FINANCIAL MANAGEMENT OF INFRASTRUCTURE CONSTRUCTION PROJECTS IN SRI LANKA

Samadhi Chathurika Roshini Kumari Rambukwella

(118437 T)

Degree of Master of Science in Project Management

Department of Building Economics

University of Moratuwa

Sri Lanka

April 2016

FINANCIAL MANAGEMENT OF INFRASTRUCTURE CONSTRUCTION PROJECTS IN SRI LANKA

Samadhi Chathurika Roshini Kumari Rambukwella

(118437 T)

This dissertation was submitted in partial fulfillment of the requirements for the Degree of Master of Science in Project Management

Department of Building Economics

University of Moratuwa

Sri Lanka

April 2016

DECLARATION

I declare that this submission is my own work and, this dissertation does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where acknowledgement is made in the text.

Also I hereby grant to University of Moratuwa the non-exclusive right to reproduce and distribute my dissertation, in whole or in part in print, electronic or other medium. I retain the right to use this content in whole or part in future works.

…….. ……..

S.C.R.K. Rambukwella *Date:*

The above candidate has carried out research for the Masters Dissertation under my supervision

…….. ……..

Dr. K.A.K. Devapriya *Date:*

Dissertation Supervisor

ABSTRACT

Infrastructure construction as a market segment has always attracted the attention of the society since it is connected with the alleviation of the living standards of the people. But often the infrastructure construction projects encounter financial blunders which are due to various reasons such as complexity, advance technology, external influences, high resource requirements and poor managements. The performance of the infrastructure construction projects is important in retaining and attracting the investment on the infrastructure construction. Since government reserves are limited the private investments are required in the infrastructure developments.

In this context a look at the financial performance of the investment in infrastructure is important. The client of an infrastructure development who is at the high end of the disbursement of the investment and who is often responsible for the payback of the investment, should have the optimum performance out of the project. But the proper use of this investment is also dependent on the proper financial management of the construction organization who sits at the low end of the investment project.

Out of the many stakeholders of the construction sector the survival of the construction organization is important in the continuity of the construction industry. The capability of the construction organization to handle large projects with success is important in the survival of the organization.

This study has undertaken the task of studying how financial management is carried out with the execution of the infrastructure projects by a construction organization. Altogether ten numbers of infrastructure projects have been chosen to study with their cash flows and other financial details and along with the quantitative details qualitative details have also been studied regarding the project management and structure in order to strengthen the quantitative data analysis.

The study revealed that the outcome of each project differed along with the project management structure and the project management structure was similar for similarly characterized projects which produced similar achievements. The study also revealed that the construction organization adopts different management methods for the large scale projects even if they are similar in characteristics for other small scale projects. The results have concluded that the financial management differs with the experience the contractor has gained in the particular sector and a major contribution can be from the reason that the contractor has achieved maturity regarding the types of risk he can face in the sector and has developed risk management mechanisms accordingly.

Keywords: *Financial management, Infrastructure construction, Construction organization, Risk management in infrastructure*

Dedication

To my family

And

To those who gave the strength I needed

ACKNOWLEDGEMENT

This research is an achievement I made, with many helping hands lent to me as guidance, motivation, encouragement, assistance and knowledge. As I finally present the outcome of the research I wish to thank all the individuals whose help was an immense support.

First and foremost my gratitude should go out to Dr. K.A.K. Devapriya who was my supervisor from the beginning of the study and who was always keen to guide me to achieve most fruitful results out of the study. I thank him for the motivation I received.

I would also like to thank Dr. Y.G. Sandanayake (Head of the Department of Building Economics). And I'm indebted to the academic staff of the Department of Building Economics for the helping hand I received in carrying out my research. Special thanks to Ms. L.A. Siriwardena (Programme Administrator) and Mr. A Srithayanandarajah (Technical Officer). And also a word of thanks goes to the non-academic staff of the department for their support.

A special gratitude also goes out to Mr. R.M.N.D. Bandara (Accountant), Ms. A.S. Liyanage (Accountant), Ms. B.A.P.R. Kumari (Quantity Surveyor), Ms. Deepa Samaraweera (CIDA Advisory Services Division), Ms. Chaya Kulathilaka (CIDA Industry Services Division) for providing me with information and assisting me with my queries.

Finally I'm grateful to my family and my friends for being there in every rise and fall to help me out in my work.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

GDP	-	Gross Domestic Product
GDFCF	-	Gross Domestic Fixed Capital Formation
COWAM	-	Community Waste Management
NGO	-	Non Government Organization
OECD	-	Organization for Economic Co-operation and Development
NPV	-	Net Present Value
IRR	-	Internal Rate of Return

Chapter 1

1 INTRODUCTION

1.1 Background

1.1.1 Investment

Investment is the commitment of a resource in creating, upgrading or owning a tangible or intangible asset with the expectation of receiving a future return (Zavadskas, 2004). Making an investment decision is dependent upon numerous factors and carries an opportunity cost with it. Choosing in between investment options should be done with care and logic since once invested one reduces the capacity of investing in a separate option by the same value or perhaps a different value considering a future investment option. The criticality of investment decision will differ with the scale of investment, economic sector and the impact of investment in micro and macro-economic environments. Accordingly investment decision is analysed with regard to the return it makes. But does the financial performance forecasted initially give a real enough picture? Is it really monitored throughout, and most importantly what are the impacts of deviations?

According to Zavadskas (2004) scope and objectives of each investment should be pre-formulated and ideally they should go hand in hand with the national economic environment. He goes on to state that regardless of the type, investments are characterized with the large financial expenditures, expected future return, associated risk and return and a chance to formulate and achieve strategic objectives.

1.1.2 Construction investment

Taking the overall economy, the investment in each sector and the return it makes can vary. Construction as an economic sector consumes a considerable amount of investment. Currently Construction investment is around 13% of the total global investment. The global construction investment in 2014 is around 7 trillion US dollars (World Bank, 2015). Considering the global economy the developing countries tend to invest more on construction sector to develop their infrastructure.

Construction investment according to Kun (2004) is one of the most volatile components of GDP. It's said to be the barometer of the economy. In his studies regarding the behaviour of construction investment Kun (2004) reveals that construction investment is characterized by long development periods and long response time since a considerable gap exist between planning and completion phases.

1.1.3 Construction investment and national economy

Studies into the relationship between the economy and construction investment however have produced varying results for different economies worldwide. Anaman (2003) has studied the relationship between construction investment and economy based on Brunei economy which revealed that GDP drove construction industry. A study on construction industry and macro economy in Ghana by Anaman and Amponsah (2007) showed that the growth of construction industry led GDP from a period of three years. This means that economy forecasts can be done with three years lead based on construction industry. Tse and Ganesan (1997) have studied the relationship between construction flows and GDP based on economy of Hong Kong to reveal that GDP leads construction flow at least in short term. A logical explanation to these varying results would be that the relationship varies with the national economic composition.

1.1.4 Interest on construction investment

Comparative to other sectors construction investment tends to be large in scale. In most economies construction investment composition is such that the investment on infrastructure and mega constructions is a considerable portion (World Bank, 2014). Annually each economy spends billions of dollars on large infrastructure projects expecting both monetary and non-monetary returns. Management of these large scale investments made on large projects is a national interest of an economy. According to Dieguez et al (2015) the interest is partly due to the fact that these large projects often tend to encounter financial pitfalls.

1.1.5 Financial performance evaluation

Large projects have structural attributes like high level of leverage which can result in high level of financial risks. It is not uncommon therefore to spend huge sums on

evaluating the financial performance of the investment even at the conceptual stage of the project. But according to Chen et al (2013) even with the numerous methods to predict project performance the studies do not focus sufficiently on the profitability forecasting. And even with the numerous researches large project investments are continuing to be financial blunders. Further the study has concluded that by forecasting the financial performance of the project the process is streamlined focusing the strategic direction established.

1.1.6 Investment risks

Zavadskas (2004) states that investment risks should be studied closely and managed properly. In his view management of investment risks consists of

- "Estimation and implementation of long term investment strategy
- Tactical actions carried out within the limits of turnover of financial capacities and strategic solutions
- Operative management of investment activity within the limits of investment portfolio of the company"

1.1.7 Risks of infrastructure investment

Studies on large infrastructure projects such as Musrom et al (2015) and Dunovic et al (2014) have revealed that these projects encounter risks due to various reasons such as following;

1. Large initial investments
2. High requirement of resources
3. Involvement and influences of many stakeholders
4. Complex designs and technology requirements
5. Change requirements

Along with these characteristics the fact which is common to almost all the economies is that these infrastructure projects are often politically sensitive and hence mismanagements can create more impacts than purely financial losses. Being able to manage the risks associated with an investment in an infrastructure project, effectively,

brings success to the investment. The burden of effective management of the investment lies with the stakeholders involved with it in varying weights.

1.1.8 Sri Lankan construction investment

Sri Lankan construction industry has also shown a tendency to invest more on large projects recently. The investment on construction sector has grown considerably over the past decade with the post war developments taking place around the country. At present construction industry accounts for 10% of the GDP according to the (Central Bank Report, 2014). Construction investment accounts for 65% of the total Gross Fixed Capital Formation (GFCF) (Central Bank Report, 2014).

Following is a graph indicating growth of infrastructure investment done in Sri Lanka according to the Central Bank

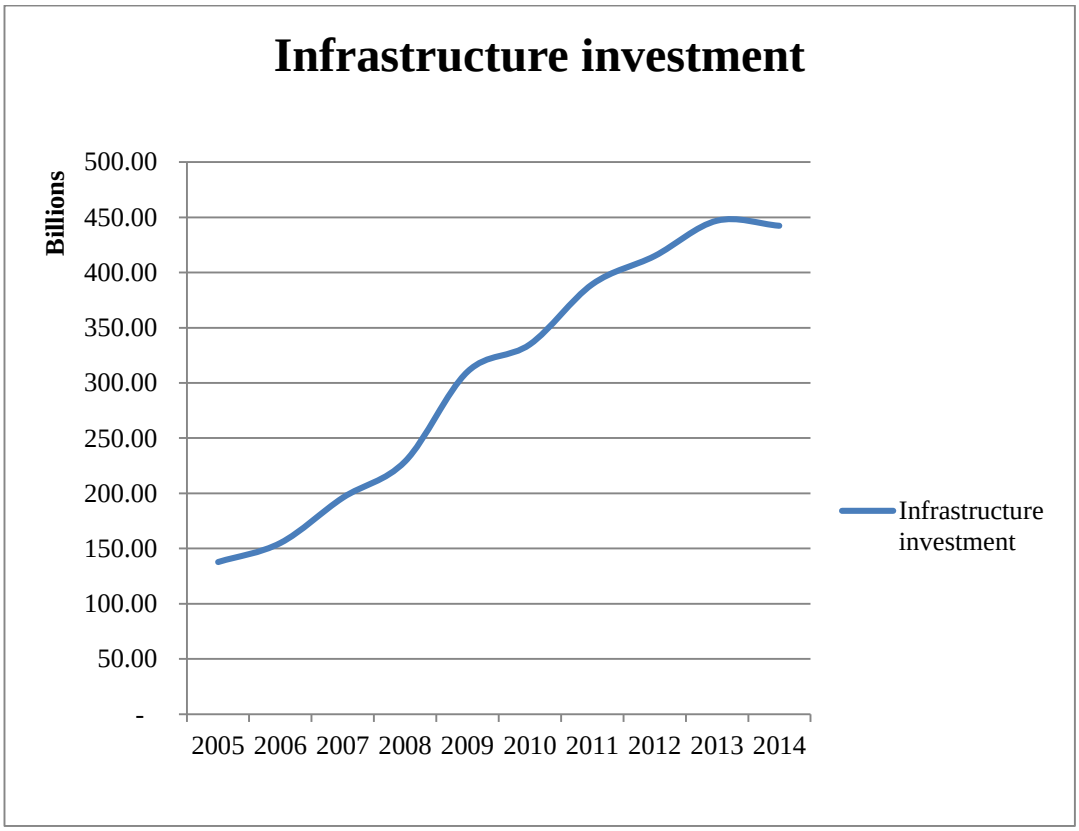


Figure 1-1: Trend of Infrastructure Investment of Sri Lanka

Source: Central Bank Annual Report 2014

Value of work done in type of construction according to the survey of construction industry, 2013 by Department of Census and Statistics is as follows

Table 1-1: Work done value by type of construction in Sri Lanka

Type of construction	Value of work done (Rs. Mn)	Percentage from total
Building	57,960.00	51.1%
Highway	30,381.00	26.8%
Bridge	10,429.00	9.2%
Water supply and drainage	1,058.00	0.9%
Irrigation and land drainage	6,697.00	5.9%
Dredging and reclamation	1.00	0.0%
Other	6,904.00	6.1%
Total	**113,430.00**	**100.0%**

Source: Department of Census and Statistics Report 2013

Government or the public sector is the largest client in Sri Lankan construction industry accounting for 91% of the work done value as per the Department of Statistics report (2013). In a presentation by Prof. R. Rameezdeen at the COWAM seminar (2006) the forward and backward linkages of Sri Lankan construction industry with each economic sector is illustrated. These forward and backward linkages are due to the investments on public infrastructure projects in the construction sector.

Function of the Sri Lanka construction industry can be described briefly. The demand of the industry is almost all the time derived. Either a public or a private client initiates the requirement which is either funded internally or externally most of the time on a borrowed basis. Then the investment project passed on after a tender and evaluation to a contractor for a particular sum. Contractor then disburse the investment in the practical execution of the project. He gets his income according to his work progress and according to a pre-arranged price. Before the commencement of his work he prepares and submits the client his work plan including his cash flow so that the client has an idea of the contractor's operational plan. During the work execution the

contractor adopt performance measurement and management methods to monitor the actual work according to plan. In an ideal scenario actuals don't deviate from the plans considerably and the contractor is capable of delivering the project to the client within time cost and quality parameters set.

1.2 Research Issue

Annual allocation on infrastructure development and large projects has become a matter of discussion over the recent past with the post war construction boom which took place in Sri Lanka. Huge development projects were carried out in Southern, Western and North Central, Northern and Eastern Provinces with many planned projects yet to come. Some of these projects were foreign funded or local bank funded public projects while others were development of private clients.

As a result of these developments government or the private sector incurs costs of finance of a considerable amount. Going to the low end of these investments the practical disbursement of these funds are at the hands of the contractor.

Sri Lankan contractors who are capable of managing these large projects singularly are a handful. Even with the construction boom many have incurred losses from projects due to various reasons. For the consistency of the industry therefore it is worth to see how a construction organization manages its finances for survival and profit making with these large infrastructure projects.

1.3 Research Problem

How the construction organizations manage their financial resources committed to projects with the existence of inherent risks in large infrastructure construction to improve financial performance?

1.4 Aim and Objectives

1.4.1 Aim

To study how financial management is done in large infrastructure construction projects undertaken by a construction organization as a specialized industrial firm.

1.4.2 Objectives

This study is carried out with following objectives

1. To study the structure of a construction organization
2. To analyse the disbursement of funds in a construction organization
3. To study the financial management policy of the construction organization on infrastructure construction projects undertaken
4. To critically analyse the issues faced

1.5 Scope and Limitations

The study is conducted with the records of large engineering and infrastructure projects in a construction organization. A sample of 10 nrs of projects have been chosen with the selection criteria like project value and complexity

1.6 Methodology

According to the research problem and the formulated aim and objectives this research is best conducted in case study method. The selected projects of an organization are studied with their financial performances.

In order to decide the methodology of the research and details to be studied first a literature review is carried out. Literature survey has following intentions.

1. To familiarize the theory and principles behind the financial management
2. To research the nature and characteristics of the construction industry, infrastructure projects and risks
3. To establish the requirement of the study
4. To assist the deciding of the research process, methodology and analysis.

After the literature survey the selection criteria of infrastructure projects are decided and the details and records which should be collected from the projects are also formulated based upon the literature survey conducted.

The project survey is carried out to obtain the qualitative and quantitative data of the projects with relevance to the achievement of aim and objectives. Mixed method (using both quantitative and qualitative data) is used in data analysis.

1.7 Chapter Breakdown

Chapter 1 – Introduction

Chapter one gives the introduction and background of the research study with justification as to why it is carried out. This chapter introduces the research topic in detail within which scope limitation it's carried out.

Chapter 2 – Construction sector and construction organization

The first literature synthesis chapter gives an overall understanding as to the construction sector and its stakeholders with particular attention to the project organization and structure

Chapter 3 – Financial management in infrastructure construction projects

This chapter which is the second literature chapter gives the details of studies carried out on financial management practices in construction industry focusing more on the construction stage of the infrastructure projects and the construction organization.

Chapter 4 – Research methodology

This chapter illustrate the methodology used for this research study.

Chapter 5 – Data collection and analysis

This is the chapter which analyses in detail the data gathered for the study using the techniques given in the previous chapter validate and criticise them as necessary.

Chapter 6 – Research findings and discussions

This particular chapter of the study discusses the results of the data analysis.

Chapter 7 – Conclusions and recommendations

Final chapter of the study which concludes the research findings, summarize them and gives recommendations if any.

Chapter 2

2 CONSTRUCTION SECTOR AND CONSTRUCTION ORGANIZATION

2.1 Construction Sector

2.1.1 Introduction

Construction is identified separately as an economic sector due to the uniqueness of the process and product. World Bank statistics indicate that in most of the economies construction accounts for 5% to 8% of GDP as an average.

Construction grows through cycles of expansion and contraction that vary widely in amplitude (Kun, 2004). Ofori (1980) has classified construction products as capital and social goods, demand for which rise at different stages of the economy and hence become a reason for the cyclical demand. Construction has been seen from the beginning as a key part of the development process. It accounts for the major part of the capital formation.

Construction product demands lot of resources and a high initial investment and therefore has complexities of its own. Similarly the construction project management becomes complex. Once in a lifetime nature of the product makes it important to manage resources associated since even a single error can cost a few millions.

2.1.2 Link with other economic sectors

As Ofori (1980) mentioned construction has its forward and backward linkages. Backward linkages indicate the links created by construction inputs and forward linkages indicate the links created by the construction outputs. Rameezdeen et al (2004) has studied the linkages between the construction sector and other sectors of the Sri Lankan economy to reveal that the sector has strong backward linkages and insignificant forward linkages. World Bank, 1984 cited Rameezdeen et al (2004) states that the construction sector is important to an economy because of its linkages with the other industries. Studies done on different economies by researchers have revealed

that the linkages by type and strength differ to each economy. It also differs in different eras of economy with the particular economic policies.

2.1.3 Construction stakeholders

The construction process as Ofori (1980) has mentioned brings together people of different skills across many sectors and it also has many forward and backward linkages. Hence the industry has many stakeholders. Rameezdeen (2006) in his presentation regarding Sri Lankan construction industry at COWAM seminar has divided industry stakeholders into direct and indirect. Indirect stakeholders can also be categorized into levels according to the interest and relationship with the industry.

Direct stakeholders of construction involved client (private, government and NGO), consultant and contractor whereas indirect stakeholders in general included regulatory bodies, financial institutions, environmental groups, investors and suppliers.

Different stakeholders involve in different stages of construction process and the involvement can differ for each and every product. Therefore the relationship between these stakeholders cannot be considered typical for every product of the industry neither can the management of these stakeholders be standardized. These stakeholders are treated uniquely with every construction product.

Focusing on direct stakeholders, the involvement of different stakeholders is at different stages. Client is involved in all stages of the product, consultant at the design and construction phases and the contractor (traditionally) at the construction phase. The investor on the other hand is involved until the return on investment is achieved, either it's until the repayment of a loan, practical completion of a project into usable state or a certain point of operation where expected return is achieved.

Considering a particular investment project while the investor sits at the top end and is responsible for the initial feasibility studies and performance forecasting of the investment it is the contractor who stays at the bottom end and becomes responsible for the management of the practical utilization of the investments. Contractor, as one of the major stakeholders of the industry, is responsible for the management of performance for the benefit of the investment project as well as the survival of the project organization.

2.2 Construction Organization

2.2.1 Organizational theories and structures

Schein, 1970 cited McCauley et al. (2007) defines an organization as "a rational coordination of activities of a number of people for the achievement of some common explicit purpose or goal, through division of labour or function, and through a hierarchy of authority and responsibility."

Organization is an important unit in the construction industry. When considering a construction project organization the rational coordination becomes temporary. The stress on the word temporary is to highlight the importance of focus of the organizational management within the time dimension and to point to the unique nature of the construction project.

Since the organization is an important unit in construction industry before introducing a project organization it is worth looking at the management theories of an organization. Following is a chart which exhibits the organization theories of management.

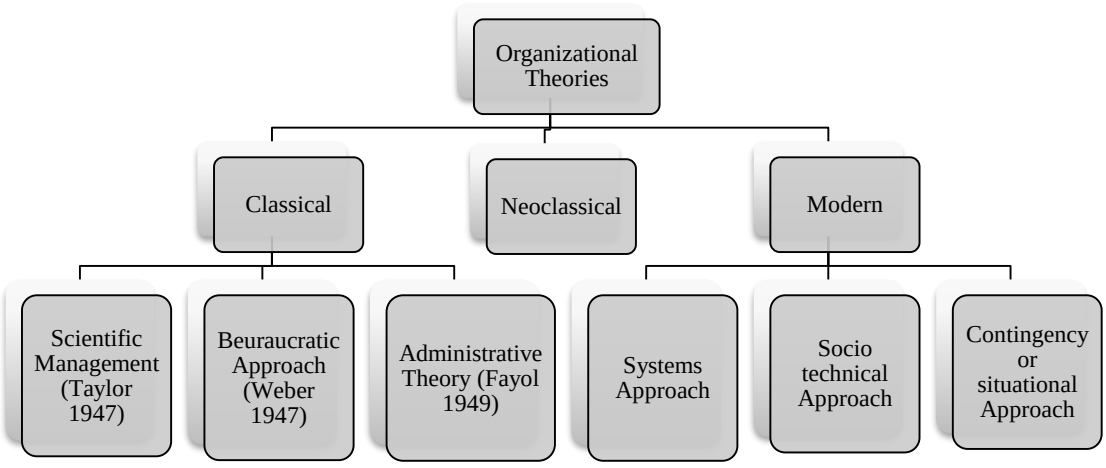


Figure 2-1: Classification of different organizational theories

Source: Organizational theory by McCauley (2007)

Scientific management theory is built on the premise that improving work efficiency and procedures and minimizing the energy and resources need can be achieved by

scientific analysis and the manager plays the role of a scientific analyst rather than a governor.

Bureaucracy approach which is mainly contributed by Max Weber, is built on the premise that the employee should maintain the interest of his superior and a hierarchy is maintained with assigned authority with the requirement that the organizational employees are to stay within the authority of the hierarchy for it to function smoothly

Administrative approach which is mainly contributed by Henry Fayol is focused on the achievement of goal by following the principles of management as follows.

Table 2-1: Fayol's 14 principles of management

Nr	**Management Principle**	**Description**
1	Division of work or specialization	Dividing work according to the specialty and hierarchy
2	Authority and responsibility	Giving proper authority and responsibility being in line with company objectives
3	Discipline	Compliance with company rules and regulations
4	Unity of command	A single command per employee
5	Unity of direction	A single direction for each employee
6	Subordination of individual interest to general interest	Prevailing general interest of the company
7	Remuneration	Proper remuneration
8	Centralization	Centralized authority and decision making capability
9	Scalar chain	Employees of similar levels can work together
10	Order	Order of everything and everyone who is engaged should be defined
11	Equity	Fairness and equity should be there for everyone in the organization

Nr	Management Principle	Description
12	Stability of tenure of personnel	The work tenure of personnel should be secure
13	Initiative	Work initiative should be encouraged as an organization policy
14	Espirit de corps	Belongingness to the place and unity improves performance of the organization

Source: Organizational theory by McCauley (2007)

Neoclassical theory recognizes the management through the improvement of human relations and behaviour. Neoclassical theory emphasized on the major aspects of the human nature and achievement of goal through managing these aspects rather than the formal organization approaches.

Systems approach which falls under the modern theories see the organization as combination of three basic elements

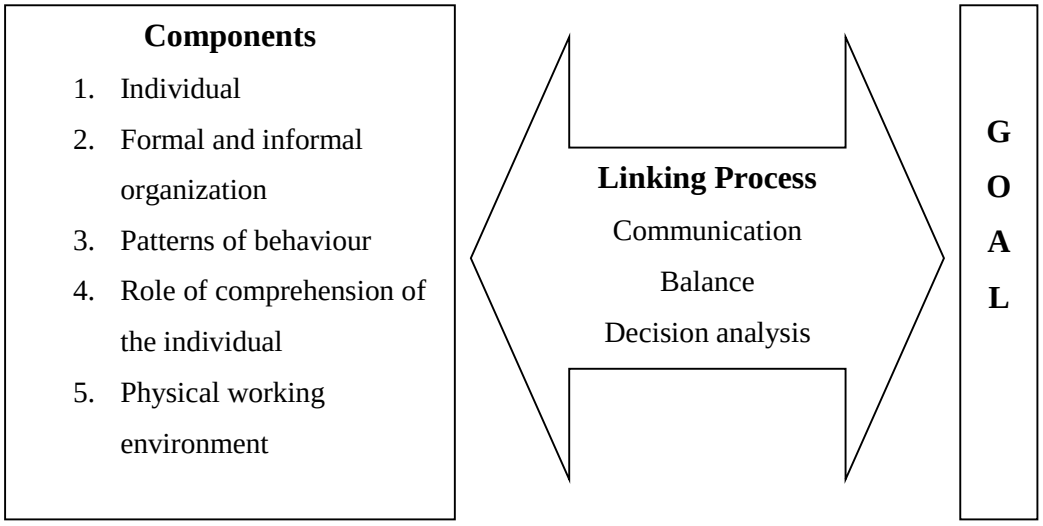


Figure 2-2: Three elements of an organization in systems approach

Socio technical approach seeks to achieve organizational objectives by balancing the social systems (people), technical system and the environment.

Contingency or situational approach believes that the management of an organization differs with the environment in which it is established and there cannot be a universal system of management. Since an organization is not separable from its environment the management method differs with the environment.

When discussing the organization theories organization structure is also important. According to Laegaard & Bindslev (2006) Weber see the organizational structure as the link between the structural plan and the operational plan and it necessarily facilitate the process of achieving the structural plan through the operational plan.

Some of the most common types of organizational structures can be mentioned as follows

1. Simple structure

A simple organization structure has only one level of hierarchy

2. Hierarchical organization

Hierarchical organization can have many levels in the organizational structure which should be followed in decision making and delegating authority and also reporting.

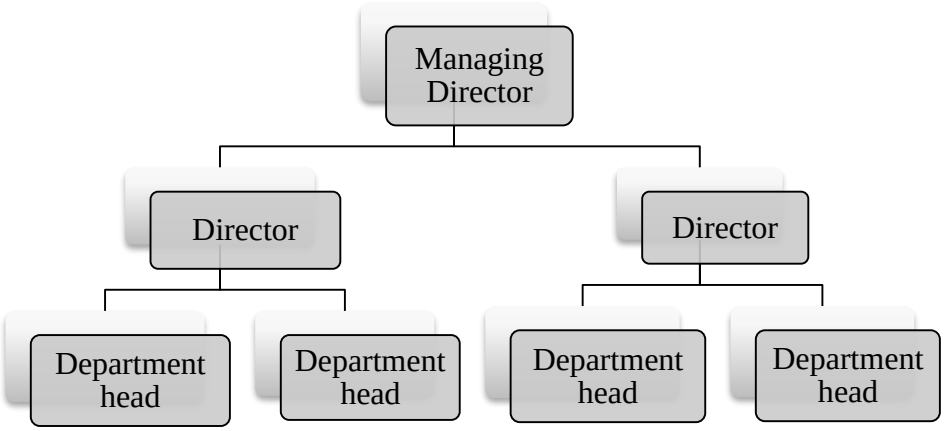


Figure 2-3: Hierarchical Organization Structure

Source: Organizational theory by Jorgen Laegaard and Mille Bindslev

3. Functional organization

This type of organization divides the functions and each function is connected to a central goal or function. The disadvantage of this type of a structure is that the integration of each function does not happen effectively and often employees tend to come into conflict.

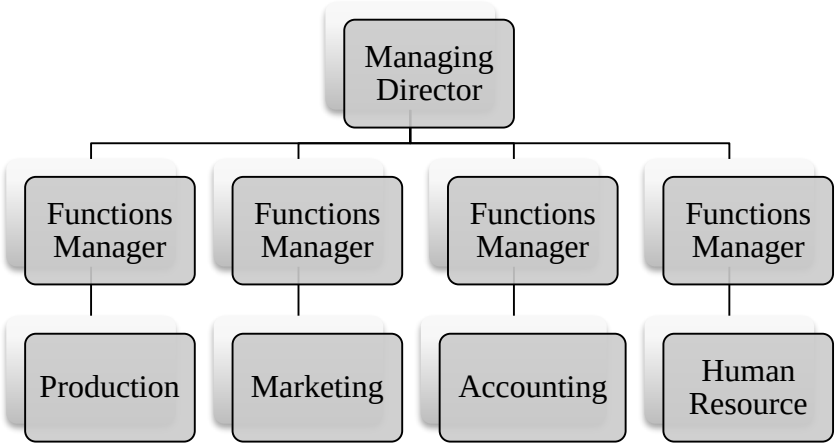


Figure 2-4: Functional Organization Structure

Source: Organizational theory by Jorgen Laegaard and Mille Bindslev

4. Product organization

Product organization focuses primarily on products whereas other supportive functions are separated.

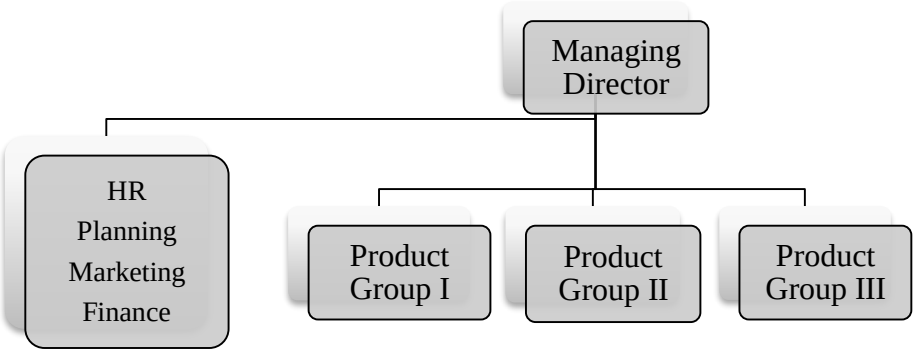


Figure 2-5: Product Organization Structure

Source: Organizational theory by Jorgen Laegaard and Mille Bindslev

5. Matrix organization

Matrix organization is such that the production and different functions of the production are in a matrix.

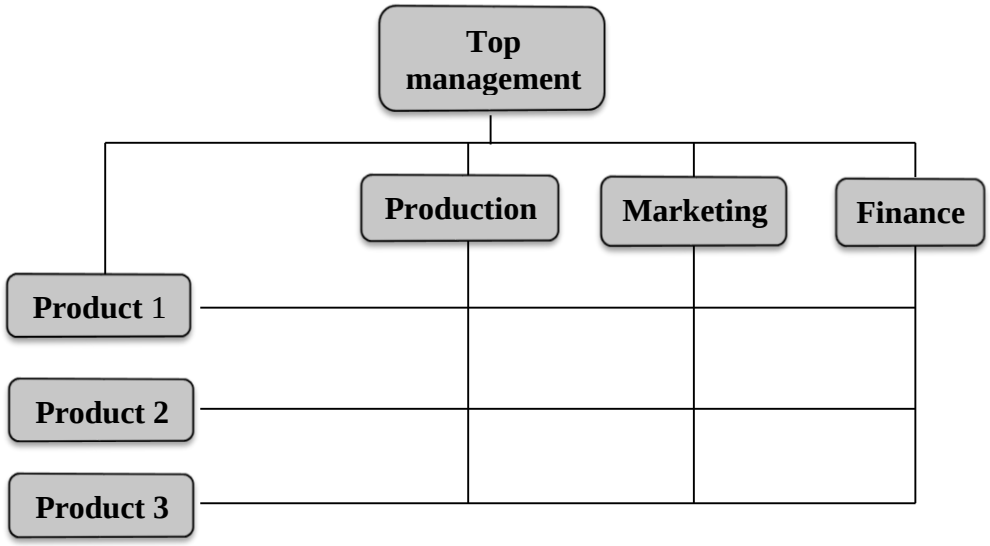


Figure 2-6: Matrix Organization Structure

Source: Organizational theory by Jorgen Laegaard and Mille Bindslev

Each of these organizational structures has advantages and disadvantages of their own.

2.2.2 Project organizations

Project organization is distinguished by the organizational structure which is made to facilitate the planning and execution of project activities. Main target of a project activity is to create an environment in which the project will attain its goals effectively. This mainly involves creating an organization structure considering the characteristics of the project and lessening the confusion and uncertainties associated with the project execution. The structure facilitates and defines the line of authority, communication channels and interactions. In creating a project organization specialization requirements and coordination between elements of project are important factors.

According to Hyvari (2014) organizational resources of projectized organizations are committed mainly to the projects. Many organizations which are not purely project based can have separate project office as a functional unit. Hyvari (2014) states that some of the organizations maintain different structures at various levels and

organizations which handle multiple projects maintain matrix structures which blend both functional and projectized structures.

Winch 2014 cited Lidelow (2014) state that projects are executed by temporary units created to deliver that project to the client and will disperse at the completion whereas the contractor is a permanent organization designed to carry out projects. In case of construction organizations majority adopt a matrix organizational structure. In maintaining a matrix organization while the construction projects are the main business of the organization the functional units which facilitate the projects also have to be maintained. In a long running construction organization organizational strategy should be developed in a way that the functional units are capable of facilitating the major business of the organization effectively and the resource including finance should accordingly be utilized.

2.2.3 Portfolio management

Subject of project portfolio management for organizational development and profit maximization has been studied by many since it is increasingly recognized that portfolio management plays a vital role in achieving company objectives.

Hyvari (2014) mentions portfolio management as being the process which allocates the resources to projects or functions according to the company strategy. By linking portfolio management with organizational strategy the organization can establish an executable plan which impacts following six areas.

1. Aligning portfolio with strategic objective
2. Allocating financial resources
3. Allocating human resources
4. Allocation material or equipment resources
5. Measuring portfolio component performance
6. Managing risk

In summary project portfolio management is a continuous process of executing the projects targeting the strategic goals of the company. In a study by Purnes and Bodea (2014) regarding project portfolio performance measurement they state that the

projects in actual implementation face the problem of the financial sustainability of the cash flow. Tanaka 1984 cited Purnus and Bodea (2014) mentions that project executing organization (ex. Contractor) tend to focus on individual project level instead of overall company level in applying profit based criteria. Portfolio performance is decided by project performance and portfolio structure. Portfolio of the company reflects the production capacity and development potential (Purnus & Bodea, 2014). Components in a portfolio are programmes, projects and other operational activities. Portfolio structure is created by prioritizing and grouping these components following certain characteristics in line with organizational goals. The main processes of portfolio management are;

1. The components identification and selection
2. Assessment and prioritization of components
3. Portfolio monitoring and control

Criteria which are used to evaluate portfolio components are

1. Financial criteria
2. Technical criteria
3. Risk related criteria
4. Resource related criteria
5. Contractual condition criteria
6. Experience and other qualitative criteria

Portfolio management of an organization is ultimately targeting at the maximization of company profits which makes it interlinked with financial management.

Discussing the organizational theorise and structures in length it should be stated that organizational structure and management theory in a company impacts all the company performance measurement and management systems. In a construction organization where the major function is the management and execution of the construction projects the structure and the theory of management should necessarily facilitate the successful project implementation. And also according to the theorists who contributed to these management theories the organizational performance is

impacted by these theories the organizational performance is impacted by these theories and structure. Hence in line with the aim and objectives a background study of the organizational environment will strengthen the study.

In an organization where several simultaneous activities and processes are occurring streamlining them towards a central goal and assigning priorities to them is important. Going along with Fayol's principle general interest prevails, the portfolio should be structured and managed to maximize the company returns.

Since the study was inspired by the fact that the sound performance of the construction industry is an important factor in the continuity and consistency of the construction sector analysing the organizational portfolio management has also to be looked at.

2.3 Summary

The first literature chapter discusses the construction sector in general and the management side of the research topic. The discussion flows from the construction industry as a whole to a single highly important stakeholder – contractor – to the continuity of the industry. Then the organizational theories with respect to any organization are discussed. Next the project organization and portfolio management which is an important practise is discussed since it is relevant to the research topic. The inspiration and relevance of the literature review to the study and research design is mentioned finally.

Chapter 3

3 FINANCIAL MANAGEMENT IN INFRASTRUCTURE CONSTRUCTION PROJECTS

3.1 Infrastructure Construction Projects

Infrastructure projects or mega projects fall into the category of capital goods of the construction industry production. Hence the positive or negative effects are shared by a wider community than the project participants if not by the whole society (Dunovic et al, 2014). Link between infrastructure and development is a prominent well established one because of the reasons of improvements in the society (Schwartz et al. 2014). Clegg et al 2002, cited Dunovic et al (2014) states that these large projects have characteristics of uncertainty, complexity and political sensitivity and involvement of many stakeholders. Dunovic et al (2014) state that researchers have defined six elements of complexity of infrastructure projects as follows;

1. Technical - Large scale product
2. Social - Number of stakeholders involved are many
3. Financial - Cost and benefit calculations are difficult
4. Legal - Legal implications are many and complex
5. Organizational - Large number of organizations involved
6. Temporal - Planning of activities and their relationships

Masrom et al (2005) has studied the success factors of large projects and listed them under six categories including

1. Project management actions
2. Project related factors
3. Human related factors
4. External environment
5. Role's and responsibility
6. Project procedures

In a study by Riemann & Spang (2014) on public financed infrastructure projects in Germany they have identified that the failure of obtaining practical knowledge from contractor at the designing phase also can have a negative impact on efficient project execution and makes it exposed to more risk at the execution level.

Infrastructure investment according to OECD is mostly financed with public funds. In an article by OECD (2015) on infrastructure financing instruments and incentives, it is stated that reduction in the level of public funds has occurred due to the incapability of the public sector to deliver efficient investment spending. Hence alternative sources of financing are required for infrastructure financing. Attention is being driven towards institutional investor sector due to this requirement. But because of the non-familiarity with infrastructure investment it is not yet popular among the institutional investors. Investors use different capital channels like financial structures and instrument for financing. Common characteristics of infrastructure assets with regard to financing according to OECD (2015) are;

1. Capital intensity and longevity

The initial capital requirement being high and longer duration and lack of liquidity and high resource requirement generate high risks for the project. The initial cash flow often goes negative but once the infrastructure facility is in operation generates stable cash flows.

2. Economics of scale externalities

In considering the nature of the infrastructure projects the direct pay offs may be inadequate for covering the costs but the return can be received in the form of social benefits which can be practically difficult to be measured.

3. Heterogeneity, complexity and presence of large number of parties

Uniqueness increases the complexity of the infrastructure project and makes the investment less liquid.

4. Opaqueness

The diversity of projects reduces the transparency of the information associated with it or makes it difficult to regularize or obtain the available details. This increases uncertainty and tend to be a barrier in the process of evaluating and deciding on an investment.

Corporate finance is considered as the main channel of private infrastructure finance. The channels of financing need to be evaluated for their risk return characteristics by investors because of the particular characteristics afore mentioned.

A study by Ray (2015) on infrastructure finance and financial sector development focused on South Asian economy has attempted to identify the various sources of financing and the constraints attached. The paper has discussed the role of the credit provider at each level of project maturity.

Ray (2015) states that the funding problem in South Asia, stems from the immaturity of the region's capital markets. Project financing according to him has been influences by three factors which are;

1. Lack of a mature and liquid debt capital market
2. High rate of inflation
3. The traditional banking model which fails to innovate on structured financing schemes

Ray (2015) has listed out infrastructure financing options by debt and equity classifying under domestic sources (i.e. domestic investors and domestic commercial banks) and external sources (i.e. foreign investors and international commercial banks). Further he states that often the public infrastructure projects have both commercial and non-commercial components which make it unattractive for private investors in which case the non-commercial components should be separately financed by a government funding by budgetary allocations

OECD article classifies risks in infrastructure projects by source

1. Political and regulatory risks
2. Macro-economic and business risks
3. Technical risks

Though the investors may be equipped for certain risks the fact that the infrastructure projects need large cash outlays and operate in regulatory environments can still create a high risk.

The risks associated with the infrastructure projects are not only impacting the investor it's impacting the side of the contractor as well. Contractors who undertake large projects face the problems created by the characteristics of infrastructure projects.

Investors analyse the risk return characteristics and viability of investment projects at the conceptual phase but when it comes to practical execution phase the practical problem might deviate from planned, and the organization which implements the investment project (contractor) faces the problem of using internal resources in case of an issue thereby interrupting their company plan (Purnus & Bodea, 2014). This situation impacts both the project and the contractor and could cause failures on both.

3.2 Financial Management in Infrastructure Construction Projects

3.2.1 Risks in large projects

Risks management in construction industry is a widely researched and narrowly practised subject. Focussing more on the side of the contractor and particularly the implementation of infrastructure projects, prominent risks faced as highlighted by literature are the complexity of the projects, high resource requirements, financial instability and external influences. The impact partly due to the magnitude of the project activities can be so severe upon a construction organization to either have a huge setback or to crumple the organization altogether. The contractor's strategy to manage these large infrastructure projects impact a lot to the health of the organization as well as the project.

Caron (2007) states that the financial performance of the construction sector is deteriorating and the construction organizations are having lesser improvements as a result. He further states that the contractors, in addition to the already available risks, are getting burdened by the clients' passing on the risks arbitrarily to them. Contractors have two conflicting interests for offering the client best competitive price and to receive optimum profit from the project. In order to fulfil these interests the contractor should keep the performance of these projects from deviating from the plan which requires management of his finances.

3.2.2 Evaluating financial performance

A case study concerning financial evaluation of construction projects at pre investment phase in developing countries by Halawa et al (2013) suggested that the financial evaluation carried out at the pre investment phase will be a base for understanding the project value production and determine its feasibility. Financial evaluation is considered an important step of the feasibility study.

The study has been based on the assumption that any type of risk can be transferred into money value and can be involved in the cash flow. Graham (2006) cited Halawa et al (2013) indicated the client and the contractor will see the project feasibility by considering financial issues such as return on investment, demand and supply and risk analysis on market conditions. Halawa et al (2013) further stated based on previous researches that economic and financial viability is given major concern in feasibility studies. He has divided the financial activity into three phases such as pre construction, construction and post construction and stated that project performance enhancement through financial management is necessary.

Behrens and Hawranek (1991) cited Halawa et al (2013) suggested three methods of financial evaluation in investment as discounting methods (which included NPV and IRR), simple methods (which included payback period and simple rate of return) and financial evaluation under uncertainty (which included breakeven analysis and sensitivity analysis)

3.2.3 Modelling finances on projects

Baloi & Price (2003) in a study of risks affecting construction cost performance states that poor cost performance is a major concern of both contractors and clients and that this is more common in developing countries. They further state that the factors which affect the construction costs are related to the construction organizations and the socio-cultural, economic, technological and political environments within which the organization operates. Rosenbaum (1997) cited Baloi and Price (2013) said that risk factors associated with political instability, fluctuation in currency, corruption, interest rates and material availability are the main causes of cost overruns in privately financed infrastructure projects of developing countries.

Mohamed and McCowan (2001) have studied modelling investment options under uncertainty. They have made it clear that both the monetary and non-monetary aspects should be considered in assessing the investment options. They state that while contractors tend to establish financial viability of an investment option the non-monetary aspects also can impact the project performance immensely.

Mohamed and McCowan (2001) used possibility theory to develop a model for assessing the monetary and non-monetary aspects of investment option using the aggregated possibility distribution of both aspects and creating combined possibility distribution and calculating overall project ranking index.

3.2.4 Budget allocations

Xenidis & Stavrakas (2012) have studied risk based budgeting for infrastructure projects. Budget according to them has three main purposes.

1. Act as a cost baseline
2. A tool for performance measurement
3. Effects the competitiveness of the bid

The study has concluded that stochastic processes are more effective in deciding contingency reserves which are included as risk buffer in budgeting or infrastructure projects.

Sato & Hirao (2013) argues that since risk and return is a trade-off extra budgets may be required to eliminate risks may affect the cash flow. On the other hand cost reduction efforts may introduce more risks. The study is done to find an optimal solution to the trade-off problem between budget and risk at the final stage of the risk analysis procedure which is the risk response planning. Budget allocations are possible for cost dependent risk drivers there has to be contingency reserves. A budget will be established with the optimum cost of each activity and the contingency.

3.2.5 Financial management

Definition of financial management by Kuchal cited Paramasivan & Subramanian is simply that "financial management deals with procurement of funds and their effective utilization in the business". There have been other more or less similar definitions by Howard & Upton, Weston & Brigham and Joshep and Massie.

Financial management is directly related to the various functional departments of business. Paramasivan & Subramanian state that financial management has two major objectives such as profit maximization and wealth maximization.

Profit maximization is the traditional view which is the maximization of the difference between the income and the expenditure of a business activity. Wealth maximization is the modern view where financial management seeks to maximize value or net present worth of the firm.

Paramasivan and Subramanian speaks of two approaches to financial management traditional approach and the modern approach. Traditional approach has mainly been focussed on acquisition of funds whereas modern practise focuses on following

1. Forecasting financial requirements
2. Acquiring necessary capital
3. Investment decision
4. Cash management
5. Interrelation with other department

Each and every business requires financing which is important for the smooth functioning of the business activities. Finance is a resource, which like all other resources if not properly managed will not perform up to the ownership of the resource will become a waste in the overall scenario. Hence the practise of financial management is of utmost importance. Following activities highlight the importance of financial management.

1. Financial planning

Financial planning involved activities like determining capital requirement, determining in which form and proportion it is required and form financial policies to manage financial plan. Capital requirement can be classified into two as fixed capital requirement or the long term financial requirement is the financial requirement for purchasing fixed assets and hence called capital expenditure. Working capital requirement or the short term financial requirement is the requirement of finance for day to day operational activities. Determining both these requirements are important for the purpose of planning.

2. Acquisition of funds

Acquiring fund involve the identification of sources of finance which gives a minimum cost of finance.

3. Proper use of funds

Management of the usage of funds optimally so as to ensure that it is used in the interest of the company to achieve the goals is a major part of financial management.

4. Financial decision

Financial decision in financial management is three fold as financing decision, investment decision and dividend decision. These decisions are taken considering the risk and return trade off problem in financing as well. Financial decision involves capitalization which is the determination of funds a firm requires in running a business and deciding capital structure which is the form and proportions which make up

capitalization. Objectives of an optimum capital structure are maximizing the value of the firm and minimizing the overall cost of capital.

5. Improve profitability

Financial management functions aim at improving profitability of a firm through financial planning and control.

6. Increase the value of the firm
7. Promote savings

In order to have an effective financial management system a proper financial accounting system is a prerequisite. Accounting records financial information of the company to be used by different users in decision making. There exist two types of users to which accounting attempts to address.

1. Users who are directly involved with the management
2. Users who does not directly involve in management

Accounting is split into managerial accounting and financial accounting to address these two types of users respectively.

Accounting records transactions of a business and periodically summarizes these records to prepare reports for the users. These reports are called financial statements. Analysing these financial statements is important in making financial plans and decisions which is a major part in financial management. Financial statements in order of preparation are as follows

1. Income statement - A periodic summary of revenue and expenses
2. Statement of owner's equity - A summary of the changes in owner's equity for a period
3. Balance sheet - A list of assets, liabilities and owners' equity for a period
4. Statement of cash flow - A summary of cash payments and receipts for a period

All the businesses use the double entry system for recording transactions which requires;

1. Every transaction be recorded in at least in two accounts
2. Total debit balances should equal to total credit balances

Group of accounts for a business entity is a ledger. A list of accounts in the ledger is called a chart of accounts. Transactions are first recorded in a journal and periodically transferred to the ledger accounts which is called posting. Accounts closing at the end of a period involve closing all the temporary accounts or accounts reported on income statement and carrying forward permanent accounts reported on balance sheet.

Statements after preparation is analysed to see the financial position of the company. Basic analytical methods are

1. Horizontal analysis
2. Vertical analysis
3. Common sized statement
4. Other

Horizontal analysis is done across periods in financial statements. Vertical analysis is done to compare each component with the total in a single period. Results by this vertical analysis can be analysed horizontally across periods. Common sized statement is where all the items are expressed as percentages. This allows comparisons across firms.

Other analytical measures can be expressed in ratios and percentages. These other measures include

- Solvency analysis

Solvency analysis measures the capacity of a company to meet its financial obligations. Assessing solvency is done by several measures such as following.

1. Current position analysis
2. Accounts receivable analysis

3. Inventory analysis
4. Ratio of fixed assets to long term liabilities
5. Ratio of liabilities to stakeholder equity
6. Number of times interest charges earned

- Profitability analysis

Profitability measures the company capability to earn profits. The income statements and the balance sheets are often used to evaluate company profitability. Following are the measures analysing profitability.

1. Ratio of net sales to assets
2. Rate earned on total assets
3. Rate earned on stakeholders' equity
4. Rate earned on common stakeholders' equity
5. Earnings per share on common stock
6. Price earnings ratio
7. Dividends per share
8. Dividend yield

Financial accounting and financial management are interrelated since financial statements are prepared as end reports of accounting process and the analysis of financial statements give inputs to financial planning and decision making which in turn effect the firm's transactions and value.

3.3 Financial Engineering

Financial Engineering is an evolving field which seeks to find innovative solutions to financial problems. It can be considered as one step ahead to financial management.

Finnerty's definition which is widely accepted as a fool proof illustration of financial engineering states that the field involves "the design, development and the implementation of innovative financial instruments and process and the formulation of creative solutions to problems in finance"

Derived from the definition and the available literature financial engineering has three dimensions. One is the engineering and the introducing totally new products to finance. Second dimension is the novel usage of an existing product or a variant of it. The other dimension which is often undermined is using existing products to create a solution to fit a particular set of problems or circumstances. However it is the expectation of financial engineering to add the standardized products to the market and it might be needed to repackage a product which was developed to a particular circumstance for it to be marketable.

Financial engineering includes practicing engineering solutions to problems in finance and for that financial engineers need a tool kit. Marshal & Bansal, 2010 classify the tools of financial engineering into two broad categories as conceptual and physical. Conceptual tools comprise theory or concept which formulates the underlying disciplines which forms the fundamental basis on which new developments are made. Examples of these conceptual tools are

1. Valuation theory
2. Portfolio theory
3. Hedging theory
4. Accounting relationships
5. Tax treatment

Some examples of physical tools of a financial engineer can be listed as follows.

1. Futures and forwards
2. Swaps
3. Single and multi-period options
4. Fixed income securities
5. Equity and related instruments
6. Hybrid securities

According to Marsall & Bansal, 2010 financial engineering discipline is practiced in a number of important areas including cooperate finance, trading, investment and money management and risk management. Financial engineering is heavily involved in risk management hence most people on trade use the terms in a similar meaning.

Scope of financial engineering in risk management is studying the risk exposures of a particular investment or a company, understanding their behaviour and impact, deciding on a desired outcome and formulating a structured solution out of existing products to achieve the desired outcome or engineering a totally new product to deal the risk.

Construction sector depends on the derived demand. It really acts as a barometer of a nation's economy. Since the other sectors develop they create demand for construction. In the online article "why construction firms must recruit financial engineers" Brian Green says that construction firms must be talented enough to build financial models and create new financial propositions which work effectively. Green further says if the financial models are reengineered to reallocate and pass on risks associated with funding or create new funding systems, contractors would have more work.

Construction investment being fairly larger compared to other sectors funding is most of the time on borrowed basis. Except the associated risks with funding and financial risks there are also other risks in the industry of which some are industry specific.

3.4 Summary

The second literature review chapter described the project financial management with focus mainly on infrastructure construction. The chapter discusses the complications faced by infrastructure project stressing the importance of financial management of the investment on infrastructure projects and financial engineering. Further the chapter discusses the risks faced by contractors on implementation laying a foundation for this study. Researches done on financial modelling, analysis and budget allocation in infrastructure projects are discussed. Finally since financial management discipline is discussed with regard to its scope, importance, functions and the related disciplines and activities with respect to an organizational background.

Chapter 4

4 RESEARCH METHODOLOGY

4.1 Introduction

Research is an attempt to find answers some problem with the application of logical and scientific procedures. According to Woody cited Kothari (2004) "research comprises defining and redefining problems, formulating hypothesis or suggested solutions; collecting, organising and evaluating data; making deductions and reaching conclusions; and at last carefully testing the conclusions to determine whether they fit the formulating hypothesis."

Objectives of research vary with the each and every research undertaken but has broadly been categorized into four by Kothari (2004) as following;

- To familiarize or get an insight to a concept or phenomenon
- To clearly layout the characteristics of scenario, individual or group
- To search for patterns and frequency of relationship between variables
- To detect the causal relationship between two variables

Types of research as per Kothari (2004) are as follows

1. Descriptive and analytical - Describing the present state of a certain existence and getting available information and critically analyse them to make evaluation
2. Applied and pure - Applied research is finding solutions to an immediate practical problem whereas pure or fundamental research is establishing a theory
3. Quantitative and qualitative - Quantitative research is the solving of the problem using the quantitative data and qualitative research is the research of a scenario using qualitative data
4. Conceptual and empirical - Conceptual research is done with regard to philosophy whereas empirical is with regard to observations or experience.

This research attempts to study the usage of financial management in infrastructure projects for which both qualitative and quantitative methods have been used.

4.2 Research Problem

Even though investment appraisal is extensively studied the use of financial management at organization level in managing the investment disbursement is an understudied subject. Whether the capacity of a construction organization is improved by the proper management of its finances and whether it is reflected in the project's return remains interesting.

The research problem of the study as mentioned in the introduction chapter is as follows;

"How the construction organizations manage their financial resources committed to projects with the existence of inherent risks in large infrastructure construction to improve financial performance?"

4.3 Research Design

According to Creswell (2009) research design is the plan and procedure which spans from the research problem to the data collection and analysis. Hence to structure a good study a design should be chosen bearing in mind the research problem, the audience of the study and the experience of the researcher.

Creswell (2009) has given mainly three types of designs as qualitative, quantitative and mixed. Qualitative method included the collection of qualitative data and the analysis is flexible in structure and will vary with interpretation of the researcher. Quantitative method is the collection of data in a quantitative form, analysis of which will have a firm structure. Mixed method combines both these quantitative and qualitative methods in order to strengthen the study.

The research is to study how financial management is done in a construction organization. Hence the study is conducted as a case study of several projects executed by a single construction organization. Associated objectives include the study of the organizational structure, internal fund distribution plan and the financial management of infrastructure projects after which issues highlighted are to be critically discussed.

Bearing in mind the purpose of the study it should be noted that the literature review concluded the need of a qualitative and quantitative study to achieve the objectives (a quantitative data survey alone would not be sufficient). It also laid the foundation to which details of the project need to be collected.

The financial details can be collected through a quantitative data survey but the analysis would reveal certain indicators, the interpretation of which would not have much meaning without the associated qualitative data. Being particular about this study collection of financial data and analysing would indicate the performance but will not have any indication with regard to the qualitative factors associated with that. Hence the study will be most successful with a mixed method of qualitative and quantitative approaches.

4.3.1 Mixed method

Mixed method as previously stated involves both the use of qualitative and quantitative approach. In planning a mixed method approach Creswell (2009) has mentioned four important aspects as following;

1. Timing - Timing of the data collection whether the quantitative data and qualitative data are collected sequentially or concurrently
2. Weighting - The weight or priority given to the qualitative and quantitative data
3. Mixing - At which stage the quantitative and qualitative data are mixed (data collection, analysis, interpretation)
4. Theorizing - Whether a larger theoretical perspective guides the entire design

These four aspects help to shape the mixed method approach. In developing the research proposal Cresswell (2009) mentions six major strategies as follows;

1. Sequential explanatory design
2. Sequential exploratory design
3. Sequential transformative design
4. Concurrent triangulation design

5. Concurrent embedded design
6. Concurrent transformative design

Sequential strategies consist of a sequential data collection procedure where quantitative data collection and qualitative data collection is done one after the other and then moved on to the data analysis

Concurrent strategies consist of concurrent data collection approaches. In this particular study since the qualitative and quantitative data regarding the project have different sources and since they were both required for the analysis together concurrent triangulation strategy was used in collection and analysis of the data. Quantitative data of the projects most of which were financial were collected from the finance division (one functional division of the project structure which handled project financial transactions) and the qualitative data were collected from a questionnaire survey from the project proponent itself. Since the combined analysis provides strength and meaning the data analysis was done by combining both qualitative and processed quantitative data. A graphical view of the concurrent triangulation design has been given in following figure.

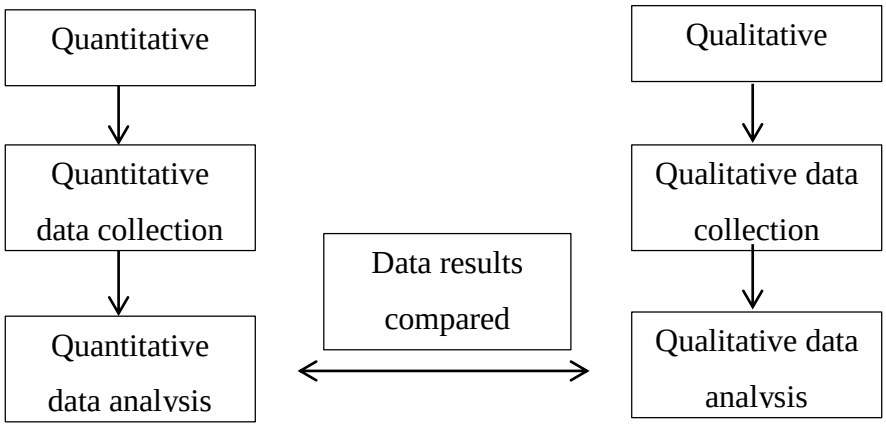


Figure 4-1: Concurrent triangulation design

Source: Research design by J.W. Creswell

4.4 Data Collection and Analysis

The organization in overall was studied qualitatively to obtain general details of the structure and functions and the financial environment as per the literature chapter one-

construction sector and construction organization. 10 numbers of infrastructure projects were selected based on their value and complexity.

Questionnaire survey was undertaken to gather the qualitative data of the projects. Chapter two of the literature review contributed to form the questionnaire which included;

1. General project details
2. Project financial set up
3. Project risk management details

Types of risks and risk management methods were extracted from risk management literature.

Project survey was undertaken to gather the quantitative data. The review of literature on financial evaluation financial modelling, budget allocations and financial engineering and the availability of data within the financial environment of the projects contributed to decide which details should be gathered. Accordingly quantitative data focuses on calculating three measures as project profitability, project risk exposure and financial strength.

To calculate these measures project budget, initial fund disbursement plan, income expenditure statement, and cash flow statement are gathered project wise. The calculated measures are statistically analysed to have an idea about each project performance in the sample. Each project is analysed critically referring to the qualitative data which were gathered by the questionnaires and finally the deductions are made considering the construction organization.

4.4.1 Data sampling

This study recognizes a specialized sample which has certain characteristics. To be particular the projects chosen to study are infrastructure projects of high value or complex nature. Therefore the sample is selected purposefully considering the project characteristics in particular. 10 numbers of projects were chosen since the study involved financial data which were sensitive information.

4.4.2 Quantitative data processing

The financial data which were collected were used to calculate three measures such as project profitability, project risk exposure and financial strength. Since an overall idea regarding the project sample can be obtained through the calculation of statistical measures such as mean and standard deviation both these indicators were calculated for the financial measures.

Mean gives an average value of each financial measure of the project whereas standard deviation gives the dispersion of the values around the mean

4.5 Summary

Research methodology is the plan and process of executing the research. With the aim of this study it was decided that the research design should be a mixed method which is a combination of both qualitative and quantitative methods. Hence a quantitative data survey of a selected project sample was carried out along with a qualitative data survey by the use of a questionnaire. The quantitative data collected are used to calculate the financial indicators of projects and the qualitative data are used in analysing the interpretations of the indicators.

Chapter 5

5 DATA COLLECTION AND ANALYSIS

5.1 Data Collection

5.1.1 Organizational background

The construction organization selected for research is a limited liability company (a private limited company) where the stakeholders are with limited liability and the shares are not traded to the general public. The shareholders are liable to the creditors up to the capital they have invested in case of an insolvency issue. Under the ICTAD grading system following grades are obtained by the particular organization for different work sectors.

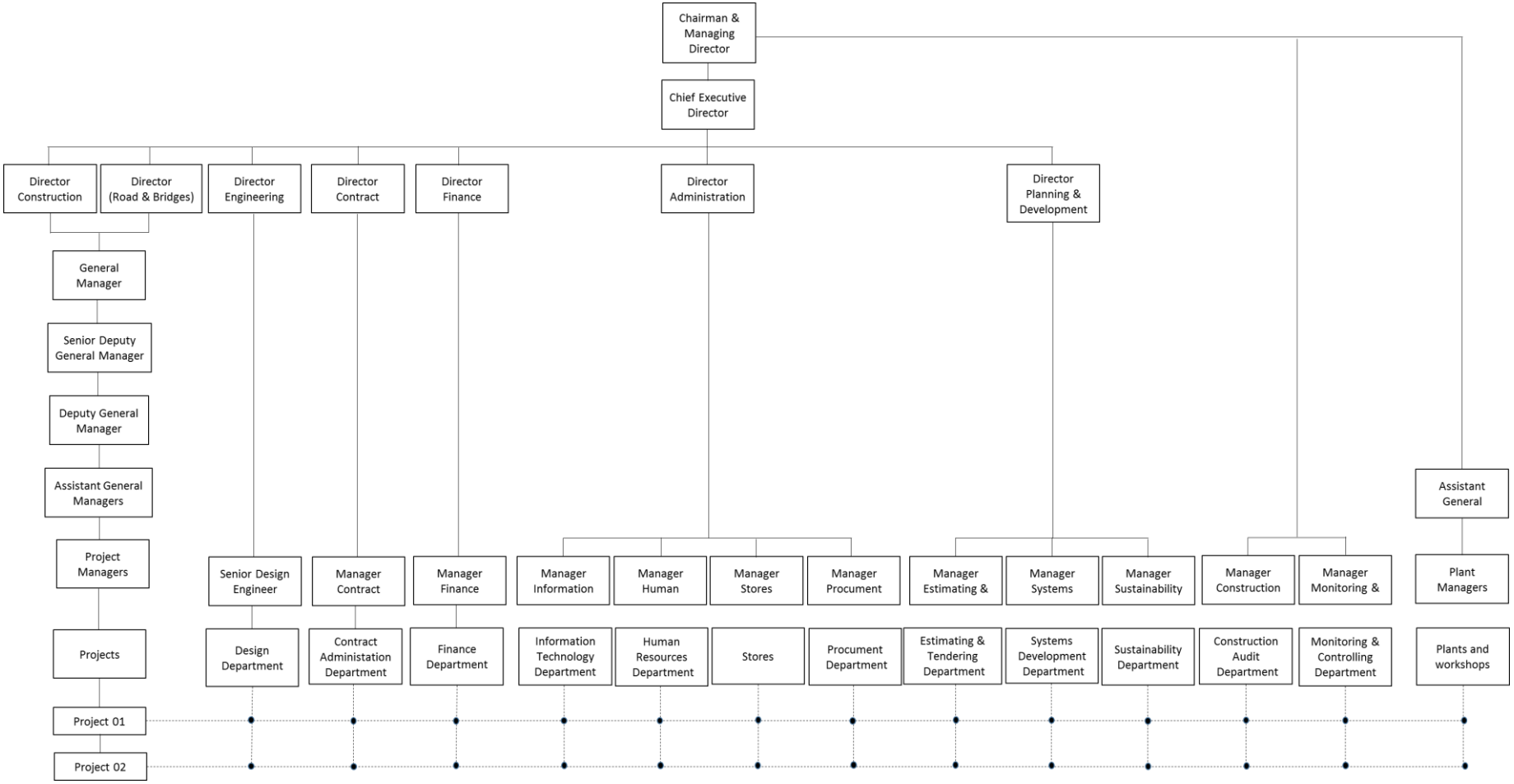
Table 5-1: Sector wise ICTAD Grading of the contractor

	Construction sector	**Grading**
1	Building construction	C1
2	Highway construction	C1
3	Bridge construction	C1
4	Water supply & sewerage	C1
5	Irrigation & drainage canals	C7
6	Dredging & reclamation	C7

Source: ICTAD contractor registry

Organization is governed by a group of 11 directors who are overseeing different functional units of the company. Company organization structure is shown in figure 5.1

Figure 5-1: Company organization chart



Organization has a matrix type of an organization structure where the different projects are handled across various functional divisions. The higher management based on the information obtained by clients makes a forecast of the revenue and the work load and comparatively draws up a financial plan for the functional divisions. Number of operating projects handled by the organization at any given period averages to 35 out of which generally 5-8 are large engineering and infrastructure projects.

Having collected general detail on the organizational background the qualitative and quantitative data of the selected projects were collected through a questionnaire survey and a project quantitative data survey.

5.1.2 Questionnaire survey

A questionnaire survey was conducted with the aim of obtaining the qualitative data of the project which was not possible to be captured by obtaining the financial and other quantitative data. Before the collection of quantitative data in a general discussion with the company accountants it was observed that financial engineering practises are not adopted in the financial management of the company. Hence details of financial engineering practises were omitted from the questionnaire.

Qualitative data analysis is intended to form a background for the quantitative data analysis and assist in explaining the results obtained. It is also intended to provide an idea regarding the project environment. The types of data collected by the questionnaire are (Annex 01)

1. Financial set up of the project
2. What is the expectation of the organization in executing the project
3. What is the nature of the project financial practise
4. What is the risk management culture of the project

10 numbers of projects from the construction organization were selected for both the questionnaire survey and the project quantitative data survey. Details obtained by the questionnaires are summarized and tabulated under relevant topics as follows.

General project details

Table 5-2: General details of the project sample

Project	Status	Type of project			Value of project		
		Road	Water supply	Flyover	< 1Bn	1 Bn< x <5 Bn	> 5 Bn
Project 1	Completed	√				√	
Project 2	Completed	√					√
Project 3	Completed	√				√	
Project 4	Completed		√			√	
Project 5	Completed	√				√	
Project 6	Completed			√		√	
Project 7	Completed		√		√		
Project 8	Ongoing	√					√
Project 9	Completed	√				√	
Project 10	Completed		√		√		

Project Procedures

Table 5-3: Project procedures

Project	Separate profit center	Initial planning document prepared	Monitoring and controlling mechanism established	Structured management of stakeholders
Road 1	√	√	√	
Road 2	√	√	√	√
Road 3	√	√		
Project 4	√			
Project 5	√	√	√	
Project 6	√	√	√	
Project 7	√			
Project 8	√	√	√	√
Project 9	√	√		
Project 10	√	√		

Project representation and authority

Table 5-4: Project representation and authority

Project	Not delegated	Fully delegated	Partially delegated	Delegated as and when necessary
Project 1				√
Project 2	√			
Project 3				√
Project 4				√
Project 5				√
Project 6			√	
Project 7				√
Project 8	√			
Project 9			√	
Project 10				√

Intention of the project undertaking

Table 5-5: Intention of undertaking the project

Project	Profit making	Social recognition	Maintaining qualification	Survival	Other
Project 1	√				
Project 2	√				
Project 3	√				
Project 4			√		
Project 5	√				
Project 6	√				
Project 7			√		
Project 8	√				
Project 9	√				
Project 10			√		

Accounts procedure

Table 5-6: Project accounts procedure

Project	Separate financing separate account keeping	Integrated financing integrated account keeping	Integrated financing separate account keeping
Project 1			√
Project 2			√
Project 3			√
Project 4			√
Project 5			√
Project 6			√
Project 7			√
Project 8			√
Project 9			√
Project 10			√

Profit treatment

Table 5-7: Profit treatment method

Project	Re invest in construction projects	Re invest in another trade	Distribute as dividend
Project 1	√		
Project 2	√		
Project 3	√		
Project 4			
Project 5	√		
Project 6	√		
Project 7			
Project 8	√		
Project 9	√		
Project 10			

Project financing

Table 5-8: Project financing method

Project	Type of project	Retained profit	Bank loans	Advance payment and project revenue
Project 1	Road			√
Project 2	Road			√
Project 3	Road			√
Project 4	Water supply		√	√
Project 5	Road			√
Project 6	Flyover			√
Project 7	Water supply		√	√
Project 8	Road			√
Project 9	Road			√
Project 10	Water supply		√	√

Project payment delay

Table 5-9: Period of project payment delay

Project	Type of project	Less than 1 month	1 month	2 month	3 months	More than 3 months
Project 1	Road			√		
Project 2	Road	√				
Project 3	Road			√		
Project 4	Water supply			√		
Project 5	Road				√	
Project 6	Flyover			√		
Project 7	Water supply		√			
Project 8	Road			√		
Project 9	Road			√		
Project 10	Water supply			√		

Project financial performance

Table 5-10: Project financial performance

Project	Type of project	Financial planning done?	Financial performance measurement procedures established?	Financial statements done periodically?	Did the project achieve the planned return?
Project 1	Road	√		√	√
Project 2	Road	√		√	√
Project 3	Road			√	√
Project 4	Water supply			√	
Project 5	Road	√		√	
Project 6	Flyover	√		√	√
Project 7	Water supply			√	
Project 8	Road	√		√	√
Project 9	Road			√	√
Project 10	Water supply			√	

Project risk management details

Project risk management details were collected under following categories by the questionnaire

1. Financial
2. Operational
3. Management
4. Engineering
5. External

A study by Rezakhani (2012) illustrated several factors under above categories and the extraction of the most applicable risk factors were done according to the organization. The feedback received for the risk management practise of the projects have been attached as annexure 03 and referred in the analysis where necessary.

5.1.3 Project quantitative data survey

As described in the research methodology the focus of the collection of quantitative data is to calculate the profitability, the financial strength and the risk exposure of the project. In order to do this following quantitative data were obtained.

The quantitative details collected in each project are attached as annexures in the order of the project. For the purpose of calculation of the above measures the required details are abstracted from the financial statements, budget and cash flow.

Project financial detail

Table 5-11: Project financial detail

Project	Type of project	Initial contract value (Rs. Mn.)	Total budget (Rs. Mn.)	Total actual cost (Rs. Mn)	Total revenue (Rs. Mn.)	Total profit (Rs. Mn.)
Project 1	Road	1,553.00	1,384.10	1,758.30	2,034.90	276.60
Project 2	Road	6,766.60	5,882.90	6,808.30	9,289.30	2,481.00
Project 3	Road	3,740.10	3,253.80	2,840.40	3,761.20	920.70
Project 4	Water supply	1,300.10	1,216.10	2,195.00	1,956.70	(238.30)
Project 5	Road	4,409.00	4,230.60	4,809.80	4,928.10	118.30
Project 6	Flyover	1,323.50	1,189.50	1,643.90	2,012.20	368.30
Project 7	Water supply	811.00	708.70	1,206.40	834.60	(371.80)
Project 8	Road	8,460.30	5,218.70	5,075.30	6,160.00	1,084.60
Project 9	Road	1,696.10	1,394.30	1,578.40	1,938.30	359.90
Project 10	Water supply	755.50	787.90	836.60	786.20	(50.40)

Table 5-12: Project budgeted and actual cash flows

	Type	Cumulative budgeted cash in	Cumulative budgeted cash out	Cumulative budgeted net flow	Cumulative actual cash in	Cumulative actual cash out	Cumulative actual net flow
P1	Road	1,553,022,058.00	1,384,087,895.73	168,934,162.27	2,036,877,917.14	1,758,261,310.05	278,616,607.09
P2	Road	6,766,575,279.41	5,882,934,579.30	883,640,700.11	7,995,669,211.33	6,808,288,449.12	1,187,380,762.21
P3	Road	3,740,087,734.10	3,253,777,863.99	486,309,870.11	3,398,672,162.70	2,831,977,640.91	566,694,521.79
P4	Water supply	1,300,114,965.58	1,216,051,588.03	84,063,377.55	1,956,742,631.64	2,194,970,374.73	(238,227,743.09)
P5	Road	4,409,006,128.63	4,230,573,838.31	144,896,919.09	4,465,039,683.54	4,807,826,405.25	(342,786,721.71)
P6	Flyover	1,323,467,364.62	1,189,467,364.62	134,000,000.00	1,832,448,144.33	1,641,874,697.86	190,573,446.47
P7	Water supply	810,999,936.42	708,747,211.20	102,252,725.22	722,967,113.92	1,201,934,926.98	(478,967,813.06)
P8	Road			1,115,784,486.00	5,046,719,415.84	5,004,388,306.96	42,331,108.88
P9	Road	1,696,084,852.77	1,394,325,111.36	301,759,741.41	1,840,548,922.73	1,578,138,329.84	262,410,592.89
P10	Water supply	755,531,986.69	787,931,924.40	(32,399,937.70)	590,680,172.77	817,696,049.62	(227,015,876.85)

Table 5-13: Project planned and actual values of work done

Project	Type of project	Planned value of work done	Actual value of work done
Project 1	Road	1,484,730,758.00	1,766,411,525.02
Project 2	Road	6,351,499,093.33	8,654,185,539.02
Project 3	Road	3,568,571,538.10	3,589,647,898.38
Project 4	Water supply	1,398,724,084.00	1,534,749,415.61
Project 5	Road	3,468,758,211.37	3,358,810,224.27
Project 6	Flyover	1,323,467,364.62	1,998,623,353.20
Project 7	Water supply	810,999,936.42	806,315,423.90
Project 8	Road	7,233,364,494.00	6,051,862,532.11
Project 9	Road	1,532,145,305.12	1,708,648,787.12
Project 10	Water supply	789,320,769.39	756,186,828.12

Fund disbursement plan

At the planning stages of the project with the budgeting a provisional fund disbursement plan is created for major expenses of the project. In the project sample selected the disbursement plan is given for major six expense categories such as;

1. Assets
2. Plant and machinery
3. Staff salaries and welfare
4. Worker salaries
5. Operating expenses (cash)
6. Construction material

The allocation amounts for the selected projects are given in the following table.

Table 5-14: Fund disbursement plan

Project		Assets	Plant & machinery		Staff salaries and welfare	Worker salaries		Cash	Construction Material	Total
			Company	Hiring		Direct	Supply			
Project 1	Rs. (Mn)	12.00	52.00	162.50	50.00	142.50	25.00	268.00	684.00	1,384.00
Road	%	0.87%	3.76%	11.74%	3.61%	10.30%	1.81%	19.36%	49.42%	100.00%
Project 2	Rs. (Mn)	100.00	547.50	484.00	328.00	616.00	196.50	880.50	2,829.50	5,882.00
Road	%	1.70%	9.31%	8.23%	5.58%	10.47%	3.34%	14.97%	48.10%	100.00%
Project 3	Rs. (Mn)	20.00	173.00	204.00	146.00	229.00	53.00	159.00	1,266.50	2,230.50
Road	%	0.90%	7.76%	9.15%	6.55%	10.27%	2.38%	7.13%	56.78%	100.00%
Project 4	Rs. (Mn)	0	0	0	-	0	0	0	-	-
Water supply	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Project 5	Rs. (Mn)	50.00	156.00	203.00	156.00	215.00	94.50	723.00	2,682.00	4,230.50
Road	%	1.18%	3.69%	4.80%	3.69%	5.08%	2.23%	17.09%	63.40%	100.00%
Project 6	Rs. (Mn)		6.50	17.00	6.00	20.50	12.00	182.50	944.50	1,189.00
Flyover	%	0.00%	0.55%	1.43%	0.50%	1.72%	1.01%	15.35%	79.44%	100.00%
Project 7	Rs. (Mn)	2.00	58.00	42.00	49.00	200.00	153.50	56.00	150.50	709.00
Water supply	%	0.28%	8.18%	5.92%	6.91%	28.21%	21.65%	7.90%	21.23%	100.00%
Project 8	Rs. (Mn)	50.00	217.00	234.00	126.50	441.00	140.50	492.00	3,567.50	5,218.50
Road	%	0.96%	4.16%	4.48%	2.42%	8.45%	2.69%	9.43%	68.36%	100.00%
Project 9	Rs. (Mn)	15.00	42.50	107.50	92.50	154.00	60.50	280.00	657.00	1,394.00
Road	%	1.08%	3.05%	7.71%	6.64%	11.05%	4.34%	20.09%	47.13%	100.00%
Project 10	Rs. (Mn)	2.00	96.00	15.50	71.00	158.00	73.00	107.00	267.00	787.50
Water supply	%	0.25%	12.19%	1.97%	9.02%	20.06%	9.27%	13.59%	33.90%	100.00%

5.2 Data Analysis

5.2.1 Calculation of financial measures

Project profitability is an indicator of how well the project has been financially. For the 10 projects chosen the profitability was calculated by following equation.

$$Gross\ profit\ ratio = \frac{Gross\ profit}{Total\ revenue}$$

$$Net\ profit\ ratio = \frac{Net\ profit}{Total\ revenue}$$

Table 5-15: Profit ratio calculation

Project	Type of project	Gross profit ratio	Net profit ratio
Project 1	Road	0.14	0.15
Project 2	Road	0.27	0.27
Project 3	Road	0.24	0.25
Project 4	Water supply	(0.12)	(0.10)
Project 5	Road	0.03	0.05
Project 6	Flyover	0.18	0.21
Project 7	Water supply	(0.45)	(0.43)
Project 8	Road	0.18	0.18
Project 9	Road	0.19	0.19
Project 10	Water supply	(0.06)	(0.04)

Table 5-16: Statistical measures of the profit ratios

Statistical measure	Gross profit ratio	Net profit ratio
Mean	0.06	0.07
Standard deviation	0.22	0.21

Risk is an event which causes the actual output of the project to deviate from the initial expected output. Hence the deviation of the actual cost from the expected is calculated as per the following equation as a measure of the risk exposure of the project.

$$Risk\ exposure = \frac{Total\ expected\ cost - Total\ actual\ cost}{Total\ expected\ cost}$$

The measure gives the deviation of actual per unit of planned or expected cost.

Table 5-17: Project risk exposure calculation

Project	Type of project	Risk exposure
Project 1	Road	(0.27)
Project 2	Road	(0.16)
Project 3	Road	0.13
Project 4	Water supply	(0.80)
Project 5	Road	(0.13)
Project 6	Flyover	(0.38)
Project 7	Water supply	(0.70)
Project 8	Road	0.03
Project 9	Road	(0.13)
Project 10	Water supply	(0.06)

Table 5-18: Statistical measures of the project risk exposures

Statistical measure	Risk exposure
Mean	(0.25)
Standard deviation	0.30

Financial strength of the project is indicated by following ratios.

$$Current\ ratio\ = \frac{Current\ assets}{Current\ liabilities}$$

$$Quick\ ratio\ = \frac{Current\ assets - Inventory}{Current\ liabilities}$$

Current ratio and quick ratio are both indicators of the capability of the project entity to meet its short term financial obligations which gives an idea of the financial strength of the project. Current and quick ratios of the projects can be given as follows.

Table 5-19: Project current ratio calculation

Project	Type of project	Current ratio	Quick ratio
Project 1	Road	14.49	14.20
Project 2	Road	18.04	16.25
Project 3	Road	2.94	2.07
Project 4	Water supply	74.47	74.47
Project 5	Road	31.58	31.58
Project 6	Flyover	0.64	0.64
Project 7	Water supply	0.27	0.27
Project 8	Road	2.35	0.31
Project 9	Road	54.22	26.71
Project 10	Water supply	0.63	0.12

Table 5-20: Statistical measures of the project financial strength

Statistical measure	Current ratio	Quick ratio
Mean	19.96	16.66
Standard deviation	25.92	23.46

Cash flows of projects are shown in graphs below

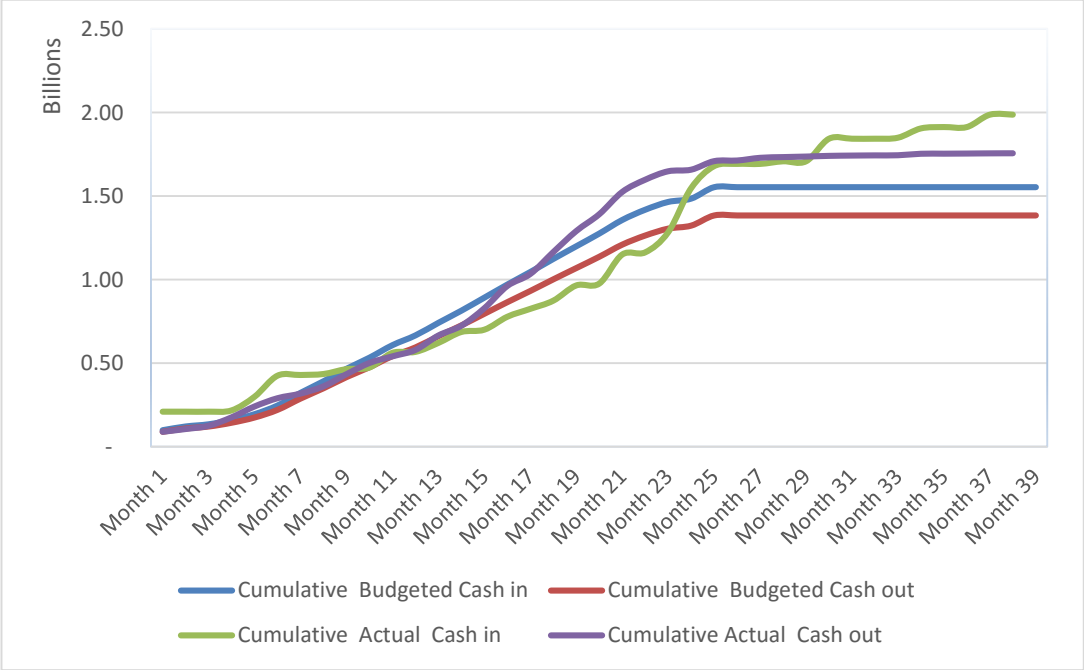


Figure 5-2: Budgeted and actual cash flows of project 1

Cash flows of project one indicate both actual cash in and out higher than the budgeted values indication either escalation or scope increase of project. A point of special significance is that the project has suffered a huge actual negative cash flow in the operation peak but more than expected profit margin has been achieved at the end of the project. Even the result is satisfying it is not the best performance since the negative impact has incurred a certain financial charge on the project which has eroded the financial benefits of the project account.

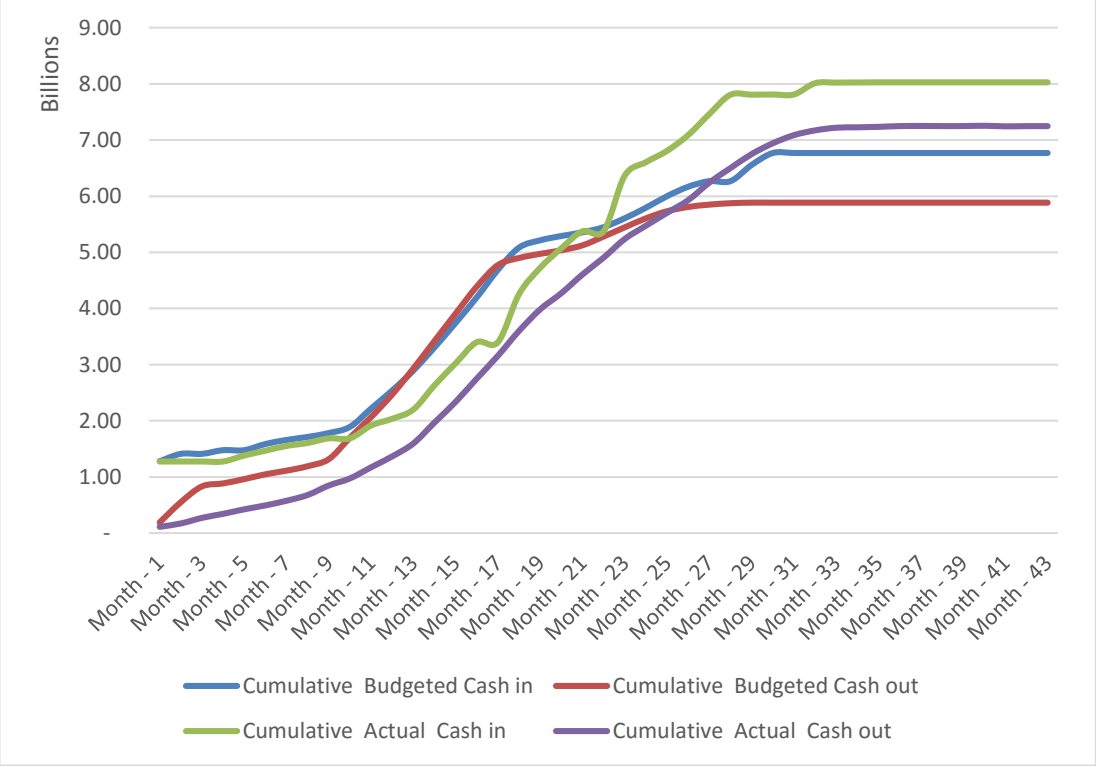


Figure 5-3: Budgeted and actual cash flows of project 2

Project 2 which is also a road project has maintained a positive cash flow throughout but has not comparative to the margin between the budgeted cash in and out maintained the expected profit.

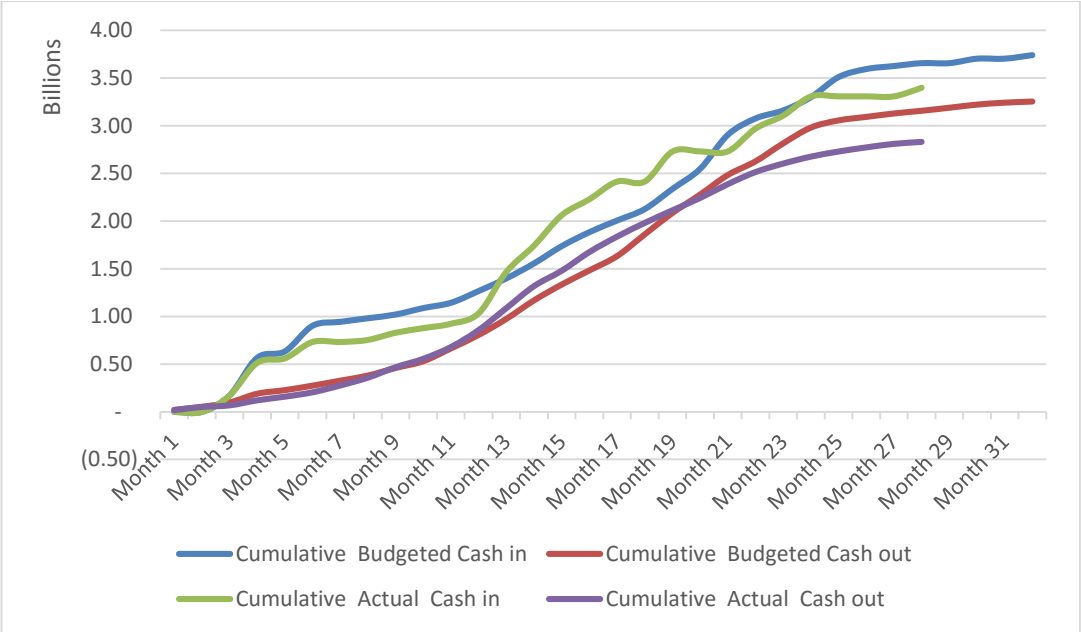


Figure 5-4: Budgeted and actual cash flows of project 3

Project 3 also has maintained a positive cash flow throughout but the project shows a reduction of scope comparative to the budgeted (deflations were not recorded within period)

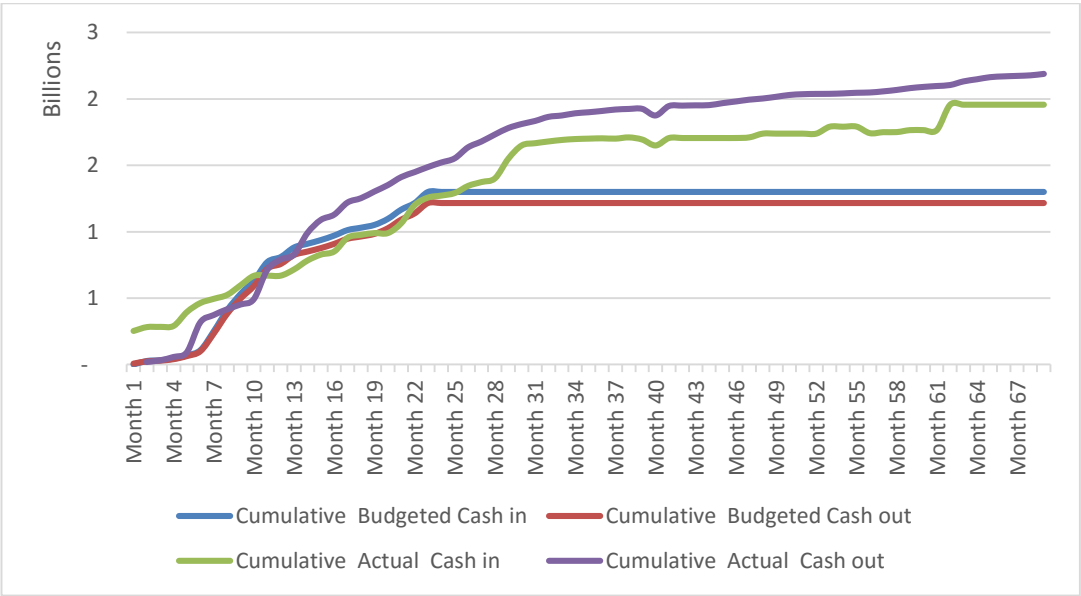


Figure 5-5: Budgeted and actual cash flows of project 4

Project 4 is a water supply project. There are significant characteristics of this cash flow. One is the huge scope increase which is reflected by the budgeted and planned amounts. The other is that actual cash out is higher than the actual cash in indicating a loss. Another factor shown is the increased project duration.

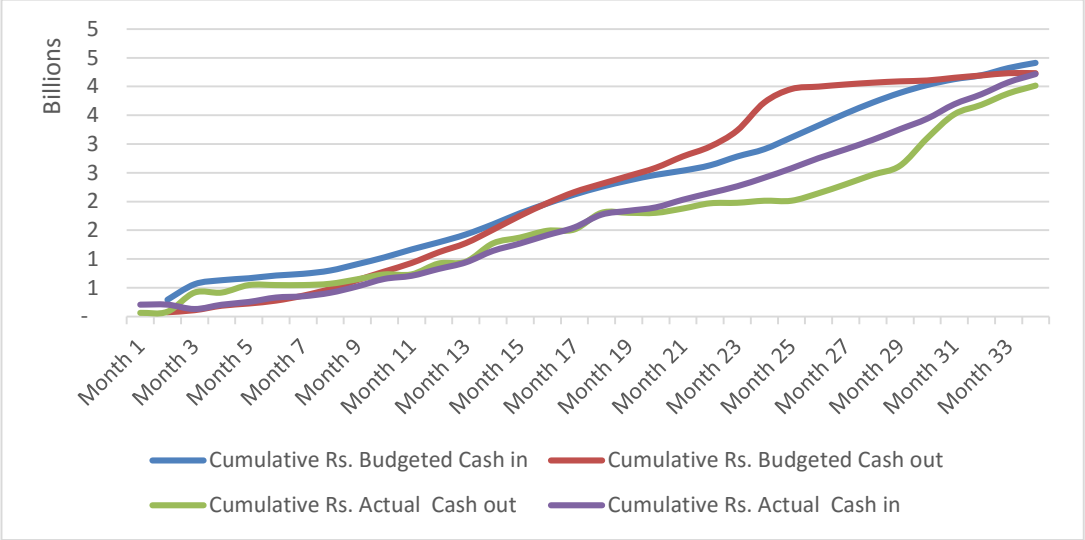


Figure 5-6: Budgeted and actual cash flows of project 5

This project has no special characteristics. This has been budgeted for minus cash flow towards the end of the project with a small margin at the end. Almost similar margin has been achieved.

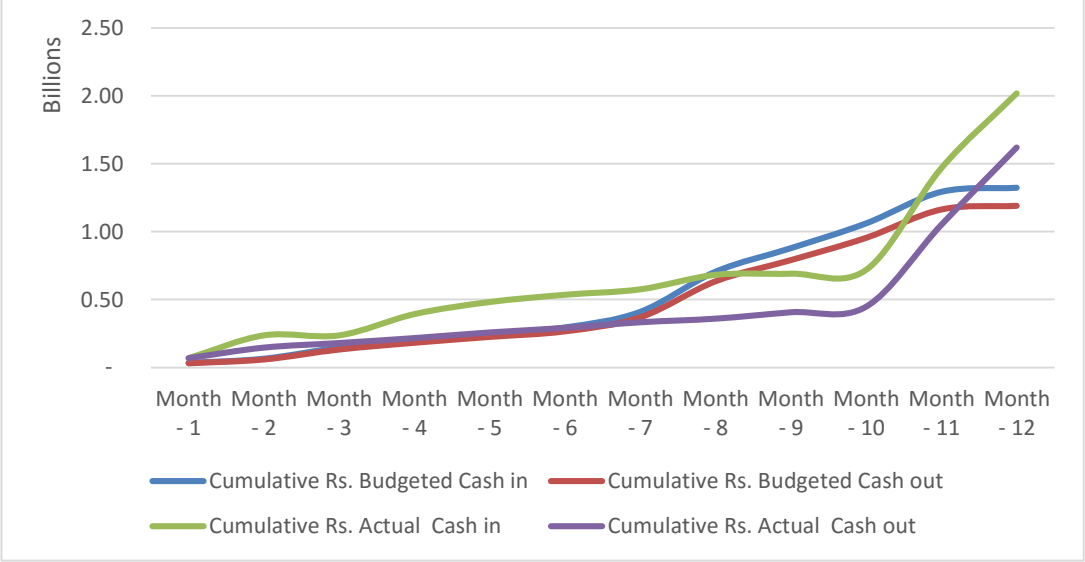


Figure 5-7: Budgeted and actual cash flows of project 6

This is the cash flow of the flyover project. The prominent features of this cash flow are the back end peak activity and the significant margin which has been achieved.

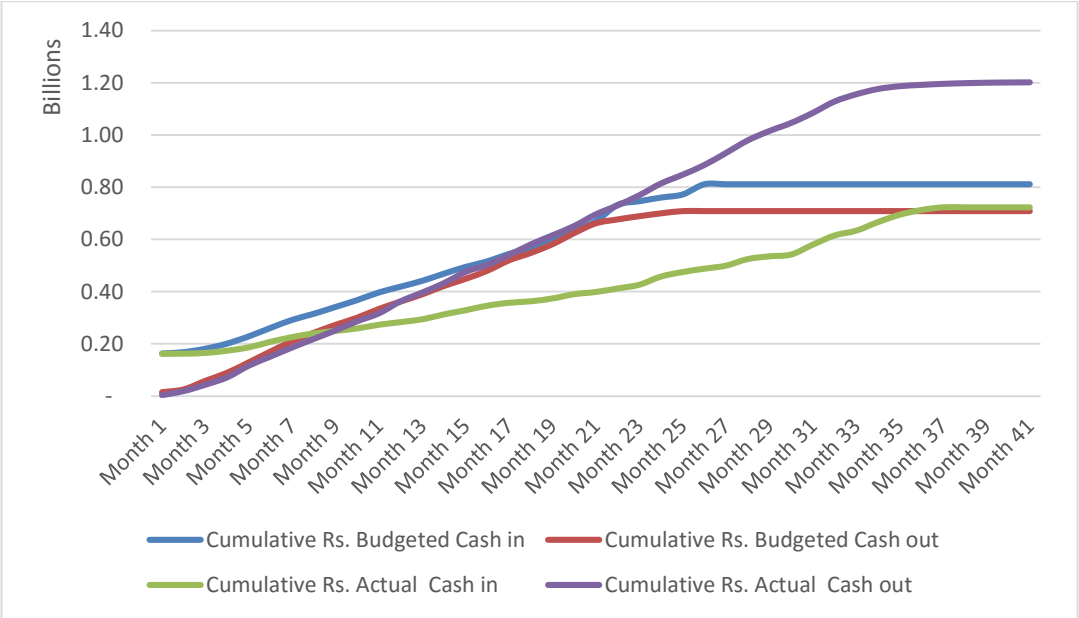


Figure 5-8: Budgeted and actual cash flows of project 7

Project 7 is a water supply project. Similar to previous water supply project cash flow this also has the actual cash out curve on top of the actual cash in curve indicating a loss

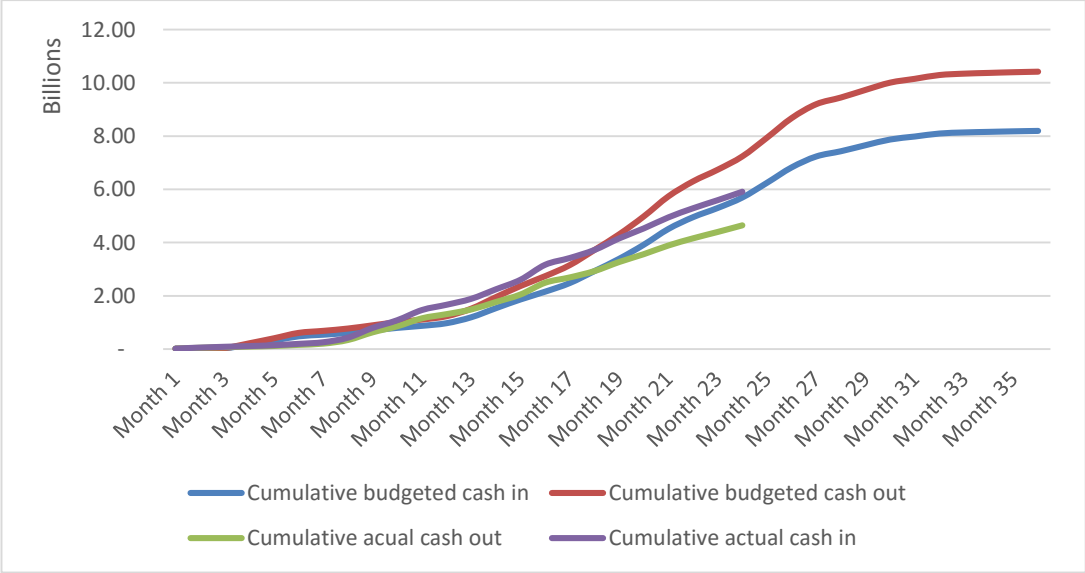


Figure 5-9: Budgeted and actual cash flows of project 8

Project 8 is an ongoing road project. The contract value of this project exceeds 10 Bn and as the cash flow so far indicates the project is going healthily.

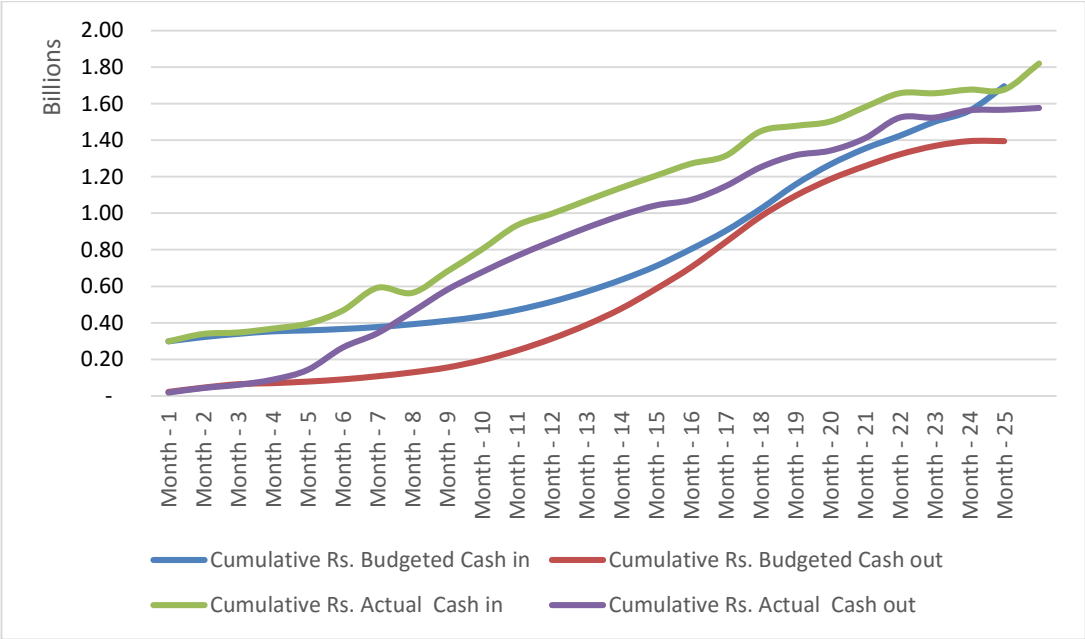


Figure 5-10: Budgeted and actual cash flows of project 9

Project 9 is also a road project. As per this cash flow the project margin is positive although lesser than planned.

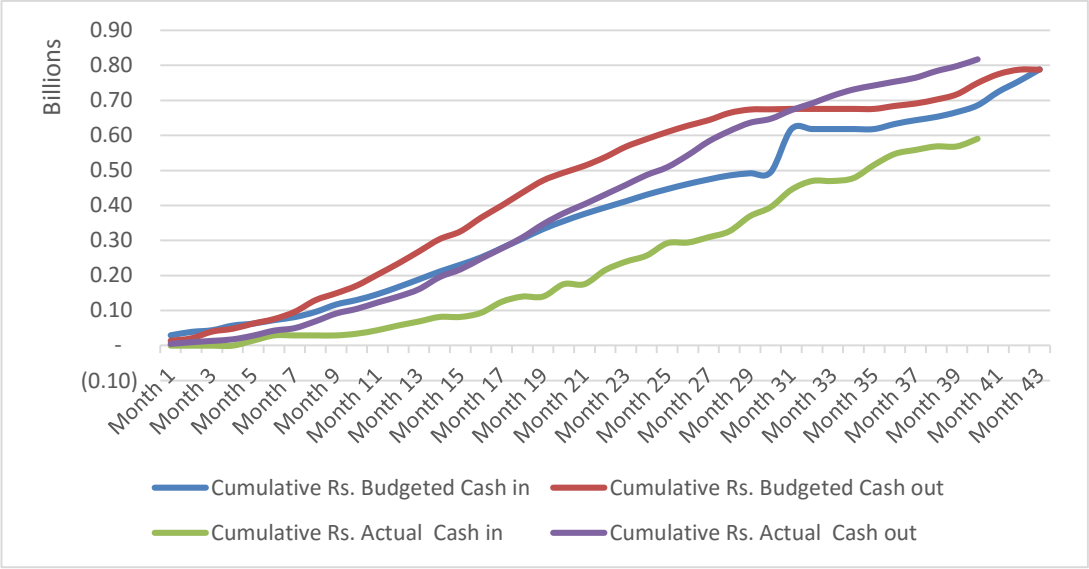


Figure 5-11: Budgeted and actual cash flows of project 10

Project 10 is a water supply project which similar to previous water supply projects have recorded a loss.

5.3 Summary

Data collection and analysis chapter displays all the gathered data which includes organizational background and structure, general project details, project financial set up and project risk management details which are obtained by the questionnaire survey and project financial details which are obtained by the project quantitative data survey. The collected data are then analysed quantitatively and qualitatively. Financial ratios which indicated project profitability, project risk exposure and project financial strength were calculated. Each project is then analysed based on the calculated financial ratios, fund disbursement plan of the project, project cash flows and the qualitative data gathered of the project which assisted in interpreting the quantitative data.

Chapter 6

6 RESEARCH FINDINGS AND DISCUSSIONS

6.1 Quantitative Data Findings

6.1.1 Financial ratios

The quantitative data analysis of the project revealed following results

Table 6-1: Summary of financial ratios of projects

Description	Type of project	Gross profit ratio	Net profit ratio	Risk exposure	Current ratio	Quick ratio
Project 1	Road	0.14	0.15	(0.27)	14.49	14.20
Project 2	Road	0.27	0.27	(0.16)	18.04	16.25
Project 3	Road	0.24	0.25	0.13	2.94	2.07
Project 4	Water supply	(0.12)	(0.10)	(0.80)	74.47	74.47
Project 5	Road	0.03	0.05	(0.13)	31.58	31.58
Project 6	Flyover	0.18	0.21	(0.38)	0.64	0.64
Project 7	Water supply	(0.45)	(0.43)	(0.70)	0.27	0.27
Project 8	Road	0.18	0.18	0.03	2.35	0.31
Project 9	Road	0.19	0.19	(0.13)	54.22	26.71
Project 10	Water supply	(0.06)	(0.04)	(0.06)	0.63	0.12
Mean		***0.06***	***0.07***	***(0.25)***	***19.96***	***16.66***
Standard deviation		***0.22***	***0.21***	***0.30***	***25.92***	***23.46***

Looking at the summary table two facts are immediately apparent.

- All the financial ratios are unfavourable for water projects
- 80% of the projects have negative risk exposures which caused the projects to deviate from the planned

According to the immediately apparent facts the summary table is rearranged with two groups as following;

Table 6-2: Financial ratios of road projects

Description	Type of project	Gross profit ratio	Net profit ratio	Risk exposure	Current ratio	Quick ratio
Project 1	Road	0.14	0.15	(0.27)	14.49	14.20
Project 2	Road	0.27	0.27	(0.16)	18.04	16.25
Project 3	Road	0.24	0.25	0.13	2.94	2.07
Project 5	Road	0.03	0.05	(0.13)	31.58	31.58
Project 6	Flyover	0.18	0.21	(0.38)	0.64	0.64
Project 8	Road	0.18	0.18	0.03	2.35	0.31
Project 9	Road	0.19	0.19	(0.13)	54.22	26.71
Mean		0.17	0.19	(0.13)	17.75	13.11
Standard deviation		0.08	0.07	0.17	19.50	12.77

Table 6-3: Financial ratios of water supply projects

Description	Type of project	Gross profit ratio	Net profit ratio	Risk exposure	Current ratio	Quick ratio
Project 4	Water supply	(0.12)	(0.10)	(0.80)	74.47	74.47
Project 7	Water supply	(0.45)	(0.43)	(0.70)	0.27	0.27
Project 10	Water supply	(0.06)	(0.04)	(0.06)	0.63	0.12
Mean		(0.21)	(0.19)	(0.52)	25.12	24.95
Standard deviation		0.21	0.21	0.40	42.74	42.89

Statistical measures of financial ratios change significantly between the two categories of projects which gives non averaged picture of the financial performance of the two types of projects. The difference between the structures of the two types of projects are seen in the fund allocation plan as well which can be given as follows.

6.1.2 Fund allocation structure of road projects

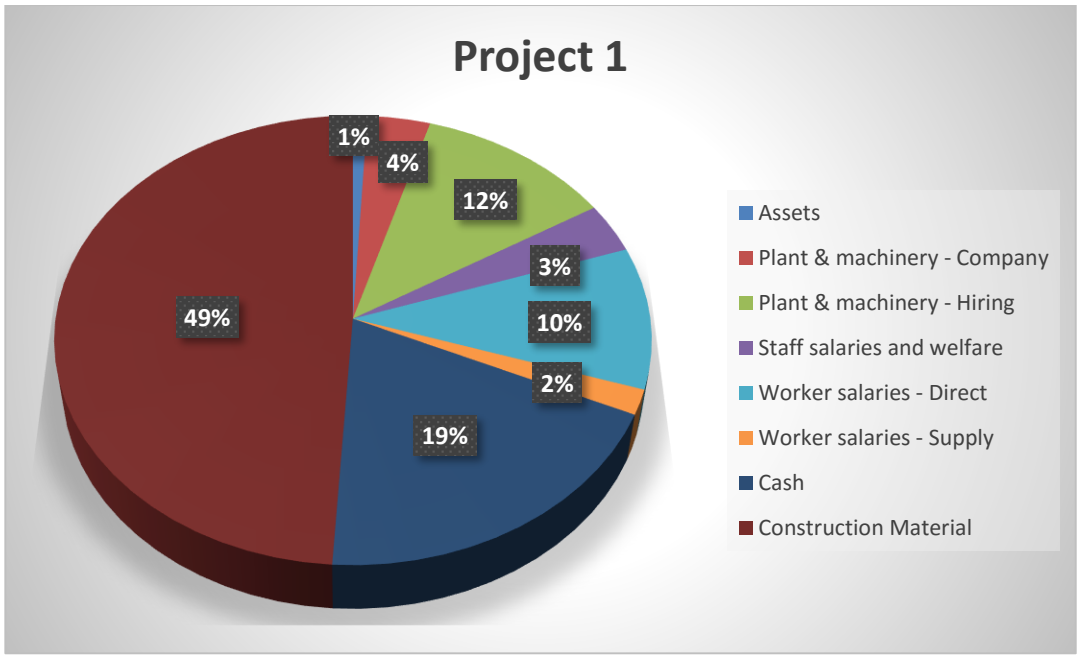


Figure 6-1: Fund allocation structure of project 1

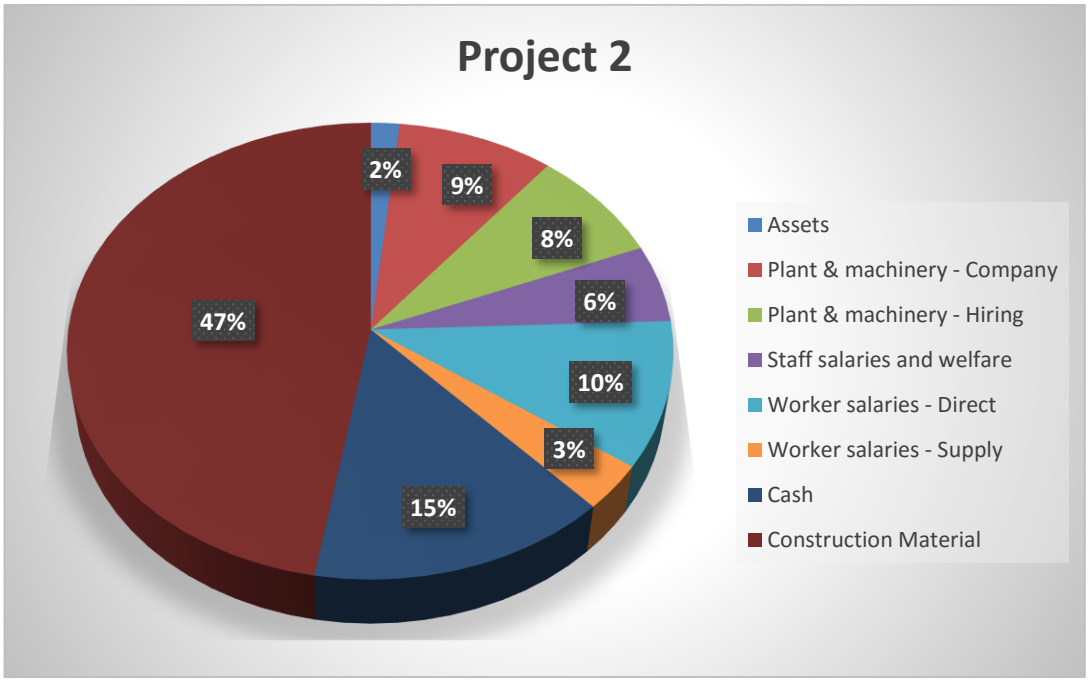


Figure 6-2: Fund allocation structure of project 2

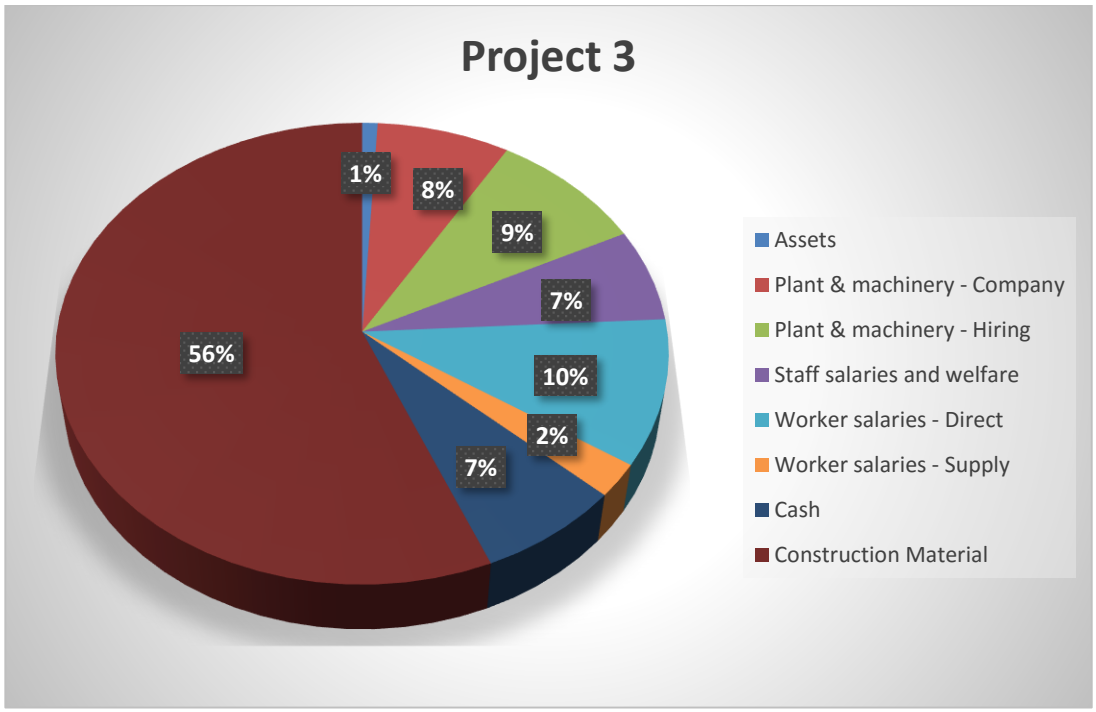


Figure 6-3: Fund allocation structure of project 3

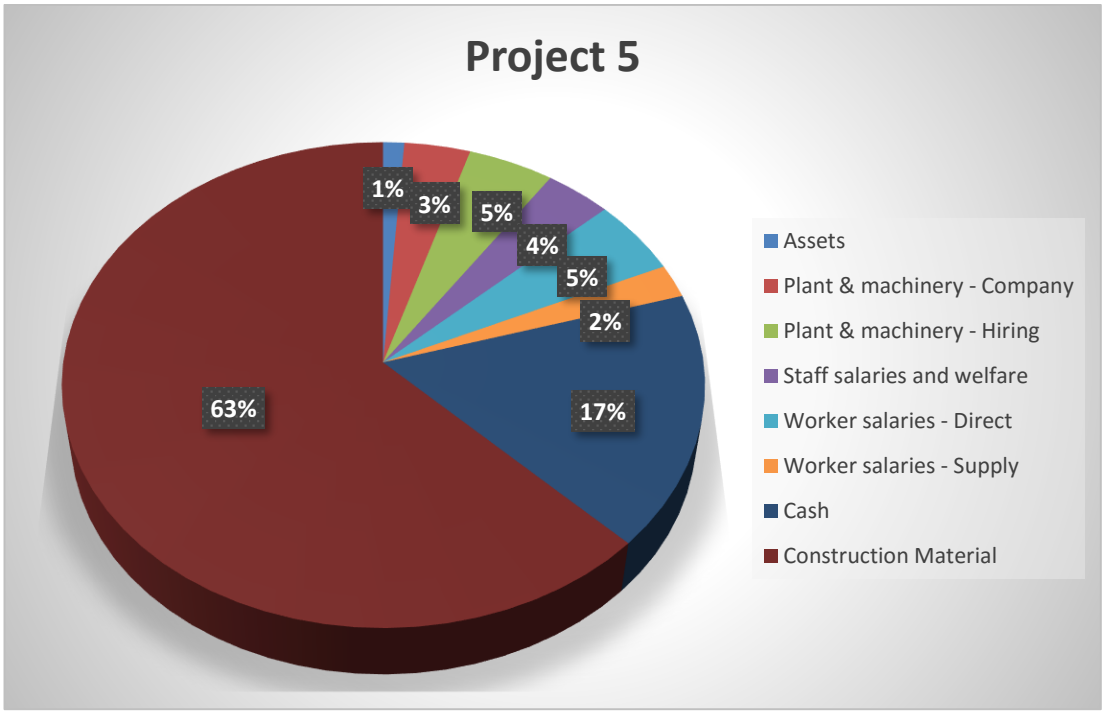


Figure 6-4: Fund allocation structure of project 5

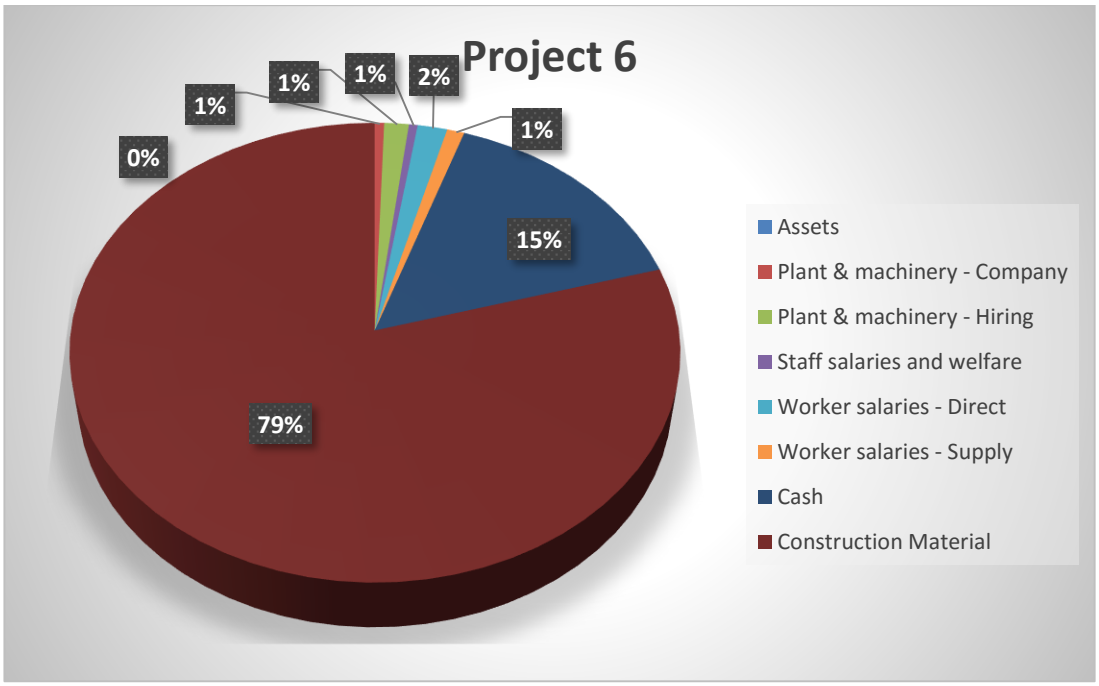


Figure 6-5: Fund allocation structure of project 6

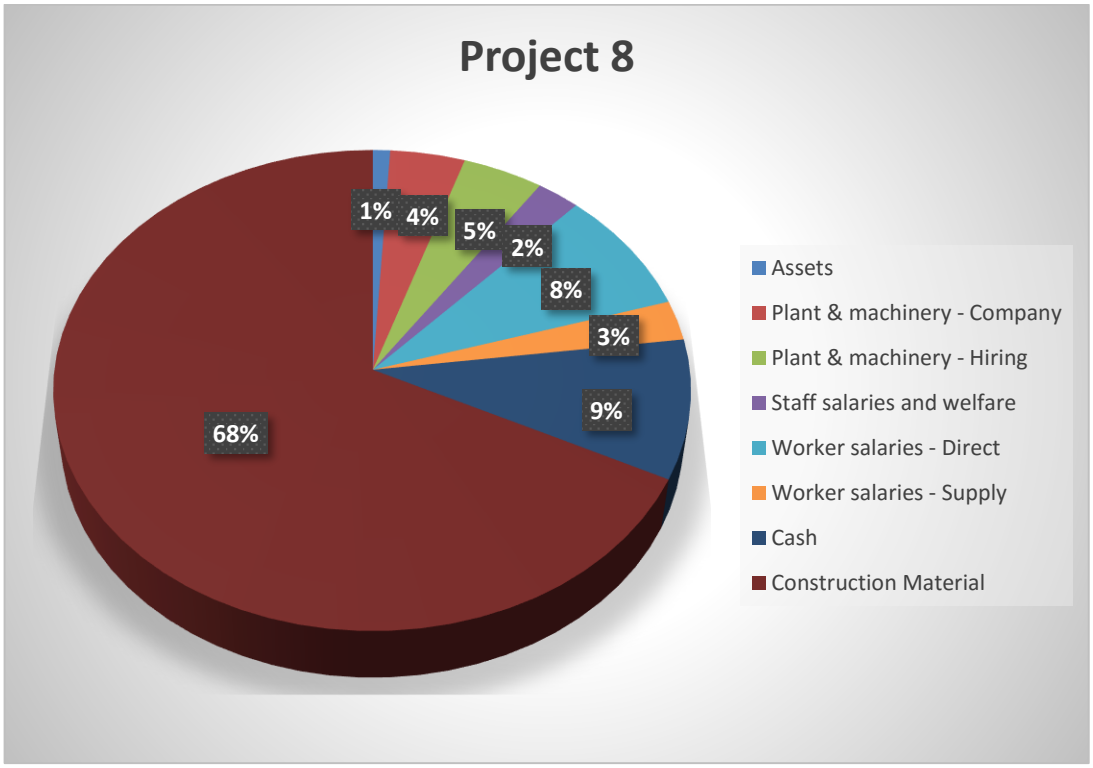


Figure 6-6: Fund allocation structure of project 8

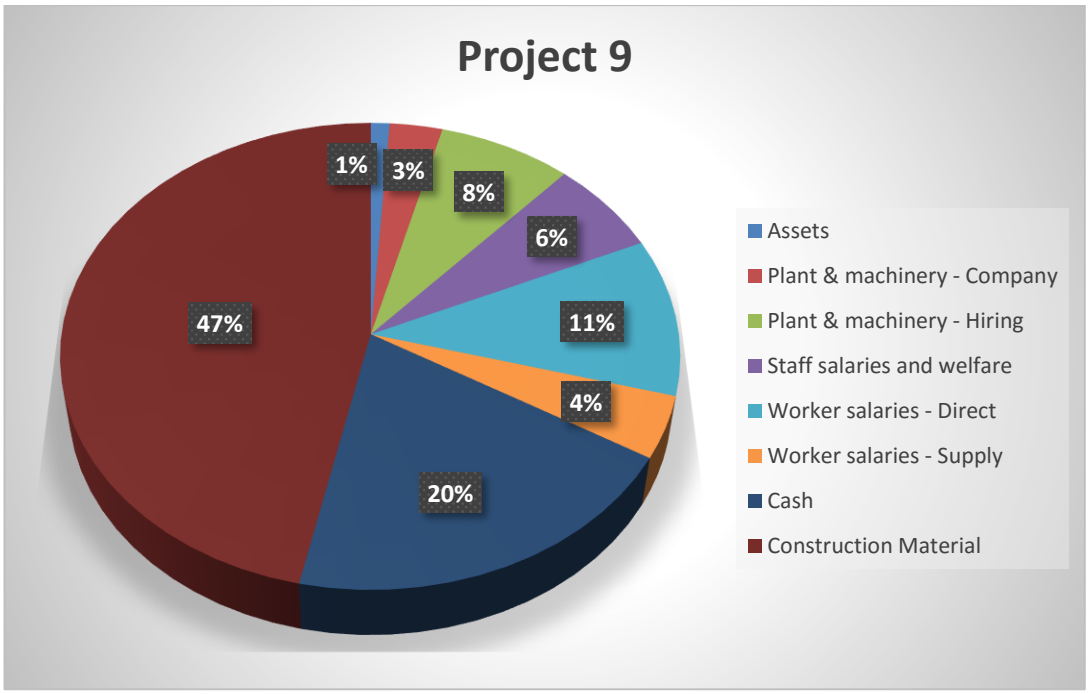


Figure 6-7: Fund allocation structure of project 9

6.1.3 Fund allocation structure of a water project

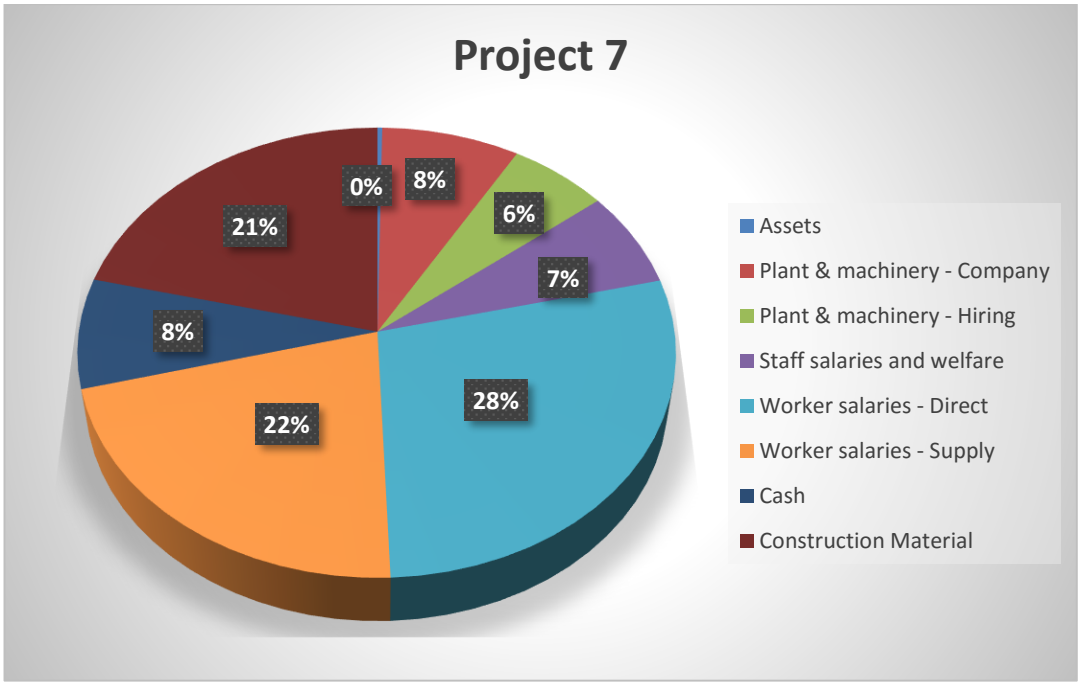


Figure 6-8: Fund allocation structure of project 7

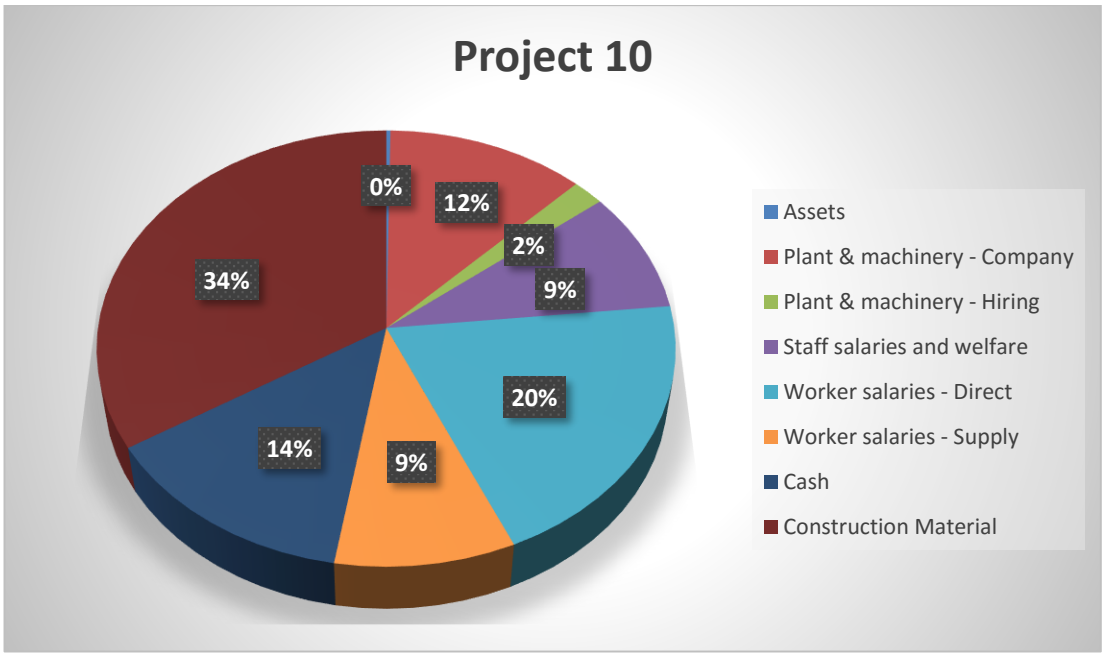


Figure 6-9: Fund allocation structure of project 10

Fund allocation structure of a road project indicate that major part of the expense is allocated for construction materials. As a major case normally the material expenses of a road is around 50% of the total expenses on the project, whereas in the fund allocation structure of a water project the major expense is allocated for worker salaries.

6.1.4 Cash flow analysis

The cash flows connected with the projects arise from the operating activities. A summary of the cumulative cash inflows and outflows for the 10 projects (budgeted and actual) can be given. These project cash flows were analysed project wise in the data analysis chapter to reveal the status of each cash flow. The losses of the water supply sector were reflected therein. The questionnaire feedback revealed that the average payment delay of the projects averaged at 2 months. It should be stated that this delay is incorporated in the planned cash flows when they are prepared. This actually indicates that the organization is attempting at a realistic cash flow forecast with as much detail as predictable.

Another information which is important regarding project financial details are the planned and actual values of work done which shows the increases or decreases of the original scope which can also be taken as a type of risk. A summary of the planned and actual work done values is also shown.

Table 6-4: Budgeted and actual cash flows of projects

Project	Type of project	Budgeted net flow	Actual net flow
Project 1	Road	168,934,162.27	278,616,607.09
Project 2	Road	883,640,700.11	1,187,380,762.21
Project 3	Road	486,309,870.11	566,694,521.79
Project 4	Water supply	84,063,377.55	(238,227,743.09)
Project 5	Road	144,896,919.09	(342,786,721.71)
Project 6	Flyover	134,000,000.00	190,573,446.47
Project 7	Water supply	102,252,725.22	(191,526,351.06)
Project 8	Road	1,115,784,486.00	42,331,108.88
Project 9	Road	301,759,741.41	262,410,592.89
Project 10	Water supply	(32,399,937.70)	(227,015,876.85)

Table 6-5: Planned and actual work done project wise

Project	Type of project	Planned value of work done	Actual value of work done
Project 1	Road	1,484,730,758.00	1,766,411,525.02
Project 2	Road	6,351,499,093.33	8,654,185,539.02
Project 3	Road	3,568,571,538.10	3,589,647,898.38
Project 4	Water supply	1,398,724,084.00	1,534,749,415.61
Project 5	Road	3,468,758,211.37	3,358,810,224.27
Project 6	Flyover	1,323,467,364.62	1,998,623,353.20
Project 7	Water supply	810,999,936.42	806,315,423.90
Project 8	Road	7,233,364,494.00	6,051,862,532.11
Project 9	Road	1,532,145,305.12	1,708,648,787.12
Project 10	Water supply	789,320,769.39	756,186,828.12

6.2 Qualitative Data Findings

A summary of the qualitative data collected can be given as following.

Table 6-6: A project wise summary of qualitative data collected

Description	Project 1	Project 2	Project 3	Project 4	Project 5
General					
Project type	Road	Road	Road	Water supply	Road
Project value	1,553,022,058.00	6,766,575,279.41	3,740,087,734.10	1,300,114,965.58	4,409,006,128.63
Project planning					
Separate profit center	Yes	Yes	Yes	Yes	Yes
Initial planning document prepared	Yes	Yes	Yes	No	Yes
Monitoring and controlling mechanism established	Yes	Yes	No	No	Yes
Structured management of stakeholders	No	Yes	No	No	No
Project representation and decision making authority delegated or not?	No	Yes	No	No	No
Expectation of undertaking the project	Profit making	Profit making	Profit making	Maintaining PQ	Profit making
Accounts keeping is separated for the project	Yes	Yes	Yes	Yes	Yes
Project financial management					
Project is financed by?	Advance payment and project revenue	Advance payment and project revenue	Advance payment and project revenue	Advance payment and project revenue	Advance payment and project revenue
Project profit treatment method	Re invest in construction projects	Re invest in construction projects	Re invest in construction projects		Re invest in construction projects
Average project payment delay	2 months	less than 1 month	2 months	2 months	2 months
Was the financial planning done	Yes	Yes	No	No	Yes
Were the financial statements done periodically?	Yes	Yes	Yes	Yes	Yes
Financial performance measurement procedure established?	No	No	No	No	No
Did the project achieve the planned return?	Yes	Yes	Yes	No	No

Description	Project 6	Project 7	Project 8	Project 9	Project 10
General					
Project type	Flyover	Water supply	Road	Road	Water supply
Project value	1,323,467,364.62	811,000,000.00	8,460,335,586.01	1,696,084,852.77	755,531,986.69
Project planning					
Separate profit center	Yes	Yes	Yes	Yes	Yes
Initial planning document prepared	Yes	No	Yes	Yes	Yes
Monitoring and controlling mechanism established	Yes	No	Yes	No	No
Structured management of stakeholders	No	No	Yes	No	No
Project representation and decision making authority delegated or not?	No	No	Yes	No	No
Expectation of undertaking the project	Profit making	Maintaining PQ	Profit making	Profit making	Maintaining PQ
Accounts keeping is separated for the project	Yes	Yes	Yes	Yes	Yes
Project financial management					
Project is financed by?	Advance payment and project revenue	Advance payment and project revenue	Advance payment and project revenue	Advance payment and project revenue	Advance payment and project revenue
Project profit treatment method	Re invest in construction projects		Re invest in construction projects	Re invest in construction projects	Re invest in construction projects
Average project payment delay	2 months	2 months	2 months	2 months	2 months
Was the financial planning done	Yes	No	Yes	No	No
Were the financial statements done periodically?	Yes	Yes	Yes	Yes	Yes
Financial performance measurement procedure established?	No	No	No	No	No
Did the project achieve the planned return?	Yes	No	Yes	Yes	No

6.3 Project Wise Overall Data Summary

Table 6-7: Project wise overall data summary table

Description	Project 1	Project 2
General		
Project type	Road	Road
Project value	1,553,022,058.00	6,766,575,279.41
Project planning		
Separate profit center	Yes	Yes
Initial planning document prepared	Yes	Yes
Monitoring and controlling mechanism established	Yes	Yes
Structured management of stakeholders	No	Yes
Project representation and decision making authority delegated or not?	No	Yes
Expectation of undertaking the project	Profit making	Profit making
Accounts keeping is separated for the project	Yes	Yes
Project financial management		
Project is financed by?	Advance payment and project revenue	Advance payment and project revenue
Project profit treatment method	Re invest in construction projects	Re invest in construction projects
Average project payment delay	2 months	less than 1 month
Was the financial planning done	Yes	Yes
Were the financial statements done periodically?	Yes	Yes
Financial performance measurement procedure established?	No	No
Did the project achieve the planned return?	Yes	Yes
Financial details		
Initial contract value (Rs. Mn)	1,553.00	6,766.60
Total budget (Rs. Mn)	1,384.10	5,882.90
Total actual cost (Rs. Mn)	1,758.30	6,808.30
Total revenue (Rs. Mn)	2,034.90	9,289.30
Total profit (Rs. Mn)	276.60	2,481.00
Planned value of work done	1,484,730,758.00	6,351,499,093.33
Actual value of work done	1,766,411,525.02	8,654,185,539.02
Cumulative budgeted net flow	168,934,162.27	883,640,700.11
Cumulative actual net flow	278,616,607.09	1,187,380,762.21
Gross profit ratio	0.14	0.27
Net profit ratio	0.15	0.27
Risk exposure	(0.27)	(0.16)
Current ratio	14.49	18.04
Quick ratio	14.20	16.25

Description	Project 3	Project 4
General		
Project type	Road	Water supply
Project value	3,740,087,734.10	1,300,114,965.58
Project planning		
Separate profit center	Yes	Yes
Initial planning document prepared	Yes	No
Monitoring and controlling mechanism established	No	No
Structured management of stakeholders	No	No
Project representation and decision making authority delegated or not?	No	No
Expectation of undertaking the project	Profit making	Maintaining PQ
Accounts keeping is separated for the project	Yes	Yes
Project financial management		
Project is financed by?	Advance payment and project revenue	Advance payment and project revenue
Project profit treatment method	Re invest in construction projects	
Average project payment delay	2 months	2 months
Was the financial planning done	No	No
Were the financial statements done periodically?	Yes	Yes
Financial performance measurement procedure established?	No	No
Did the project achieve the planned return?	Yes	No
Financial details		
Initial contract value (Rs. Mn)	3,740.10	1,300.10
Total budget (Rs. Mn)	3,253.80	1,216.10
Total actual cost (Rs. Mn)	2,840.40	2,195.00
Total revenue (Rs. Mn)	3,761.20	1,956.70
Total profit (Rs. Mn)	920.70	(238.30)
Planned value of work done	3,568,571,538.10	1,398,724,084.00
Actual value of work done	3,589,647,898.38	1,534,749,415.61
Cumulative budgeted net flow	486,309,870.11	84,063,377.55
Cumulative actual net flow	566,694,521.79	(238,227,743.09)
Gross profit ratio	0.24	(0.12)
Net profit ratio	0.25	(0.10)
Risk exposure	0.13	(0.80)
Current ratio	2.94	74.47
Quick ratio	2.07	74.47

Description	Project 5	Project 6
General		
Project type	Road	Flyover
Project value	4,409,006,128.63	1,323,467,364.62
Project planning		
Separate profit center	Yes	Yes
Initial planning document prepared	Yes	Yes
Monitoring and controlling mechanism established	Yes	Yes
Structured management of stakeholders	No	No
Project representation and decision making authority delegated or not?	No	No
Expectation of undertaking the project	Profit making	Profit making
Accounts keeping is separated for the project	Yes	Yes
Project financial management		
Project is financed by?	Advance payment and project revenue	Advance payment and project revenue
Project profit treatment method	Re invest in construction projects	Re invest in construction projects
Average project payment delay	2 months	2 months
Was the financial planning done	Yes	Yes
Were the financial statements done periodically?	Yes	Yes
Financial performance measurement procedure established?	No	No
Did the project achieve the planned return?	No	Yes
Financial details		
Initial contract value (Rs. Mn)	4,409.00	1,323.50
Total budget (Rs. Mn)	4,230.60	1,189.50
Total actual cost (Rs. Mn)	4,809.80	1,643.90
Total revenue (Rs. Mn)	4,928.10	2,012.20
Total profit (Rs. Mn)	118.30	368.30
Planned value of work done	3,468,758,211.37	1,323,467,364.62
Actual value of work done	3,358,810,224.27	1,998,623,353.20
Cumulative budgeted net flow	144,896,919.09	134,000,000.00
Cumulative actual net flow	(342,786,721.71)	190,573,446.47
Gross profit ratio	0.03	0.18
Net profit ratio	0.05	0.21
Risk exposure	(0.13)	(0.38)
Current ratio	31.58	0.64
Quick ratio	31.58	0.64

Description	Project 7	Project 8
General		
Project type	Water supply	Road
Project value	811,000,000.00	8,460,335,586.01
Project planning		
Separate profit center	Yes	Yes
Initial planning document prepared	No	Yes
Monitoring and controlling mechanism established	No	Yes
Structured management of stakeholders	No	Yes
Project representation and decision making authority delegated or not?	No	Yes
Expectation of undertaking the project	Maintaining PQ	Profit making
Accounts keeping is separated for the project	Yes	Yes
Project financial management		
Project is financed by?	Advance payment and project revenue	Advance payment and project revenue
Project profit treatment method		Re invest in construction projects
Average project payment delay	2 months	2 months
Was the financial planning done	No	Yes
Were the financial statements done periodically?	Yes	Yes
Financial performance measurement procedure established?	No	No
Did the project achieve the planned return?	No	Yes
Financial details		
Initial contract value (Rs. Mn)	811.00	8,460.30
Total budget (Rs. Mn)	708.70	5,218.70
Total actual cost (Rs. Mn)	1,206.40	5,075.30
Total revenue (Rs. Mn)	834.60	6,160.00
Total profit (Rs. Mn)	(371.80)	1,084.60
Planned value of work done	810,999,936.42	7,233,364,494.00
Actual value of work done	806,315,423.90	6,051,862,532.11
Cumulative budgeted net flow	102,252,725.22	1,115,784,486.00
Cumulative actual net flow	(478,967,813.06)	42,331,108.88
Gross profit ratio	(0.45)	0.18
Net profit ratio	(0.43)	0.18
Risk exposure	(0.70)	0.03
Current ratio	0.27	2.35
Quick ratio	0.27	0.31

Description	Project 9	Project 10
General		
Project type	Road	Water supply
Project value	1,696,084,852.77	755,531,986.69
Project planning		
Separate profit center	Yes	Yes
Initial planning document prepared	Yes	Yes
Monitoring and controlling mechanism established	No	No
Structured management of stakeholders	No	No
Project representation and decision making authority delegated or not?	No	No
Expectation of undertaking the project	Profit making	Maintaining PQ
Accounts keeping is separated for the project	Yes	Yes
Project financial management		
Project is financed by?	Advance payment and project revenue	Advance payment and project revenue
Project profit treatment method	Re invest in construction projects	Re invest in construction projects
Average project payment delay	2 months	2 months
Was the financial planning done	No	No
Were the financial statements done periodically?	Yes	Yes
Financial performance measurement procedure established?	No	No
Did the project achieve the planned return?	Yes	No
Financial details		
Initial contract value (Rs. Mn)	1,696.10	755.50
Total budget (Rs. Mn)	1,394.30	787.90
Total actual cost (Rs. Mn)	1,578.40	836.60
Total revenue (Rs. Mn)	1,938.30	786.20
Total profit (Rs. Mn)	359.90	(50.40)
Planned value of work done	1,532,145,305.12	789,320,769.39
Actual value of work done	1,708,648,787.12	756,186,828.12
Cumulative budgeted net flow	301,759,741.41	(32,399,937.70)
Cumulative actual net flow	262,410,592.89	(227,015,876.85)
Gross profit ratio	0.19	(0.06)
Net profit ratio	0.19	(0.04)
Risk exposure	(0.13)	(0.06)
Current ratio	54.22	0.63
Quick ratio	26.71	0.12

6.4 Discussion

The prominent points of qualitative data analysis can be mentioned as follows

- The projects which had project values of more than 5 Bn had been pre-planned and had structured methods of stakeholder management
- The decision making and representation of these projects were not delegated
- All the water projects were undertaken with the expectation of maintaining pre-qualification
- Water projects were lacking the initial planning and did not make the expected return
- Payment delays of all the projects averaged at two months with the exception of projects 2 &7 which was lesser and project 5 which was higher

Considering the results of the qualitative and quantitative analysis the discussion can be built in two groups separately to give an accurate picture of the financial performances. First to discuss about the 10 projects selected for the study 3 projects were water supply project 1 was a flyover project and the other six were road projects. Because of the similar characteristics flyover project is analysed with the road projects but the difference can be seen in the fund allocation structure where construction material expenditure is higher than that of the road projects. Water supply projects are analysed separately.

Discussing the financial performance of the water projects they have all performed poorly which is reflected by the profit ratios being negative. The average gross profit ratio of water projects is -0.21 and the average net profit ratio is -0.19. The standard deviation of both the gross and net profit ratios are 0.21 which is higher hence the values deviation from the mean profit ratio is higher. The risk exposure of water projects are also high, financial strength indicated by the current and quick ratios are also poor in water projects except for project 4 which has a higher asset value relative to the liabilities. Reasoning the results of water supply projects with the qualitative data first and foremost the prime intention of the water projects has been maintaining pre-qualification not the profit generation. Secondly the initially planning of the water projects have been poor according to the qualitative data and lack of skilled staff has

been mentioned as a risk factor in the water projects in common which can also be a cause of poor performance. No monitoring procedure is established for water supply projects which can at least record the actual details of the project. In order to check the intention of the project undertaking for these selected projects the tender results were collected and the bid amount was analysed with the second lowest tender to have a rough idea regarding the margin. The analysis revealed following.

Project	Project type	Bid value	Second lowest	Margin	%
Project 1	Road	1,863,626,469.60	2,057,070,897.14	193,444,427.54	10.38%
Project 2	Road	7,140,457,892.01	Proposal		
Project 3	Road	4,420,099,716.00	4,994,712,679.08	574,612,963.08	13.00%
Project 4	Water supply	1,585,633,431.51	1,828,167,236.37	242,533,804.86	15.30%
Project 5	Road	4,409,006,128.63	4,778,480,842.21	369,474,713.58	8.38%
Project 6	Flyover	1,323,467,364.62	1,530,854,700.66	207,387,336.04	15.67%
Project 7	Water supply	811,000,000.00	Negotiated		
Project 8	Road	8,460,335,586.01	Proposal		
Project 9	Road	1,696,084,852.77	1,926,752,392.74	230,667,539.98	13.60%
Project 10	Water supply	755,531,986.69	Negotiated		

One water project has been won with a more than 15% lower price from the second lowest bid and the other two are negotiated

Discussing the road projects the average gross profit ratio of road projects is 0.17 and average net profit ratio is 0.19. The standard deviations of the two ratios are 0.06 and 0.07 respectively indicating the deviation from the mean lesser than that of water projects. Road projects also have a negative risk exposure but lesser than water supply projects. The standard deviation of the risk exposure is high indicating a higher deviation from the mean risk exposure. The financial strength of the road projects as indicated by the current and quick ratios are high indicating the project's capability to meet the short term financial liabilities well but the standard deviation of the current and quick ratios although lower than the water supply projects still maintain higher values.

Analysing the qualitative details of the road projects all the road projects are executed with the expectation of profit making and relative to the water projects the initial planning of the road projects are good. The road projects which have contract values of higher than 5 Bn are represented by a single representative without delegation and there is a structured method of managing stakeholders.

Relating the highlighted findings of the study with the initial aim and objectives, the financial details studied of the projects selected indicate the level usage of financial management in infrastructure projects. All these selected projects require large cash outlays and resources to function. Looking at the company organization structure it is apparent that the projects are handled across various functional divisions. Hence in an additional project undertaking the additional expenditure incurring due to it depends on the size and nature of the project. While the project operating expenditure is a total addition the running expenses of the functional divisions also have to be increased. Each and every project has a fund disbursement plan and a separate account within the organization which enables the recording and analysis of the project finances.

Since the corporate culture has been developed to have separate financial plans and accounts for each project the performance could also be recorded separately.

Analysing the financial performances of the projects as previously stated the organization has developed a comparatively strong financial management culture for road projects whereas it can be concluded that the financial management culture in water supply projects is poor. This shows that the experience of a particular construction organization within a particular type of infrastructure construction impacts the effectiveness of the financial management associated with the infrastructure project.

Finally discussing regarding the risk associated with the infrastructure construction projects and risk management of the construction organization it can be stated that 80% of the selected projects have not been able to manage the associated risks fully. But from the risk exposures it is apparent that with the experience within the type of construction the risk management capability of the construction organization improves. Studying the qualitative data gathered it can be seen the issues with the

financial management and risk management in road projects have mostly risen externally while in the water projects the external issues have contributed to much larger internal issues of unskilled staff, poor management, technology and lesser experience

6.5 Summary

The chapter illustrates the quantitative and qualitative data findings of the 10 numbers of projects studied along with the discussion of the particular findings. From the findings it was apparent that the water projects have to be separately analyses and that they have produced poor financial results. The risk exposure of the water projects was higher than that of road projects. From qualitative data analysis the details which explained the results of the quantitative data analysis were that the water supply projects were undertaken with the expectation of maintaining qualification hence the poor performance and high risk exposure is explained.

Chapter 7

7 CONCLUSIONS AND RECOMMENDATIONS

7.1 Summary of the Study

The study was conducted with the aim of analysing how financial management is carried out in large infrastructure construction projects. The study was stimulated by the facts that the infrastructure construction consumed a large resource base and had vast social impacts, but more often than not were financial blunders due to various reasons such as the complexity, technology involvement, and management issues. Studying reasons for the poor financial performance is not the focus of the study. To be particular the focus on financial performance of construction projects is a poorly studied subject. Construction project studies more often focus on the practical issues like planning and risks faced. The possibility of viewing the project entity as a profit maximizing undertaking is not common placed in construction industry which differs in characteristics to the other industries. Therefore the study is focused on analysing the existing practice of financial management in projects.

The 10 number of projects which were qualitatively and quantitatively studied revealed several factors which were discussed in the previous chapter. First deduction by the summary of quantitative data analysis is that the result differs with the infrastructure project type concluding that the nature of the project matters to the financial performance management.

The financial performance management is also effected by the intention with which the project is undertaken which is shown by the fact that all the water supply projects which were executed with the prime intention of maintaining pre-qualification were incurring losses.

Another fact which is seen in the study is that the projects which were pre-planned and budgeted along with a monitoring system to measure the actuals against planned have recorded good financial performances concluding that the goal with which the

financial performance management is carried out is effectively achieved by the initial planning.

From the findings and discussions a conclusion can be drawn as to the aim of the study which was to analyse how financial management was carried out with the infrastructure construction projects undertaken by a construction organization. The conclusion is that within the selected projects the construction organization has implemented financial management with different success levels as per the experience in similar types of construction. The company policy has facilitated separate accounts keeping and financial planning for infrastructure projects undertaken and the resulting return from the projects are reinvested in construction projects. The functional divisions across which the projects are handled also have been allocated a provisional budget with the size of the work load these divisions handle. Risk management capability also differs with the type of infrastructure construction in the construction organizations and improves with the experience in particular type.

The study was feasible because the financial account keeping and recording was done for the individual projects which would otherwise have been difficult. Regardless of the outcome of the project the importance of proper account keeping has been discussed in the literature review.

7.2 Conclusion

Concluding the study to answer the research problem how financial management is done for large infrastructure projects by construction organizations it can be stated that within this particular case financial management has following steps.

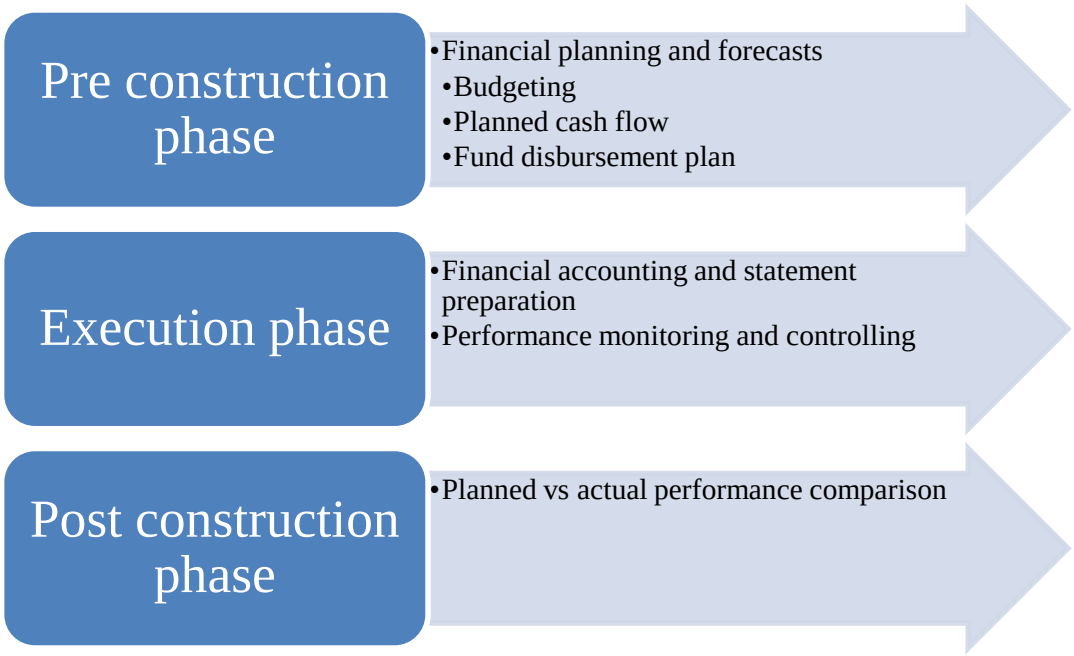


Figure 7-1: Financial management steps

It is also possible to be concluded from the data analysis that the method of financial management and the risk management capabilities differ with the type of project. The results of the quantitative data analysis showed that the financial performance of the road sector was better than that of the water supply sector. Qualitative data revealed that the company has lesser experience in water supply sector than the road sector and also the risks which the two project types faced differed. Hence the structure of management of the two types of projects also differed. Although not very significantly shown the project value also had effects on the management structure as shown by the qualitative data.

7.3 Recommendations

A little financial management can go a long way as proven by the study. How the particular organization has attempted at managing his finances are some basic requirements in financial management. There is a lot of room for improvements in financial management specially within the project execution phase. In this particular case it was stated that certain projects are being monitored and controlled within the operation phase. But the even the projects of the road sector which have done well financially have not in certain cases achieved the planned margin. Hence it is recommended that the control measures within the execution phase be improved than existing. It can also be recommended that the organization as a whole attempt at innovative financial management through financial engineering. Before the preparation of the questionnaire within a background search it was revealed that financial engineering is not a practise in the organization. Even though it might not be feasible perhaps at the project level it can be attempted as a construction organization and would be a positive addition to the construction industry as a whole.

7.4 Limitations

Since the study involved financial details the accessible data were limited hence the study had to be limited to a case study within a single construction company. The study would have been capable of generalization if the study was conducted across several organizations and multiple types of infrastructure projects which would reveal more factors.

7.5 Further research

Following qualitative and quantitative topics can be recommended as further research

1. The success criteria of financial management in construction industry
2. Does financial management drive the construction project performance?
3. Does the financial performance differ with the type of construction?
4. Factors impacting the financial management of infrastructure projects
5. Financial managers as construction industry employees

8 REFERENCES

Akalu, M.M. (2002). The process of investment appraisal: the experience of 10 large British and Deutch companies. *International journal of project management*, 21(2003), 355-362. Doi: 10.1016/s0263-7863(02)00051

Balkiz, Y., Therese, L.W. (2014). Small but complex: the construction industry in North Cyprus. *Procedia social and behavioural science*, 119 (2014), 466-474. Doi: 10.1016/j.sbspro.2014.03.052

Baloi, D., Price, A.D.F. (2002). Modelling global risk factors affecting construction cost performance. *International journal of project management*, 21(2003), 261-269. Doi: 10.1016/s0263-7863(02)00017-0

Benjaoran, V. (2008). A cost control system development: A collaborative approach for small and medium sized contractors. *International journal of project management*, 27(2009), 270-277. Doi: 10.1016/j.ijproman.2008.02.004

Bittner, E. (1965). *The concept of organization* (Social research 32(3), 239-255). Retrieved from http://edoc.zhbluzern.ch/oaj/es/ethnographic_studies_13_17.pdf

Bobera, D. (2008). Project management organization. Management information systems, 3(2008), 003-009. Retrieved from http://www.ef.uns.ac.rs/mis/archive-pdf/2008%20-%20No1/MIS2008_1_1.pdf

Caron, F., Fumagalli, M., & Rigamonti, A. (2007). Engineering and contracting projects: a value at risk based approach to portfolio balancing. *International journal of project management*, 25(2007), 569-578. Doi: 10.1016/j.ijproman.2007.01.016

Central Bank. (2013). *Annual Report*. Retrieved from http://www.cbsl.gov.lk/pics_n_docs/ 10_pub/_docs/efr/annual_report/AR2013/English/content.htm

Chen, H.L., Liu, C.H., Chen, C.I., & Wei, N.C. (2012). Estimating a project's profitability: a longitudinal approach. *International journal of project management*, 31(2013), 400-410. Doi: 10.1016/j.ijproman.2012.09.009

Creswell, J.W. (2019). *Research Design – Qualitative, Quantitative and mixed methods approaches*. New Delhi, India.

Croce, D.R., & Yermo, J. (2013). *Institutional investors and infrastructure financing* (OECD working papers on finance, insurance and private pensions – No.36). Retrieved from http://doi.org/10.1787/5k3wh99xgc33-en

Department of Census and Statistics. (2008). *Annual survey of construction industries 2008*. Retrieved from http://www.statistics.gov.lk/industry/Annual%20Servry%20of%20Construction%20Industries_2008.pdf

Department of Census and Statistics. (2013). *Annual survey of construction industries 2013*. Retrieved from http://www.statistics.gov.lk/industry/SCI_Final_Report_2013.pdf

Department of Census and Statistics. (2014). *National accounts of Sri Lanka 2014*. Retrieved from http://www.statistics.gov.lk/national_accounts/Annual2014/Annual2014.pdf

Diaz, P., (2007) *Project management organizational structures*. Retrieved from http://www.classtoolkit.org/sites/default/files/documents/PM4DEV_Project_Management_Structures.pdf

Dieguez, A.I.I., Lopez, C.M., & Luque, R.A. (2014). Financial management of large projects: A research gap. *Procedia economics and finance*, 23(2015), 652-657. Doi: 10.1016/s2212-5671(15)00495-5

Dunovic, I.B., Radujkovic, M., & Skreb, K.A. (2014). Towards a new model of complexity – the case of large infrastructure projects. *Procedia social and behavioural sciences*, 119(2014), 730-738. Doi: 10.1016/j.sbspro.2014.03.082

Dziadosz, A., Tomczyk, A., & Kaplinski, O. (2015). Financial financial risk estimation in construction contracts. *Procedia engineering*, 122(2015), 120-128). Doi: 10.1016/j.proeng.2015.10.015

Ehlers, T. (2014). *Understanding the challenges of infrastructure finance* (BIS working papers No. 454). Retrieved from http://www.bis.org/publ/work454.pdf

Elazouni, A., Alghazi, A., & Selim, S.Z. (2014). Finance based scheduling using meta heuristics: discrete vs continuous optimization problems. *Journal of financial management of property and construction*, 20(2015), 85-104. Doi: 10.1108/JFMPC-07-2014-0013

Halawa, W.S., Abdelaim, A.M.K., & Elrashed, I.A. (2012). Financial evaluation program for construction projects at the pre investment phase in developing phase in developing countries: A case study. *International journal of project management*, 31(2013), 912-923. Doi: 10.1016/j.ijproman.2012.11.001

Hermans, M., Eisma, P. (2015). Behind the scenes of public construction clients-collecting data on commissioning activities and organizational approach. *Procedia economic and finance*, 21(2015), 391-398. Doi: 10.1016/s2212-5671(15)00191-4

Hwee, N.G., Tiong, R.L.K. (2001). Model on cash flow forecasting and risk analysis for contracting firms. *International journal of project management*, 20(2002), 351-363. Doi: s0263-7863(01)00037-0

Hyvari, I. (2014). Project portfolio management in a company strategy implementation, a case study. *Procedia social and behavioural sciences*, 119(2014), 229-236. Doi: 10.1016/j.sbspro.2014.03.027

Jaffar, N., Tharim, A.H.A., & Shuib, M.N. (2011). Factors of conflict in construction industry: a literature review. *Procedia engineering*, 20(2011), 193-202. Doi: 10.1016/j.proeng. 2011.11.156

Kun, G. (2004). *Measuring cyclical fluctuations in construction investment.* Israel: Central Bureau of Statistic. Retrieved from: http://www.cbs.gov.il/publications/helsinki.pdf

Kothari, C.R., (2004). *Research methodology methods and techniques*. New Delhi: India

Laegaard, J., & Bindslev, M. (2006). *Organizational theory*. Retrieved from http://fbemoodle.emu.edu.tr/file.php/777/organizational-theory.pdf

Lidelow, H., Simu, K. (2015). Understanding construction contractors and their operations strategies. *Procedia economics and finance*, 21(2015), 48-56. Doi: 10.1016/s2212-5671(15)00149-5

Malkat, M., & Gyoo, K.B., *An investigation on the stakeholders of construction projects in Dubai and adjacent regions*. University of Nottinham. Retrieved from http://www.ipedr.com/vol45/016-ICMTS2012-M00008.pdf

Marshall, J.F. & Bansal, V.K. (2010). *Financial Engineering – a complete guide to financial innovation*. New Delhi, India.

Masrom, M.A.N., Rahim, M.H.I.A., Mohamed, S., Chen, G.K., & Yunus, R. (2015). Successful criteria for large infrastructure projects in Malaysia. *Procedia engineering*, 125(2015), 143-149. Doi: 10,1016/j.proeng.2015.11.021

Matsukawa, T., & Habeck, O. (2007). *Review of risk mitigation instruments for infrastructure financing and recent trends and developments* (The World Bank). Retrieved from https://www.ppiaf.org/sites/ppiaf.org/files/publication/Trends%20Policy%20Options-4-Review%20of%20Risk%20Mitigation%20Instrument%20-%20TMatsukawa%20OHabeck.pdf

Mc.Auley, J., Duberley, J., & Johnson, P. (2007). *Organization Theory : Challenges and perspectives*. Retrieved from http://www.nimarket.ir/pdf/modiran90/Organization%20Theory.pdf

Mohamed, S., McCowan, A.K. (1999). Modelling project investment decision under uncertainty using possibility theory. *International journal of project management*, 19(2001), 231-241. Doi: 10.1016/s0263-7863(99)00017-0

Montana, P., & Charnov, B. *Management: A streamlined course for students and business people* (pp 155-169). Retrieved from http://www.ils.unc.edu/daniel/405/Montana11.pdf

Natural Resources Management and Environment Department. *Organizational theories*. Retrieved from http://www.fao.org/docrep/w7503e/w7503e03.html

OECD. (2015). *Infrastructure financing instruments and incentives*. Retrieved from http://www.oecd.org/finance/private-pensions/Infrastructure-Financing-Instruments-and-Incentives.pdf

OECD. (2015). *Mapping of instruments and incentives for infrastructure financing: A taxonomy*. Retrieved from http://www.oecd.org/finance/private-pensions/Infrastructure-Financing-Instruments-and-Incentives.pdf

Ofori, G. (1980). *The construction industries of developing countries : the applicability of existing theories and strategies for their improvement and lessons for the future. The case of Ghana* (Doctoral dissertation). Retrieved from http://discovery.ucl.ac.uk/1317715/1/279216.pdf

Paramasivan, C., & Subramanian, T. *Financial management*. Retrieved from http://vcmdrp.tums.ac.ir/files/financial/istgahe_mali/moton_english/financial_management_[www.accfile.com].pdf

Platon, V.,Frone, S., & Constantinescu, A. (2013). Financial and economic risks to public projects. *Procedia economics and finance*, 8(2014), 204-210. Doi: 10.1016/s2212-5671(14)00082-3

Purnus, A., Bodea, C.N. (2014). Project prioritization and portfolio performance management in project oriented organizations. *Procedia social and behavioural sciences*, 119(2014), 339-348. Doi: 10.1016/j.sbspro.2014.03.039

Raisanen, C., Josephsson, P.E., & Luvo, B. (2015). Stakeholders' views and experiences of leadership education in construction: suggestions for improvements. *Procedia economics and finance*, 21(2015), 540-547. Doi: 10.1016/s2212-5671(15)00210-5

Rameezdeen, R. (2006). *Construction sector in Sri Lanka* (COWAM seminar). Retrieved from http://cowam.tec-hh.net/060419_Construction_Sector_SL.pdf

Rameezedeen, R., Zainudeen, N., & Ramachandra, (2004) T. *Study of linkages between the construction sector and other sectors of the Sri Lankan economy*. Moratuwa, Sri Lanka: University of Moratuwa, Department of Building Economics. Retrieved from https://www.iioa.org/conferences/15th/pdf/rameezdeen.pdf

Ray, S. 2015. Infrastructure Finance and Financial Sector Development. ABDI Working Paper 522. Tokyo: Asian Development Bank Institute. Available: http://www.abdi.org/working-paper /2015/04/13/6593.investment.finance.sector.dev/

Rezakhani, P. (2012), C*lassifying key risk factors in construction projects*. Korea: Kyungpook National University.

Riemann, S., Spang, K. (2014). Application of contractor's knowledge in public financed infrastructure projects in Germany. *Procedia social and behavioural sciences*, 119(2014), 202-209. Doi: 10.1016/j.sbspro.2014.03.024

Salawu, R.A., Abdullah, F. (2014). Assessing risk management maturity of construction organizations on infrastructural project delivery in Nigeria. *Procedia social and behavioural sciences*, 172(2015), 643-650. Doi: 10.1016/j.sbspro.2015.01.414

Sato, T., Hirao, M., (2012). Optimum budget allocation methods for projects with critical risk. *International journal of project management*, 31(2013), 126-135. Doi: 10.1016/j.ijproman.2012.04.002

Schewartz, J.Z., Nunez, F.R., & Chelsky, J. (2014). *Closing the infrastructure finance gap: addressing risk*. Retrieved from http://www.rba.gov.au/publications/confs/2014/pdf/schwartz-ruiz-nunez-chelsky.pdf

Serpell, A., Rubio, L., Arauzo, S., Ferrada, X. (2014). Evaluating risk management practices in construction organisations. Procedia social and behavioural scineces, 194(2015), 201-210. Doi:10.1016/j.sbspro.2015.06.135

Shatrevich, V. (2013). Industrial structures as a competitive factor in organization development. *Procedia social and behavioural sciences*, 110 (2014), 871-878. Doi: 10.1016/j.sbspro.2013.12.932

Solis, J.L.F. (2007). *Systematic nature of construction industry* (CIB World building congress 2007). Texas, United States: Texas A&M University, College of Architecture. Retrieved from http://faculty.arch.tamu.edu/media/cms_page_media/3141/The%20Systemic%20Nature%20of%20the%20Construction%20Industry.pdf

Warren, C.S., Reeve, J.M., & Duchac, J.E. (2009). *Financial accounting concepts, methods and applications*. New Delhi: Cengage Learning

Whyte, J., Stasis, A., & Lindkvist, C. (2015). Managing change in delivery of complex projects: configuration management, asset information and big data. *International journal of project management*, doi:10.1016/j.ijproman. 2015.02.006

Xenidis, Y., Stavrakas, E. (2013). Risk based budgeting of infrastructure projects. *Procedia social and behavioural sciences*, 74(2013), 478-487. Doi: 10.1016/j.sbspro.2013.03.049

Zavadskas, E.K., Ustinovichius, L., & Stasiulionis, A. (2004). Multicriteria valuation of commercial construction projects for investment purposes. *Journal of civil engineering and management*, 10(2), 151-166. Doi: 10.1080/ 13923730.2004.9636299

9 ANNEXURES

9.1 Annexure 1 : Questionnaire Sample

Questionnaire

Dear All,

This is an academic questionnaire which is distributed with the intention of obtaining financial management practices of your project. It is known fact that the construction industry is difficult to be standardized or fit into any regular procedures or frameworks which originates from its characteristics. Hence risk associated with the industry is higher. This affects the stakeholders of the industry significantly and becomes a concern when considering the stability and the continuity of the industry.

Analyzing the culture of the industry in Sri Lanka, Contractor's role is important in the successful execution of the construction project and also Contractor becomes the party who has to bear the major portion of the risk. The capacity of contractors to bear all these risks and stay in business is not only important from the side of the contractor but also from the industry perspective as well. Hence practices like financial management are important.

It is important to improve the financial management practices of contractors but before that it would help to get a knowledge of how the contractors cope up with large projects in the present scenario. This questionnaire is intended to capture the qualitative aspects of project management practices with regard to financial management.

Declaration

I hereby declare that this information is used for academic purposes only and by no account be revealed to a third party who can affect your business competitiveness and be harmful to you socially or politically.

……

S.C.R.K. Rambukwella (118437T)

QUESTIONNAIRE REGARDING PROJECT FINANCIAL MANAGEMENT

Project Number: _____

Project Scope: _____

_____

_____

Contract value: _____

Respondent Name (Optional): _____

Designation: _____

Please tick (√) the appropriate answer / answers where applicable

1.0 General project details

Description	Yes	No
Do you realize the project as a separate profit center?		
Have you done the initial planning documents of the project?		
Do you have a monitoring and controlling mechanism established in the project?		
Did you have a structured mechanism to manage stakeholders of the project		

How was the decision making authority and project representing capability of the staff delegated?

Fully Delegated	Partially Delegated	Not Delegated	Delegated as and when necessary

What was the major interest of the company in undertaking the project?

Profit making	Social recognition	Maintaining qualification	Survival	Other

2.0 Project Financial Management

What is the financial arrangement of the project?

Arrangement	Description	√
Separate financing	Individual arrangement, none other than only the specifically allocated resources are used for the project	
Integrated financing	Project financing and resources are not separately identified. As and when the requirement occurs fulfil it with any resource the company possess.	
Separate account keeping	Account keeping is separate for each project	
Integrated account keeping	Single profit and loss account is prepared for the company	

What is the financing structure, cost of finance and profit treatment method of the project?

Financing method	√	Cost of finance (%)	Profit treatment method	√
Retained profit			Re invest in construction projects	
Bank loans			Re invest in another trade	
Advance payment and project revenue			Distribute as dividend	

Tick the average period until an investment produced returns for this project (Payment lag for work done)

Less than 1 month	1 month	2 month	3 months	More than 3 months

Did you have financial management practices involved with the project?

Question	Yes	No
Was financial planning executed to the project?		
Were the financial performance measurement procedures established?		
Were the financial statements done periodically for the project?		
Did the project achieve the planned return?		

3.0 Project risk management

Stage of Risk Identification and Impact Recognition

Item	Risk description	Identified project stage			Project goal impacted by the risk			Quantified the risk
		Initiation	Execution	Closure	Time	Cost	Quality	
1	**Financial**							
1.1	*Inflation*							
1.2	*Funding*							
1.3	*Delayed payment*							
1.4	*Cash flow*							
1.5	*Currency risk*							
1.6	*Credit risk*							
1.7	*Liquidity risk*							
2	**Operational**							
2.1	*Unforeseen site conditions*							
2.2	*Safety*							
2.3	*Unavailability of resources*							
2.4	*Unskilled staff*							
2.5	*Lack of technology*							
3	**Management**							
3.1	*Decision making*							
3.2	*Planning and controlling*							
3.3	*Communication*							
4	**Engineering**							
4.1	*Design errors and changes*							
4.2	*Scheduling*							
4.3	*Approval delays*							
5	**External**							
5.1	*Project stakeholders*							
5.2	*Environmental issues*							
5.3	*Government regulations*							
5.4	*Social and political issues*							

Developing Risk Response

Accept - Accept the risk and make allowances to absorb impact

Mitigate - Risk elimination or reduce risk impact on to an acceptable level

Transfer - Transfer the risk to another party who is better equipped at handling it

Avoid - Total avoidance either through planning or omitting part performance

Monitor - Allow the risk to occur and monitor it

Item	Risk description	Risk response				
		Accept	**Mitigate**	**Transfer**	**Avoid**	**Monitor**
1	**Financial**					
1.1	*Inflation*					
1.2	*Funding*					
1.3	*Delayed payment*					
1.4	*Cash flow*					
1.5	*Currency risk*					
1.6	*Credit risk*					
1.7	*Liquidity risk*					
2	**Operational**					
2.1	*Unforeseen site conditions*					
2.2	*Safety*					
2.3	*Unavailability of resources*					
2.4	*Unskilled staff*					
2.5	*Lack of technology*					
3	**Management**					
3.1	*Decision making*					
3.2	*Planning and controlling*					
3.3	*Communication*					
4	**Engineering**					
4.1	*Design errors and changes*					
4.2	*Scheduling*					
4.3	*Approval delays*					
5	**External**					
5.1	*Project stakeholders*					
5.2	*Environmental issues*					
5.3	*Government regulations*					
5.4	*Social and political issues*					

Risk Management Measure Adopted

Item	Risk description	Attempt at risk management				
		Transfer or share by contract or agreement	**Insure against**	**Plan and control against**	**Design against**	**Make allowances by budget**
1	**Financial**					
1.1	*Inflation*					
1.2	*Funding*					
1.3	*Delayed payment*					
1.4	*Cash flow*					
1.5	*Currency risk*					
1.6	*Credit risk*					
1.7	*Liquidity risk*					
2	**Operational**					
2.1	*Unforeseen site conditions*					
2.2	*Safety*					
2.3	*Unavailability of resources*					
2.4	*Unskilled staff*					
2.5	*Lack of technology*					
3	**Management**					
3.1	*Decision making*					
3.2	*Planning and controlling*					
3.3	*Communication*					
4	**Engineering**					
4.1	*Design errors and changes*					
4.2	*Scheduling*					
4.3	*Approval delays*					
5	**External**					
5.1	*Project stakeholders*					
5.2	*Environmental issues*					
5.3	*Government regulations*					
5.4	*Social and political issues*					

9.2 Annexure 2 : Project Income Expenses Statements

			INCOME EXPENDITURE STATEMENT		
		Ref. No.			
PROJECT / ACTIVITY CENTRE	**Project 1**				
NO	**DESCRIPTION**		**UP TO END OF LAST MONTH**	**THIS MONTH**	**UP TO END OF THIS MONTH**
	INCOME (EXCLUDING TAXES)				
01	ADVANCE PAYMENT RECEIVED		353,305,514.40		353,305,514.40
02	PROGRESS PAYMENT RECEIVED		1,681,545,328.74		1,681,545,328.74
03	OTHER INCOME RECEIVED (INSURANCE CLAIM)		2,027,074.00		2,027,074.00
04	**TOTAL RECEIVED**	1+2+3 +3A	**2,036,877,917.14**	-	**2,036,877,917.14**
05	COST OF MATERIALS SUPPLIED BY CLIENT				-
06	**TOTAL RECEIVED WITH MATERIALS SUPPLIED BY CLIENT**	4+5	2,036,877,917.14	-	2,036,877,917.14
	EXPENDITURE				
07	PAYMENT BY CASH OR CHEQUE		1,275,489,487.40	58,362.03	1,275,547,849.43
08	MACHINARY,ASSETS,SCAFFOLDING,TRANSPORTS & OTHER CHARGES		49,372,139.75	-	49,372,139.75
09	COST OF MATERIALS RECEIVED FROM OTHER SITE OR HEAD OFFICE		354,678,713.83	-	354,678,713.83
10	LESS: COST OF MATERIALS TRANSFERRED TO OTHER SITE OR HEAD OFFICE		28,423,408.83	-	28,423,408.83
11	**TOTAL EXPENDITURE**	7+8+9-10	**1,651,116,932.15**	**58,362.03**	**1,651,175,294.18**
12	HEAD OFFICE OVERHEAD		105,984,691.50	-	105,984,691.50
13	FINANCE COST			-	-
14	**TOTAL EXPENDITURE WITH HEAD OFFICE OVERHEAD & FINANCE COST**	11+12 +13	**1,757,101,623.66**	**58,362.03**	**1,757,159,985.69**
15	ADD: BILLS PAYABLE		1,101,324.36	-	1,101,324.36
16	**TOTAL EXPENDITURE WITH BILLS PAYABLE**	14+15	**1,758,202,948.02**	**58,362.03**	**1,758,261,310.05**
17	COST OF MATERIALS SUPPLIED BY CLIENT		-	-	-
18	**TOTAL EXPENDITURE WITH MATERIAL SUPPLIED BY CLIENT**	16+17	**1,758,202,948.02**	**58,362.03**	**1,758,261,310.05**
19	ACTUAL VALUE OF WORK DONE (EXCLUDING MATERIALS SUPPLIED BY CLIENT)		1,766,411,525.02	-	1,766,411,525.02
20	COST OF MATERIALS SUPPLIED BY CLIENT		-	-	-
21	**ACTUAL VALUE OF WORK DONE (INCLUDING MATERIALS SUPPLIED BY CLIENT**	19+20	1,766,411,525.02	-	1,766,411,525.02
22	ADD: PRICE ESCALATION (IF NOT INCLUDED IN ITEM NO.19)		268,439,318.22	-	268,439,318.22
23	**TOTAL VALUE OF WORK DONE**	21+22	**2,034,850,843.24**	**-**	**2,034,850,843.24**
24	VALUE OF UNUSED MATERIAL AT SITE		316,830.73		316,830.73
25	**TOTAL VALUE OF WORK DONE & UNUSED MATERIALS AT SITE**	23+24	**2,035,167,673.97**	**-**	**2,035,167,673.97**
					-
26	**CASH FLOW**	**4-14**	**279,776,293.48**	**(58,362.03)**	**279,717,931.45**
27	**COST OVERRUN / SURPLUS**	**25-18**	**276,964,725.95**	**(58,362.03)**	**276,906,363.92**
28	CAPITAL ASSETS PURCHASED		15,953,998.26		15,953,998.26
29	LESS: REPAYMENT AS INDICATED IN ITEM NO. 08 B		15,953,998.26	-	15,953,998.26
30	ADVANCE PAYMENT MADE BUT NOT RECOVERD				-
31	VAT INPUT REIMBURSEMENT AVAILABLE				-

	Prepared By	**Checked By**	**Checked By Head Office**	**Approved By**
Signature				
Date				
Name				
Designation				

INCOME EXPENDITURE STATEMENT

Ref. No.

PROJECT / ACTIVITY CENTRE **Project 2**

NO	DESCRIPTION		UP TO END OF LAST MONTH	THIS MONTH	UP TO END OF THIS MONTH
	INCOME (EXCLUDING TAXES)				
01	ADVANCE PAYMENT RECEIVED		1,278,230,830.78		1,278,230,830.78
02	PROGRESS PAYMENT RECEIVED		6,717,438,380.55		6,717,438,380.55
03	OTHER INCOME RECEIVED (INSURANCE CLAIM)				-
04	**TOTAL RECEIVED**	1+2+3 +3A	**7,995,669,211.33**	-	**7,995,669,211.33**
05	COST OF MATERIALS SUPPLIED BY CLIENT				-
06	**TOTAL RECEIVED WITH MATERIALS SUPPLIED BY CLIENT**	4+5	7,995,669,211.33	-	7,995,669,211.33
	EXPENDITURE				
07	PAYMENT BY CASH OR CHEQUE		4,116,170,812.95	3,873,705.75	4,120,044,518.70
08	MACHINARY,ASSETS,SCAFFOLDING,TRANSPORTS & OTHER CHARGES		540,726,137.12	392,500.00	541,118,637.12
09	COST OF MATERIALS RECEIVED FROM OTHER SITE OR HEAD OFFICE		2,633,175,181.69	-	2,633,175,181.69
10	LESS: COST OF MATERIALS TRANSFERRED TO OTHER SITE OR HEAD OFFICE		1,050,184,012.11	-	1,050,184,012.11
11	**TOTAL EXPENDITURE**	7+8+9-10	**6,239,888,119.65**	**4,266,205.75**	**6,244,154,325.40**
12	HEAD OFFICE OVERHEAD		557,360,126.89	-	557,360,126.89
13	FINANCE COST		-	-	-
14	**TOTAL EXPENDITURE WITH HEAD OFFICE OVERHEAD & FINANCE COST**	11+12 +13	**6,797,248,246.54**	**4,266,205.75**	**6,801,514,452.29**
15	ADD: BILLS PAYABLE		7,038,754.11	(264,757.28)	6,773,996.83
16	**TOTAL EXPENDITURE WITH BILLS PAYABLE**	14+15	**6,804,287,000.65**	**4,001,448.47**	**6,808,288,449.12**
17	COST OF MATERIALS SUPPLIED BY CLIENT		-	-	-
18	**TOTAL EXPENDITURE WITH MATERIAL SUPPLIED BY CLIENT**	16+17	**6,804,287,000.65**	**4,001,448.47**	**6,808,288,449.12**
19	ACTUAL VALUE OF WORK DONE (EXCLUDING MATERIALS SUPPLIED BY CLIENT)		8,654,185,539.02	-	8,654,185,539.02
20	COST OF MATERIALS SUPPLIED BY CLIENT		-	-	-
21	**ACTUAL VALUE OF WORK DONE (INCLUDING MATERIALS SUPPLIED BY CLIENT**	19+20	8,654,185,539.02	-	8,654,185,539.02
22	ADD: PRICE ESCALATION (IF NOT INCLUDED IN ITEM NO.19)		635,149,909.12	-	635,149,909.12
23	**TOTAL VALUE OF WORK DONE**	21+22	**9,289,335,448.14**	**-**	**9,289,335,448.14**
24	VALUE OF UNUSED MATERIAL AT SITE		12,093,886.12	-	12,093,886.12
25	**TOTAL VALUE OF WORK DONE & UNUSED MATERIALS AT SITE**	23+24	**9,301,429,334.26**	**-**	**9,301,429,334.26**
					-
26	**CASH FLOW**	**4-14**	**1,198,420,964.79**	**(4,266,205.75)**	**1,194,154,759.04**
27	**COST OVERRUN / SURPLUS**	**25-18**	**2,497,142,333.61**	**(4,001,448.47)**	**2,493,140,885.14**
28	CAPITAL ASSETS PURCHASED		122,169,666.03		122,169,666.03
29	LESS: REPAYMENT AS INDICATED IN ITEM NO. 08 B		122,169,666.03	-	122,169,666.03
30	ADVANCE PAYMENT MADE BUT NOT RECOVERD				-
31	VAT INPUT REIMBURSEMENT AVAILABLE		12,258,485.12		12,258,485.12

	Prepared By	Checked By	Checked By Head Office	Approved By
Signature				
Date				
Name				
Designation				

INCOME EXPENDITURE STATEMENT

Ref. No.

PROJECT / ACTIVITY CENTRE **Project 3**

NO	DESCRIPTION		UP TO END OF LAST MONTH	THIS MONTH	UP TO END OF THIS MONTH
	INCOME (EXCLUDING TAXES)				
01	ADVANCE PAYMENT RECEIVED		686,064,787.43		686,064,787.43
02	PROGRESS PAYMENT RECEIVED		2,620,502,682.20	89,472,552.02	2,709,975,234.22
03	OTHER INCOME RECEIVED (INSURANCE CLAIM)		1,948,224.32	683,916.73	2,632,141.05
04	**TOTAL RECEIVED**	1+2+3 +3A	**3,308,515,693.95**	90,156,468.75	**3,398,672,162.70**
05	COST OF MATERIALS SUPPLIED BY CLIENT				-
06	**TOTAL RECEIVED WITH MATERIALS SUPPLIED BY CLIENT**	4+5	3,308,515,693.95	90,156,468.75	3,398,672,162.70
	EXPENDITURE				
07	PAYMENT BY CASH OR CHEQUE		1,685,842,655.74	17,257,216.90	1,703,099,872.64
08	MACHINARY,ASSETS,SCAFFOLDING,TRANSPORTS & OTHER CHARGES		175,963,225.33	1,874,772.04	177,837,997.37
09	COST OF MATERIALS RECEIVED FROM OTHER SITE OR HEAD OFFICE		1,256,820,642.17	9,779,065.86	1,266,599,708.03
10	LESS: COST OF MATERIALS TRANSFERRED TO OTHER SITE OR HEAD OFFICE		531,676,725.17	9,553,057.67	541,229,782.84
11	**TOTAL EXPENDITURE**	7+8+9-10	**2,586,949,798.07**	**19,357,997.13**	**2,606,307,795.20**
12	HEAD OFFICE OVERHEAD		224,284,483.72	1,385,362.00	225,669,845.72
13	FINANCE COST		-	-	-
14	**TOTAL EXPENDITURE WITH HEAD OFFICE OVERHEAD & FINANCE COST**	11+12 +13	**2,811,234,281.79**	**20,743,359.13**	**2,831,977,640.92**
15	ADD: BILLS PAYABLE		9,403,270.39	(952,744.52)	8,450,525.87
16	**TOTAL EXPENDITURE WITH BILLS PAYABLE**	14+15	**2,820,637,552.18**	**19,790,614.61**	**2,840,428,166.79**
17	COST OF MATERIALS SUPPLIED BY CLIENT		-	-	-
18	**TOTAL EXPENDITURE WITH MATERIAL SUPPLIED BY CLIENT**	16+17	**2,820,637,552.18**	**19,790,614.61**	**2,840,428,166.79**
19	ACTUAL VALUE OF WORK DONE (EXCLUDING MATERIALS SUPPLIED BY CLIENT)		3,566,558,531.77	23,089,366.61	3,589,647,898.38
20	COST OF MATERIALS SUPPLIED BY CLIENT		-	-	-
21	**ACTUAL VALUE OF WORK DONE (INCLUDING MATERIALS SUPPLIED BY CLIENT**	19+20	3,566,558,531.77	23,089,366.61	3,589,647,898.38
22	ADD: PRICE ESCALATION (IF NOT INCLUDED IN ITEM NO.19)		171,516,196.86	-	171,516,196.86
23	**TOTAL VALUE OF WORK DONE**	21+22	**3,738,074,728.63**	**23,089,366.61**	**3,761,164,095.24**
24	VALUE OF UNUSED MATERIAL AT SITE		6,263,381.23	1,042,043.97	7,305,425.20
25	**TOTAL VALUE OF WORK DONE & UNUSED MATERIALS AT SITE**	23+24	**3,744,338,109.86**	**24,131,410.58**	**3,768,469,520.44**
					-
26	**CASH FLOW**	**4-14**	**497,281,412.16**	**69,413,109.62**	**566,694,521.78**
27	**COST OVERRUN / SURPLUS**	**25-18**	**923,700,557.68**	**4,340,795.97**	**928,041,353.65**
28	CAPITAL ASSETS PURCHASED		24,805,891.48		24,805,891.48
29	LESS: REPAYMENT AS INDICATED IN ITEM NO. 08 B		24,805,891.48	-	24,805,891.48
30	ADVANCE PAYMENT MADE BUT NOT RECOVERD				-
31	VAT INPUT REIMBURSEMENT AVAILABLE		8,596,727.90		8,596,727.90

	Prepared By	Checked By	Checked By Head Office	Approved By
Signature				
Date				
Name				
Designation				

INCOME EXPENDITURE STATEMENT

Ref. No.

PROJECT / ACTIVITY CENTRE **Project 4**

NO	DESCRIPTION		UP TO END OF LAST MONTH	THIS MONTH	UP TO END OF THIS MONTH
	INCOME (EXCLUDING TAXES)				
01	ADVANCE PAYMENT RECEIVED		251,946,232.07		251,946,232.07
02	PROGRESS PAYMENT RECEIVED		1,606,945,021.29		1,606,945,021.29
03	OTHER INCOME RECEIVED (INSURANCE CLAIM)		97,851,378.28		97,851,378.28
04	**TOTAL RECEIVED**	1+2+3 +3A	**1,956,742,631.64**	-	**1,956,742,631.64**
05	COST OF MATERIALS SUPPLIED BY CLIENT				-
06	**TOTAL RECEIVED WITH MATERIALS SUPPLIED BY CLIENT**	4+5	1,956,742,631.64	-	1,956,742,631.64
	EXPENDITURE				
07	PAYMENT BY CASH OR CHEQUE		1,307,116,975.26		1,307,116,975.26
08	MACHINARY,ASSETS,SCAFFOLDING,TRANSPORTS & OTHER CHARGES		41,236,762.14		41,236,762.14
09	COST OF MATERIALS RECEIVED FROM OTHER SITE OR HEAD OFFICE		740,213,438.22	8,477,241.72	748,690,679.94
10	LESS: COST OF MATERIALS TRANSFERRED TO OTHER SITE OR HEAD OFFICE		11,799,693.67		11,799,693.67
11	**TOTAL EXPENDITURE**	7+8+9-10	**2,076,767,481.95**	**8,477,241.72**	**2,085,244,723.67**
12	HEAD OFFICE OVERHEAD		112,751,213.39	(3,025,562.33)	109,725,651.06
13	FINANCE COST		-	-	-
14	**TOTAL EXPENDITURE WITH HEAD OFFICE OVERHEAD & FINANCE COST**	11+12 +13	**2,189,518,695.34**	**5,451,679.39**	**2,194,970,374.73**
15	ADD: BILLS PAYABLE			35,000.00	35,000.00
16	**TOTAL EXPENDITURE WITH BILLS PAYABLE**	14+15	**2,189,518,695.34**	**5,486,679.39**	**2,195,005,374.73**
17	COST OF MATERIALS SUPPLIED BY CLIENT		-	-	-
18	**TOTAL EXPENDITURE WITH MATERIAL SUPPLIED BY CLIENT**	16+17	**2,189,518,695.34**	**5,486,679.39**	**2,195,005,374.73**
19	ACTUAL VALUE OF WORK DONE (EXCLUDING MATERIALS SUPPLIED BY CLIENT)		1,886,728,157.40	(50,426,038.83)	1,836,302,118.57
20	COST OF MATERIALS SUPPLIED BY CLIENT		-	-	-
21	**ACTUAL VALUE OF WORK DONE (INCLUDING MATERIALS SUPPLIED BY CLIENT**	19+20	1,886,728,157.40	(50,426,038.83)	1,836,302,118.57
22	ADD: PRICE ESCALATION (IF NOT INCLUDED IN ITEM NO.19)			-	-
23	**TOTAL VALUE OF WORK DONE**	21+22	**1,886,728,157.40**	**(50,426,038.83)**	**1,836,302,118.57**
24	VALUE OF UNUSED MATERIAL AT SITE				-
25	**TOTAL VALUE OF WORK DONE & UNUSED MATERIALS AT SITE**	23+24	**1,886,728,157.40**	**(50,426,038.83)**	**1,836,302,118.57**
					-
26	**CASH FLOW**	**4-14**	**(232,776,063.70)**	**(5,451,679.39)**	**(238,227,743.09)**
27	**COST OVERRUN / SURPLUS**	**25-18**	**(302,790,537.94)**	**(55,912,718.22)**	**(358,703,256.16)**
28	CAPITAL ASSETS PURCHASED		2,606,559.76		2,606,559.76
29	LESS: REPAYMENT AS INDICATED IN ITEM NO. 08 B		2,606,559.76	-	2,606,559.76
30	ADVANCE PAYMENT MADE BUT NOT RECOVERD				-
31	VAT INPUT REIMBURSEMENT AVAILABLE		41,110,286.52		41,110,286.52

	Prepared By	Checked By	Checked By Head Office	Approved By
Signature				
Date				
Name				
Designation				

INCOME EXPENDITURE STATEMENT

Ref. No.

PROJECT / ACTIVITY CENTRE **Project 5**

NO	DESCRIPTION		UP TO END OF LAST MONTH	THIS MONTH	UP TO END OF THIS MONTH
	INCOME (EXCLUDING TAXES)				
01	ADVANCE PAYMENT RECEIVED		388,808,729.10		388,808,729.10
02	PROGRESS PAYMENT RECEIVED		4,074,483,441.94		4,074,483,441.94
03	OTHER INCOME RECEIVED (INSURANCE CLAIM)		1,747,512.50		1,747,512.50
04	**TOTAL RECEIVED**	1+2+3 +3A	**4,465,039,683.54**	-	**4,465,039,683.54**
05	COST OF MATERIALS SUPPLIED BY CLIENT				-
06	**TOTAL RECEIVED WITH MATERIALS SUPPLIED BY CLIENT**	4+5	4,465,039,683.54	-	4,465,039,683.54
	EXPENDITURE				
07	PAYMENT BY CASH OR CHEQUE		3,132,480,751.69	3,060,942.83	3,135,541,694.52
08	MACHINARY,ASSETS,SCAFFOLDING,TRANSPORTS & OTHER CHARGES		196,658,031.98		196,658,031.98
09	COST OF MATERIALS RECEIVED FROM OTHER SITE OR HEAD OFFICE		1,267,940,188.89	1,573,569.99	1,269,513,758.88
10	LESS: COST OF MATERIALS TRANSFERRED TO OTHER SITE OR HEAD OFFICE		35,228,709.59		35,228,709.59
11	**TOTAL EXPENDITURE**	7+8+9-10	**4,561,850,262.97**	**4,634,512.82**	**4,566,484,775.79**
12	HEAD OFFICE OVERHEAD		241,341,629.46		241,341,629.46
13	FINANCE COST		-	-	-
14	**TOTAL EXPENDITURE WITH HEAD OFFICE OVERHEAD & FINANCE COST**	11+12 +13	**4,803,191,892.43**	**4,634,512.82**	**4,807,826,405.25**
15	ADD: BILLS PAYABLE		5,607,740.41	(3,595,712.41)	2,012,028.00
16	**TOTAL EXPENDITURE WITH BILLS PAYABLE**	14+15	**4,808,799,632.84**	**1,038,800.41**	**4,809,838,433.25**
17	COST OF MATERIALS SUPPLIED BY CLIENT		-	-	-
18	**TOTAL EXPENDITURE WITH MATERIAL SUPPLIED BY CLIENT**	16+17	**4,808,799,632.84**	**1,038,800.41**	**4,809,838,433.25**
19	ACTUAL VALUE OF WORK DONE (EXCLUDING MATERIALS SUPPLIED BY CLIENT)		4,821,487,872.41		4,821,487,872.41
20	COST OF MATERIALS SUPPLIED BY CLIENT		-	-	-
21	**ACTUAL VALUE OF WORK DONE (INCLUDING MATERIALS SUPPLIED BY CLIENT**	19+20	4,821,487,872.41	-	4,821,487,872.41
22	ADD: PRICE ESCALATION (IF NOT INCLUDED IN ITEM NO.19)		106,602,301.11	-	106,602,301.11
23	**TOTAL VALUE OF WORK DONE**	21+22	**4,928,090,173.52**	**-**	**4,928,090,173.52**
24	VALUE OF UNUSED MATERIAL AT SITE				-
25	**TOTAL VALUE OF WORK DONE & UNUSED MATERIALS AT SITE**	23+24	**4,928,090,173.52**	**-**	**4,928,090,173.52**
					-
26	**CASH FLOW**	**4-14**	**(338,152,208.89)**	**(4,634,512.82)**	**(342,786,721.71)**
27	**COST OVERRUN / SURPLUS**	**25-18**	**119,290,540.68**	**(1,038,800.41)**	**118,251,740.27**
28	CAPITAL ASSETS PURCHASED		2,606,559.76		2,606,559.76
29	LESS: REPAYMENT AS INDICATED IN ITEM NO. 08 B		2,606,559.76	-	2,606,559.76
30	ADVANCE PAYMENT MADE BUT NOT RECOVERD				-
31	VAT INPUT REIMBURSEMENT AVAILABLE		41,110,286.52		41,110,286.52

	Prepared By	Checked By	Checked By Head Office	Approved By
Signature				
Date				
Name				
Designation				

INCOME EXPENDITURE STATEMENT

Ref. No.

PROJECT / ACTIVITY CENTRE **Project 6**

NO	DESCRIPTION		UP TO END OF LAST MONTH	THIS MONTH	UP TO END OF THIS MONTH
	INCOME (EXCLUDING TAXES)				
01	ADVANCE PAYMENT RECEIVED		473,122,594.08		473,122,594.08
02	PROGRESS PAYMENT RECEIVED		905,766,455.15		905,766,455.15
03	OTHER INCOME RECEIVED (INSURANCE CLAIM)		453,559,095.10		453,559,095.10
04	**TOTAL RECEIVED**	1+2+3 +3A	**1,832,448,144.33**	-	**1,832,448,144.33**
05	COST OF MATERIALS SUPPLIED BY CLIENT				-
06	**TOTAL RECEIVED WITH MATERIALS SUPPLIED BY CLIENT**	4+5	1,832,448,144.33	-	1,832,448,144.33
	EXPENDITURE				
07	PAYMENT BY CASH OR CHEQUE		932,228,313.58	438,089.57	932,666,403.15
08	MACHINARY,ASSETS,SCAFFOLDING,TRANSPORTS & OTHER CHARGES		85,760,049.94		85,760,049.94
09	COST OF MATERIALS RECEIVED FROM OTHER SITE OR HEAD OFFICE		825,634,744.57	833,200.62	826,467,945.19
10	LESS: COST OF MATERIALS TRANSFERRED TO OTHER SITE OR HEAD OFFICE		323,749,638.02		323,749,638.02
11	**TOTAL EXPENDITURE**	7+8+9-10	**1,519,873,470.07**	**1,271,290.19**	**1,521,144,760.26**
12	HEAD OFFICE OVERHEAD		120,729,937.60		120,729,937.60
13	FINANCE COST		-	-	-
14	**TOTAL EXPENDITURE WITH HEAD OFFICE OVERHEAD & FINANCE COST**	11+12 +13	**1,640,603,407.67**	**1,271,290.19**	**1,641,874,697.86**
15	ADD: BILLS PAYABLE		2,028,414.75		2,028,414.75
16	**TOTAL EXPENDITURE WITH BILLS PAYABLE**	14+15	**1,642,631,822.42**	**1,271,290.19**	**1,643,903,112.61**
17	COST OF MATERIALS SUPPLIED BY CLIENT		-	-	-
18	**TOTAL EXPENDITURE WITH MATERIAL SUPPLIED BY CLIENT**	16+17	**1,642,631,822.42**	**1,271,290.19**	**1,643,903,112.61**
19	ACTUAL VALUE OF WORK DONE (EXCLUDING MATERIALS SUPPLIED BY CLIENT)		1,874,234,057.06		1,874,234,057.06
20	COST OF MATERIALS SUPPLIED BY CLIENT		-	-	-
21	**ACTUAL VALUE OF WORK DONE (INCLUDING MATERIALS SUPPLIED BY CLIENT**	19+20	1,874,234,057.06	-	1,874,234,057.06
22	ADD: PRICE ESCALATION (IF NOT INCLUDED IN ITEM NO.19)		137,931,569.60	-	137,931,569.60
23	**TOTAL VALUE OF WORK DONE**	21+22	**2,012,165,626.66**	**-**	**2,012,165,626.66**
24	VALUE OF UNUSED MATERIAL AT SITE				-
25	**TOTAL VALUE OF WORK DONE & UNUSED MATERIALS AT SITE**	23+24	**2,012,165,626.66**	**-**	**2,012,165,626.66**
					-
26	**CASH FLOW**	**4-14**	**191,844,736.66**	**(1,271,290.19)**	**190,573,446.47**
27	**COST OVERRUN / SURPLUS**	**25-18**	**369,533,804.24**	**(1,271,290.19)**	**368,262,514.05**
28	CAPITAL ASSETS PURCHASED		1,305,207.15		1,305,207.15
29	LESS: REPAYMENT AS INDICATED IN ITEM NO. 08 B		1,305,207.15	-	1,305,207.15
30	ADVANCE PAYMENT MADE BUT NOT RECOVERD				-
31	VAT INPUT REIMBURSEMENT AVAILABLE		46,112,946.37		46,112,946.37

	Prepared By	Checked By	Checked By Head Office	Approved By
Signature				
Date				
Name				
Designation				

INCOME EXPENDITURE STATEMENT

Ref. No.

PROJECT / ACTIVITY CENTRE **Project 7**

NO	DESCRIPTION		UP TO END OF LAST MONTH	THIS MONTH	UP TO END OF THIS MONTH
	INCOME (EXCLUDING TAXES)				
01	ADVANCE PAYMENT RECEIVED		80,926,995.70		80,926,995.70
02	PROGRESS PAYMENT RECEIVED		320,463,125.08		320,463,125.08
03	OTHER INCOME RECEIVED (INSURANCE CLAIM)				-
04	**TOTAL RECEIVED**	1+2+3 +3A	**401,390,120.78**	-	**401,390,120.78**
05	COST OF MATERIALS SUPPLIED BY CLIENT				-
06	**TOTAL RECEIVED WITH MATERIALS SUPPLIED BY CLIENT**	4+5	401,390,120.78	-	401,390,120.78
	EXPENDITURE				
07	PAYMENT BY CASH OR CHEQUE		414,810,411.99	17,822.17	414,828,234.16
08	MACHINARY,ASSETS,SCAFFOLDING,TRANSPORTS & OTHER CHARGES		49,534,707.90		49,534,707.90
09	COST OF MATERIALS RECEIVED FROM OTHER SITE OR HEAD OFFICE		135,118,753.38	212,977.10	135,331,730.48
10	LESS: COST OF MATERIALS TRANSFERRED TO OTHER SITE OR HEAD OFFICE		34,862,714.07		34,862,714.07
11	**TOTAL EXPENDITURE**	7+8+9-10	**564,601,159.20**	**230,799.27**	**564,831,958.47**
12	HEAD OFFICE OVERHEAD		28,084,513.37		28,084,513.37
13	FINANCE COST		-	-	-
14	**TOTAL EXPENDITURE WITH HEAD OFFICE OVERHEAD & FINANCE COST**	11+12 +13	**592,685,672.57**	**230,799.27**	**592,916,471.84**
15	ADD: BILLS PAYABLE		3,870,510.25		3,870,510.25
16	**TOTAL EXPENDITURE WITH BILLS PAYABLE**	14+15	**596,556,182.82**	**230,799.27**	**596,786,982.09**
17	COST OF MATERIALS SUPPLIED BY CLIENT		-	-	-
18	**TOTAL EXPENDITURE WITH MATERIAL SUPPLIED BY CLIENT**	16+17	**596,556,182.82**	**230,799.27**	**596,786,982.09**
19	ACTUAL VALUE OF WORK DONE (EXCLUDING MATERIALS SUPPLIED BY CLIENT)		439,805,399.20		439,805,399.20
20	COST OF MATERIALS SUPPLIED BY CLIENT		-	-	-
21	**ACTUAL VALUE OF WORK DONE (INCLUDING MATERIALS SUPPLIED BY CLIENT**	19+20	439,805,399.20	-	439,805,399.20
22	ADD: PRICE ESCALATION (IF NOT INCLUDED IN ITEM NO.19)		28,269,823.62	-	28,269,823.62
23	**TOTAL VALUE OF WORK DONE**	21+22	**468,075,222.82**	**-**	**468,075,222.82**
24	VALUE OF UNUSED MATERIAL AT SITE				-
25	**TOTAL VALUE OF WORK DONE & UNUSED MATERIALS AT SITE**	23+24	**468,075,222.82**	**-**	**468,075,222.82**
					-
26	**CASH FLOW**	**4-14**	**(191,295,551.79)**	**(230,799.27)**	**(191,526,351.06)**
27	**COST OVERRUN / SURPLUS**	**25-18**	**(128,480,960.00)**	**(230,799.27)**	**(128,711,759.27)**
28	CAPITAL ASSETS PURCHASED		1,179,510.72		1,179,510.72
29	LESS: REPAYMENT AS INDICATED IN ITEM NO. 08 B		1,179,510.72	-	1,179,510.72
30	ADVANCE PAYMENT MADE BUT NOT RECOVERD		39,989,580.09		-
31	VAT INPUT REIMBURSEMENT AVAILABLE		10,253,815.00		10,253,815.00

	Prepared By	Checked By	Checked By Head Office	Approved By
Signature				
Date				
Name				
Designation				

INCOME EXPENDITURE STATEMENT

Ref. No.

PROJECT / ACTIVITY CENTRE **Project 8**

NO	DESCRIPTION		UP TO END OF LAST MONTH	THIS MONTH	UP TO END OF THIS MONTH
	INCOME (EXCLUDING TAXES)				
01	ADVANCE PAYMENT RECEIVED		1,631,876,172.63		1,631,876,172.63
02	PROGRESS PAYMENT RECEIVED		3,117,759,514.26	248,837,512.92	3,366,597,027.18
03	OTHER INCOME RECEIVED (INSURANCE CLAIM)		48,246,216.03		48,246,216.03
04	**TOTAL RECEIVED**	1+2+3 +3A	**4,797,881,902.92**	248,837,512.92	**5,046,719,415.84**
05	COST OF MATERIALS SUPPLIED BY CLIENT				-
06	**TOTAL RECEIVED WITH MATERIALS SUPPLIED BY CLIENT**	4+5	4,797,881,902.92	248,837,512.92	5,046,719,415.84
	EXPENDITURE				
07	PAYMENT BY CASH OR CHEQUE		3,260,565,678.56	143,148,996.49	3,403,714,675.05
08	MACHINARY,ASSETS,SCAFFOLDING,TRANSPORTS & OTHER CHARGES		259,864,832.59	17,324,026.57	277,188,859.16
09	COST OF MATERIALS RECEIVED FROM OTHER SITE OR HEAD OFFICE		1,498,422,995.66	128,027,701.68	1,626,450,697.34
10	LESS: COST OF MATERIALS TRANSFERRED TO OTHER SITE OR HEAD OFFICE		640,988,469.57	22,873,517.03	663,861,986.60
11	**TOTAL EXPENDITURE**	7+8+9-10	**4,377,865,037.24**	**265,627,207.71**	**4,643,492,244.95**
12	HEAD OFFICE OVERHEAD		340,500,384.20	20,395,677.81	360,896,062.01
13	FINANCE COST		-	-	-
14	**TOTAL EXPENDITURE WITH HEAD OFFICE OVERHEAD & FINANCE COST**	11+12 +13	**4,718,365,421.44**	**286,022,885.52**	**5,004,388,306.96**
15	ADD: BILLS PAYABLE		-	70,944,699.11	70,944,699.11
16	**TOTAL EXPENDITURE WITH BILLS PAYABLE**	14+15	**4,718,365,421.44**	**356,967,584.63**	**5,075,333,006.07**
17	COST OF MATERIALS SUPPLIED BY CLIENT		-	-	-
18	**TOTAL EXPENDITURE WITH MATERIAL SUPPLIED BY CLIENT**	16+17	**4,718,365,421.44**	**356,967,584.63**	**5,075,333,006.07**
19	ACTUAL VALUE OF WORK DONE (EXCLUDING MATERIALS SUPPLIED BY CLIENT)		5,710,177,343.70	341,685,188.41	6,051,862,532.11
20	COST OF MATERIALS SUPPLIED BY CLIENT		-	-	-
21	**ACTUAL VALUE OF WORK DONE (INCLUDING MATERIALS SUPPLIED BY CLIENT**	19+20	**5,710,177,343.70**	**341,685,188.41**	**6,051,862,532.11**
22	ADD: PRICE ESCALATION (IF NOT INCLUDED IN ITEM NO.19)		(35,170,940.40)	(1,757,224.95)	(36,928,165.35)
23	**TOTAL VALUE OF WORK DONE**	21+22	**5,675,006,403.30**	**339,927,963.46**	**6,014,934,366.76**
24	VALUE OF UNUSED MATERIAL AT SITE			145,048,303.56	145,048,303.56
25	**TOTAL VALUE OF WORK DONE & UNUSED MATERIALS AT SITE**	23+24	**5,675,006,403.30**	**484,976,267.02**	**6,159,982,670.32**
					-
26	**CASH FLOW**	**4-14**	**79,516,481.48**	**(37,185,372.60)**	**42,331,108.88**
27	**COST OVERRUN / SURPLUS**	**25-18**	**956,640,981.86**	**128,008,682.39**	**1,084,649,664.25**
28	CAPITAL ASSETS PURCHASED		166,732,366.68		166,732,366.68
29	LESS: REPAYMENT AS INDICATED IN ITEM NO. 08 B		166,732,366.68	-	166,732,366.68
30	ADVANCE PAYMENT MADE BUT NOT RECOVERD				-
31	VAT INPUT REIMBURSEMENT AVAILABLE		23,677,304.57		23,677,304.57

	Prepared By	Checked By	Checked By Head Office	Approved By
Signature				
Date				
Name				
Designation				

INCOME EXPENDITURE STATEMENT

Ref. No.

PROJECT / ACTIVITY CENTRE **Project 9**

NO	DESCRIPTION		UP TO END OF LAST MONTH	THIS MONTH	UP TO END OF THIS MONTH
	INCOME (EXCLUDING TAXES)				
01	ADVANCE PAYMENT RECEIVED		304,486,149.31		304,486,149.31
02	PROGRESS PAYMENT RECEIVED		1,533,248,689.03		1,533,248,689.03
03	OTHER INCOME RECEIVED (INSURANCE CLAIM)		2,814,084.39		2,814,084.39
04	**TOTAL RECEIVED**	1+2+3 +3A	**1,840,548,922.73**	-	**1,840,548,922.73**
05	COST OF MATERIALS SUPPLIED BY CLIENT				-
06	**TOTAL RECEIVED WITH MATERIALS SUPPLIED BY CLIENT**	4+5	1,840,548,922.73	-	1,840,548,922.73
	EXPENDITURE				
07	PAYMENT BY CASH OR CHEQUE		1,324,865,752.63	197,963.02	1,325,063,715.65
08	MACHINARY,ASSETS,SCAFFOLDING,TRANSPORTS & OTHER CHARGES		142,813,206.79		142,813,206.79
09	COST OF MATERIALS RECEIVED FROM OTHER SITE OR HEAD OFFICE		473,623,460.44	19,099.00	473,642,559.44
10	LESS: COST OF MATERIALS TRANSFERRED TO OTHER SITE OR HEAD OFFICE		467,411,856.40		467,411,856.40
11	**TOTAL EXPENDITURE**	7+8+9-10	**1,473,890,563.46**	**217,062.02**	**1,474,107,625.48**
12	HEAD OFFICE OVERHEAD		103,546,923.91	483,780.45	104,030,704.36
13	FINANCE COST		-	-	-
14	**TOTAL EXPENDITURE WITH HEAD OFFICE OVERHEAD & FINANCE COST**	11+12 +13	**1,577,437,487.37**	**700,842.47**	**1,578,138,329.84**
15	ADD: BILLS PAYABLE		277,696.04		277,696.04
16	**TOTAL EXPENDITURE WITH BILLS PAYABLE**	14+15	**1,577,715,183.41**	**700,842.47**	**1,578,416,025.88**
17	COST OF MATERIALS SUPPLIED BY CLIENT		-	-	-
18	**TOTAL EXPENDITURE WITH MATERIAL SUPPLIED BY CLIENT**	16+17	**1,577,715,183.41**	**700,842.47**	**1,578,416,025.88**
19	ACTUAL VALUE OF WORK DONE (EXCLUDING MATERIALS SUPPLIED BY CLIENT)		1,725,782,065.19	8,063,007.50	1,733,845,072.69
20	COST OF MATERIALS SUPPLIED BY CLIENT		-	-	-
21	**ACTUAL VALUE OF WORK DONE (INCLUDING MATERIALS SUPPLIED BY CLIENT**	19+20	**1,725,782,065.19**	**8,063,007.50**	**1,733,845,072.69**
22	ADD: PRICE ESCALATION (IF NOT INCLUDED IN ITEM NO.19)		208,616,240.33	(4,147,854.60)	204,468,385.73
23	**TOTAL VALUE OF WORK DONE**	21+22	**1,934,398,305.52**	**3,915,152.90**	**1,938,313,458.42**
24	VALUE OF UNUSED MATERIAL AT SITE		7,807,841.16	(169,007.80)	7,638,833.36
25	**TOTAL VALUE OF WORK DONE & UNUSED MATERIALS AT SITE**	23+24	**1,942,206,146.68**	**3,746,145.10**	**1,945,952,291.78**
					-
26	**CASH FLOW**	**4-14**	**263,111,435.36**	**(700,842.47)**	**262,410,592.89**
27	**COST OVERRUN / SURPLUS**	**25-18**	**364,490,963.27**	**3,045,302.63**	**367,536,265.90**
28	CAPITAL ASSETS PURCHASED		15,056,452.27		15,056,452.27
29	LESS: REPAYMENT AS INDICATED IN ITEM NO. 08 B		15,056,452.27	-	15,056,452.27
30	ADVANCE PAYMENT MADE BUT NOT RECOVERD				-
31	VAT INPUT REIMBURSEMENT AVAILABLE				-

	Prepared By	Checked By	Checked By Head Office	Approved By
Signature				
Date				
Name				
Designation				

INCOME EXPENDITURE STATEMENT

Ref. No.

PROJECT / ACTIVITY CENTRE **Project 10**

NO	DESCRIPTION		UP TO END OF LAST MONTH	THIS MONTH	UP TO END OF THIS MONTH
	INCOME (EXCLUDING TAXES)				
01	ADVANCE PAYMENT RECEIVED		43,777,098.42		43,777,098.42
02	PROGRESS PAYMENT RECEIVED		532,841,849.35	14,061,225.00	546,903,074.35
03	OTHER INCOME RECEIVED (INSURANCE CLAIM)				-
04	**TOTAL RECEIVED**	1+2+3 +3A	**576,618,947.77**	14,061,225.00	**590,680,172.77**
05	COST OF MATERIALS SUPPLIED BY CLIENT				-
06	**TOTAL RECEIVED WITH MATERIALS SUPPLIED BY CLIENT**	4+5	576,618,947.77	14,061,225.00	590,680,172.77
	EXPENDITURE				
07	PAYMENT BY CASH OR CHEQUE		683,397,871.88	13,835,170.53	697,233,042.41
08	MACHINARY,ASSETS,SCAFFOLDING,TRANSPORTS & OTHER CHARGES		76,168,200.12	1,999,813.00	78,168,013.12
09	COST OF MATERIALS RECEIVED FROM OTHER SITE OR HEAD OFFICE		23,691,983.45	1,040,591.43	24,732,574.88
10	LESS: COST OF MATERIALS TRANSFERRED TO OTHER SITE OR HEAD OFFICE		29,518,462.42	90,328.06	29,608,790.48
11	**TOTAL EXPENDITURE**	7+8+9-10	**753,739,593.03**	**16,785,246.90**	**770,524,839.93**
12	HEAD OFFICE OVERHEAD		44,794,201.83	2,377,007.86	47,171,209.69
13	FINANCE COST		-	-	-
14	**TOTAL EXPENDITURE WITH HEAD OFFICE OVERHEAD & FINANCE COST**	11+12 +13	**798,533,794.86**	**19,162,254.76**	**817,696,049.62**
15	ADD: BILLS PAYABLE		15,432,974.41	3,457,612.19	18,890,586.60
16	**TOTAL EXPENDITURE WITH BILLS PAYABLE**	14+15	**813,966,769.27**	**22,619,866.95**	**836,586,636.22**
17	COST OF MATERIALS SUPPLIED BY CLIENT		-	-	-
18	**TOTAL EXPENDITURE WITH MATERIAL SUPPLIED BY CLIENT**	16+17	**813,966,769.27**	**22,619,866.95**	**836,586,636.22**
19	ACTUAL VALUE OF WORK DONE (EXCLUDING MATERIALS SUPPLIED BY CLIENT)		746,570,030.44	39,616,797.68	786,186,828.12
20	COST OF MATERIALS SUPPLIED BY CLIENT		-	-	-
21	**ACTUAL VALUE OF WORK DONE (INCLUDING MATERIALS SUPPLIED BY CLIENT**	19+20	**746,570,030.44**	**39,616,797.68**	**786,186,828.12**
22	ADD: PRICE ESCALATION (IF NOT INCLUDED IN ITEM NO.19)		-		-
23	**TOTAL VALUE OF WORK DONE**	21+22	**746,570,030.44**	**39,616,797.68**	**786,186,828.12**
24	VALUE OF UNUSED MATERIAL AT SITE		11,373,197.72	(1,610,415.43)	9,762,782.29
25	**TOTAL VALUE OF WORK DONE & UNUSED MATERIALS AT SITE**	23+24	**757,943,228.16**	**38,006,382.25**	**795,949,610.41**
					-
26	**CASH FLOW**	**4-14**	**(221,914,847.09)**	**(5,101,029.76)**	**(227,015,876.85)**
27	**COST OVERRUN / SURPLUS**	**25-18**	**(56,023,541.11)**	**15,386,515.30**	**(40,637,025.81)**
28	CAPITAL ASSETS PURCHASED		11,956,257.43		11,956,257.43
29	LESS: REPAYMENT AS INDICATED IN ITEM NO. 08 B		11,956,257.43	-	11,956,257.43
30	ADVANCE PAYMENT MADE BUT NOT RECOVERD				-
31	VAT INPUT REIMBURSEMENT AVAILABLE				-

	Prepared By	Checked By	Checked By Head Office	Approved By
Signature				
Date				
Name				
Designation				

9.3 Annexure 3: Risk management practice

Project 1

Item	Risk description	Identified project stage			Project goal impacted by the risk			Quantified the risk	Risk response					Attempt at risk management				
		Initiation	Execution	Closure	Time	Cost	Quality		Accept	Mitigate	Transfer	Avoid	Monitor	Transfer or share by contract or agreement	Insure against	Plan and control against	Design against	Make allowances by budget
1	**Financial**	**0**	**3**	**0**	**0**	**3**	**0**	**2**	**1**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**1**
1.1	*Inflation*		1			1			1									1
1.2	*Funding*																	
1.3	*Delayed payment*		1			1		1					1					
1.4	*Cash flow*		1			1		1					1					
1.5	*Currency risk*																	
1.6	*Credit risk*																	
1.7	*Liquidity risk*																	
2	**Operational**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
2.1	*Unforeseen site conditions*																	
2.2	*Safety*																	
2.3	*Unavailability of resources*																	
2.4	*Unskilled staff*																	
2.5	*Lack of technology*																	
3	**Management**	**0**	**3**	**0**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
3.1	*Decision making*		1		1													
3.2	*Planning and controlling*		1		1													
3.3	*Communication*		1		1		1											
4	**Engineering**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**
4.1	*Design errors and changes*																	
4.2	*Scheduling*																	
4.3	*Approval delays*		1		1									1				
5	**External**	**0**	**4**	**0**	**2**	**3**	**3**	**0**	**2**	**2**	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**0**
5.1	*Project stakeholders*		1				1			1								
5.2	*Environmental issues*		1			1				1					1			
5.3	*Government regulations*		1		1	1	1		1							1		
5.4	*Social and political issues*		1		1	1	1		1							1		

Project 2

Item	Risk description	Identified project stage			Project goal impacted by the risk			Quantified the risk	Risk response					Attempt at risk management				
		Initiation	Execution	Closure	Time	Cost	Quality		Accept	Mitigate	Transfer	Avoid	Monitor	Transfer or share by contract or agreement	Insure against	Plan and control against	Design against	Make allowances by budget
1	**Financial**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
1.1	*Inflation*		1			1			1									1
1.2	*Funding*																	
1.3	*Delayed payment*																	
1.4	*Cash flow*																	
1.5	*Currency risk*																	
1.6	*Credit risk*																	
1.7	*Liquidity risk*																	
2	**Operational**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**
2.1	*Unforeseen site conditions*		1							1						1	1	
2.2	*Safety*																	
2.3	*Unavailability of resources*																	
2.4	*Unskilled staff*																	
2.5	*Lack of technology*																	
3	**Management**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**
3.1	*Decision making*																	
3.2	*Planning and controlling*																	
3.3	*Communication*		1		1					1						1		
4	**Engineering**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
4.1	*Design errors and changes*																	
4.2	*Scheduling*																	
4.3	*Approval delays*																	
5	**External**	**0**	**3**	**0**	**2**	**3**	**2**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**0**
5.1	*Project stakeholders*																	
5.2	*Environmental issues*		1			1				1					1			
5.3	*Government regulations*		1		1	1	1		1							1		
5.4	*Social and political issues*		1		1	1	1		1							1		

Project 3

Item	Risk description	Identified project stage			Project goal impacted by the			Quantified the risk	Risk response					Attempt at risk management				
		Initiation	Execution	Closure	Time	Cost	Quality		Accept	Mitigate	Transfer	Avoid	Monitor	Transfer or share by contract or agreement	Insure against	Plan and control against	Design against	Make allowances by budget
1	**Financial**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
1.1	*Inflation*		1			1			1									1
1.2	*Funding*																	
1.3	*Delayed payment*																	
1.4	*Cash flow*																	
1.5	*Currency risk*																	
1.6	*Credit risk*																	
1.7	*Liquidity risk*																	
2	**Operational**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**
2.1	*Unforeseen site conditions*		1							1						1	1	
2.2	*Safety*																	
2.3	*Unavailability of resources*																	
2.4	*Unskilled staff*																	
2.5	*Lack of technology*																	
3	**Management**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
3.1	*Decision making*																	
3.2	*Planning and controlling*																	
3.3	*Communication*																	
4	**Engineering**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
4.1	*Design errors and changes*																	
4.2	*Scheduling*																	
4.3	*Approval delays*																	
5	**External**	**0**	**3**	**0**	**2**	**3**	**2**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**0**
5.1	*Project stakeholders*																	
5.2	*Environmental issues*		1			1				1					1			
5.3	*Government regulations*		1		1	1	1		1							1		
5.4	*Social and political issues*		1		1	1	1		1							1		

Project 4

Item	Risk description	Identified project stage			Project goal impacted by the			Quantified the risk	Risk response					Attempt at risk management				
		Initiation	Execution	Closure	Time	Cost	Quality		Accept	Mitigate	Transfer	Avoid	Monitor	Transfer or share by contract or agreement	Insure against	Plan and control against	Design against	Make allowances by budget
1	**Financial**	**1**	**2**	**0**	**0**	**3**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**0**	**2**	**0**	**1**
1.1	*Inflation*					1			1									1
1.2	*Funding*																	
1.3	*Delayed payment*		1			1							1			1		
1.4	*Cash flow*		1			1							1			1		
1.5	*Currency risk*	1																
1.6	*Credit risk*																	
1.7	*Liquidity risk*																	
2	**Operational**	**3**	**2**	**0**	**4**	**4**	**5**	**0**	**0**	**0**	**0**	**0**	**5**	**3**	**1**	**1**	**1**	**0**
2.1	*Unforeseen site conditions*		1		1	1	1						1			1	1	
2.2	*Safety*		1				1						1		1			
2.3	*Unavailability of resources*	1			1	1	1						1	1				
2.4	*Unskilled staff*	1			1	1	1						1	1				
2.5	*Lack of technology*	1			1	1	1						1	1				
3	**Management**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
3.1	*Decision making*																	
3.2	*Planning and controlling*																	
3.3	*Communication*																	
4	**Engineering**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
4.1	*Design errors and changes*																	
4.2	*Scheduling*																	
4.3	*Approval delays*																	
5	**External**	**0**	**3**	**0**	**2**	**3**	**2**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**0**
5.1	*Project stakeholders*																	
5.2	*Environmental issues*		1			1				1					1			
5.3	*Government regulations*		1		1	1	1		1							1		
5.4	*Social and political issues*		1		1	1	1		1							1		

Project 5

Item	Risk description	Identified project stage			Project goal impacted by the			Quantified the risk	Risk response					Attempt at risk management				
		Initiation	Execution	Closure	Time	Cost	Quality		Accept	Mitigate	Transfer	Avoid	Monitor	Transfer or share by contract or agreement	Insure against	Plan and control against	Design against	Make allowances by budget
1	**Financial**	**0**	**2**	**0**	**0**	**2**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**
1.1	*Inflation*		1			1			1									1
1.2	*Funding*																	
1.3	*Delayed payment*		1			1			1							1		
1.4	*Cash flow*																	
1.5	*Currency risk*																	
1.6	*Credit risk*																	
1.7	*Liquidity risk*																	
2	**Operational**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
2.1	*Unforeseen site conditions*																	
2.2	*Safety*																	
2.3	*Unavailability of resources*																	
2.4	*Unskilled staff*																	
2.5	*Lack of technology*																	
3	**Management**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
3.1	*Decision making*																	
3.2	*Planning and controlling*																	
3.3	*Communication*																	
4	**Engineering**	**0**	**2**	**0**	**2**	**0**	**2**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**2**	**0**	**0**
4.1	*Design errors and changes*																	
4.2	*Scheduling*		1		1		1					1				1		
4.3	*Approval delays*		1		1		1					1				1		
5	**External**	**0**	**3**	**0**	**2**	**3**	**2**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**0**
5.1	*Project stakeholders*																	
5.2	*Environmental issues*		1			1				1					1			
5.3	*Government regulations*		1		1	1	1		1							1		
5.4	*Social and political issues*		1		1	1	1		1							1		

Project 6

Item	Risk description	Identified project stage			Project goal impacted by the			Quantified the risk	Risk response					Attempt at risk management				
		Initiation	Execution	Closure	Time	Cost	Quality		Accept	Mitigate	Transfer	Avoid	Monitor	Transfer or share by contract or agreement	Insure against	Plan and control against	Design against	Make allowances by budget
1	**Financial**	**0**	**2**	**0**	**0**	**2**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**
1.1	*Inflation*		1			1			1									1
1.2	*Funding*																	
1.3	*Delayed payment*		1			1			1							1		
1.4	*Cash flow*																	
1.5	*Currency risk*																	
1.6	*Credit risk*																	
1.7	*Liquidity risk*																	
2	**Operational**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
2.1	*Unforeseen site conditions*																	
2.2	*Safety*																	
2.3	*Unavailability of resources*																	
2.4	*Unskilled staff*																	
2.5	*Lack of technology*																	
3	**Management**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
3.1	*Decision making*																	
3.2	*Planning and controlling*																	
3.3	*Communication*																	
4	**Engineering**	**0**	**3**	**0**	**3**	**1**	**3**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**3**	**0**	**0**
4.1	*Design errors and changes*		1		1	1	1					1				1		
4.2	*Scheduling*		1		1		1					1				1		
4.3	*Approval delays*		1		1		1					1				1		
5	**External**	**0**	**3**	**0**	**2**	**3**	**2**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**0**
5.1	*Project stakeholders*																	
5.2	*Environmental issues*		1			1				1					1			
5.3	*Government regulations*		1		1	1	1		1							1		
5.4	*Social and political issues*		1		1	1	1		1							1		

Project 7

Item	Risk description	Identified project stage			Project goal impacted by the			Quantified the risk	Risk response					Attempt at risk management				
		Initiation	Execution	Closure	Time	Cost	Quality		Accept	Mitigate	Transfer	Avoid	Monitor	Transfer or share by contract or agreement	Insure against	Plan and control against	Design against	Make allowances by budget
1	**Financial**	**0**	**3**	**0**	**0**	**3**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**1**
1.1	*Inflation*		1			1			1									1
1.2	*Funding*																	
1.3	*Delayed payment*		1			1							1					
1.4	*Cash flow*		1			1							1					
1.5	*Currency risk*																	
1.6	*Credit risk*																	
1.7	*Liquidity risk*																	
2	**Operational**	**3**	**1**	**0**	**4**	**4**	**4**	**0**	**1**	**0**	**3**	**0**	**0**	**3**	**0**	**1**	**0**	**0**
2.1	*Unforeseen site conditions*		1		1	1	1		1							1		
2.2	*Safety*																	
2.3	*Unavailability of resources*	1			1	1	1				1			1				
2.4	*Unskilled staff*	1			1	1	1				1			1				
2.5	*Lack of technology*	1			1	1	1				1			1				
3	**Management**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
3.1	*Decision making*																	
3.2	*Planning and controlling*																	
3.3	*Communication*																	
4	**Engineering**	**0**	**3**	**0**	**3**	**1**	**3**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**3**	**0**	**0**
4.1	*Design errors and changes*		1		1	1	1					1				1		
4.2	*Scheduling*		1		1		1					1				1		
4.3	*Approval delays*		1		1		1					1				1		
5	**External**	**0**	**4**	**0**	**3**	**3**	**3**	**0**	**2**	**1**	**1**	**0**	**0**	**1**	**1**	**2**	**0**	**0**
5.1	*Project stakeholders*		1		1		1				1			1				
5.2	*Environmental issues*		1			1				1					1			
5.3	*Government regulations*		1		1	1	1		1							1		
5.4	*Social and political issues*		1		1	1	1		1							1		

Project 8

Item	Risk description	Identified project stage			Project goal impacted by the			Quantified the risk	Risk response					Attempt at risk management				
		Initiation	Execution	Closure	Time	Cost	Quality		Accept	Mitigate	Transfer	Avoid	Monitor	Transfer or share by contract or agreement	Insure against	Plan and control against	Design against	Make allowances by budget
1	**Financial**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1.1	*Inflation*		1			1			1									√
1.2	*Funding*																	
1.3	*Delayed payment*																	
1.4	*Cash flow*																	
1.5	*Currency risk*																	
1.6	*Credit risk*																	
1.7	*Liquidity risk*																	
2	**Operational**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
2.1	*Unforeseen site conditions*																	
2.2	*Safety*																	
2.3	*Unavailability of resources*																	
2.4	*Unskilled staff*																	
2.5	*Lack of technology*																	
3	**Management**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**
3.1	*Decision making*																	
3.2	*Planning and controlling*																	
3.3	*Communication*		1		1					1						1		
4	**Engineering**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
4.1	*Design errors and changes*																	
4.2	*Scheduling*																	
4.3	*Approval delays*																	
5	**External**	**0**	**3**	**0**	**2**	**3**	**2**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**0**
5.1	*Project stakeholders*																	
5.2	*Environmental issues*		1			1				1					1			
5.3	*Government regulations*		1		1	1	1		1							1		
5.4	*Social and political issues*		1		1	1	1		1							1		

Project 9

Item	Risk description	Identified project stage			Project goal impacted by the			Quantified the risk	Risk response					Attempt at risk management				
		Initiation	Execution	Closure	Time	Cost	Quality		Accept	Mitigate	Transfer	Avoid	Monitor	Transfer or share by contract or agreement	Insure against	Plan and control against	Design against	Make allowances by budget
1	**Financial**	**0**	**2**	**0**	**0**	**2**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**
1.1	*Inflation*		1			1			1									1
1.2	*Funding*																	
1.3	*Delayed payment*		1			1							1					
1.4	*Cash flow*																	
1.5	*Currency risk*																	
1.6	*Credit risk*																	
1.7	*Liquidity risk*																	
2	**Operational**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
2.1	*Unforeseen site conditions*																	
2.2	*Safety*																	
2.3	*Unavailability of resources*																	
2.4	*Unskilled staff*																	
2.5	*Lack of technology*																	
3	**Management**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**
3.1	*Decision making*																	
3.2	*Planning and controlling*																	
3.3	*Communication*		1		1					1						1		
4	**Engineering**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
4.1	*Design errors and changes*																	
4.2	*Scheduling*																	
4.3	*Approval delays*																	
5	**External**	**0**	**3**	**0**	**2**	**3**	**2**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**0**
5.1	*Project stakeholders*																	
5.2	*Environmental issues*		1			1				1					1			
5.3	*Government regulations*		1		1	1	1		1							1		
5.4	*Social and political issues*		1		1	1	1		1							1		

Project 10

Item	Risk description	Identified project stage			Project goal impacted by the risk			Quantified the risk	Risk response					Attempt at risk management				
		Initiation	Execution	Closure	Time	Cost	Quality		Accept	Mitigate	Transfer	Avoid	Monitor	Transfer or share by contract or agreement	Insure against	Plan and control against	Design against	Make allowances by budget
1	**Financial**	**0**	**3**	**0**	**0**	**3**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**1**
1.1	*Inflation*		1			1			1									1
1.2	*Funding*																	
1.3	*Delayed payment*		1			1							1					
1.4	*Cash flow*		1			1							1					
1.5	*Currency risk*																	
1.6	*Credit risk*																	
1.7	*Liquidity risk*																	
2	**Operational**	**3**	**1**	**0**	**4**	**4**	**4**	**0**	**1**	**0**	**3**	**0**	**0**	**3**	**0**	**1**	**0**	**0**
2.1	*Unforeseen site conditions*		1		1	1	1		1							1		
2.2	*Safety*																	
2.3	*Unavailability of resources*	1			1	1	1				1			1				
2.4	*Unskilled staff*	1			1	1	1				1			1				
2.5	*Lack of technology*	1			1	1	1				1			1				
3	**Management**	**0**	**1**	**0**	**1**	**1**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**
3.1	*Decision making*																	
3.2	*Planning and controlling*																	
3.3	*Communication*		1		1	1	1		1					1				
4	**Engineering**	**0**	**3**	**0**	**3**	**1**	**3**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**3**	**0**	**0**
4.1	*Design errors and changes*		1		1	1	1					1				1		
4.2	*Scheduling*		1		1		1					1				1		
4.3	*Approval delays*		1		1		1					1				1		
5	**External**	**0**	**4**	**0**	**3**	**3**	**3**	**0**	**2**	**1**	**1**	**0**	**0**	**1**	**1**	**2**	**0**	**0**
5.1	*Project stakeholders*		1		1		1				1			1				
5.2	*Environmental issues*		1			1				1					1			
5.3	*Government regulations*		1		1	1	1		1							1		
5.4	*Social and political issues*		1		1	1	1		1							1		