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## **The Impacts of Lack of Total Quality Management on Local Construction Companies in Liberia**

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### **Abstract**

Many local construction companies in Liberia are faced with serious challenges when it comes to delivering projects per the required scope, budget and time frame due to lack of efficient management implementation. To find the solutions to the problems faced by local construction companies in Liberia, it was established that most of the impacts derived from lack of quality management. Therefore, this thesis will focus on identifying the impacts of lack of Total Quality Management; the causes of these impacts using root cause analysis; and finding mitigation measures and strategies by implementing Total Quality Management principles. Total Quality Management (TQM) is an integrated organizational effort designed to improve quality at every level of an organization. This means that the organization needs to make quality a priority by putting customer needs first. Sample survey will be conducted using questionnaires and available statistical data to collect all needed information for this thesis. Statistical data collected will be analyzed in tabular and graphical format. The outcome of this thesis will benefit the local construction companies in Liberia by helping them to improve their businesses through maintaining qualified staffs, obtaining long lasting life span (company existence), by developing good customer services and relationship, by increasing profit through cost savings on zero non-compliance (re-work and retention fees), and to deliver projects within the required scope and schedule.

**Keywords:** Total quality management; Local construction companies; Impacts.

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## **1. Introduction**

### ***1.1 Problem Statement***

The performance of some local construction companies in Liberia over the years have been dissatisfactory to many customers due to numerous problems including failure to complete projects on time, not delivering project in accordance with the scope of work, mismanagement of project funds, etc. This has created huge setback for local construction companies. Some customers are dissatisfied and they cannot trust other projects into the hands of local construction companies for the second time. Because of this, many local construction companies cannot afford to continue operation due to lack of operational funds.

### ***1.2 Discussion***

The poor performance of some local construction companies has raised lot of concerns and possess serious threat to the overall economy of Liberia. Local construction companies will not be able to compete with international construction companies during tendering process, they will go out of funds due to lack of contract and so many other consequences as relates to construction work in Liberia. It is high time that solutions to address these issues be established and implemented to stop local construction companies from facing such problems.

### ***1.3 Research Goals***

Currently in Liberia, many local construction companies are victim of lack of Total Quality Management. They have suffered many consequences for not managing their projects properly.

The goal of this thesis is to examine the impacts that lack of Total Quality Management has had on these local companies, the Total Quality Management concepts to be applied to prevent these impacts and control measures to be implemented to ensure continuous improvement.

### ***1.4 Research Environment – Liberia***

This research is conducted in Liberia. Liberia is one of the Sub-Saharan nation in West Africa. It is bounded on the north by republic of Guinea, on the east by the republic of Cote d'Ivoire, on the west by the republic of Sierra Leone and on the south by the Atlantic Ocean. The total area of Liberia is approximately 111,00 km with a population of about 3.5 million people.

Liberia has two seasons, the raining season and the dry season. The country is divided into fifteen counties, namely: Bomi, Bong, Gbarpolu, Grand Cape Mount, Grand Bassa, Grand Gedeh, Lofa, Grand Kru, Margibi, Montserrado, Nimba, Maryland, Sinoe, River Cess, and River Gee. The capital city of Liberia is Monrovia, named after one of the former president of the united State called James Monroe and it is located in Montserrado county.

A civil war broke out in Liberia in December 1989 and lasted up to August 2003 (14 years). Since the end of the

civil war people have been living peacefully and many with developmental mind sets. They have been striving for improvement at all levels, especially in the field of construction. Construction is of great importance to Liberians because people are trying to rebuild the damage infrastructures and to build new ones. This is one of the priorities of all Liberians because people want to redeem the lost time wasted during the period of the war.

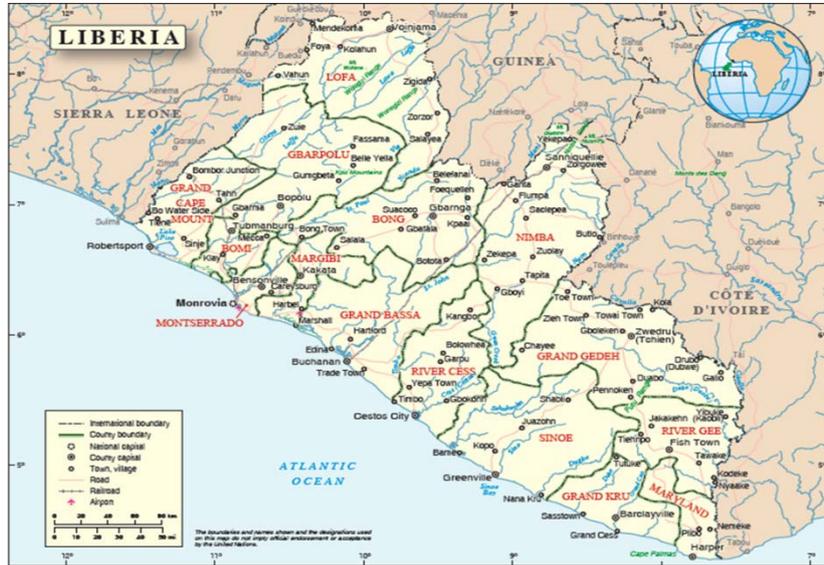


Figure 1: Map of Liberia (Copyright 2008 liberiamediacycenter.org. Liberia Geography[3])

## 2. Total quality management

Quality is a serious concern to all industries, especially to those with experiences of poor quality. These experiences might involve an automobile supplier delivering a defective spare part, a brick manufacturing company not producing the required quantity and quality of bricks to be used on a building project, and delay in custom clearance of imported goods/materials from the national port of your country. In most instances, poor quality is as a result of untrained employees handling the identification and correction of quality issues. Some companies are also not concern about the quality of services that they render to their customers. This can result to loss of customers to your competitors that put more time and energy on improving their quality standards. Quality has many definitions. Some people view it as “performance to standards”. To other as “meeting customer’s needs” or “satisfying the customer”[2].

- **Conformance to specifications** this is the measurement of how well the product or service aligned with the targets and tolerances determined by its designers. For instance, if the design tolerance of a bridge abutment height is  $5m \pm 0.5$  and the abutment is constructed within this allowable tolerance, then that is conformance to specification.
- **Fitness for use** this concern with how well the product performs its intended function or use. A Concrete Mixer was purchased to produce 50 cubic meters of concrete in 1 hour. If the output of the Concrete Mixer is less than what was required, then it is not fit for use but if it does, then it is fit for use.
- **Value for price paid** this definition of quality is often use by consumers to refer to product or service

usefulness. If a welding machine with an expected lifespan of 4 years is purchased at a price of \$5,000 but after the machine is been used for 1 year, the machine got damaged. This welding machine is not value for price paid but if it lasted for more than 4 years or exact, then is value for price paid.

- **Support services provided** this is refer to how the quality of a product or service is assessed. It is not only applicable to both products and services but also to people, processes, and organizational environment associated with it. This can be linked to a hospital that request for lot of money as medical charges but the services provided to patients are not adequate. Sometimes you need to have some connection with one, two or more of the hospital staffs before good services can be given to you.
- **Psychological Criteria** this definition focuses on the evaluation of the key components of product or the quality of the service provided.

Total Quality Management (TQM) is a concept that is focus on improving quality at every stage of an organizational process. This means that quality should be the first priority at every level of the organization. Total Quality Management can be achieved through organizational effort to ensure that customer's satisfaction is met at all times.

### **2.1 Identify Cost of Quality**

In recent years, many organizations have realized that they spent more money on issues of poor quality. This is due to the manufacturing of defective product or providing poor services which injects dissatisfaction to the customers and result into business reduction. The cost that is associated to poor quality is known as the "Cost of Quality" and it can be divided into two categories[1]:

- 1) Costs required to achieve high quality, this is known as quality control costs. These include Prevention costs and Appraisal costs.
- 2) Costs for correcting or compensating for failure in product or service. These include Internal Failure costs and External Failure costs.

**Prevention Costs** this costs is incurred in the process of preventing poor quality from occurring. This include preventive maintenance costs for equipment used for production, such as cost of maintaining concrete mixers (scheduled maintenance) used for mixing huge volume of concrete for casting, during construction of bridges or story buildings. Also included is the cost for training employees, to ensure that all employees are competent to perform their duties efficiently.

**Appraisal Costs** are costs incurred in the process of uncovering defects. This include the cost of quality control inspections, product testing, and performing audits to make sure that quality standards are being met. Also, included in this category is the cost used to purchase quality inspection equipment and tools.

**Internal Failure Costs** are associated with discovering poor product quality before the product reaches the customer site. Example of internal failure cost is rework, correcting the defect within a product or rendering a service that is out of the approval scope and you are require to redo the work per the correct specification. Sometime the defect cannot be eliminated on the product thereby causing that product to be declared as scrap

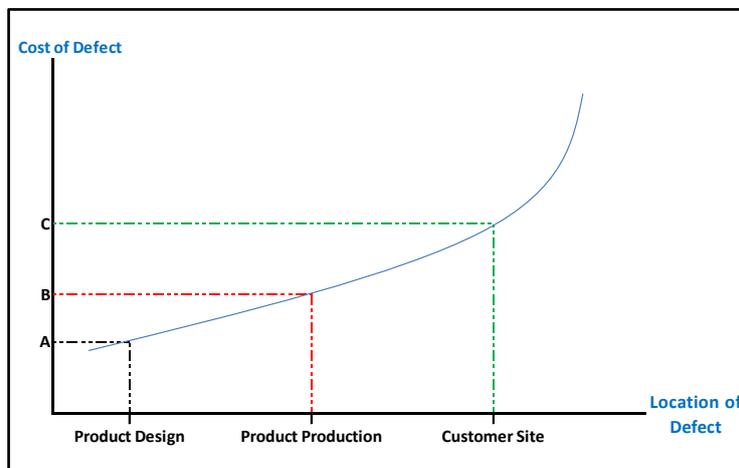
and new process is initiated to manufacture a new one.

**External Failure Costs** are costs associated with quality problems that occur at the customer site. These costs can be particularly damaging because customer faith and loyalty can be difficult to regain. This include everything from customer complaints, product returns, and repairs, to warranty claims, recalls, and even litigation costs resulting from product liability issues. The final component of this cost is lost sales and lost customers. For example, an Earth Moving equipment manufacturer supplied a Motor Grader machine cost \$ 700,000 to a road construction company with one year warranty including running spares for preventive maintenance. Eight months after delivery to site, the machine developed a serious problem that required \$ 250,000 to be resolved. This cost will be the responsibility of the supplier and not the customer. Therefore, the supplier will incur external failure cost of \$250,000 after the transaction of selling the machine.

**Table 1:** Cost of quality categories

Costs	Description	Categories
Prevention	Costs of preparing & implementing a quality plan	Quality Control Costs
Appraisal	Costs of testing, evaluating and inspecting quality	
Internal Failure	Costs of scrap, rework and material losses	Correcting or Compensation Costs
External Failure	Costs of failure at customer site, including returns, repairs and recalls	

Companies that regard quality as important invest heavily in prevention and appraisal costs to prevent internal and external failure costs. The earlier defects are detected, the less costly they are to correct. If a defect is observed during the manufacturing stage, it will be less expensive to correct then if it was observed at the site of the customer. Plotting the location of defect against the cost of defect the below graph is obtained, where  $C > B$  and  $B > A$ .



**Figure 6:** Location of defect against cost of defect

## **2.2 Tools for Identifying and Solving Quality Problems**

The enforcement of the concept of Total Quality Management is the responsibility of all workers. Therefore, empowering your workforce by providing adequate training and ensuring proper supervision during the execution of work can put your company in a better position to address quality issues whenever they arise.

There are seven tools used to identify and solve quality issues. These tools are sometimes referred to as the seven tools of quality control. These tools are not difficult to understand but they are very useful for identifying and solving quality issues. They are:

- 1) Cause – and – Effect Diagrams
- 2) Flowchart
- 3) Checklist
- 4) Control Chart
- 5) Scatter Diagrams
- 6) Pareto Analysis
- 7) Histograms

## **3. Thesis statement**

This thesis will:

1. identify the impacts of lack of Total Quality Management on local construction companies in Liberia.

There are numerous impacts (negative consequences) on local construction companies in Liberia due to lack of Total Quality Management. For this thesis, we will be looking at the following impacts:

- Failure to complete projects on time.
- Failure to deliver project per the required and approved scope.
- Failure to complete project due to budget being exhausted without completing the project (lack of proper budget control).
- End of company existence due to lack of operational funds.
- Under estimation of project Bill of Quantity (BOQ) due to competition during the tendering process.

2. find the causes of these impacts using root cause analysis.

All the identified impacts will be analyze using some of the Total Quality Management analytical tools to find the root causes, i.e. the origin of the problem.

3. find mitigation measures and strategies by implementing Total Quality Management principles throughout the entire scope of operations of local construction companies.

After finding the root causes of the impacts on the local construction companies in Liberia, corrective measures will be established to tackle the problems. Thereby creating an atmosphere for continuous improvement for the local construction companies in Liberia.

#### 4. Methodology

Sample survey will be conducted using questionnaires (see appendix ‘A’ for empty sample survey questionnaires used for the collection of data) and face to face interviews to identify the impacts of lack of Total Quality Management on local companies in Liberia. The people to participate in the sample survey and interview should be experience Engineers, Construction Supervisors/Managers and other qualified individuals with a Bachelor’s degree or above.

Statistical data collected will be analyzed in tabular and graphical format. Impacts will be identified using Total Quality Management tools for identifying and solving quality problems (see 2.2 above for details). All information collected from local companies will be treated as confidential. Therefore, this thesis will be addressing the impacts on the local companies and not the companies themselves.

Below are table formats to be used for the analysis of the data collected during the sample survey:

**Table 2:** Statistical data from sample survey

Impacts of Lack of TQM on Local Construction Companies in Liberia - Statistical Data from Sample Survey							
No.	Impacts	95%	90%	85%	50%	25%	% rating
1	Failure to complete project on time						
2	Failure to deliver project per required scope						
3	Failure to complete project due to lack of proper budget control						
4	Failure to complete project due to under estimation of project budget						
5	End of company existence due to lack of operational funds						
Total							

**Table 3:** Failure to complete project statistical data

Failure to complete project on time - Statistical Data from Sample Survey							
No.	Impacts - Due to	95%	90%	85%	50%	25%	% rating
1	Lack of proper planning and project control						
2	Lack of trained and qualified staffs						
3	Rework to correct non-conformance						
4	Mismanagement of funds						
Total							

**Table 4:** Failure to deliver project per required scope statistical data

Failure to deliver project per required scope - Statistical Data from Sample Survey							
No.	Impacts - Due to	95%	90%	85%	50%	25%	% rating
1	Lack of qualified staffs						
2	Lack of proper monitoring or control						
3	Use of substandard materials						
4	Mismanagement of funds						
Total							

**Table 5:** Failure to complete project due to lack of proper budget control statistical data

Failure to complete project due to lack of proper budget control - Statistical Data from Sample Survey							
No.	Impacts - Due to	95%	90%	85%	50%	25%	% rating
1	Unavailability of qualified staffs						
2	Spending outside the budget						
3	Embezzlement of project funds						
Total							

**Table 6:** End of company existence due to lack of funds statistical data

End of company existence due to lack of operational funds - Statistical Data from Sample Survey							
No.	Impacts - Due to	95%	90%	85%	50%	25%	% rating
1	Mismanagement of funds						
2	Lack of qualified staffs						
3	Lack of profit generation						
4	Lack of income saving for future projects						
Total							

**Table 7:** Statistical data for Pareto Analysis

Impacts of Lack of TQM on Local Construction Companies in Liberia - Statistical Data for Pareto Analysis				
No.	Impacts	Survey points	Cumulative	Cumulative %
1				
2				
3				
4				
5				
Total				

**Table 8:** Statistical data for participant rating

Impacts of Lack of TQM on Local Construction Companies in Liberia - Statistical Data from Sample Survey (Participant Rating)						
No.	Participant ID#	Failure to complete project on time	Failure to deliver project per required scope	Failure to complete project due to lack of proper budget control	Failure to complete project due to under estimation of project budget	End of company existence due to lack of operational funds
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
<b>Total - Survey points</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Rating:</b>		<b>95% = 5,</b>	<b>90% = 4,</b>	<b>85% = 3,</b>	<b>50% = 2,</b>	<b>25% = 1</b>

**5. Statistical Analysis and Results**

The sample survey was successfully conducted with twenty qualified and competent participants from within Liberia contributing to this research. The qualifications of the participants include; fourteen Civil Engineers, one Electrical Engineer, three Construction Managers, one Environmental Officer and one Human Resources Specialist. Among the participants, the highest years of experience was 35 and the lowest was 3, giving an average year of experience for all the participants to 19 years.

**5.1 Sample Survey Data and Graphical Analysis**

From the sample survey conducted, the following data and graphical analysis were obtained:

**Table 9:** Statistical data from sample survey – with inputted data

Impacts of Lack of TQM on Local Construction Companies in Liberia - Statistical Data from Sample Survey							
No.	Impacts	95%	90%	85%	50%	25%	% rating
1	Failure to complete project on time	1	1	6	9	3	50%
2	Failure to deliver project per required scope	0	2	5	6	7	25%
3	Failure to complete project due to lack of proper budget control	0	7	5	5	3	90%
4	Failure to complete project due to under estimation of project budget	2	1	3	8	6	50%
5	End of company existence due to lack of operational funds	3	1	7	6	3	85%
<b>Total</b>		<b>6</b>	<b>12</b>	<b>26</b>	<b>34</b>	<b>22</b>	

From table 9, the highest number of participants per percentage allocation from the sample survey was selected as the percentage rating for the impacts. Failure to complete project on time was rated at 50%, failure to deliver project per required scope at 25%, failure to complete project due to lack of proper budget control at 90% (highest percentage obtained from sample survey), failure to complete project due to under estimation of project budget at 50% and end of company existence due to lack of operational funds at 85%.

Figure 7 below shows the graphical representation of the information on table 9 above. Figure 8, shows the graphical analysis of impacts from the sample survey against the participant tally per percentage. From the graph, 50% has the highest participant tally; second to 25%, 85%, and 90%; and the less is 95%.

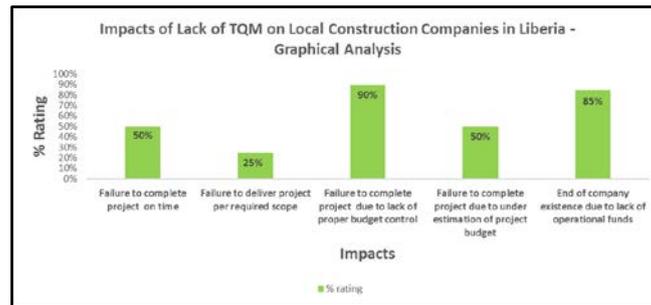


Figure 7: Graphical Analysis – Lack of TQM on Local Construction Companies in Liberia

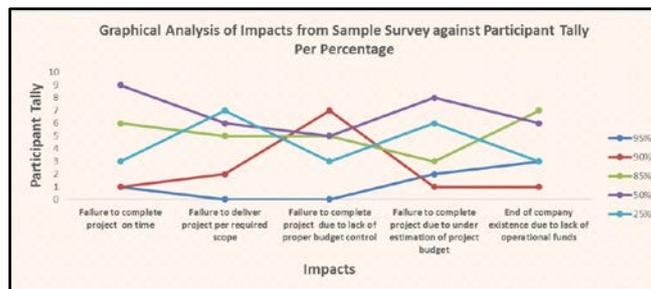


Figure 8: Graphical Analysis – Impacts against participant tally per percentage

Table 10: Failure to complete project statistical data – with inputted data

Failure to complete project on time - Statistical Data from Sample Survey							
No.	Impacts - Due to	95%	90%	85%	50%	25%	% rating
1	Lack of proper planning and project control	1	3	4	11	1	50%
2	Lack of trained and qualified staffs	0	1	6	4	9	25%
3	Rework to correct non-conformance	0	1	5	8	6	50%
4	Mismanagement of funds	1	2	8	7	2	85%
<b>Total</b>		<b>2</b>	<b>7</b>	<b>23</b>	<b>30</b>	<b>18</b>	

From table 10, the highest number of participants per percentage allocation from the sample survey was selected as the percentage rating for the impacts – due to. Lack of proper planning and project control was rated at 50%, lack of trained and qualified staffs at 25%, rework to correct non - conformance at 50%, and mismanagement of

funds at 85% (highest percentage obtained from sample survey).

Figure 9 below shows the graphical representation of the information on table 10 above.

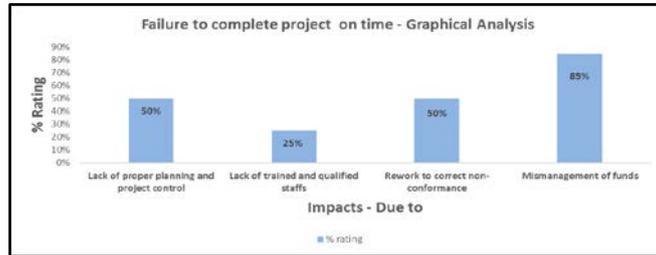


Figure 9: Graphical Analysis – Failure to complete project on time

Table 11: Failure to deliver project per required scope statistical data – with inputted data

Failure to deliver project per required scope - Statistical Data from Sample Survey							
No.	Impacts - Due to	95%	90%	85%	50%	25%	% rating
1	Lack of qualified staffs	1	3	6	4	6	55%
2	Lack of proper monitoring or control	1	2	7	7	3	67.50%
3	Use of substandard materials	1	4	1	6	8	25%
4	Mismanagement of funds	0	5	6	6	3	67.50%
<b>Total</b>		3	14	20	23	20	

From table 11, the highest number of participants per percentage allocation from the sample survey was selected as the percentage rating for the impacts – due to. For cases where there is more than one highest number of participants per percentage allocation, the average was taken between the percentages to get the percentage rating. Lack of qualified staffs was rated at 55%, lack of proper monitoring or control at 67.50%, use of substandard materials at 25%, and mismanagement of funds at 67.50%. The highest percentage obtained from sample survey was 67.50% which occur for two different impacts – due to.

Figure 10 below shows the graphical representation of the information on table 11 above.

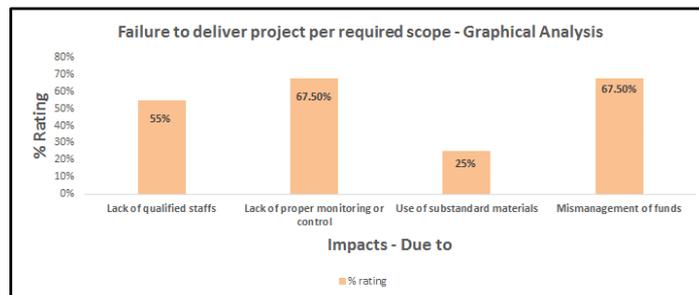


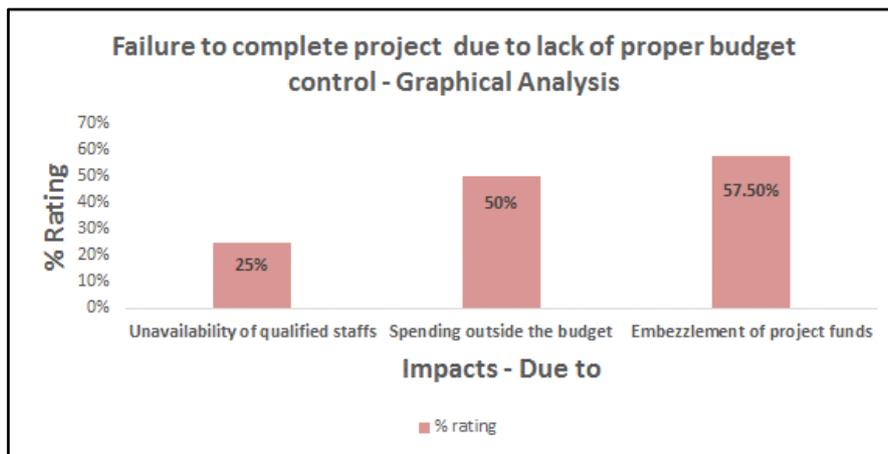
Figure 10: Graphical Analysis – Failure to deliver project per required scope

**Table 12:** Failure to complete project due to lack of proper budget control statistical data – with inputted data

Failure to complete project due to lack of proper budget control - Statistical Data from Sample Survey							
No.	Impacts - Due to	95%	90%	85%	50%	25%	% rating
1	Unavailability of qualified staffs	0	4	4	3	9	25%
2	Spending outside the budget	2	2	5	8	3	50%
3	Embezzlement of project funds	2	5	4	4	5	57.50%
<b>Total</b>		4	11	13	15	17	

From table 12, the highest number of participants per percentage allocation from the sample survey was selected as the percentage rating for the impacts – due to. For cases where there is more than one highest number of participants per percentage allocation, the average was taken between the percentages to get the percentage rating. Unavailability of qualified staffs was rated at 25%, spending outside the budget at 50%, and embezzlement of project funds at 57.50% (highest percentage obtained from sample survey).

Figure 11 below shows the graphical representation of the information on table 12 above.



**Figure 11:** Graphical Analysis – Failure to complete project due to lack of proper budget control

**Table 13:** End of company existence due to lack of funds statistical data – with inputted data

End of company existence due to lack of operational funds - Statistical Data from Sample Survey							
No.	Impacts - Due to	95%	90%	85%	50%	25%	% rating
1	Mismanagement of funds	3	2	5	7	3	50%
2	Lack of qualified staffs	1	2	2	5	10	25%
3	Lack of profit generation	3	2	1	9	5	50%
4	Lack of income saving for future projects	3	1	8	6	2	85%
<b>Total</b>							

From table 13, the highest number of participants per percentage allocation from the sample survey was selected as the percentage rating for the impacts – due to. Mismanagement of funds was rated at 50%, lack of qualified staffs at 50%, lack of profit generation at 50%, and lack of income saving for future projects at 85% (highest percentage obtained from sample survey).

Figure 12 below shows the graphical representation of the information on table 13 above.

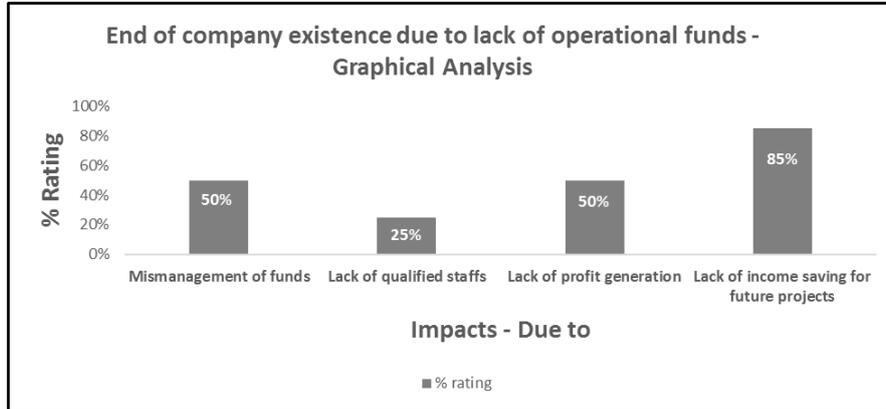


Figure 12: Graphical Analysis – End of company existence due to lack of funds

Table 14: Statistical data for participant rating – with inputted data

Impacts of Lack of TQM on Local Construction Companies in Liberia - Statistical Data from Sample Survey (Participant Rating)						
No.	Participant ID#	Failure to complete project on time	Failure to deliver project per required scope	Failure to complete project due to lack of proper budget control	Failure to complete project due to under estimation of project budget	End of company existence due to lack of operational funds
1	SSQ - 01	3	2	3	1	2
2	SSQ - 02	2	1	2	3	3
3	SSQ - 03	2	1	1	2	3
4	SSQ - 04	5	3	4	4	5
5	SSQ - 05	3	2	3	2	3
6	SSQ - 06	1	1	1	1	1
7	SSQ - 07	1	1	1	1	2
8	SSQ - 08	2	1	2	1	4
9	SSQ - 09	3	2	3	2	2
10	SSQ - 10	4	2	4	2	3
11	SSQ - 11	1	4	4	5	5
12	SSQ - 12	2	2	2	2	3
13	SSQ - 13	2	1	2	2	3
14	SSQ - 14	3	3	3	1	5
15	SSQ - 15	2	1	2	1	2
16	SSQ - 16	2	4	4	3	1
17	SSQ - 17	3	3	4	2	1
18	SSQ - 18	2	2	4	5	3
19	SSQ - 19	2	3	3	3	2
20	SSQ - 20	3	3	2	2	4
Total - Survey points		48	42	54	45	57
Rating:		95% = 5,	90% = 4,	85% = 3,	50% = 2,	25% = 1

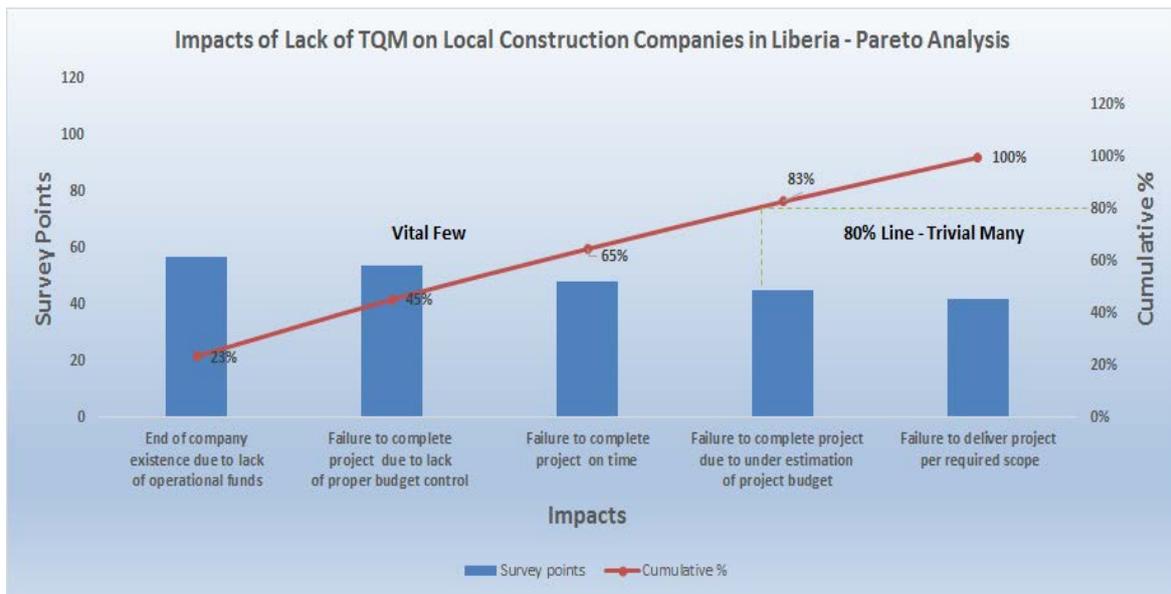
**Table 15:** Statistical data for participant rating – with inputted data

Impacts of Lack of TQM on Local Construction Companies in Liberia - Statistical Data for Pareto Analysis				
No.	Impacts	Survey points	Cumulative	Cumulative %
1	End of company existence due to lack of operational funds	57	57	23%
2	Failure to complete project due to lack of proper budget control	54	111	45%
3	Failure to complete project on time	48	159	65%
4	Failure to complete project due to under estimation of project budget	45	204	83%
5	Failure to deliver project per required scope	42	246	100%
Total		246		

Table 14 above shows the statistical data of the participants rating from the sample survey conducted against the impacts on local construction companies in Liberia due to lack of Total Quality Management. Whiles Table 15, shows the impacts with all required statistical data for the preparation of a Pareto analysis.

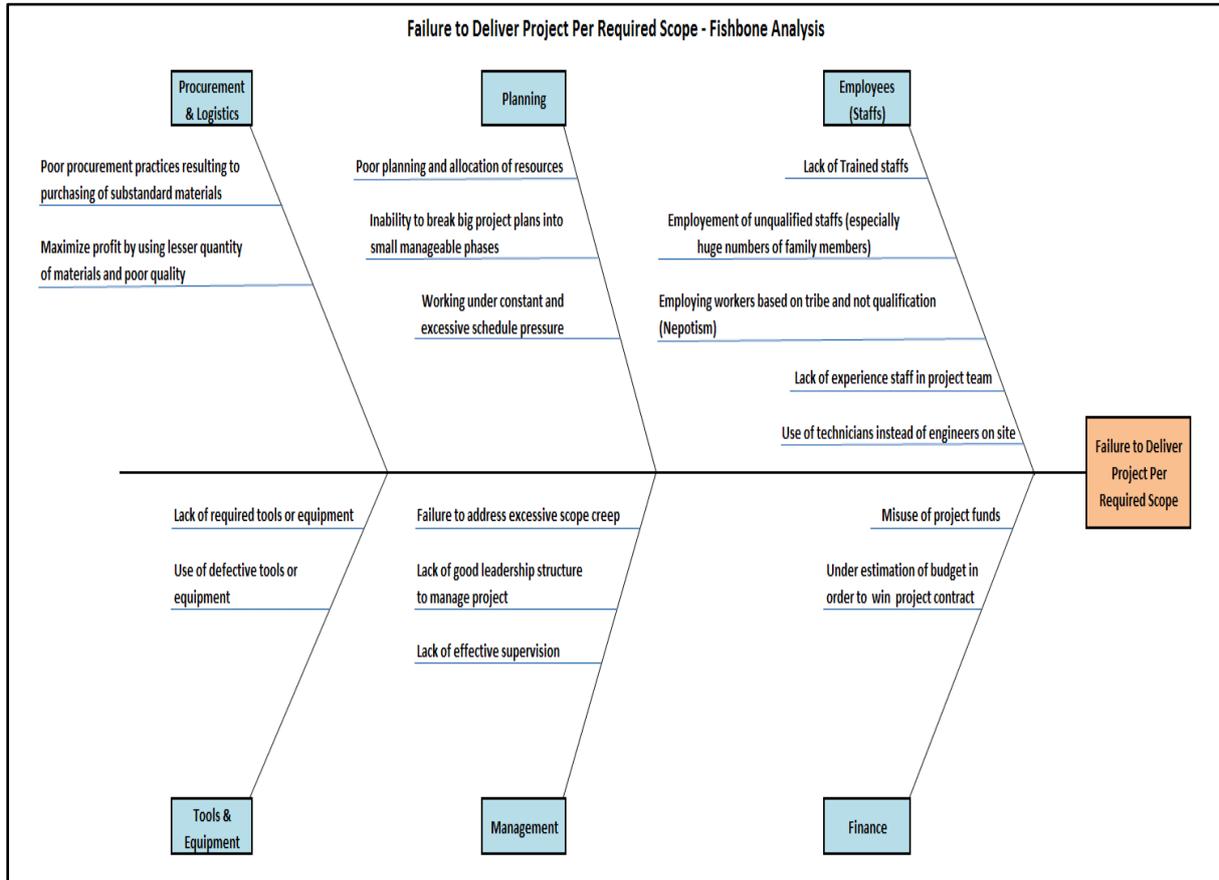
Figure 13 below shows the Pareto Analysis for the impacts of lack of Total Quality Management on local construction companies in Liberia using the data collected from the sample survey conducted for this research. Per the principle of the Pareto Analysis, 80% of every problem is because of few factors and not all the factors surround the entire process. These few factors are known as the Vital Few and the others as the Trivial Many. From the graph, the impacts that fall within the category of the vital few are:

- End of company existence due to lack of operational funds,
- Failure to complete project due to lack of proper budget control, and
- Failure to complete project on time.



**Figure 13:** Pareto Analysis

5.2 Root Cause Analysis



**Figure 2:** Root cause analysis – failure to deliver project per required scope

Figure 2 shows the root cause analysis for the failure to deliver project per required scope by some local construction companies in Liberia. The root causes obtained from the sample survey are:

**1) Employees (staffs)**

- Lack of trained staffs – use of staffs that are not trained to perform the task they are assigned to do.
- Employment of unqualified staffs (especially huge number of family members) – Employing workers not on qualification but based on family connection.
- Lack of experience staff in project team – the company does not have experience staffs in the project team who have worked on similar projects before and know all the possible risks associated with delivering the project per required scope.
- Use of technicians instead of engineers on site – some local construction companies are in the constant practice of using technicians in place of engineers on projects because they don't want to pay more money to the engineers.

**2) Finance**

- Misuse of project funds – using project fund for other activities, thereby creating a situation wherein they need to improvise some materials to compensate for the misused fund.
- Under estimation of budget to win project contract – many local companies in Liberia usually quote for project with limited budget to win contract. After winning the contract, they are left with no option but to buy substandard materials or use lesser quantities and ratios to do the work.

### **3) Planning**

- Poor planning and allocation of resources – failure to plan properly during the tendering and mobilization processes.
- Inability to break big project plans into small manageable phases – some local construction companies do not have the ability to break the entire project scope into phases that can be easily managed and achievable.
- Working under constant and excessive schedule pressure – due to delay in certain portion of the project and to recover to meet project deadline, some local construction companies will put more pressure to complete all the remaining works on time.

### **4) Management**

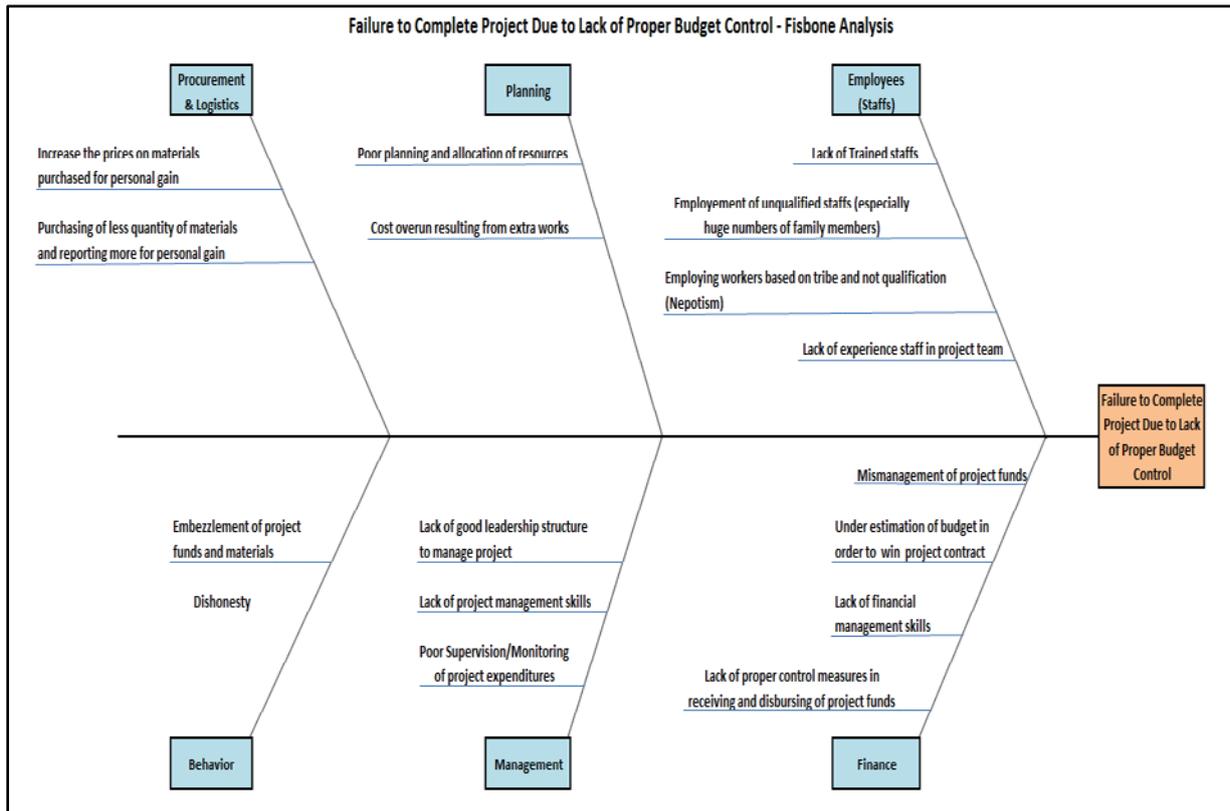
- Failure to address excessive scope creep – scope creep in project management refers to changes, continuous or uncontrolled growth in a project's scope, at any point after the project begins. Failure to address it on time can lead to delivering project out of the required scope.
- Lack of good leadership structure to manage project – some local construction companies do not have good leadership structure to look after project affairs effectively.
- Lack of effective supervision – supervisors not performing their roles efficiently, especially to ensure that work is done per required scope.

### **5) Tools and Equipment**

- Lack of required tools or equipment – company failing to provide the required tools and equipment for the job on site and at the right time.
- Use of defective tools or equipment – use of defective tools or equipment can result to work being done out of the required scope.

### **6) Procurement and Logistics**

- Poor procurement practices resulting to purchasing of substandard materials – purchase of substandard materials for project can lead to work done out of required scope.
- Maximize profit by using lesser quantity of materials and poor quality – some companies purchase less quantity of required materials with poor quality to maximize their profit margin.



**Figure 3:** Root cause analysis – failure to complete project due to lack of proper budget control

Figure 3 shows the root cause analysis for failure to complete project by local construction companies in Liberia due to lack of proper budget control. The root causes obtained from the sample survey are:

**1) Employees (staffs)**

- Lack of trained staffs - use of staffs that are not trained to perform the task they are assigned to do.
- Employment of unqualified staffs (especially huge number of family members) – Employing workers not on qualification but based on family connection.
- Lack of experience staff in project team – the company does not have experience staffs in the project team to ensure that the budget stays within control.
- Use of technicians instead of engineers on site – some local construction companies are in the constant practice of using technicians in place of engineers on projects because they don't want to pay more money to the engineers.

**2) Finance**

- Mismanagement of project funds – using project fund for other activities, thereby creating a situation wherein fund will not be available to complete the project.
- Under estimation of budget to win project contract – many local companies in Liberia usually quote for project with limited budget to win contract. After winning the contract, they are left with no option but

to complete the job with the limited fund, and in most cases the project cannot be completed.

- Lack of financial management skills – some local companies do not have the required financial management skills to control budget during project execution.
- Lack of proper control measures in receiving and disbursing of project funds – failure to implement a proper control system to monitor the moving of cash coming to (income) and going out (expenditures) of the company can lead to project not being completed.

### **3) Planning**

- Poor planning and allocation of resources – failure to plan properly during the tendering and mobilization processes.
- Cost overrun resulting from extra works - cost overrun, also known as a cost increase, underrated or budget overrun, involves unexpected costs incurred more than budgeted amounts due to an under estimation of the actual cost during budgeting. Adding of extra works to the scope of work in the contract without making provision for the extra cost can lead to incompleteness of project.

### **4) Management**

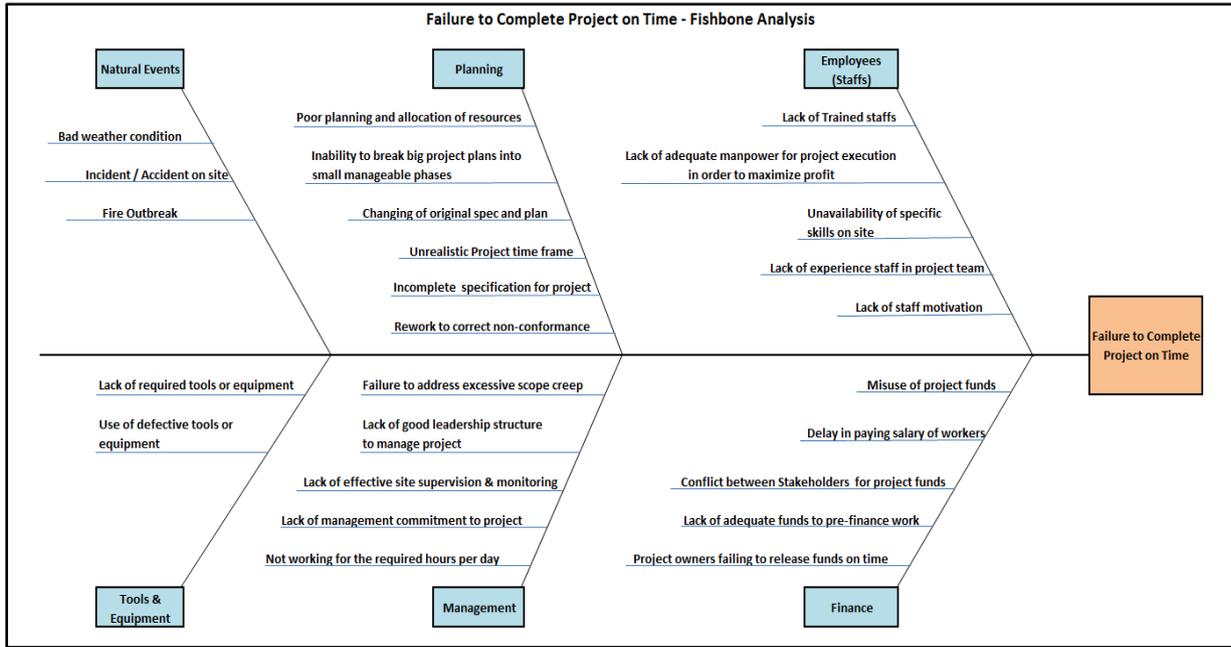
- Lack of good leadership structure to manage project – some local construction companies do not have good leadership structure to look after project affairs effectively.
- Poor Supervision/Monitoring of project expenditures – lack of effective supervision and monitoring of project expenditures can result to incompleteness of project.
- Lack of project management skills – lack of project management skills, especially the top staffs of the company, can lead to failure to complete project due to improper budget control.

### **5) Behavior**

- Embezzlement of project funds and materials – some staff members steal the company's fund and materials, instead of using it for the intended purpose. This type of behavior can lead to incompleteness of project.
- Dishonesty – some of the staff members of local construction companies are not honest. They will use the project resources for their own interest without considering the completion of the project or the integrity of the company.

### **6) Procurement and Logistics**

- Increase the prices on materials purchased for personal gain – company logistics staffs will purchase materials for a cheaper cost but will report high cost to siphon the balance fund.
- Purchasing of less quantity of materials and reporting more for personal gain – company logistics staffs will purchase less quantity of required materials and report more, so that they can be able to steal some of the project fund.



**Figure 4:** Root cause analysis – failure to complete project on time

Figure 4 shows the root cause analysis for the failure to complete project on time by local construction companies in Liberia. The root causes obtained from the sample survey are:

**1) Employees (staffs)**

- Lack of trained staffs - use of staffs that are not trained to perform the task they are assigned to do.
- Lack of adequate manpower for project execution to maximize profit – some companies will employ lesser than the actual manpower requirement on the contract to complete the work on time.
- Unavailability of specific skills on site – there are specific tasks on a project that required employee(s) with special skills to perform the task. Failure to employ such type of employee(s) to be part of the project team will lead to delay in complete the project on time.
- Lack of experience staff in project team – the company does not have experience staffs in the project team to ensure that the work is perform in a safe, timely and effective manner.
- Lack of staff motivation – lack of staff motivation can prevent workers from working extra hours and putting in all efforts to ensure that the project is completed on time.

**2) Finance**

- Misuse of project funds – using project fund for other activities, thereby creating a situation wherein fund will not be available to complete the project on time.
- Delay in paying salary of workers – failure to pay workers salary on time can affect the project completion date because sometimes the workers will have to go on strike, thereby losing days of production.
- Conflict between stakeholders for project funds – sometimes the stakeholders will have disagreement

on how they are to use income generated from a project. Some will want to get their own share before the completion of the project and this can result to project not being completed on time.

- Lack of adequate funds to pre-finance work – some local companies do not have the ability to pre-finance project work, but because they want to win project tender, they will agree to pre-finance the project without the capacity to do so. This can lead to project not completed on time.
- Project owners failing to release funds on time – some project owners will agree to pay certain percentage of the total project cost against certain percentage of work done on the entire project scope of work (e.g. 40% completion of work, requires 30% of payment on total project cost, 70% completion of work, requires 60% of payment on total project cost, 100% completion of work, requires 90% of payment on total project cost, and the 10% is retention fee for a period of six months). After completion of the required percentage of work, the contractor company expect to receive the allocated payment by submitting all relevant documents, but some project owner will delay in doing the payment due to many bureaucracy in some cases.

### **3) Planning**

- Poor planning and allocation of resources – failure to plan properly during the tendering and mobilization processes.
- Inability to break big project plans into small manageable phases – failure to break project scope into smaller phases to make it easily manageable can lead to not completing project on time.
- Changing of original spec and plan – constant modification of specifications and plans during the period of project execution can lead to not completing project on time.
- Unrealistic project time frame – accepting to complete project within a certain time frame that is not realistic will lead to not completing the project on time.
- Incomplete specification for project – executing project without the complete scope of work can lead to not completing project on time.
- Rework to correct non-conformance – it is good to do things right the first time, this will eliminate wasted time in the entire process which can result to not completing project on time.

### **4) Management**

- Failure to address excessive scope creep – excessive scope creep can lead to not completing project on time.
- Lack of good leadership structure to manage project – if a company does not have a good leadership structure, there will be no proper management of project execution and this can lead to not completing project on time.
- Lack of effective site supervision & monitoring – lack of effective site supervision and monitoring can result to project works not being done per schedule.
- Lack of management commitment to project – if the management of local companies are not committed to ensuring that every project they are undertaken is completed within the required time frame, completing project on time cannot be achievable.

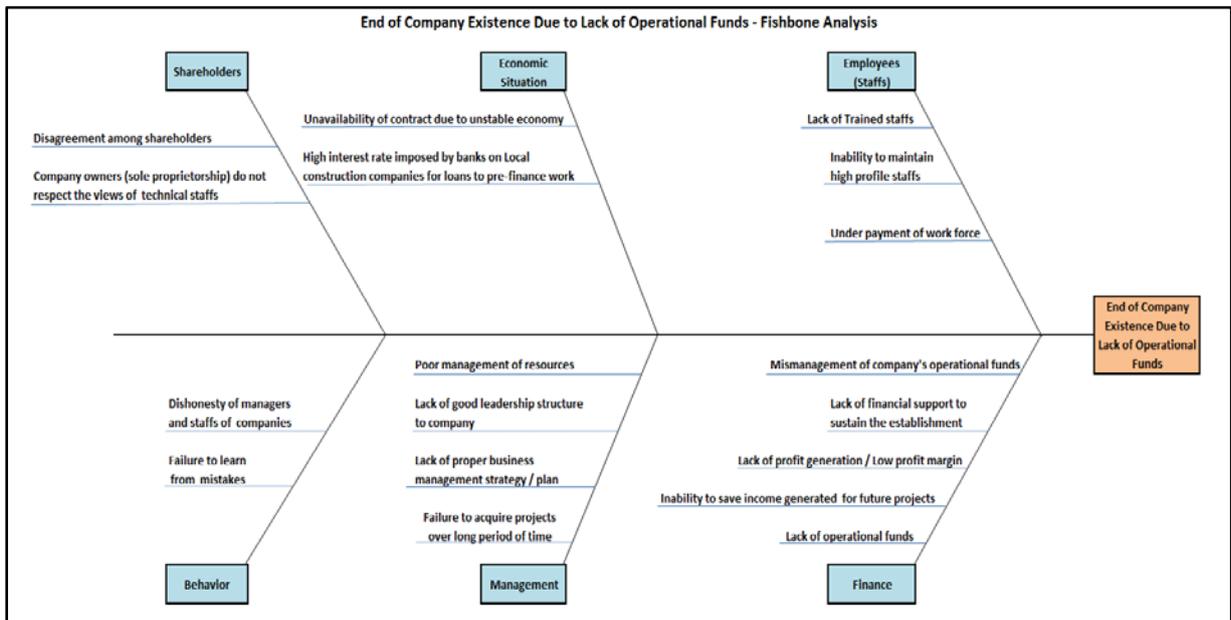
- Not working for the required hours per day – not starting daily work on time and departing from work site earlier can result to not completing project on time.

**5) Natural Events**

- Bad weather condition – bad weather can obstruct project schedule negatively and if provision is not made in the schedule to address it, can result to not completing project on time.
- Incident / Accident on site – unexpected occurrences like any form of incident or accident, in some cases can result to not completing project on time.
- Fire outbreak – natural disasters such as fire outbreak can result to not completing project on time.

**6) Tools and Equipment**

- Lack of required tools or equipment – company failing to provide the required tools and equipment for the job on site and at the right time can lead to not completing project on time.
- Use of defective tools or equipment – use of defective tools or equipment can result to work not being done on time; causes delay in project schedule.



**Figure 5:** Root cause analysis – End of company existence due to lack of operational funds

Figure 5 shows the root cause analysis for the end of local construction company’s existence in Liberia due to lack of operational funds. The root causes obtained from the sample survey are:

**1) Employees (staffs)**

- Lack of trained staffs - use of staffs that are not trained to perform the task they are assigned to do.
- Inability to maintain high profile staffs – failure to maintain staffs with high qualification and many

years of experience due to lack of operational fund.

- Under payment of work force – paying salaries to employees that are below the requirement of their qualification and the Labor law of Liberia (bad labor practice).

## **2) Finance**

- Mismanagement of company's operational funds – use of company's operational funds on non-company activities on or without control.
- Lack of financial support to sustain the establishment – company not having the required financial support to keep on operating.
- Lack of profit generation / Low profit margin – company operating without profit generation or with little realization of profit.
- Inability to save income generated for future projects – some local companies are unable to save generated income for future projects because they need to pay debts acquired during the project with high interest rates.
- Lack of operational funds – some people come together to form a company without having the required financial strength or support. This normally result to the end of company existence due to lack of operational funds.

## **3) Economic Situation**

- Unavailability of contract due to unstable economy – local construction companies sometimes go for long period without acquiring any contract. There are times when contracts are unavailable due to the economic situation of the country (e.g. global financial crisis 2008).
- High interest rate imposed by banks on local construction companies for loans to pre-finance work – local companies with no or limited financial support acquire loans from the bank to be able to pre-finance project in return for high interest rate. This can result to the end of company existence.

## **4) Management**

- Poor management of resources – companies that do not manage their resources properly will run out of operational funds and stop existing.

Lack of good leadership structure to manage company – some local construction companies do not have good leadership structure to look after the affairs of the company effectively. This can lead to end of company existence.

- Lack of proper business management strategy / plan – operation of a company without a proper business management strategy or plan can result to end of company existence.
- Failure to acquire projects over long period – if a company cannot win project bid over long period to generate operational funds to sustain the company, that company will stop existing.

**5) Behavior**

- Dishonesty of managers and staffs of companies – failure of managers and staffs to keep the values and objects of the company, and not being honest by using company resources for personal gain can result to end of company existence.
- Failure to learn from mistakes – it is good for people to learn from past mistakes to prevent reoccurrence in the future. Failure of the management of some company to learn from past mistakes and find ways to correct them in the future can lead to end of company existence.

**6) Shareholders**

- Disagreement among shareholders – some companies stop existing due to conflict among shareholders because of disagreement during decision making.
- Company owners (sole proprietorship) do not respect the views of technical staffs – many local construction companies in Liberia are owned by one person that is not knowledgeable about construction or running a company. Instead of them employing and giving chance to the technical people in their company to handle technical issues, they will take crucial decisions on their own and this can lead to end of company existence.

**6. Conclusions**

From the analysis conducted, the root causes associated to the impacts on local construction companies in Liberia due to lack of Total Quality Management can be classify into ten categories. They are:

- 1) Employees (staffs)
- 2) Finance
- 3) Planning
- 4) Management
- 5) Tools and Equipment
- 6) Procurement and Logistics
- 7) Behavior
- 8) Natural Events
- 9) Economic Situation
- 10) Shareholders

For local construction companies in Liberia to be able to operate effectively, they need to address the issues surrounding the above listed sources of problems by implementing Total Quality Management. Total Quality Management has great benefits that can be attained through its implementation. Yet there are still many companies that attempt a variety of quality improvement efforts and find that they have not achieved any or most of the expected outcomes. The most important factor in the success or failure of Total Quality Management efforts is the genuineness of the organizations commitment (company management). Total Quality

Management is a complete philosophy that should be embraced with true belief, not mere lip service. Looking at Total Quality Management as a short – term financial investment is a sure recipe for failure. Some organizations view the responsibility for quality and elimination of waste to be on the employees other than top management. Another mistake by some organizations is over – or – under – reliance on statistical process control (SPC) methods. SPC is not a substitute for continuous improvement, teamwork, and a change in the organization’s belief system. However, SPC is a necessary tool for identifying quality problems. To tackle the issues identified as root causes, an action plan need to be prepared and implemented. This will help local construction companies to have a sustainable business operation.

**Table 16:** Action plan to address root causes

<b>ACTION PLAN TO ADDRESS ROOT CAUSES</b>			
No.	Category	Root Cause	Action to be taken
1	Employees (staffs)	Lack of trained staffs	Provide adequate training for staffs
2		Employment of unqualified staffs (especially huge number of family members)	Employ qualified and competent workers and not by family connection.
3		Lack of experience staff in project team	Employ experienced staffs. This can be achieved by making years of experience as one of the requirements for employment in your company.
4		Use of technicians instead of engineers on site	Do not use technicians to perform jobs that are to be done by engineers. Employ engineers.
5		Lack of adequate manpower for project execution to maximize profit	Always employ the required number of manpower needed for the execution of projects. Don’t try to increase your profit by reducing the employment number.
6		Unavailability of specific skills on site	During employment, provision must be made to employ employees with specialized skilled per project scope requirement.
7		Inability to maintain high profile staffs	Companies should make special provision in their annual operational budget to maintain high profile staffs. Motivate high level staffs.
8		Under payment of work force	Companies should offer good salary structure for work force in line with the labor law. Don’t under pay your work force. Promote good and conducive working environment for workers.
		Under estimation of budget to win project contract	Ensure proper estimation of budget during bidding process. Ensure that the scope of

<b>ACTION PLAN TO ADDRESS ROOT CAUSES</b>			
No.	Category	Root Cause	Action to be taken
9	Finance		project is well understood before quoting for the contract. Don't reduce your estimate to win project.
10		Mismanagement (misuse) of project funds	Companies should ensure implementation of proper financial and materials management. Use project funds for intended purpose.
11		Lack of financial management skills	Financial issue of company must be handle by qualified employee with financial management skills.
12		Lack of proper control measures in receiving and disbursing of project funds	Companies should implement a strong cost control policy to monitor the cash flow.
13		Delay in paying salary of workers	Pay workers on time.
14		Conflict between stakeholders for project funds	Companies stakeholders should give chance to their financial managers to handle financial issues instead of numerous interruption in financial decision process.
15		Lack of adequate funds to pre-finance work	Companies should have the financial ability to pre-finance projects before accepting to do so without the necessary financial backing. Don't accept just to win contracts.
16		Project owners failing to release funds on time	Project owner must ensure to meet with their contractual financial obligations on time, at the required period during the project execution or conclusion.
17		Mismanagement of company's operational funds	Companies should implement good financial management program to monitor all company transactions.
18		Lack of financial support to sustain the establishment	Shareholders to have the necessary financial support to sustain a company before it establishment.
19		Lack of profit generation / Low profit margin	Establish an effective communication with clients and employees to ensure that projects under taken are implemented per contract. Always provide good services to clients to attract future and bigger project works.
20	Inability to save income	Companies need to always save certain	

<b>ACTION PLAN TO ADDRESS ROOT CAUSES</b>				
No.	Category	Root Cause	Action to be taken	
		generated for future projects	percentage of generated income from past projects for future projects. Don't spend all your income without saving.	
21		Lack of operational funds	Companies to ensure availability of operational funds before commencing operation. Don't rely on future contracts to support company's operation.	
22	Planning	Poor planning and allocation of resources	Create proper project plan and ensure proper allocation of resources.	
23		Inability to break big project plans into small manageable phases	Always break big project plans into manageable phases. This will help you to effectively manage a project.	
24		Working under constant and excessive schedule pressure	Companies to ensure proper planning and work per plan to avoid working under excessive schedule pressure to make up for lost time.	
25		Cost overrun resulting from extra works	Companies should ensure that all extra works during project execution are booked separately to accord for added cost and time. This will enable the company to claim payment, thereby avoiding cost overrun on the original project budget.	
26		Changing of original spec and plan	Enhance quick response to project scope changes. Project scope changes should pass through the required process and all factors that will affect the changes must be considered.	
27		Unrealistic project time frame	Time allocation to work processes during project planning must be realistic. Don't use unrealistic time frame.	
28		Incomplete specification for project	Scope of work for all project must be well defined.	
29		Rework to correct non-conformance	Ensure that all works are done correctly the first time to avoid rework to correct non-conformance which involves the use of extra resources and time.	
30			Failure to address excessive scope creep	Enhance quick response to project scope changes to avoid excessive scope creep.

<b>ACTION PLAN TO ADDRESS ROOT CAUSES</b>			
No.	Category	Root Cause	Action to be taken
31	Management	Lack of good leadership structure to manage project/company	Companies should build a good leadership structure to manage the affairs of the company.
32		Lack of effective supervision	Ensure good monitoring and inspection implementation.
33		Poor Supervision/Monitoring of project expenditures	Ensure that all project expenditures are supervised and control effectively.
34		Lack of project management skills	Companies should ensure that their top management team possess the necessary skills to manage project effectively.
35		Lack of management commitment to project	Delivering quality services is a result of management commitment. Therefore, management must be committed to every project that they are undertaking.
36		Not working for the required hours per day	Companies should ensure that project works are executed per approved project schedule. Workers need to start work on time and complete on time and not the opposite.
37		Poor management of resources	Implement an effective resources management program within your company supported by a good document control system in place.
38		Lack of proper business management strategy / plan	Companies should have a proper business management strategy in place before sources contracts.
39		Failure to acquire projects over long period	Companies to ensure that they deliver quality services, avoid quoting for excessive profit and perform job on time. Also, establish good customer relationship with clients.
40	Tools and Equipment	Lack of required tools or equipment	Companies to ensure that all required tools and equipment are available for any given task to be done
41		Use of defective tools or equipment	Don't use defective tools or equipment to perform any task. This can lead to incident/accident which may result to Lost Time Injury or Fatality. It can also lead to doing the work in the wrong way due to error from the use of the defective tools or equipment.

<b>ACTION PLAN TO ADDRESS ROOT CAUSES</b>			
No.	Category	Root Cause	Action to be taken
42	Procurement and Logistics	Poor procurement practices resulting to purchasing of substandard materials	Implement proper procurement and logistics management.
43		Maximize profit by using lesser quantity of materials and poor quality	Don't purchase lesser quantity of materials or poor quality for project work to increase profit. This is a bad business practice. Purchase the required quantity and quality per contract scope.
44		Increase the prices on materials purchased for personal gain	Implement proper procurement and logistics management to prevent fraudulent practices.
45		Purchasing of less quantity of materials and reporting more for personal gain	Implement proper procurement and logistics management to prevent fraudulent practices.
46	Behavior	Embezzlement of project funds and materials	Implement a strong compliance policy on corruption. Zero tolerance if anyone within the company is cut in corruption activities.
47		Dishonesty of managers and staffs	Implement a be honest policy and conduct regular sensitization meetings with managers and staffs.
48		Failure to learn from mistakes	Management of companies to implement tracking system to record all past mistakes and challenges, and prepare an action plan to prevent future occurrences.
49	Natural Events	Bad weather condition	Provision must always be made during scheduling to allocate time for bad weather, especially if the work is to be done during the raining season.
50		Incident / Accident on site	Implement a strong Health, Safety and Environmental program within your company.
51		Fire outbreak	Prepare and implement an effective emergency response plan.
52	Economic Situation	Unavailability of contract due to unstable economy	Companies need to create an alternate means of continuing operation and raising revenue by involving into other construction related activities if they cannot obtain contract over certain period. Example, bricks manufacturing, concrete production etc.
53		High interest rate imposed by	Companies to negotiate better interest rate

<b>ACTION PLAN TO ADDRESS ROOT CAUSES</b>			
No.	Category	Root Cause	Action to be taken
		banks on local construction companies for loans to pre-finance work	with banks to obtain loan to pre-finance project works.
54	Shareholders	Disagreement among shareholders	Shareholders of companies need to comport themselves to avoid conflict due to disagreement. They need to be professional in the execution of their duties, not to affect ongoing projects.
55		Company owners (sole proprietorship) do not respect the views of technical staffs	Companies owner to respect the views of site managers and supervisor.

This thesis will benefit the local construction companies in Liberia by helping them to improve their businesses through employing and maintaining qualified staffs, obtaining long lasting life span (company existence), by developing good customer services and relationship, by increasing profit through cost savings on zero non-compliance (re-work and retention fees), and to deliver projects within the required scope and schedule.

Finally, companies that have attained the benefits of Total Quality Management have created a quality culture. These companies have developed process for identifying customer – defined quality. In addition, they have a systematic method for listening to their customers, collecting and analyzing data pertaining to customer problems, making changes based on customer feedback.

**ACKNOWLEDGEMENT**

I am very grateful to the Almighty God for giving me the ability to successfully complete this thesis.

I would like to thank my Thesis Advisor Dr. Jack Rosen Zweig of Atlantic International University, my Tutor Kinmberly Diaz and my Admission Counselor Judith Brown. They were always willing to help me whenever I have a problem or a question concerning my thesis. They did their very best to ensure that this thesis is my own work by guiding me throughout the entire process.

I would also like to appreciate all those who participated in the sample survey for this research project. Without their passionate participation and input, the sample survey could not have been successfully conducted.

Finally, I must express my profound gratitude to my wife Mrs. Matu M. Denton and children for providing me with their endless support and continuous encouragement throughout the period of study and through the process of researching and writing this thesis. This accomplishment would not have been possible without them. Thanks to All.

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**APPENDIX A: Sample Survey Questionnaire**

RESEARCH TITLE: THE IMPACTS OF LACK OF TOTAL QUALITY MANAGEMENT

ON

LOCAL CONSTRUCTION COMPANIES IN LIBERIA

(SAMPLE SURVEY QUESTIONNAIRE)

**Table 17**

<b>Name</b>			
<b>Occupation</b>	<b>Years of Experience</b>		
<b>Email</b>	<b>Phone #</b>		
<b>Date</b>	<b>Signature</b>		

**Aim:**

This research is conducted to identify the impacts of lack of TQM on local construction companies in Liberia; to find the causes of these impacts using root cause analysis; and to find mitigation measures and strategies by implementing Total Quality Management principles throughout the entire scope of operations of local construction companies.

**Note:**

The information provided on this questionnaire will be treated as confidential and will be used only for this research, and not anything else.

**Section1:** Answer the following questions by circling the letter against your choice of answer on the list of options provided below each question.

- 1. What percentage of local construction companies in Liberia cannot complete project on time?  
a) 95%      b) 90%      c) 85%      d) 50%      e) 25%
  
- 2. What percentage of local construction companies in Liberia fail to complete project on time due to lack

of proper planning and control of project?

- a) 95%    b) 90%    c) 85%    d) 50%    e) 25%

3. What percentage of local construction companies in Liberia fail to complete project on time due to lack of trained and qualified staffs?

- a) 95%    b) 90%    c) 85%    d) 50%    e) 25%

4. What percentage of local construction companies in Liberia fail to complete project on time due to rework to correct non-conformance?

- a) 95%    b) 90%    c) 85%    d) 50%    e) 25%

5. What percentage of local construction companies in Liberia fail to complete project on time due to mismanagement of funds?

- a) 95%    b) 90%    c) 85%    d) 50%    e) 25%

6. What percentage of local construction companies in Liberia fail to deliver project according to the required scope?

- a) 95%    b) 90%    c) 85%    d) 50%    e) 25%

7. What percentage of local construction companies in Liberia fail to deliver project according to the required scope due to lack of qualified staffs?

- a) 95%    b) 90%    c) 85%    d) 50%    e) 25%

8. What percentage of local construction companies in Liberia fail to deliver project according to the required scope due to lack of proper monitoring or control?

- a) 95%    b) 90%    c) 85%    d) 50%    e) 25%

9. What percentage of local construction companies in Liberia fail to deliver project according to the required scope due to use of substandard materials?

- a) 95%    b) 90%    c) 85%    d) 50%    e) 25%

10. What percentage of local construction companies in Liberia fail deliver to project according to the required scope due to mismanagement of funds?

- a) 95%    b) 90%    c) 85%    d) 50%    e) 25%

11. What percentage of local construction companies in Liberia fail to complete project due to lack of proper budget control?

- a) 95%    b) 90%    c) 85%    d) 50%    e) 25%

12. What percentage of local construction companies in Liberia fail to complete project due to lack of proper budget control cause by unavailability of qualified staffs?

- a) 95%    b) 90%    c) 85%    d) 50%    e) 25%

13. What percentage of local construction companies in Liberia fail to complete project due to spending outside the budget?

- a) 95%    b) 90%    c) 85%    d) 50%    e) 25%

14. What percentage of local construction companies in Liberia fail to complete project due embezzlement of project funds?

- a) 95%    b) 90%    c) 85%    d) 50%    e) 25%

15. What percentage of local construction companies in Liberia fail to complete project due to lack under estimation of project budget?

- a) 95%    b) 90%    c) 85%    d) 50%    e) 25%

16. What percentage of local construction companies in Liberia stop existing due to lack of operational funds?

- a) 95%    b) 90%    c) 85%    d) 50%    e) 25%

17. What percentage of local construction companies in Liberia stop existing due to mismanagement of funds?

- a) 95%    b) 90%    c) 85%    d) 50%    e) 25%

18. What percentage of local construction companies in Liberia stop existing due to lack of qualified staffs?

- a) 95%    b) 90%    c) 85%    d) 50%    e) 25%

19. What percentage of local construction companies in Liberia stop existing due to lack of profit generation?

- a) 95%    b) 90%    c) 85%    d) 50%    e) 25%

20. What percentage of local construction companies in Liberia stop existing due to lack of saving of income generated to be used for future projects?

- a) 95%    b) 90%    c) 85%    d) 50%    e) 25%

**Section 2:** Please answer the following essay questions according to your own experience and opinion.

21. What are the reasons for the failure of some local construction companies in Liberia to deliver project according to the required and approved scope?

22. What are the factors responsible for the failure to complete projects by some local construction companies in Liberia due to lack of proper budget control?

23. What are the reasons for failure to complete projects on time by some local construction companies in Liberia?

24. What are the reasons for short life span (period of existence) by some local construction companies in Liberia?

25. If you were the manager of one of these local construction companies in Liberia, what measures will be put in place to ensure that project scope are delivered according to the required standard, cost and time?

General Statement about this research:

