

Assessment of Quality Management Practices of Building Construction Firms in Uganda: A Case of Kamwenge District

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Abstract: Quality management in the construction industry includes quality control, quality planning and quality assurance to improve the quality of buildings. However, there have been challenges related to cost variations, timeliness and delays in maintenance which affect quality management of buildings. The study assessed quality management practices of building construction firms in Uganda with the purpose of developing a framework that can be used by construction firms to improve on the quality of buildings. In this study, descriptive design was employed in which both qualitative and quantitative data were collected from a sample size of 54 respondents purposively selected from employees of construction firms and Kamwenge local government using a survey questionnaire and documentary reviews. Data were analyzed using descriptive and multivariate analysis in SPSS version 25. The contribution of each of the factors on the quality of construction firms was determined by use of Relative Importance Index (RII) and the ranking of these attributes in terms of their criticality as perceived by the respondents. The findings indicated that procurement systems, third party certification and on site supervision greatly influenced the cost, timeliness and delivery of buildings hence affecting the quality management practices. The developed framework shall be used to engage stakeholders in the phases of the construction projects mainly buildings to improve on cost estimation and timely completion hence improving on quality management of buildings and service delivery.

Keywords: Quality Management, Quality Planning, Quality Control, Construction Firms

1. Introduction

Construction industry has been widely criticized for its low quality of delivery of construction projects [1]. Construction firms need to adopt quality management in order to solve quality problems in order to meet the demands of the clients [2]. Total quality management is defined as a management viewpoint that encompasses all functions of an entity like human resources, operations and marketing in order to focus on meeting customer needs and firm's objectives [3].

Globally, building construction sector is considered to be a basic sector on which the development of a country depends [4]. Quality of global firms in building projects is driven by practices adopted [5]. It is asserted that the majority of the

construction companies in all over the world face a lot of many challenges and problems such as workmanship defects, delay and cost overrun in complementing their construction projects for the past three decades [6].

Total quality Management culture has contributed to increased productivity of firms around the world [7]. Global international, regional and local firms always strive to gain competitive edge in building projects based on TQM initiatives that are customer centric in nature. In Africa, [8] pointed out that the collapse of buildings in Africa has been attributed to weak foundations, substandard construction materials, poor material mixing by construction workers, excessive load on strength of buildings and poor testing of

building strength. Many construction industries have criticized especially in terms of productivity and quality system because implementing managers mainly focus on the cost and time instead of quality for construction projects [9].

Collapsed buildings are a growing problem where many buildings in the region's major cities are under construction or renovation [10]. Research indicates that Kenya has probably suffered the most building collapses in the last decade due to lack of quality and poor construction materials [11]. In one of those instances, it was revealed that although the developer was served with a stoppage order due to violation of construction regulation and huge cracks that had developed in the said building, work continued and hence the collapse [12].

In Uganda, it is estimated that building construction employs 1.3% of the total registered employees with ideal of quality output [13]. The construction industry contributed 12% of the GDP by 2005 [14]. Despite this contribution, there have been reported cases of irregularity in the quality of buildings whereby for example a storied building collapsed in the city suburb of Kansanga and the causes were poor materials and inexperienced engineers. This, therefore, prompted the Government to shift the contracts to design-build with the notion that the contractor will do more testing to improve on the quality of designs and save construction costs [15].

1.1. Statement of the Problem

Building construction firms in Uganda implement ISO 9001 Quality Management System and obtain consequent approvals, rewards and certificates. The standard is based on a number of quality management principles including a strong customer focus, the motivation and implication of top management, the process approach and continual improvement and using US ISO 9001:2015 helps to ensure that customers get consistent good quality products and services, which in turn brings many business benefits. The design and implementation of building construction's quality management system is influenced by varying prices of inputs for instance, there was highest 25.8 percent increase in average prices of inputs in the overall construction sector registered in 2011, followed by an increase of 11.4 percent in 2009 and the lowest increases in average prices for the whole sector was 2.2 percent which was registered in 2013 [1]. Despite the standard set by ISO 9001, the quality of buildings have continued to deteriorate in Kamwenge district whereby there has been a high death rate because of collapsed buildings during rainy seasons and earth quakes, they have experienced cost and time over run. The cause of the breakdown might be caused by un experienced personnel using poor materials to maintain the quality of building projects by many building firms and it is against this background that this study sought to assess the quality management practices of building construction firms in Uganda particularly Kamwenge District.

1.2. Objectives of the Study

The main objective of the study was to assess the quality management practices of building construction firms in Uganda and was guided by the following specific objectives:

- i) To determine the current quality management practices in building construction firms in Uganda;
- ii) To determine the extent to which quality management is practiced in building construction firms in Uganda.
- iii) To establish the challenges in implementation of quality management practices in building construction firms in Uganda.
- iv) To develop a framework for effective quality management practices in building construction firms in Uganda.

2. Literature Review

2.1. Stakeholder Theory

The study was guided by stakeholder theory that was propounded by [16]. According to [17], the "maximizing shareholder value" view is put forward as a "scientific" theory that is modeled and verified appropriately by ideologists called "economists." On the other hand, a study by [18] argued that stakeholder ship involved a theory of organizational management and ethics which was distinct because it addressed morals and values as explicit central features of organizational management. He also pointed out that management for stakeholders involved attention to more than simply maximizing shareholder wealth.

2.2. Quality Management Systems in Construction Projects

Quality system is defined as "the organizational structure, responsibilities, procedures, processes, and resources for implementing quality management" [19]. On the hand, quality management system refers to the set of quality activities involved in producing a product, process, or service, and encompasses prevention and appraisal [20]. It is a management discipline concerned with preventing problems from occurring by creating the attitudes and controls that make prevention possible [21]. Quality activities include: determination of the quality policy, objectives and responsibilities and implementing them through quality planning, quality control, quality assurance and quality improvement, within the quality system [19].

2.3. Factors Affecting Project Time Delay and Cost Overruns

2.3.1. Quality Planning and Quality Assurance

Quality planning is defined as a set of activities whose purpose is to define quality system policies, objectives, and requirements, and to explain how these policies will be applied, how these objectives will be achieved, and how these requirements will be met [21]. Quality assurance is defined as a set of activities whose purpose is to demonstrate that an entity meets all quality requirements. Quality

assurance activities are carried out in order to inspire the confidence of both customers and managers, confidence that all quality requirements are being met. It is noted that quality requirements should be clear and verifiable so that all parties in the project can understand them for conformance [22]. Quality assurance emphasizes defect prevention, unlike quality control that focuses on defect detection once the item is produced or constructed. According to [22], it was further established that quality assurance concentrates on the production or construction management methods and procedural approaches to ensure that quality is built into the production system.

2.3.2. Stakeholder Framework and Building Construction

Stakeholder involvement in building construction involves determining how to plan, developing the scope statement, selecting the planning team, identifying deliverables and creating the work breakdown structure, identifying the activities needed to complete those deliverables and networking the activities in their logical sequence, estimating the resource requirements for the activities. It also involves estimating time and cost for activities, developing the schedule, developing the budget, risk planning and gaining formal approval to begin work in order to construct output with quality specification, time and cost [23].

Stakeholders can affect an organization's functioning, goals, development and even survival [24]. Successful engagement of stakeholders involves actively giving and getting their support and working together to devise, plan and develop new construction designs [25]. Senior leaders in construction projects can adopt stakeholder engagement as an opportunity to influence other organizations and create alignment to structures and processes to support the vision and mission of timeliness, quality, durability and minimizing costs [26].

3. Methodology

Research design as the overall plan or strategy for conducting research [27]. It is a master plan specifying the methods and procedure for collecting, analyzing and interpreting the data in order to get the desirable information. The study adopted descriptive survey design citing [28] that descriptive survey design is easy to manage and administer. The design is preferred because it will give a broad understanding that leads to a justifiable means of investigating the relationship between variables in the study. The study sample that was randomly selected constituted 10 local government officials in engineering and procurement departments and 50 employees of construction firms prequalified with Kamwenge District because they were believed to have enough knowledge for the study. Data were collected using a self-administered questionnaire, interviews, desk survey and a document review guide. The questionnaire was selected as the main data collection tool because it is cheap to administer and covers a wide geographical area; it provides a hard copy that can be filed for reference purposes.

The questionnaire was equally used because the information had to be collected from a large sample in a short period of time. The questionnaire was pretested for content validity and a content validity index (CVI) value of 0.75 was obtained. These CVI values exceeded the 0.7 threshold implying a reliable questionnaire as suggested by [29]. Interview guides were also administered to the top district management for in-depth data collection.

3.1. Data Collection

The study used multiple sources of data because of the added benefits (such as the validity of the data gathered) associated with multiple sources fieldwork (primary data collection) and desk study (secondary data collection). The approach for collecting data in this study was divided into two main parts desk survey and field survey.

3.2. Data Analysis

The filled questionnaires were collected, checked for accuracy, consistency and completeness before leaving the field. Raw data was entered into Statistical Package for Social Scientists (SPSS-version 25) and analyzed statistically. The contribution of each of the factors to overall delays was examined and the ranking of the attributes in terms of their criticality as perceived by the respondents was done by use of Relative Importance Index (RII) which was computed, the five-point likert scale ranged from 1 to 5 that was adopted and transformed to relative importance indices (RII) for each factor using equation (1).

$$RII = \frac{\sum W}{A \times N} (0 \leq RII \leq 1) \quad (1)$$

Where;

W=weighting given to each factor by the respondents (ranging from 1 to 5),

A=highest weight (5 in this case)

N=total number of respondents (N=54)

Variables with $RII < 0.599$ were deemed to be insignificant in quality management, variables were further considered to be critical or not where they were $RII \geq 0.73$. Therefore, in this study, $RII \geq 0.73$ was considered to be critical, $0.599 < RII < 0.73$ was considered to be significant, $RII < 0.599$ were deemed to be insignificant in this study.

3.3. Frame Work Development

A framework was developed to show how different stakeholders are involved at different stages i.e. initiation stage, planning stage, implementation stage evaluation and handover stages to enhance the quality of buildings in Kamwenge district.

4. Results and Analysis

The results about demographic factors are presented in Table 1.

Table 1. Demographic factors.

Category	Variables	Frequency	Percent
Sex	Male	33	61.1
	Female	21	38.9
Age	18-30	8	14.8
	31-40	24	44.4
	41-50	16	29.6
	above 50 years	6	11.1
	Certificate & Below	12	22.2
Level of education	Diploma	23	42.6
	Degree	14	25.9
	Masters	5	9.3
	Q/S	11	20.3
Profession	Land surveyor	11	20.3
	Engineer	30	55.6
	Architect	2	3.7
	Manson	25	46.3
	Carpenter	12	22.2
Position	Electrician	5	9.3
	Plumber	4	7.4
	Steel fixer	8	14.8

Source: Primary data (2019)

The results in Table 1 show that the male respondents were 33 (61.1%) and female 21 (38.9%) which implies that majority were male who participated in the study. The ages of respondents were grouped and 18-30 were 8 (14.8%), 31-40 were 24 (44.4%), 41-50 were 16 (29.6%) and above 50 years were 6 (11.1%) which signifies that majority were aged 31-40. About the level of education, respondents with certificate and below were 12 (22.2%), diploma holders were 23 (42.6%), degree holders were 14 (25.9%) and masters respondents were 5 (9.3%) which shows that majority of the respondents were degree holders. The professional of respondents were Q/S, land surveyor, engineer and architect with 11 (20.3%), 11 (20.3%), 30 (55.6%) and 3 (2.7%) respectively. The positions of respondents were 25 (46.3%) for mansions, 12 (22.2%) for carpenters, 5 (9.3%) for electrician, 4 (7.4%) for plumbers and 8 (14.8%) for still fixers, the majority of the respondents who participated in the study were mansions.

4.1. Quality Management Practices of Construction Buildings

The results in Table 2 indicate that proper procurement

systems were ranked 1st with the highest RII of 0.84. This shows that proper procurement systems influence quality planning of building construction to a larger extent. This is in agreement with [30] who indicated that there was a trend for firms to prefer using competitive procurement systems to promote transparency, economy and efficiency and limit favoritism. Furthermore, Table 2 shows that firms always train their employees on quality was ranked 2nd with relative importance index of 0.82 which shows that training influences quality planning of building construction to moderate extent. This is in agreement with [31] who suggested that in order to facilitate the acquisition of skills and expertise for employees on quality of construction projects, training must become a mainstream function and an integral part of any firm's strategic direction. Job site quality plan was ranked 3rd with RII of 0.79. This implies that site plans contribute moderately relatively less to quality management of construction projects. The factor that resources are mobilized in time and realistic plans are drafted were assessed with RII of 0.65 and 0.58 ranked 4th and 5th respectively insignificantly contribute to quality management practices.

Table 2. Quality Planning.

S/No	Statement	RII	Rank
1	Proper procurement systems are adhered to	0.84	1 st
2	Firms always train their employees on quality	0.82	2 nd
3	There is job site quality plan	0.79	3 rd
4	Resources are mobilized in time	0.65	4 th
5	Realistic plans are drafted	0.58	5 th

RII ≥ 0.73 =Critical, $0.599 < \text{RII} < 0.73$ =Significant, $\text{RII} < 0.599$ =Insignificant

4.2. Quality Control

According to [32] quality control is critically important to a successful construction project and should be adhered to

throughout a project from conception and design to construction and installation. He further asserted that inspection during construction will prevent costly repairs after the project is completed, the inspector, engineer,

contractor, funding agency, permit agency, and system personnel must work together to inspect, document, and correct deficiencies. Results in Table 3 indicate that project managers always conduct onsite-supervision and there is compliance to standards of relevant agencies with RII of 0.93 and 0.89 respectively, this shows supervision and compliance to standards are critical in quality control of construction building projects. Team work among employees (RII=0.72), client adhering to a work plan (RII=0.62) were significant in quality control of buildings projects since $0.599 < \text{RII} < 0.73$. This finding agrees with [32] who asserted that quality

control is critically important to a successful construction project and should be adhered to throughout a project from conception and design to construction and installation. It is asserted that inspection during construction will prevent costly repairs after the project is completed; the inspector, engineer, contractor, funding agency, permit agency, and system personnel must work together to inspect, document, and correct deficiencies [32]. However, [33] agreed that quality control is evaluating whether construction projects adhere to specific standards.

Table 3. Quality Control.

S/No	Statement	RII	Rank
1	Project managers always conduct onsite-supervision	0.93	1 st
2	There is compliance to standards of relevant agencies	0.89	2 nd
3	There is team work among employees	0.72	3 rd
4	Client's work plan that are adhered to	0.62	4 th

$\text{RII} \geq 0.73$ =critical, $0.599 < \text{RII} < 0.73$ =Significant, $\text{RII} < 0.599$ =Insignificant

4.3. Quality Assurance Practices

Results in Table 4 indicate that third party certification and adequate allocation of resource with RII of 0.92 and 0.78 respectively were ranked highly thus critical in quality management of construction building. This shows that quality assurance in construction firms is greatly affected by third party certification and budget allocation. The research also revealed there is moderate effect on the quality

management practices of construction building projects were since implementers paying attention to needs of clients was ranked 3rd with RII of 0.72, employees are motivated in every firm (RII=0.67) ranked 4th and quality appraisals in the firm (RII=0.62) ranked 5th. This shows that paying attention to needs of clients, motivation of employees in firm and quality appraisal are very significant since $0.599 < \text{RII} < 0.73$.

Table 4. Quality Assurance Practices.

S/No	Quality assurance practice	RII	Rank
1	Third party certification	0.92	1 st
2	Adequate budget is always allocated for activities	0.78	2 nd
3	Implementers always pay attention to needs of clients	0.72	3 rd
4	Employees are motivated in every firm	0.67	4 th
5	There is quality appraisals in the firm	0.62	5 th
6	There are changes in administration	0.52	6 th
7	Customers are always satisfied about quality	0.46	7 th

$\text{RII} \geq 0.73$ =Critical, $0.599 < \text{RII} < 0.73$ =Significant, $\text{RII} < 0.599$ =Insignificant

Other quality assurance factors such as changes in administration (RII=0.52) and customer's satisfaction about quality (RII=0.46) are insignificant since $\text{RII} < 0.599$. These findings are in agreement with [34] who pointed out that quality assurance is easily compromised and frequently lost since construction firms rely heavily upon the individual contributions to implementation from each designer, contractor, supplier and sub-contractor.

4.4. Extent to Which Quality Management Is Practiced in Building Projects

The second objective of the study sought to establish the extent to which quality management is practiced in building construction projects in Kamwenge district. The research undertaken on building construction projects in Kamwenge district revealed in Table 5 that that testing materials before

use with highest RII=0.95 was ranked top. This research revealed that skilled personnel (RII=0.94), regular meetings of staff (RII=0.91), meeting general construction standards (RII=0.89), clearly defining goals and objectives (RII=0.82) and employing experienced worker (RII=0.78) are critical since $\text{RII} \geq 0.73$. This implies that they have high effect on the quality management practices of building projects in Kamwenge district.

Table 5 further shows that well-defined roles and responsibilities of workers (RII=0.71) ranked 7th, training and educating of team members on quality (RII=0.66) ranked 8th and sub-contractor's involvement in the quality process (RII=0.62) ranked 9th had moderate effect on the quality management of projects and were significant since $0.599 < \text{RII} < 0.73$. Table 5 still indicate that building of good storage facilities (RII=0.51) ranked 10th has less effect on quality

management practices of projects since $RII < 0.599$.

Table 5. *Extent to Which Quality Management is practiced.*

No	Statement	RII	Rank
1	Testing materials before use	0.95	1 st
2	Having a skilled work force	0.94	2 nd
3	Regular meetings of staff	0.91	3 rd
4	Meeting general construction standards	0.89	4 th
5	Clearly defining goals and objectives	0.82	5 th
6	Employing experienced worker	0.78	6 th
7	Well-defined roles and responsibilities of workers	0.71	7 th
8	Training and educating of team members on quality	0.66	8 th
9	Subcontractors involvement in the quality process	0.62	9 th
10	Building good storage facilities	0.51	10 th

Key: $RII \geq 0.73$ =critical, $0.599 < RII < 0.73$ =significant, $RII < 0.599$ =Insignificant

4.5. Challenges of Implementation of Quality Management in Building Projects

The third objective was to assess the challenges of implementation of quality management in construction projects in Kamwenge district. The research undertaken established that poor designs was the most critical challenge on the facing the quality management of construction projects with relative importance index of 0.94 and was ranked top challenge of construction projects as indicated in Table 6.

4.5.1. Quality Planning Challenges

From the summary of results in Table 6, it can be observed that the key challenges that critically affect the quality in building construction projects in Uganda were; Poor designs ($RII=0.94$); lack of proper equipment available for use ($RII=0.93$), lack of enough knowledge of the project ($RII=0.91$) and poor scheduling of projects ($RII=0.84$) respectively. Table 6 further shows that setting unrealistic deadlines ($RII=0.72$) and poor health standards at the site ($RII=0.63$) significantly affect the quality planning of projects since $0.599 < RII < 0.73$. The research, however, revealed that three (3) factors had minimal effect of quality planning and they include; bureaucracy of clients ($RII=0.52$), poor estimates ($RII=0.46$) and clients setting of unrealistic deadlines ($RII=0.42$).

Table 6. *Quality Planning Challenges.*

S/N	Quality planning challenges	RII	Rank
1	Poor designs	0.94	1 st
2	Lack of proper equipment available for use	0.93	2 nd
3	Lack of enough knowledge of the project	0.91	3 rd
4	Poor scheduling of projects	0.84	4 th
5	Setting unrealistic deadlines	0.72	5 th
6	Poor sanitation and health standards at the site	0.63	6 th
7	Bureaucracy of clients	0.52	7 th
8	Poor estimates	0.46	8 th
9	Clients setting of unrealistic deadlines	0.42	9 th

$RII \geq 0.73$ =critical; $0.599 < RII < 0.73$ =Significant; $RII < 0.599$ =Insignificant

These findings are in line with [34] who revealed that the main causes of material and equipment procurement delay in

quality management were organizational weaknesses, suppliers' defaults, governmental regulations, and transportation delays. However, [20] contends that construction project fails due to time and cost overruns resulting from; poor field investigation, under-estimates, lack of experience, inadequate project analysis, and poor investment decisions. Poor planning for implementation entails inadequacies in time plan, resource plan, equipment plan, coordination, organization, cost planning and improper pre/post contract actions. Furthermore, findings are in agreement with [35] who asserted that that inefficient and ineffective working delays, low resources productivity, change in scope, affects the planning of buildings. It is further argued that unclear objectives, unworkable schedules, failure to identify critical items, lack of understanding of operating procedures, and ignorance of appropriate planning techniques are all a manifestation of poor planning and poor management [36].

4.5.2. Quality Control Challenges

Table 7. *Quality Control Challenges.*

S/No	Quality control challenges	RII	Rank
1	Lack of management's commitment	0.96	1 st
2	Lack of enough funds	0.92	2 nd
3	It is very expensive in testing materials	0.87	3 rd
4	Poor testing procedures	0.86	4 th
5	Delay in delivering materials	0.72	5 th
6	Stakeholder's influence	0.68	6 th
7	Poor conduct of review meeting	0.59	7 th
8	No good stores at the site	0.56	8 th
9	No site safety measures	0.45	9 th

$RII \geq 0.73$ =critical, $0.599 < RII < 0.73$ =Significant, $RII < 0.599$ =Insignificant

Results in Table 7 indicate that lack of management's commitment was a critical challenge affecting quality of building projects with RII of 0.96 and was ranked top challenge critically affecting the quality control of construction buildings. Furthermore, from Table 7, the challenges that critically significantly affect the quality control in construction projects are; lack of enough funds ($RII=0.92$), very expensive in testing materials ($RII=0.87$), poor testing procedures ($RII=0.86$), delay in delivering

materials (RII=0.72) and stakeholder's influence (RII=0.68) since $RII > 0.599$. These challenges are in agreement with [37] who revealed that contract managers often face challenge of quality management due to unclear project scope, and unrealistic timeline and budgets in controlling the quality of construction buildings.

4.5.3. Quality Assurance Challenges

Results from Table 8 indicate that lack of skilled personnel for implementation (RII=0.97) was a critical challenge affecting quality assurance of construction projects in Kamwenge district. Challenges such as; lack of a quality assurance team to lead the process (RII=0.92), high labour turnover in the firm (RII=0.93), poor security in the area (RII=0.86), no enough experience of workers (RII=0.82),

poor decision making from clients (RII=0.85) and no timely completion of each phase (RII=0.62) respectively greatly affects the quality assurance of construction projects as presented in Table 8 since $RII > 0.599$. In a related study it was found out that organizational segmentation, reluctant managers, industrial relation and short term mission are some of the challenges of TQM implementation [38]. It was also pointed out that organizational culture, lack of management commitment, lack of teamwork, poorly thought out plans, focus on short term profit, poor measurement techniques, lack of education and training programs, employee fear of losing their jobs are some of the barriers of TQM implementation [38].

Table 8. Quality Assurance Challenges

S/No	Quality Assurance challenges	RII	Rank
1	Lack of skilled personnel's for implementation	0.97	1 st
2	Lack of a quality assurance team to lead the process	0.92	2 nd
3	High labour turnover in the firm	0.93	3 rd
4	Poor security in the area	0.86	4 th
5	No enough experience of workers	0.82	5 th
6	Poor decision making from clients	0.85	6 th
7	No timely completion of each phase	0.62	7 th

$RII \geq 0.73$ =critical, $0.599 < RII < 0.73$ =Significant, $RII < 0.599$ =Insignificant

4.6. Filling the Gap in Construction Projects

The study established that despite the identified pitfalls in procurement planning processes, the respondents had faith in the correction of the anomalies and loopholes identified in the planning process and made suggestions which have been incorporated in the Framework developed by this study to close the gaps quality management practices in Kamwenge district. According to Figure 1, building construction should under the following phases to maintain quality:

4.6.1. Initiation Phase

This is the first phase of the construction project and in this phase, the project objective or need is identified. A feasibility study is conducted to investigate whether each option addresses the project objective and a final recommended solution is determined. Once the recommended solution is approved, a construction project is initiated to deliver the approved solution and a project manager (District engineer) is given an approval by CAO. The major deliverables and the participating work groups are identified, and the project team begins to take shape. Approval is then sought by the project manager to move into the detailed planning phase. Stakeholders that always participate at this phase are CAO, district engineers, district planner and community represented by political leaders.

4.6.2. Planning Phase

The planning phase, is where the building project solution is developed in as much detail as possible and the steps necessary to meet the building project's objective are planned. In this step, the District planner, district engineer, CAO, Political leaders identifies all of the work to be done. The

building project's tasks and resource requirements are identified, along with the strategy for producing them. A project plan is created outlining the activities, tasks, dependencies, amount needed and timeframes. District engineer, procurement officers, planners and Chief finance officer coordinates the preparation of a project budget by providing cost estimates for the labour, equipment, and materials costs. Finally, a quality plan is documented, quality targets provided, assurance, and control measures, along with an acceptance plan, listing the criteria to be met to gain customer acceptance.

4.6.3. Implementation Stage

During the third phase, the building project plan is put into motion and the work of the project is performed. Progress is continuously monitored and appropriate adjustments are made and recorded as variances from the original plan. District engineer spends most of the time in this step. During project implementation, contractors are carrying out the tasks, and progress information is being reported to the Chief Administrative officer. District engineer uses this information to maintain control over the direction of the project by comparing the progress reports with the project plan to measure the performance of the project activities and take corrective action as required of him. Throughout this step, project funder and other key stakeholders should be kept informed of the project's progress according to the agreed-on frequency and format of communication. Progress reports should always emphasize the anticipated end point in terms of cost, schedule, and quality of deliverables. Each project deliverable produced should be reviewed for quality and measured against the acceptance criteria.

4.6.4. Closing Phase

During the final closure, or completion phase, the emphasis is on handing over the final deliverables to the

community, handing over project documentation to the business, terminating supplier contracts, releasing project resources, and commissioning of the project.

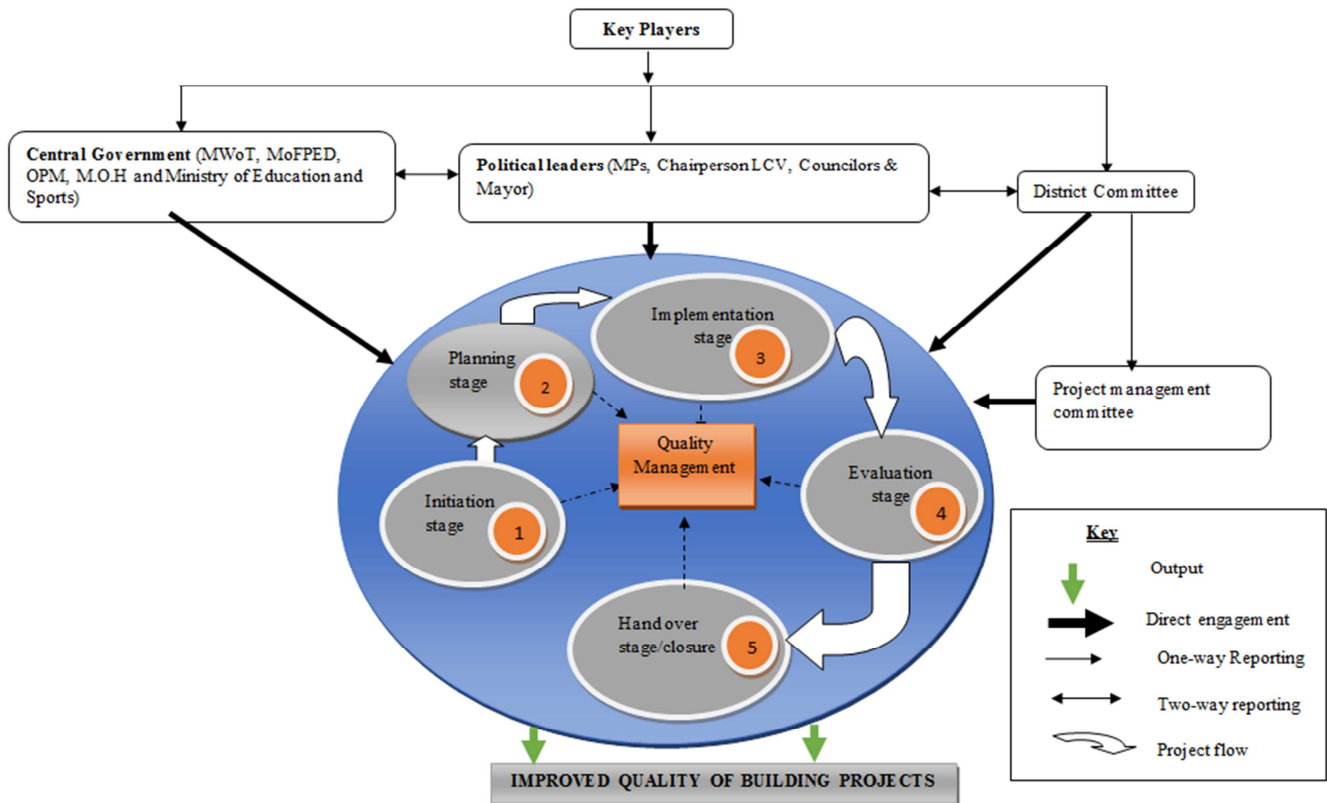


Figure 1. Developed Framework for Improving Quality Management of Buildings Projects

4.7. Role of each Stakeholder

4.7.1. Central Government

Quality management process involves two ministries that include MoWT and MoFPED, MoFPED is charged with allocating funds to DLGs through CAO and District engineer. MoWT is responsible for supervision, monitoring and evaluation of performance of construction projects, making follow ups, supervision and audits of contracted projects. The Office of the Prime Minister is charged with monitoring and evaluation.

4.7.2. Chief Administrative Officer

This is the chief accounting officer for the whole project. He is charged with authorizing funds that are used in every activity of building projects.

4.7.3. District Engineer

This charged with supervising the whole process of construction projects from initiation stage to handover. He is also charged with maintaining the project to reduce defects in the project.

4.8. Closing the Gaps in the Quality Management Process

4.8.1. Training of Staff

In the Framework (Figure 1), the researcher suggests that the only one way of closing the gaps in the quality

management practices is by training staff on short courses. The training opportunities are provided for the purposes of enhancing the concerned intervention groups with skills and capacity to implement and maintain quality as indicated by dotted black arrows. This could take inform of refresher quality training that could be organized at the district or outside the district. This could help to maintaining quality in all stages of the building construction projects.

4.8.2. Revising the Budgetary Allocations

Budget allocations are done by central government and in order to maintain quality of buildings. In closing the gaps in quality management, budget for building projects should be increased to because Kamwenge district has been facing a challenge of poor allocation of resources. In other words, more pressing issues like quality management should be given first priority with big budget. From the framework, this is indicated by purple arrow from the ministry to DLGs represented by CAO.

4.8.3. Providing Logistics to Relevant Stakeholders

This is what enables the relevant stakeholders to perform their duties in building construction projects for example supervision vehicles, material testing kits for quality assurance, protective gears, equipment like concrete mixers, excavators and many more, therefore, the central government/funder should provide the necessary logistical to

Kamwenge Local Government to support the force account mechanism.

5. Conclusions and Recommendation

The study concluded that the top most challenge affecting quality management of construction buildings was poor designs in construction projects in Uganda. The study recommended that proper procurement methods should be adhered to, there should also be third party certification, material testing should be done before actual implementation of works and there should be a quality assurance team to ensure quality of building construction projects in Uganda.

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