

Report on
Supply Chain Management Challenges on Construction
Contracts of Public Works Department

By

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20382012

An internship report submitted to the BRAC Institute of Governance and Development
(BIGD) in partial fulfillment of the requirements for the degree of
MASTERS IN PROCUREMENT AND SUPPLY MANAGEMENT (MPSM)

BRAC Institute of Governance and Development (BIGD)
Brac University
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Declaration

It is hereby declared that

1. The internship report submitted is my/our own original work while completing degree at Brac University.
2. The report does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The report does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
4. I/We have acknowledged all main sources of help.

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Subject: Submission of report on “Supply Chain Challenges Construction Contracts of Public Works Department”

Dear Sir,

It brings me immense joy to provide you the project report. The paper was written to outline the supply chain challenges and offer suggestions for overcoming them in the Public Works Department's construction contracts and contract management. During the time I spent preparing for this endeavor, I learned a lot. I used the finest information and abilities I had to provide the best report. It is envisaged that this paper will be useful in overcoming the difficulties in the PWD supply chain. Hopefully, you will find my work and effort, informative approach, and well-researched report useful.

Sincerely yours,

Abu Hayat Muhammad Shakiul Azam

20382012

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Date: August 31, 2022.

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I also want to convey my sincere gratitude to the Public Works Department (PWD) respondents, especially the Executive Engineers, Sub-divisional Engineers, and Assistant Engineers from various PWD offices who helped me at various stages of data collecting and offered a lot of official support.

I'd would really like to express my gratitude to my parents, wife, and coworkers for their continuous support and encouragement during the studies.

At last but not in least, I would like to thank everyone who helped and motivated me to work on this project

Executive Summary

This study focuses on supply chain challenges on construction contracts of PWD. Public Works Department is implementing thousands of infrastructure projects of the Government. So, construction contracts and contract management relating to supply chain is the pivotal issue from the initiation to completion of any infrastructure development projects. Every construction project has numerous types of challenges during its construction period. In PWD, officials related to the construction projects faces different types of challenges in supply chain phases. For identifying the challenges, a questionnaire was prepared and a survey was done based on the questionnaire. 25 PWD officials from Assistant Engineer to Executive Engineer responded the questionnaire. From the responses of the respondent, challenges relating to supply chain of construction contracts and contracts management of PWD are analyzed. From respondents supply chain challenges like working on schedule, quality control, cost overruns, Lack of good governance, crisis of fund allocation, stakeholder management strategy, risk management strategy, construction safety issues, global supply chain disruption etc. have been identified and after analyzing the data some recommendations have been proposed to overcome those challenges in construction contracts of PWD.

Keywords: Supply Chain Challenges; Quality assurance and control; stakeholder management strategy; risk management strategy; construction safety issues; global supply chain disruption.

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List of Acronyms:

PWD	Public Works Department
STD	Standard Tender Document
TEC	Tender Evaluation Committee
QA	Quality Assurance
QC	Quality Control
DOA	Department of Architecture
BOQ	Bill of Quantities
CPTU	Central Procurement and Technical Unit
e-GP	Electronic Government Procurement
ADB	Asian Development Bank
HQ	Head Quarter
PPA	Public Procurement Act
PPR	Public Procurement Rules

Chapter 1

Introduction

1.1. Supply chain in construction:

A supply chain is a comprehensive system that creates and delivers a good or service, from the very beginning when the raw materials are sourced to the very end when the good or service is delivered to the end customers. One of the trickiest parts of the building value chain is the movement of resources, goods, information, and money associated to all of them.

The supply chain describes all elements of the production process, such as the tasks carried out during each stage of a project, the information exchanged among all parties, the natural resources transformed into useful materials, the human resources, and other elements that are used to create the finished product.

Supply chain management is one of the most important factors to make sure that a construction project is running smoothly on time (and within budget) and that every stakeholder involved is fully aware of how their area is doing and the progress it is undergoing. This is because the value chain for the construction sector is made up of so many players and is so fragmented.

The supply chain for a typical construction project involves engineers, architects, prime contractors, suppliers of materials, and subcontractors. The complex chain often comprises of short-term interactions and non-standard procedures because every construction project is distinct and the persons involved probably only work together once in their career.

1.2 Construction Contracts and Contract Management:

Construction contracts are used by project managers and owners to outline their respective duties and the steps involved in managing a construction project. Due to the fact that they outline the procedures and duties for both parties, it is crucial to make sure that these agreements are precise in order to uphold legal and financial commitments during the construction project.

Construction contract management is the process of developing and putting into effect the legal documents that support and enable construction projects. Responsible individuals like the owner, project manager, attorneys, and contractors are involved. Fundamentally, an essential task on the part of the executives ensures quality control, accountability for the financial plan, and timeline coherence. Important details related to the construction business are contained in construction contracts. Among the contracts specifics are as follows:

a. Construction Contract Agreement

Construction contract management is a crucial part of the buying and selling of construction services. There will be a number of important parts attached to every construction contract. It is the key agreement.

b. Scope of Work

The scope of work includes a full description of the services and tools that the contractor will supply as well as the physical elements of the project, such as their location, nature, quantity, and quality.

c. General and Special Conditions

There are both common and unique conditions in construction contracts. While special conditions provide aspects that are more unique to each individual project, general conditions address the fundamental elements of the contract.

d. Construction Schedule

The construction schedule is one of the documents required in a construction contract. These enable tracking of the development of certain projects or buildings, and they, of course, also include the goal date for the installation of the building or specific components of it.

e. Specifications

It is essential to understand more about the specifications in a construction contract and how the project will look because both are essential to its success.

f. Bill of Quantities

An essential component of any construction contract is a bill of quantities. The list of supplies and the labor that has to be done are organized and documented on the "bill." In essence, it is a list organized in a thorough way that describes.

g. Cost Estimate

A cost estimate is one of many requirements for that enterprise to start. A qualified specialist in the field must finish the estimation. It resembles something similar to an agreement regarding the cost, delivery schedule, and services provided.

h. Drawings

Any building project is built on drawings. Things need to be outlined clearly in terms of what is intended to be built when it comes to building a new home or modifying an existing floor plan.

i. Construction Insurance Coverage

This ensures the owner that the contractor has the resources necessary to fulfill his obligations in accordance with the terms of the construction contract, making it a crucial component of the



document.

Figure 1 Construction Contract Life cycle

1.3 Importance of the proposed report

Public Works Department (PWD) is one of the biggest public sector engineering organizations of building construction in Bangladesh. PWD construct and maintained all public buildings including the Honorable President's house, Prime Minister's Office and residence, Secretariat, National Assembly, Hospitals, Govt. offices etc. The importance factor of that building is very high. So robust and effective project and contract management is necessary to implement those projects. PWD is facing numerous challenges in implementing these projects. So, it would be wise enough to have an independent study to overcome the challenges in construction contract management of the Public Works Department.

1.4 Objectives of the Study

The objectives of the present study are as follows:

- I. To identify the internal and external supply chain challenges in construction contracts of PWD.
- II. To find out the solutions to overcome the challenges of construction contracts in implementing the projects.

1.5 Scope of the Study:

No study has been found on challenges of construction contract management activities in PWD yet. So an independent study is proposed from the concerned authorities to find out challenges of construction contracts and contract management in projects of PWD. This study is such an approach for ascertaining the facts in PWD. The study is working with the 12(Twelve) different supply chain challenges in construction contracts of the project of PWD to measure the performance of construction contract management activities.

1.6 Limitations of the study

PWD is one of the largest organizations of Bangladesh. It has official set up in every district. But survey of my study is conducted only within PWD HQ, Dhaka and some other District offices. The limitations of this study have come from both its scope and its methodology. On the contrary, the number of project taken under this study is very few considering the volume of work PWD done.

Chapter 2

Literature Review

2.1 Historical Background and functions of Public Works Department:

Bangladesh's Public Works Department (PWD), which is part of the Ministry of Housing and Public Works, is a pioneer in the country's building industry. PWD was able to successfully set the trend and benchmark for the nation's infrastructure development throughout the course of nearly two centuries. In the execution of government construction projects, it is vital.

Organogram of PWD:

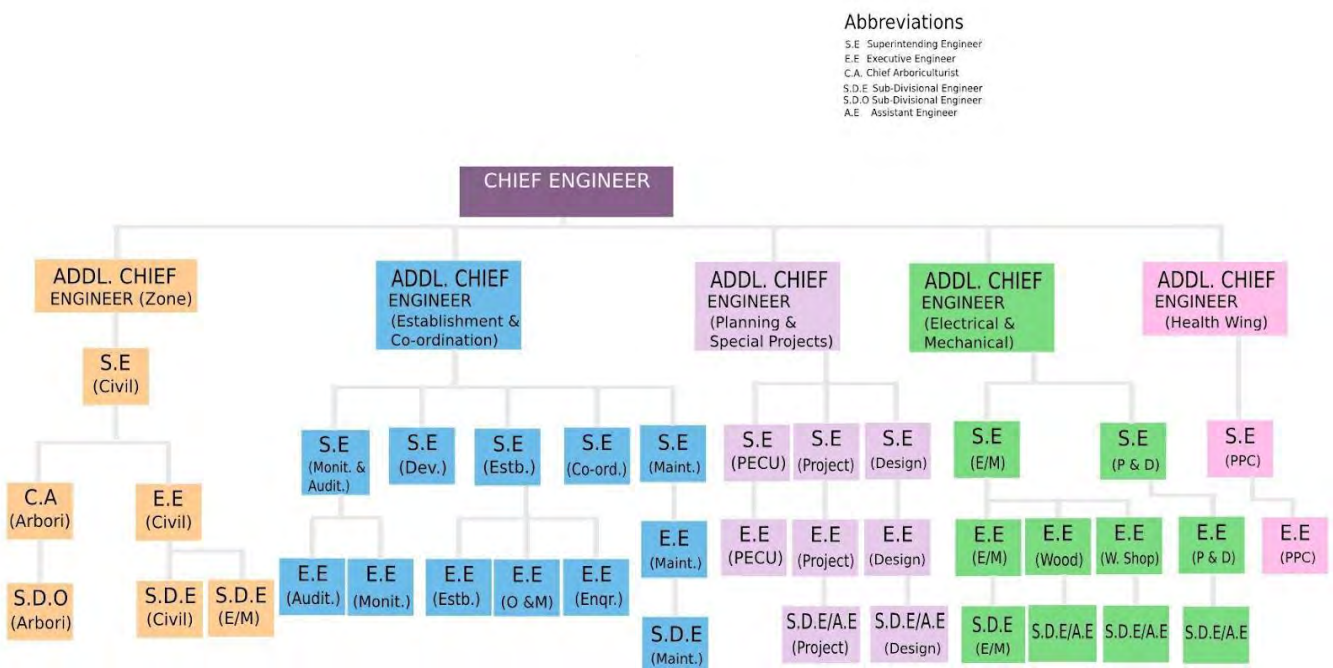


Figure 2 Organogram of PWD

Functions of PWD:

“Working arena of PWD are as follows:

- Construction and maintenance of government buildings and establishments.
- Ensure proper maintenance and management of government quarantined properties.
- Maintain the standard and quality of construction materials.
- Construction and Maintenance of other Government Structures including KPI Installations.
- Prepare structural and electromechanical design of government installations.

- Reconstruction, maintenance and renovation of Various Monuments and Historical Buildings.
- Maintenance and Development of Public Parks.
- Fix the rate of rent of government office and residential building.
- Collection of Non Tax Revenue.
- Prepare the Rate of Schedule of Civil and E/M Work.”[8]

2.2 Procurement and supply chain System in PWD:

From the last decades All public sectors procurement in Bangladesh is being implemented by following Public Procurement act-2006(PPA-2006) and Public Procurement Regulations-2008(PPR-2008) and also by following CPTU Standard Tender Documents (STD) in tendering process. Like other public sectors organizations of Bangladesh PWD also uses Electronic Government Procurement (e-GP) System in tendering process. So all constructions /maintenance works, goods and services which have been implemented by PWD have been procured by following above mentioned Act, Rules and STD of CPTU. A huge number of building construction and other infrastructure projects of public sectors have been implemented all over the Bangladesh. As a result, construction supply chains are involved in total procurement process of these projects. PWD is mainly involved in procurement of works, goods and services of government projects of Bangladesh. All construction projects implemented by PWD have following stages.

STAGES OF THE PROJECT LIFECYCLE

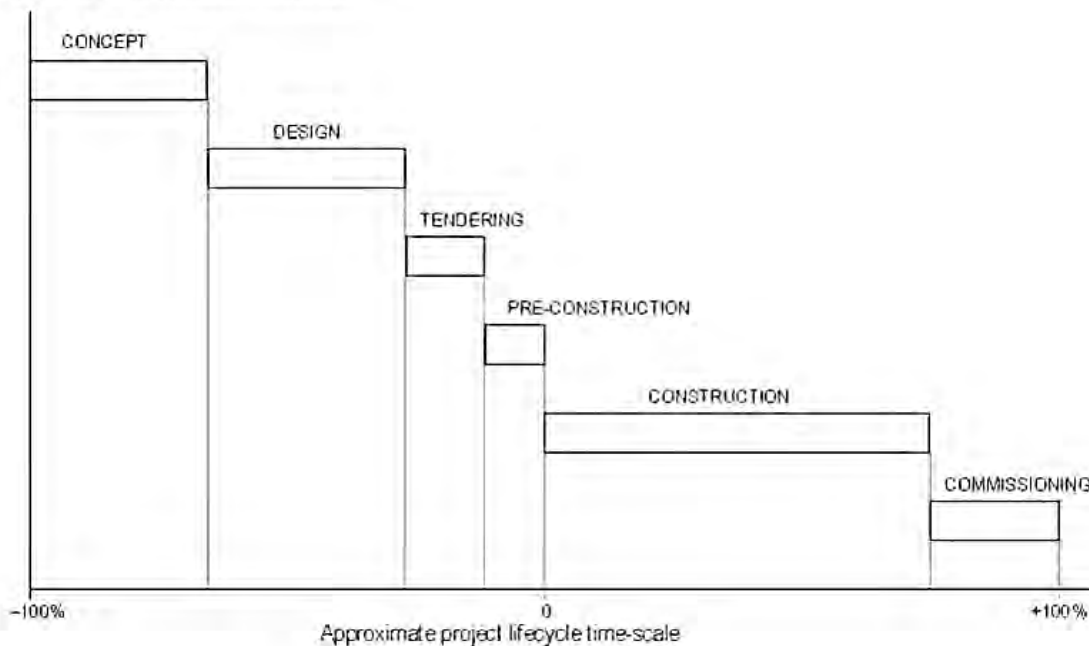


Figure 3 Stages of Project Lifecycle

A. Conceptual stage

A conceptual stage of the projects defines the extent of the work of the project and its end product. It is the initial stage of the project. It is the first and by far the most important stage in the lifecycle since the effectiveness of its execution will influence the ultimate outcome. It provides a concise picture of what the principal needs and wants. It provides a basis for the development project brief from which the designer can develop a functional, aesthetically pleasing and economically viable design. Mainly feasibility study, preparing master plan, scope statement, project organization and preparing Development Project Proposal (DPP) are the main part of this stage. A number of teams of PWD are involved in this stage.

B. Design stage

The physical design of the facility will be developed from the project's theoretical framework, as mentioned above in the brief, and will be recorded in the form of drawings & specifications. Currently, work is being done by PWD's Department of Architecture and Design unit. The local PWD working units receive the prepared drawings and specifications in order to compute the tender price, get development and building permissions, and serve as the foundation for the tender documents. It should now be obvious that the numerous post-design processes listed below all depend critically on the integrity of the design documentation. To guarantee that the design documentation meets the necessary high-quality standard, the design stage must be handled and managed successfully. A badly managed design phase will negatively impact the project's main goals of time, money, and quality.

C. Tendering stage

The most popular way of allocating construction contracts among the contractors and subcontractors ready to take on the work is still competitive tendering based on tender papers. The PWD working teams develop the tender documentation, which consists of:

- Tender Notice
- Tender Conditions
- Tender Forms
- GCC (General Conditions of the Contract)
- Tender Specification
- Bill of quantities (if any)
- Design and Drawings.
- Documents related to tender.

D. Pre-construction stage.

The pre-construction phase of the project begins when the successful general contractor receives the main contract and typically concludes when the date for site possession is achieved. The primary contractor will use this time to plan the project and gather the required resources. In this case the contractor must obliged the following procedure:

- Preparing a detailed work schedule of activities which involves time and resources.
- Preparing a detailed plans of quality & cost management. .
- Developing site supervision plan.
- Assembling of resources which is necessary for carrying out work. Subcontractors is also included in this stage.
- Establishment of framework including contracts administration for information management.
- Obtain necessary approvals from major stakeholders like different authorities and property owners.
- Developing a mechanism for ensuring the completion of the project within the stipulated time and cost & to the essential criteria.

E. Construction stage

The construction phase starts when site possession is obtained and is completed practically. In PWD, the executive engineer of any working division performs the responsibilities of project management, contract management, general administrative supervision of the project, and project supervision.

In this stage some important things must be considered.

- There must be assurance of the contractor for the correction of any arising problems that arise during the construction works.
- Contractor must correct any defects during the defects liabilities period.
- Completion of the project on time.

F. Commissioning

The commissioning stage starts the day after practical completion and ends when the faults liability period has passed. The facility is at the risk of the implementing agency once it is operationally complete (PWD). The project manager formally takes ownership of the space and starts by:

- Make the facility secure and insured.
- Prepare the space
- Set up contracts for service maintenance.

- Track the correction of flaws.
- Decide on a time for the facility's debut.
- Free transfer of the project with defects.
- Complete leases or agreements regarding staffing.

Finalize the contract with the principal contractor. The liability period for problems typically lasts three to six months. There is frequently a separate 12-month defects liability term for mechanical services. The agreement between the project manager and the principal contractor expires upon its conclusion.

G. Post-occupancy Evaluation (Audit):

The principal can evaluate the project's performance in relation to its stated goals and the project team members at the end of the commissioning stage. Future decisions will benefit greatly from this information.

Chapter 3

Methodology

3.1 Collecting Data and Sampling Method:

Data collection process of this report is performed by questionnaire survey method. Mostly close ended questionnaire survey is conducted to collect data. A set of questions using google form is prepared for survey. Online based survey is conducted by sending question form to respondents by e-mail and each respondent gave their feedback by their own mail. Questionnaire was sent to PWD working Division in Dhaka, Chottagram, Tangail, Sylhet, Jassore, Khulna and Dinajpur with a general introduction of the study. Among them 25 (Twenty Five) Divisions replied their answers considering their construction contracts. Here both open and closed ended questions were stipulated for getting the in-depth essence of construction contracts. Before asking for filling the questionnaire, the general idea of the study objectives were exchanged with them. After the exchange of general idea of the study objectives, the questionnaire was given to them. They were requested to fill the questionnaire based on the actual data of a specific project under his/her jurisdiction.

3.2 Questionnaire Design:

A set of 19(nineteen) questions in google form is prepared for survey. Since PWD is implementing construction projects of Bangladesh it has to follow different steps during the construction period. In different stages of construction contract different supply chain challenges have been identified. Questionnaire are designed in according to supply chain challenges of construction contracts of PWD as described in chapter 3. The questionnaires have been used for this study which is given in the **Appendix A**.

4.3 Sample Size:

The respondents of Questionnaire were categorized in different types namely i) Procuring Entity (PE) and Contract Manager of PWD ii) TEC Members iii) Persons who are directly involved in implementation of the PWD's projects. As there are many employees of PWD are concerned with construction contracts of the projects, a total of 25 different officers gave their feedback. Working divisions of PWD are randomly selected for data collection.

4.4 Data Analytical Framework:

As data are collected by google form all data have been processed by google form itself for preparing pie charts. Microsoft Word is used for preparing this report.

4.5 Demographic overview of the respondents

To do this, questionnaire survey has been conducted on the officers from PWD.

Respondent's Variant	Frequency	Percentage (%)
Organization		
PWD	25	100
Total	25	100
Designation		
Executive Engineer	13	52
Sub-Divisional Engineer	5	20
Assistant Engineer	7	28
Total	25	100
Relevancy of PWD		
Employee of PWD	25	100
Total	25	100
Education Level		
PhD	1	4
Masters'	5	20
Bachelors	19	74
Total	25	25

Table 1 Summary of the information regarding the respondents' different attributes

Chapter 4

Identification of Challenges, Findings of the survey and Discussion

We know PWD has implemented mainly building construction projects of government sector of Bangladesh. Any construction works is challenging from its beginning to its end. So PWD has to face huge number of challenges to implement its different projects. There are different types of challenges in different stages of construction as earlier described which PWD has to face. The respondents were asked to fill up 19 (nineteen) specific questions on the projects under his/her jurisdiction regarding supply chain challenges of construction contracts of PWD. While asked to fill up the survey questionnaire about the construction contracts of PWD, the responded replied by giving the information of a project of their territory. Findings of the survey are discussed below on individual questions basis:

A. Working schedule management:

Any construction project has its beginning and ending. During its period a working schedule must has to be followed. Every construction project of PWD has to follow its working schedule within its contract period. Working schedule management is one of the vital challenges in construction contracts of project of PWD. The initial schedule is prepared by the contractor according to the requirements of the contract. Typically, the contract manager of PWD retains the right to review the initial schedule for coordination and monitoring purposes. It is used to identify the project critical path and near critical paths that, if delayed, would result in overall delays to project completion.

By analyzing the 25 questionnaires it has been found that PWD that only 28% of the projects of respondent's territory are completed within the time frame of the contract but 72% of the projects are not completed within schedule time. So it is a big concern for PWD to implement the project.

Can you complete the construction works within time limit of initial contract period?
25 responses

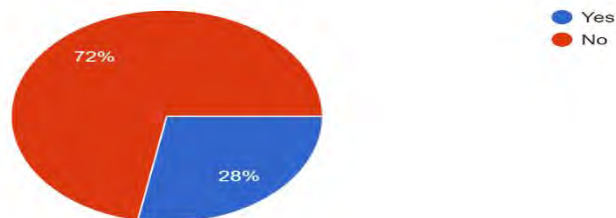


Figure 4 Schedule management of the Project

How many projects in percentage are completed within time limit of initial contract period?

25 Respondent

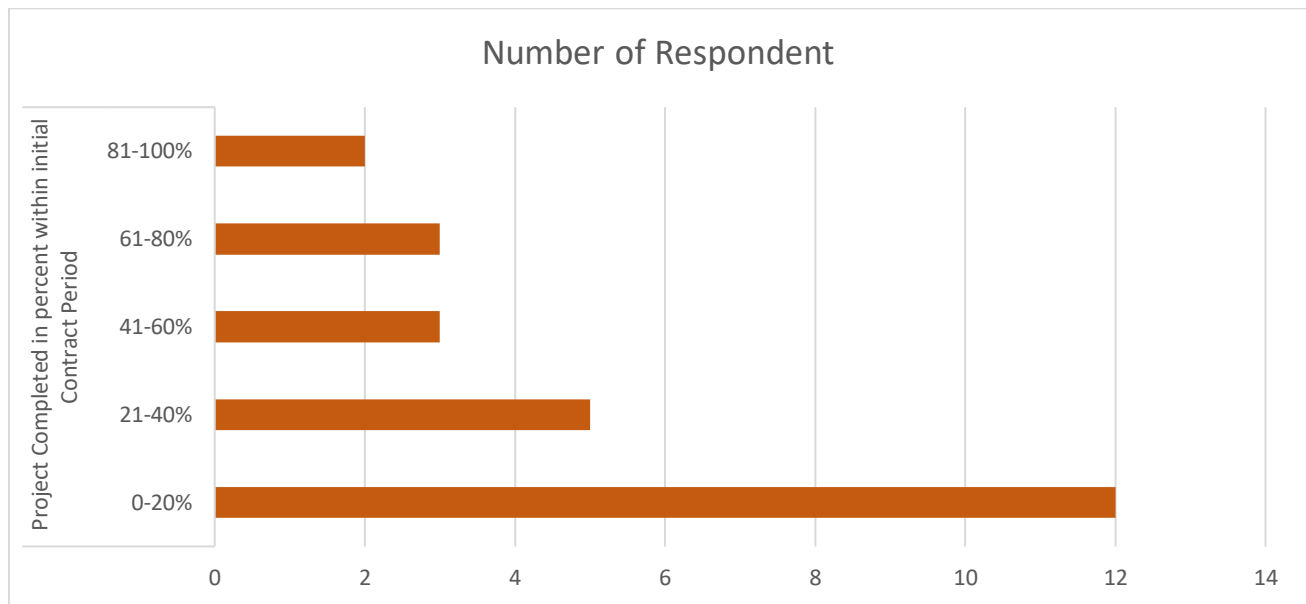


Figure 5 Project Completed Within Initial Period

According to the respondent, 12 persons stated that 0-20% project of their jurisdiction are completed within initial contract period. It can be said from the graph below that most of the projects in PWD are not completed within initial contract period.

B. Quality assurance and quality control:

The objective of an effective quality assurance (QA) program is to guarantee that the quality controls put in place at the design stage of a construction project effectively meet the organization's criteria for high-quality service, performance, and production. Generally speaking, QA is a preventative measure to guarantee the product's quality. The primary spec areas are:

- Markup guidelines for plans and drawings from creation to revision and final approval.
- The guarantee that specified materials adhere to organization-established quality standards.
- Qualifications for architects, designers, and engineers.

Design unit of PWD and Department of Architecture (DOA) are responsible for quality assurance of project. Quality of any project is immensely depends on how quality the design is. As a result only well skilled and experienced design engineers can ensure the quality design which in turn can

ensure the quality assurance of the project. A well-established skillful engineers and architects are the main players to ensure quality assurance of construction works.

The process known as quality control (QC) ensures that the project's materials actually adhere to designs and plans that have been duly signed. Second, QC makes sure that the processes for construction projects are carried out by task-specific individuals in accordance with the established QA standards. Sub-Assistant Engineers to Executive Engineer of working divisions of PWD who are responsible to implement the construction works are the main player to ensure the quality of the construction works. Quality control of project is one of the main concerns of Construction Contracts of PWD as there are lack of skill manpower in field level and also they are not well trained. And again they have no sufficient knowledge regarding PPA-2006 and PPR-2008.

To analyze the quality assurance and quality control of the projects under the jurisdiction of the respondent several questions were asked to the respondent. The Feedback are as follows:

Do you think that all structural design of our construction works is done by following all codes and other rules and regulations which is enough for the quality assurance of the project?

25 responses

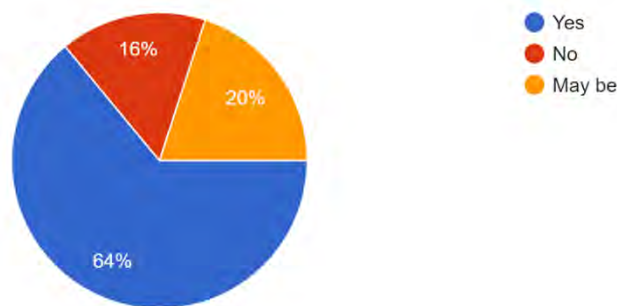


Figure 6 Quality assurance by structural design

Proper structural and architectural design of any structure is the main criteria to ensure the quality assurance of the construction. 64% of respondent thought that structural design of the construction project of PWD are done by following design codes and other rule and regulations.

Does internal supply chain (Design Unit/Project Unit/Monitoring Unit) of PWD is well equipped and supported by necessary logistics?

25 responses

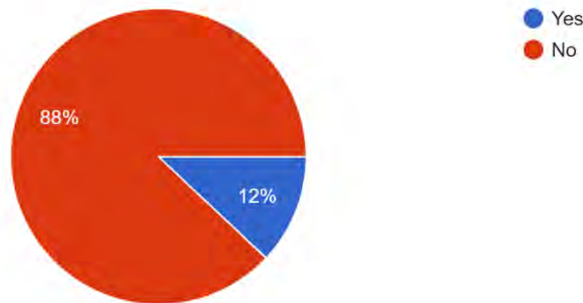


Figure 7 Logistics support for Internal Supply chain unit of PWD

But 88% of respondents thought that internal supply chain units of PWD are not well equipped and supported by necessary logistics which are very much important to ensure the proper design and monitoring of the construction projects.

Does the authority arrange sufficient training facilities in regular basis to develop the skill for the member of the internal supply chain team and does ...ent allocate sufficient fund in training purpose?

25 responses

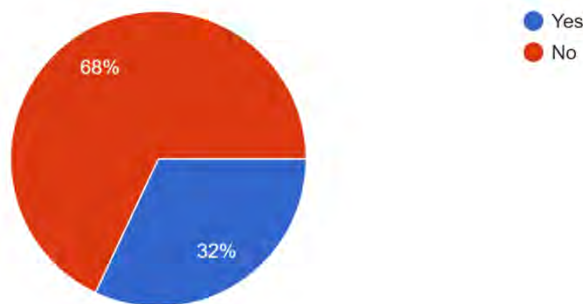


Figure 8 Training facilities for Internal Supply chain unit of PWD

Quality structural design is ensured only by the quality and skill design engineers. So they have to be facilitated with continuous training to improve their skill. 68% of respondents thought that the authority does not arrange sufficient training facility for them.

Is there any laboratory facility of PWD in field level of your jurisdiction to perform the material test and other test to ensure the quality of the construction works?

25 responses

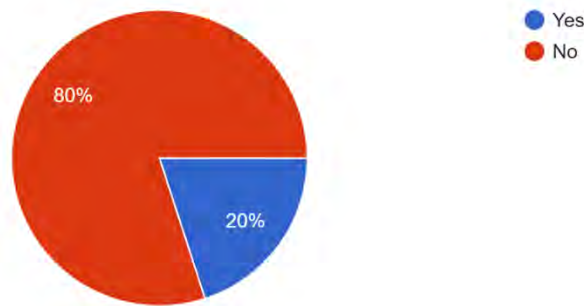


Figure 9 Laboratory test facilities in field level of PWD working division

Testing of construction materials to meet the standard of material specification in BOQ is necessary to ensure the quality of the works. But there is very much little facility for testing of construction materials in the territory of execution level of construction. So it is very tough to ensure the quality control of construction works of PWD in field level. 80% of respondents ensure that they have no laboratory facility of construction material test in field level. So it is another big concern to ensure the quality of construction works of PWD.

C. Slow Technology Adoption:

The change occurring in the technology world is accelerating. This also applies to the construction industries; in fact, construction technology continues to advance at a tremendous speed, making it safer, less expensive, and more efficient.

But whole construction contracts process in PWD is not modern technology based. A primitive system is still now the main process of construction works. Only online based e-GP system is established in tendering and bidder selection process.

In this regard the feedback of respondent are as follows:

To find out the cost of the projects estimating of different items is necessary. Various estimating software are available in this regard. It saves time. But from respondents point of view only 56% of respondents are using this type of software.

Do you use any estimating/quantity survey software to calculate the cost of the project?

25 responses

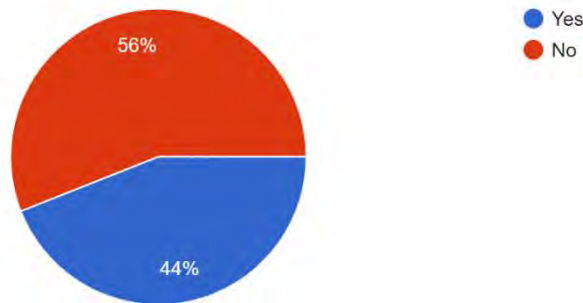


Figure 10 Using of estimating software in PWD

Tendering process of PWD is performed by online based e-Gp systems. But evaluation of the tendering process is not fully online based. 72% of respondents thought that the bidder selection process is fully online based but the rest of the respondents are still confused about the bidder selection process PWD

Do you think bidder selection process in PWD is fully online based or fully modern technology supported?

25 responses

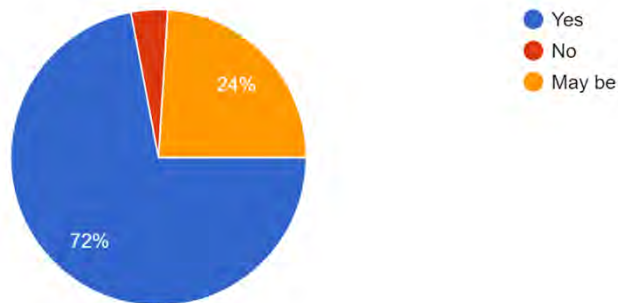


Figure 11 Online based bidder selection in PWD

D. Cash flow Issues:

Any construction project has its own budget. Proper allocation of budget and in due time allotment of fund is the key factor of construction project to implement it within the time of initial contract period. Every project of PWD is either funded by government of Bangladesh or funded by foreign aided agency like World Bank, ADB etc. It is a huge challenge for the allocation of fund in PWD

project in a proper way and in proper time. As a result we cannot pay the contractor's bill in due time and contractors suffer a lot for liquidity problem and so he cannot invest proper money in due time which, in turn, may cause the delay of project. Again a few of contractors have not sufficient liquid money of their own. So they cannot run the project according to the schedule of works.

Findings from the respondents regarding cash flow of the project are shown below:

Do you think government funds of the project are allocated properly and in due time so that contract schedule can be maintained?

25 responses

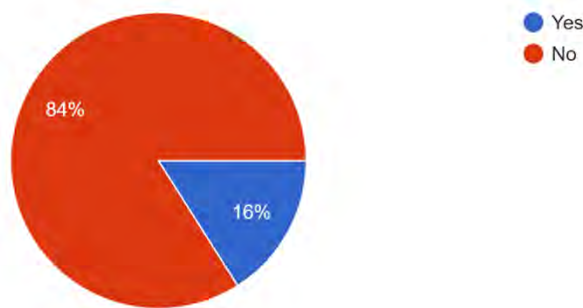


Figure 12 Fund allocation crisis of the project

84% of the respondents replied that most of the projects in their territory could not be completed within time limit of contract period due to fund crisis.

E. The lack of skilled workforce:

Lack of skilled construction labor is another big challenge for the project of PWD. Construction labor are not well trained. It is widely accepted that laborers' abilities and skills, which can have a bigger or lesser impact on the project's progress, determine how well a project will perform when it is being carried out. For most building projects, this is true. Project managers, assistant project managers, construction engineers, project architects, contractors, or subcontractors often manage and supervise projects, and duties are carried out physically on construction sites. It is observed that 92% of the respondent responses that lack of skilled workforce is the main causes of obstacles to ensure construction quality.

Do you think lack of skilled workforce is one of the main causes of obstacles to ensure construction quality?

25 responses

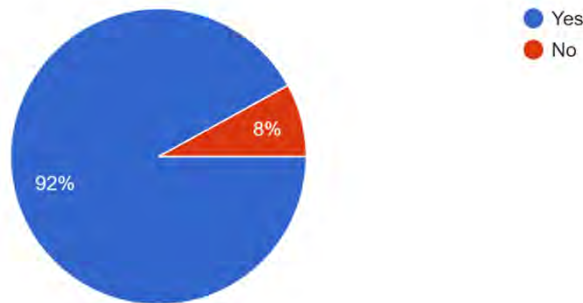


Figure 13 Lack of skilled workforce

F. The lack of reliable informal subcontractors/suppliers:

In every project of PWD there is a main contractor with whom contract agreement is signed and he is completely liable for the implementation of the project. But he is not the only one there are many informal suppliers and vendors who are unlawfully engaged by the main contractor to implement the project. They are directly involved in main supply chain of construction contracts but they have not any legal liabilities of the project. Those informal suppliers only think about their own profit which hampers the project in regarding quality issues. Again in many cases the main contractor of PWD has made an agreement of informal sub-contract with another supplier for the execution of the whole works. In that case the main contractor actually sell the whole works to the third party in a lower price. In that case quality and schedule maintain of the project falls in great challenge.

Do you think efficient and reliable informal sub-contractors/suppliers are available so that projects quality can be ensured and construction works can be completed within initial time limit of contract?

25 responses

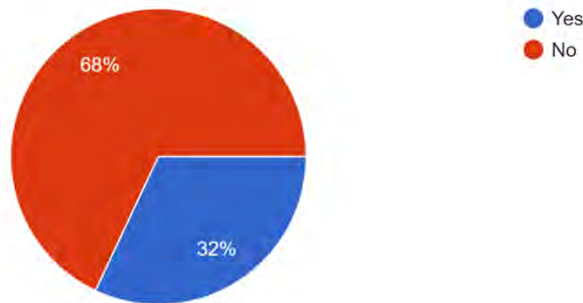


Figure 14 Lack of reliable informal Sub-contractors

According to the survey 17(68%) of respondents stated that most of the projects under their jurisdiction are not completed in scheduled time of contract because of inefficient informal subcontractors provided by the main contractors.

G. Stakeholders Management Strategy:

Construction projects are typically broken down into a series of tasks or operations carried out by various people or organizations, all of whom may have varying degrees of interest in or engagement with the project. Construction project design and execution are lengthy processes that include collaboration and negotiation among numerous stakeholders, including but not limited to clients, designers, contractors, local authorities, and the overall project environment. However, the administration of PWD building contracts keeps a stakeholder management strategy in fewer instances. As a result, many PWD projects are not successfully completed within the initial contract period, which may result in project cost overruns.

According to study of the survey 14(56%) said that they did not follow any stakeholder management strategy in implementing their project. 11(44%) follow the informal strategy to manage the stakeholders.

Do you follow any stakeholder management strategy (stakeholder identification, classification and management) to implement your construction contracts?

25 responses

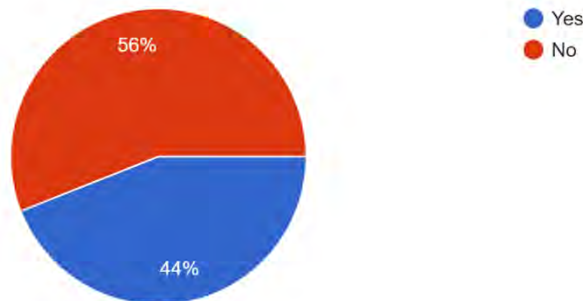


Figure 15 Stakeholder Management Strategy

Do you think interference of stakeholders (Political leaders or other bigwigs) can impact contracts under your jurisdiction?

25 responses

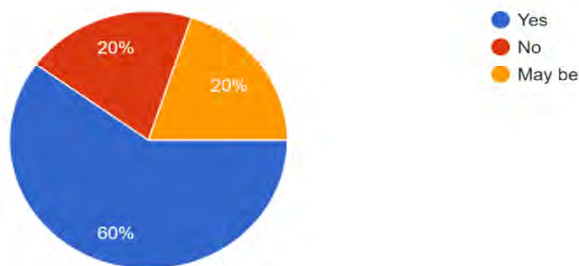


Figure 16 Local Stakeholder Management

Again local political and other bigwigs may interfere the tendering process of the projects. According to survey conducted 60% of the respondents replied that local bigwigs may interfere the contracts of the project.

H. Weak Risk Management strategy:

How well project participants handle project risks will determine if a construction project is successful. At the contract formulation stage, how well project participants allocate risks is a key factor in effective risk management. The PWD construction project is subject to a variety of hazards, including unfavorable weather and geological conditions, social risk, political risk,

economic risk, financial risk, legal risk, health and safety risk, and management risk, among others. According to the survey findings are as follows:

Do you follow any risk management strategy in your contracts documents to implement the project smoothly and to complete the project within time limit?

25 responses

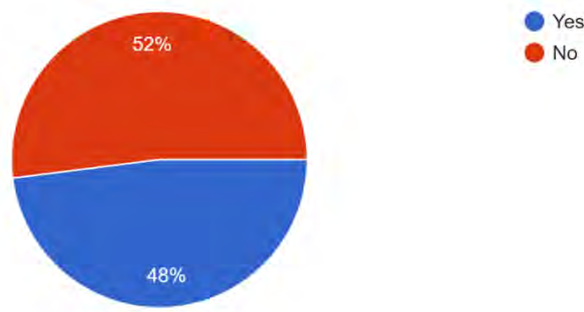


Figure 17 Risk Management Strategy

52% of the respondents stated that there is no risk management strategy was taken in their contracts of the projects and 48% of the respondent thought that they have taken some risk management strategy in contract management of the project. In reality some risk management strategy is included in tender documents but not all are implemented properly in contract period of project so that project performance can be improved.

I. Cost Overruns:

Every project has a starting budget or pricing by which bids are made public for the hiring of contractors. PWD encounters these difficulties in practically all projects. For PWD, finishing a project without deviating from the original budget is a major problem. The following are the primary reasons for building project overruns in PWD:

a) Inaccurate Project Estimate :

In the vast majority of instances, project overruns are the result of underestimating future expenses. Because the bidding process is competitive, estimates may be harmed by incorrect assumptions about the project's scope of work. The primary factor contributing to estimation mistake is a lack of technical understanding.

b) Project Performance Failures:

Another significant factor in cost overruns of the construction budget is project performance failure in PWD construction works as a result of ineffective resource coordination, a lack of critical

knowledge and technology, insufficient employee motivation and communication, an ineffective project execution plan, and a lack of clearly defined operational metrics that could be used to standardize and evaluate employee / contractor performance.

Survey data analysis regarding cost overrun in construction contracts of PWD are as follows:

What is the percentage of contracts under your jurisdiction completed without making any variation of initial contract amount in last 05(Five) financial years?

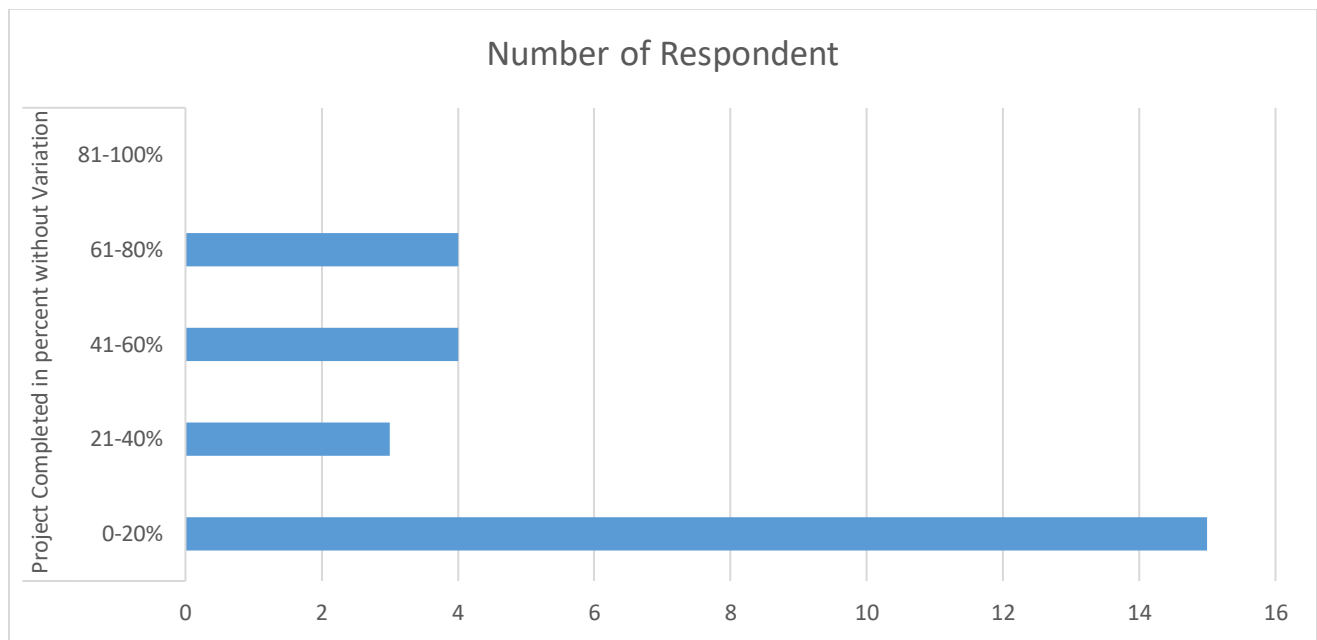


Figure 18 Cost overruns of the Project

According to 15 respondents, only 0-20% projects of their jurisdiction are completed without any variation. So, it can be said by analyzing the graph that about 80% of the projects are not completed without variation of initial contract amount.

J. Lack of good governance/Corruption:

Lack of good governance and corruption in internal supply chain system in whole contract management of PWD projects are also a great challenges in execution of construction projects. Poor governance and corruption in different stages of project implementation may cause the delay and cost overruns of the projects.

Do you think corruption in internal supply chain system in PWD is one of the main causes to delay the construction work schedule and cost overruns of the initial contract amount?

25 responses

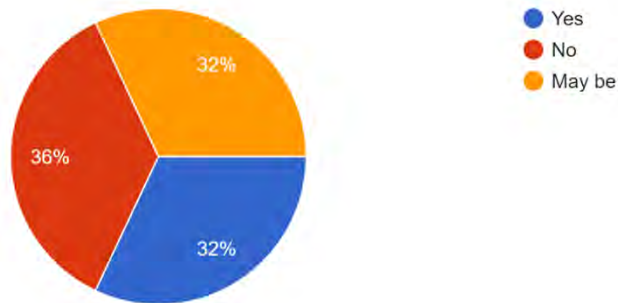


Figure 19 Lack of good governance in internal Supply chain of PWD

According to survey 36% of the respondent thought that there are lack of good governance in internal supply chain of PWD, 32% of the respondents are confused to express their opinion about good governance and 32% there is no corruption in PWD. In reality there is lack of good governance and transparency in internal supply chain of PWD and

K. Unstable Market:

PWD has its own schedule of rates of building and other infrastructure materials by which construction cost is prepared for bidding process. Every 3 to 4 years this schedule of rates is updated considering the market price of construction materials. But recently the price hike of almost all construction materials is beyond the tolerable limit. As a result all most all running projects are facing a terrible situation because of price hike of construction material. Again contracts agreement of PWD works are fixed price basis contract. So no price adjustment provision is allowed in contract documents. As a result almost all project are failing its schedule and causing the cost overruns of the project. So it's a big challenge for PWD to implement the project within time limit of contracts period.

Do you think volatile construction material market may hinder initial contract schedule and may cause cost overruns of the initial contract amount?

25 responses

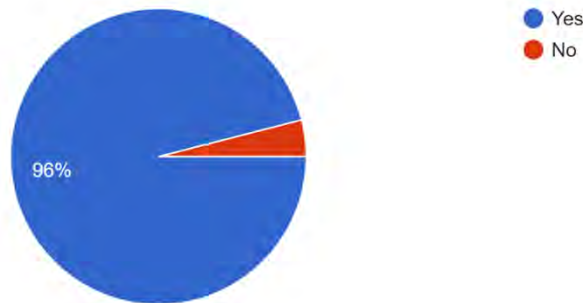


Figure 20 Volatile Construction Material Market

L. Health and Safety Issues:

Now a days health and safety is the vital issue in every construction project. PWD is implementing thousands of both high and low rise building projects all over the country. Accident in construction site is occurred frequently due to improper safety measure in construction site. There is little safety and health measure taken in PWD contract document. Again there is found almost no safety equipment in construction site of PWD. No health and safety measurement action plan found in every construction contract management.

Do you include any health and safety measures clauses in contract documents to ensure health and safety issues in construction works?

25 responses

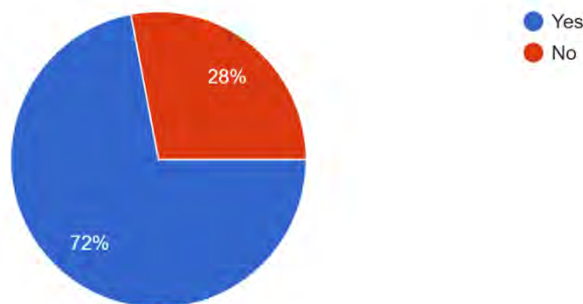


Figure 21 Health and Safety Measure in Contract Management

M. Global Supply Chain Disruption:

Almost all raw materials of construction material are being imported from different countries of the world. As a result if global supply chain is interrupted due to unavoidable circumstances local construction material price may rise. Recently due to Covid situation and war of Russia and Ukraine global supply chain system has been collapsed. So construction project of PWD is suffering a lot during its implementation and most of the contracts of the project

Do you think global supply chain disruption may cause delay of your contract schedule and may cause cost overruns of the initial contract amount?

25 responses

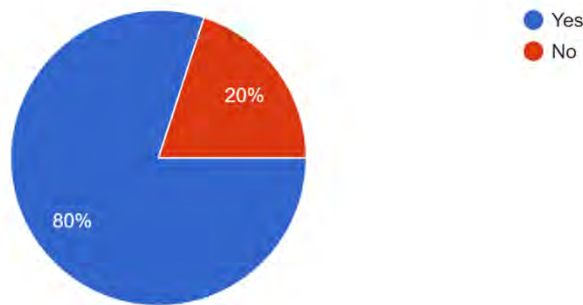


Figure 22 Global Supply Chain Disruption

Chapter 5

Conclusion and Recommendation:

The study focuses on supply chain challenges of construction contracts of Public Works Department (PWD). PWD has been implementing thousands of building projects of government sectors all over the Bangladesh. The main objective was to find the challenges in construction contracts of PWD and to find the solution to overcome the challenges. So a questionnaire survey was conducted among the different working division of PWD and responses was collected from the PWD officials. To overcome the challenges finding in the study following recommendations for each challenges should be initiated:

A. Work on Schedule

- Creating & Coordinating a Master Schedule in every project.
- Reviewing Plans, Specs, & Project Documents.
- Good communication is key to staying on schedule and the successful completion of projects.
- Keep track of progress of construction works with detailed daily reports.

B. Quality assurance and quality control

- Proper training and logistics support should be ensured for strengthening of design team and working team.
- Lab facility should be established at district level to ensure quality control of construction works.

C. Slow technology adoption

- Modern construction equipment should be used in construction works.
- Online based monitoring system should be introduced in every project.

D. Cash Flow Issues

- Sufficient fund and on due time allocation of fund should be ensured.

E. The lack of skilled workforce

- Vocational training facility regarding construction works like concrete forming and finishing, brick working, plumbing, tiles/marble work, pipe fittings, erecting, bolting and binding of steel and electro-mechanical works etc. should be provided to the construction labors to develop them as skilled workforce.

F. The lack of reliable informal subcontractors/suppliers

- Informal sub-contracting system should be brought under legal frame of construction contracts.

G. Stakeholders Management Strategy

- Stakeholder identification, classification and management strategy should be specified in contract management of every project. By managing different stakeholders.

- Methods that allow the power and legitimacy criteria to be used to evaluate the stakeholder's priority level, such as the stakeholder matrix or stakeholder map.

H. Risk Management strategy

- A concrete risk management strategy should be incorporated in tender documents and it should implemented strictly.
- Sufficient fund should be allocated to mitigate risk in constructions process.

I. Cost Overruns

- Detailed architectural and structural design of projects should be provided before preparing detail estimating.
- Contract schedule should be followed strictly during construction period.

J. Health and Safety Issues

- Health and safety issue should be incorporated in every contract documents and it should be maintained properly during implementation.

K. Lack of good governance

- Government should take proper steps to establish good governance to minimize corruptions in implementing projects.
- Training related to financial management, professional ethics and honesty should be provided to officials.

L. Volatile market

- Government should interrupt in open market economy when markets become volatile.
- PWD Schedule of Rate should be adjusted regularly following market condition.
- Price adjustment system in contract agreement should be incorporated on conditional basis in limited cases of contracts.

M. Global Supply chain disruption

- There should be some alternative sourcing of major construction materials.

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