factors that lie outside the scope and control of citizen monitoring activities.

As such these results need to be interpreted with caution. As stressed throughout the report, there is evidence gathered through the various narratives that citizen monitoring's contributions to cost savings

extend beyond mere financial gains. The examples (including for example instances where monitors' intervention averted a scenario where a school building would have been left incomplete or even revival of projects that were previously abandoned) highlight its potential to prevent wastage, revive abandoned projects, and ensure the long-term sustainability of cost efficiencies.

4. Conclusion and key messages

The question of whether citizen monitoring saves public money has been explored in this report. Through an analysis of various factors, including the role of citizen monitors, project performance, cost savings, project completion rates, and net present value (NPV) analysis, this research has provided valuable insights into the effectiveness and financial viability of citizen monitoring in construction projects.

The findings of this study suggest that citizen monitoring can indeed contribute to better value for public money in certain aspects of construction projects. The presence of citizen monitors has been shown to have positive effects on early detection of problems, course corrections, transparency and improved completion time. By actively engaging in project oversight and scrutiny, citizen monitors can identify and report issues such as poor materials, non-compliance with specifications, and potential corruption, which can ultimately lead to cost savings and better project outcomes.

One of the key findings is that citizen monitoring can play a crucial role in promoting higher standards in public infrastructure. By closely monitoring the quality of materials used in construction, citizen monitors were able to prevent the use of substandard materials that could have compromised the integrity and longevity of the infrastructure. This not only ensures the safety of the structure but also saves public money by avoiding costly repairs or reconstruction in the future. As highlighted in the case of the classroom block project, the monitors' vigilance in identifying weak blocks for the foundation led to prompt action by the contractor, thus preventing a potential collapse and further expenses.

Transparency and accountability were also found to be significant benefits associated with citizen monitoring. The presence of monitors created a culture of accountability among contractors and project initiators, as they were aware that their actions were being observed. The fear of detection and public scrutiny can act as a deterrent against corrupt practices such as bribery and kickbacks, which are often the cause of misappropriation of public funds. The reports from citizen monitors proved instrumental in issuing directives for the replacement of substandard construction materials, ensuring that public money was not wasted on low-quality materials that would compromise the project's longevity.

Furthermore, the research demonstrated that citizen monitoring has the potential to improve project management and efficiency. By keeping constant pressure on contractors, monitors can help to ensure that projects are completed on time, minimizing delays and associated economic and social losses. The example of the culvert work being corrected promptly upon the monitors' request highlights the positive impact of their scrutiny on the contractor's attention to detail and the overall project timeline.

However, it is important to note that the effectiveness of citizen monitoring is likely to vary across different projects and contexts. The analysis of incomplete projects included in this research revealed that they had been behind schedule and performing at various levels of efficiency even before the citizen monitoring began. Thus, while citizen monitoring was able to help identify issues and provide valuable

feedback, it could not guarantee successful project completion. Factors beyond the control of the monitors, such as external constraints, resource availability, and stakeholder cooperation have a significant influence on project outcomes.

Additionally, the NPV analysis of projects provided insights into the financial implications of the citizen-monitored projects. The observed NPVs for the projects were predominantly negative, indicating underperformance and financial losses compared to the original plan and budget. This suggests that while citizen monitoring may contribute to other aspects of project success, it is unable to guarantee positive financial outcomes in all cases. To fully unpack the financial viability of citizen monitoring as a standalone investment for greater project effectiveness and cost savings, further evaluation will be required in order to reach a definitive conclusion. This would need to include further analysis of broader factors such as external influences, social benefits and long-term project impacts, which were beyond the scope of this research.

This research provides strong evidence to conclude that citizen monitoring can play a valuable role in promoting better value for public money in construction projects. By facilitating early detection of problems, ensuring compliance with specifications, increasing transparency, and inspiring wider community engagement, citizen monitors contribute to cost savings, improved project management, and overall project success. However, as stated above, the effectiveness of citizen monitoring should be assessed in conjunction with other project factors, and the financial viability of citizen monitoring as a standalone investment requires careful consideration. To maximize the benefits of citizen monitoring, policymakers and organizations promoting citizen monitoring should ensure adequate training, resources, and support for citizen monitors. It is crucial to provide them with the necessary knowledge, skills, and tools to effectively carry out their monitoring tasks. Training programs can focus on areas such as project evaluation, construction standards, and corruption detection, empowering citizen monitors to identify potential issues and advocate for necessary improvements.

Furthermore, collaboration and cooperation between citizen monitors, project initiators, contractors, and relevant authorities are essential for successful project outcomes. Effective communication channels should be established to facilitate the reporting and resolution of issues identified by citizen monitors. Regular meetings and consultations can promote dialogue and understanding between all stakeholders, ensuring that the concerns and recommendations of citizen monitors are taken into account and acted upon in a timely manner.

Policy makers can draw valuable lessons from the findings of this report. It is essential to recognize the potential of citizen monitoring in improving the efficiency and effectiveness of construction projects. Policy frameworks and guidelines should be developed to encourage and support citizen monitoring initiatives, ensuring that they are integrated into project planning, implementation, and evaluation processes. This can be achieved through the establishment of legal frameworks, provision of resources, and recognition of the role of citizen monitors in project governance.

For organizations that aim to promote citizen monitoring, the lessons drawn from this study provide valuable insights. It is crucial to invest in capacity-building initiatives for citizen monitors, equipping them with the necessary skills and knowledge to fulfill their roles effectively. Collaboration with relevant stakeholders, including government agencies, civil society organizations, and local communities, is essential for the success of citizen monitoring initiatives. By fostering partnerships and sharing best practices, organizations can enhance the impact and sustainability of citizen monitoring efforts.

However, it is important to recognize that citizen monitoring is not a panacea for all challenges experienced in construction projects. It should be viewed as part of a broader framework of project governance and oversight. Other mechanisms, such as robust procurement processes, independent audits, and professional project management, should also be in place to ensure the successful delivery of projects and the protection of public funds. By incorporating citizen monitoring into project governance frameworks, providing necessary support and resources, and fostering collaboration between stakeholders, the benefits of citizen monitoring can be maximized, leading to improved project outcomes and increased public trust in the construction sector.

In conclusion, this research has shown that citizen monitoring could offer a cost-effective tool for governments to enhance oversight, reduce project costs, and detect mismanagement and fraud in a timely manner. By involving citizens as watchdogs, governments can tap into local knowledge and networks, fostering a culture of accountability and transparency. Citizens bring valuable contextual knowledge and on-the-ground experience, identifying cost-saving measures and innovative solutions. Leveraging digital platforms and data analytics can streamline monitoring processes and reduce administrative costs. Moreover, citizen monitoring has long-term benefits, promoting social capital and civic participation for sustainable communities. Overall, citizen monitoring is a valuable approach that contributes to better value for public money in construction projects.