Critical Success Factors of Project Management for Dam Construction Projects in Myanmar

Dissertation submitted in partial fulfillment of the requirements for the degree of MA in Governance and Development

Submitted by

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CERTIFICATE

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STATEMENT OF THE CANDIDATE

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Abstract

The primary purpose of this study is to determine the critical success factors in construction projects, especially in the dam construction project in Myanmar. The major objective is to analyze the managers' efficiencies to handle the knowledge area management, especially in dam construction projects and to examine the factors that ensure project success for a development project based on the empirical evidence of project practitioners on the target survey area. The percentage frequency distribution method and relative importance index (RII) method are used to figure out the critical success factors in this dissertation.

This dissertation is organized with five chapters. The contribution of development project to Myanmar economy is a main reason why I have to study this topic and some of the problem statements of study are described in the introduction of this dissertation. In the literature review, this dissertation will discuss the critical success factors of project management and the methods to figure out those factors which had been published and figured out by the researchers. The methods which are used to collect the data and figure out the success factors are described in the methodology chapter. In the data analysis and conclusion chapters, the critical success factors of targeted survey area and the reason why those factors become success factors are described.

This study was conducted in Myanmar and five dam construction projects served as subjects in a study designed to investigate. This study indicates that ten critical success factors of those five dam construction projects are very important to success those projects. On the basis of the results of this research, it can be concluded that the critical success factors which were figured out from the five dam construction projects should be used and consider deeply to ensure the success for the further dam construction projects in Myanmar as the nature of the dam construction project throughout the Myanmar are more or less same.

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CHAPTER-ONE

INTRODUCTION

1.1 Background of this study

Project management has become increasingly important in the development of any nation. Various organizations have used project management techniques as a means of bridging the gap between failure and success in the implementation of projects. Despite this increasing awareness of project management by organizations, projects still fail. The purpose of this dissertation is to systematically investigate the causes that ensure the project success and how the managers are undertaking the project knowledge areas like project integration management, project scope management, project time management, project cost management, project quality management, project human resource management, project communication management and project stakeholder management.

The development projects play a vital role in the economic development of Myanmar by contributing the gross domestic product (GDP), employing some portion of the working population, accounting for about half of the capital formation and interacting strongly with other sector of the economy. The Government of Myanmar (GoM) is also formulating Long-Term National Comprehensive Development Plan (NCDP) for 2011-2031, by which time Myanmar will have an industrial foundation and the project management issue will be critical. The first five-year plan (2011-2016), target people centered development which improves the standard of living of Myanmar's people. This means access to electricity, safe drinking water, agriculture, employment, tourism, banking and finance, trade and investment as well as rural development and poverty reduction by implementing successful projects in all- rounded sectors.

1.2 Significant of this study

At present, the Ministry of National Planning and Economic Development has been encouraged all the line ministries to follow the rules and procedures when they implement the projects. However, the line ministries still have some constraints to prepare the project properly, such as lack of professionals to prepare the project plan, the budget constraints and limited knowledge of project management. In 2012, the Planning Commission was

formulated and all the public projects have to be submitted and all the development projects have to get approval from this commission. Although the Planning Commission has some limitation to analyze and prioritize the project submitted from the line ministries, we will see the beneficial projects for the citizens in the near future.

1.3 Problem statement

Many projects around the world keep failing, resulting in the loss of millions of dollars for organizations. This persisting challenge has led many project management professionals to attempt to identify the critical factors that need to be tackled head-on to produce a successful project management outcome. There exist literatures on critical success factors for specific industry sectors, or specific country situation, and very little empirical research on critical success factors for specific organizational operational units.

In some instances, a few literatures exist on the critical success factors of a project management on a particular part of the project life cycle, like risk management, procurement and planning, etc., but rarely on the all knowledge areas of the project management.

Some of the dam construction projects in Myanmar faced the constraints, especially for time management, cost management, quality management etc. Generally, those projects were not prepared properly according to the project phases and the project managers and stakeholders of those projects have no enough knowledge for the management of knowledge areas. This has inspired me to carry out preliminary research on identifying the most critical success factors that need to be managed carefully on all the knowledge areas of project management during the dam construction project management in Myanmar.

1.4 Objectives of this study

The aim of this dissertation is to carry out appraisal on the causes of project success and to realize how the managers are undertaking the project management functions in each knowledge area according to PMBOK. This aim is intended to be achieved with the following objectives.

The main objectives of the dissertation are:

1. To find out success criteria for dam construction projects in Myanmar.
2. To examine the managers' efficiencies to handle the knowledge area management in dam construction projects.
3. To examine the factors that can ensure success of project for development projects.

1.5 Research question

The critical success factors and the project managers' efficiencies on project knowledge areas management in handling the dam construction project is the target of this dissertation. In order to achieve study objectives, the following research questions are formulated:

- Does critical factors matter on success of successful project management?
- Which factors are critical according to the knowledge area management to ensure the successful projects in the dam construction project in Myanmar?
- Which factors are effective in current practice of project management for the dam construction projects in Myanmar?

1.6 Scope and limitation

It is worth to mention that the main reasons for these limitations are the time and resource shortages. The followings are the limitations of this research:

- The research is limited to the governmental organizations whom are implementing the dam construction projects in Myanmar.
- The development of the framework is based on only the questionnaire survey. The findings are limited to the five dam construction projects of Myanmar
- The assessment of the success factors in the dam construction project in Myanmar is limited to the selected sample of general factors and knowledge areas success factors, and the assessment did not take the stages of the project life cycle.

This dissertation is based on only five dam construction projects executed in Myanmar. This dissertation work is focused on identifying the critical factors that effect on the success of dam construction project management in Myanmar.

1.7 Organization of the chapters

The study is divided into five chapters such as:

Chapter One: Introduction of the study that includes back ground of this study, significant, problem statement, research objectives, research questions and scope & limitation of this study.

Chapter Two: Theoretical description of project management and dam project in Myanmar that includes the project and success, project success, project management and success,

project management success, project success criteria and project success factors and critical success factors of project management.

Chapter Three: Methodology describes the methodology used to undertake this dissertation. It demonstrates the fact that questionnaire survey was mostly used in undertaking this dissertation. This chapter includes research strategy, research population and sampling, research location, data collection system, data measurement method and data processing.

Chapter Four: Data analysis contain the analysis of survey data and the discussion on the findings. This is derived from critically analyzing the five dam construction projects in Myanmar. This chapter include the survey data analysis with two method: i) percentage frequency distribution method and relative importance index method. Followed by chapter five conclusion and recommendation that includes the conclusion statement of this study and the recommendation for further study.

CHAPTER- TWO

THEORETICAL DESCRIPTION OF PROJECT MANAGEMENT AND DAM PROJECT IN MYANMAR

According to Salleh (2009), the study of project success or failure and critical success factors is a means of understanding and improving the project management process. This section will review literatures that will provide the understanding and explanation of critical success factors in project management. The literature review will include project and success, project success, project management and success, project management success, project success criteria and project success factors and the importance of the critical success factors for projects.

2.1 Project and Success

Gary and Larson (2008) defined project as "a complex, non-routine, one-time effort limited by time, budget and resource, and performance specifications designed to meet customer needs. This is in contrast to how an organization generally works on a permanent basis to produce their goods and services. A project can be defined as having constraints (usually centered around time and resources, but also including all aspects of the process and the outcome); projects are processes that in many circumstances are core business for organization.

A project as defined by PMBOK fifth edition, "it is a temporary endeavor undertaken to create a unique product, service, or result." Projects are generally started with an objective or a particular result in mind. It always has a fixed time period and can have one or many people working on a project. "A project is a sequence of unique, complex and connected activities having one goal or purpose and that must be completed by a specific time, within budget, and according to specification" (Wysocki and McGary, 2003)

Success really does not have a specific definition, but in case of a project's success can be defined as completing a project on time, within budget with a good level of quality. A project can have a lasting social and environmental effect, far beyond the life of the project itself. So it is very important to ensure that the project is completed successfully as it could affect many people in their day to day life.

What I am trying to look at in this dissertation is to understand the factors that affect the success of a project and the common factors which could have an impact on the overall project.

2.2 Project Success

Project success could have many definitions. It is an intangible on the whole. The success of a project could be creating a product or service within the budget available. For another team, it could be finishing something in a specific time frame. But in general, one can define project success as completing a given project on time, within the given budget and reasonably good quality.

Lewis (2005) states that project success can be defined as meeting the required expectation of the stakeholders and achieving its intended purpose. This can be attained by understanding what the end result would be, and then stating the deliverables of the project. Shenhar et al. (2001) state the opposite: that project success is commonly judged by time and budget goals criteria, whereas in some cases this does not apply to any projects. Thiry (2006) argues that project success can only be defined if executives are able to consider the contribution of benefits and if the project is able to achieve these measures in relation to resources, competencies and complexity within the project parameters.

Project success is a subject matter that is commonly talked about and yet very hardly settled upon (Baccarini, 1999). Commonly, the attitudes on project success have developed gradually over the years from simple explanations that were restricted to the implementation phase of the project life cycle to explanations that reflect the gratitude of success over the whole project and product life cycle (Jugdev and Muller, 2005).

On the other hand, Cleland (1986) suggested that "project success is significant only if measured from two vantage points: the extent to which the project's technical performance objective was accomplished on time and within budget; the contribution that the project made to the strategic mission of the organization."

According to Pinto & Slevin (1988), "Project Success" is something more difficult than just meeting cost, time, and performance specifications. As a matter of fact, client's contentment with the final result has a great deal to do with the perceived success or collapse of projects". Baccarini (1999) discovered two different components of project success: these are given below:

- *Project Management Success* - This concentrates upon the project process and especially the successful achievement of cost, time, and quality. Also the way in which the project management process was performed will be considered.
- *Product Success* - This deals with the effects of the project's final product. A clear difference should be made between product success and project management success, in order to properly identify and evaluate project management success and product success, as they are differ from each other.

According to Baccarini (1999), Project success can be summarized as

> Project success = project management success + project product success

I do agree the concept of Baccarini (1999) for project success. In my view, the most important things for project success mainly depends on the successful project management. The successful project management will include two components. The first component is the project management process such as a project initiating process, project planning process, project executing process, project monitoring process and project closing process. The second component is project knowledge areas management, such project integration management, project scope management, project time management, project quality management, project cost management, project communication management, project risk management, project procurement management and project stakeholder management. Therefore, the successful project management will support to ensure the project product success and then it definitely ensure the project success.

2.3 Project management and success

According to Gray and Larson (2006), project management is a task derived from an organization that enables professional project managers to use their skills, tools and knowledge to plan, execute and control a unique project within a limited lifespan by meeting the specification requirements of the organization.
Munns and Bjeirmi (1996) also defined project management as a process used as a control to achieve the project objectives by utilizing the organizational structure and resources to manage a project with the application of tools and techniques, without disrupting the routine operation of the company.

'Project management is the discipline of managing all the different resources and aspects of the project in such a way that the resources will deliver all the output that is required to complete the project within the defined scope, time, and cost constraints. These are agreed upon the project initiation stage and by the time the project begins all stakeholders and team members will have a clear understanding and acceptance of the process, methodology and expected outcome'.

Project management has been defined as "the process by which projects (unique, complex, non- routine, one-time effort limited by time, budget, and resources) are defined, planned, monitored, controlled and delivered such that the agreed benefits are realized" (APM, 2006). Despite all the suggestions about what is project management, the criteria for success, namely, cost, time, and quality remain and are included in the actual description. Meaning that Oisen's definition of project management was either correct, or as a discipline, project management has not really changed or developed the success criteria over 50 years.

In 2008, a survey undertaken by Booz Allen Hamilton (project management consultant) which comprises of 20 companies in engineering, procurement and construction; shows that 40 percent of all projects executed where faced with cost overruns and behind schedule. These overrun in cost and schedule has led to client's dissatisfaction on project performance; this view also agree with the research of M J Lang (1990). Therefore, effective project management is very vital in such a volatile business environment.

2.4 Project management success

Traditionally, project management success focused on the dimensions of 'within the time', 'within the budget' and 'according to the requirements' (quality and functional specifications) of a project.

The three dimensions of time, budget and specifications feature in many definitions of project management success *(e.g. Blaney 1989; Duncan 1987; Globerson & Zwikael 2002, Redmill, 1997, Thomsett 2003)*. However, time, budget and specifications are not sufficient to measure project management success as dimensions such as the quality of the project management process and the satisfaction of the project stakeholder's expectations also need to be considered (*Baccarini 1999 Schwalbe 2004)*.

Therefore, extending the traditional triangle to include the quality of the management process, the integration, the scope, the communication, the procurement, the communication, the risk and stakeholder management process will be able to provide a more complete view of project management success.

2.4.1 Effect of Quality on Success

Quality is an important attribute when it comes to a product or service. Simply putting it, if the quality of the product/service is not good, then the customer will not be interested in it. I, however personally feel that the quality is not the most important attribute to project success. The reason I say this is because the quality is generally a standard document which every organization has and therefore complying the standards will be a part of the work culture of the organization.

2.4.2 Effect of Cost on Success

For any project to be successful, money is required either for buying raw materials, or using a particular machine or even just outsourcing certain sub tasks. It is important to have a good estimate of how much is really required to make a good product/service.

2.4.3 Effect of Project Time Management on Success

Time is one of the most important factors in project success. It is the only factor on which the other attributes depend on. Cash and quality can be grossly affected if the time scales of the project are not accurate.

I feel that time is the one of the main attributes which the project manager has to handle on his own. Quality and cash to a certain extent are not in the project manger's hand.

2.4.4 Effect of Project Integration Management on Success

According to the PMBOK, the project integration management is necessary in situations where individual processes interact. For example, a cost estimate needed for a contingency plan involves integrating the processes in the Project Cost, Time, and Risk Management Knowledge Areas. When additional risks associated with various staffing alternatives are identified, then one or more of those processes may be revisited. The project deliverables may also need integrating with ongoing operations of the performing organization, the requesting organization, and with the long-term strategic planning that takes future problems and opportunities into consideration.

The experienced project management practitioners know there is no single way to manage a project. If a project has more than one phase, the level of accuracy applied within each of the project phases should be appropriate for each phase. This determination is also addressed by the project manager and project team. The integrative nature of projects and project management can be understood by thinking about other types of activities performed while completing a project. Therefore, the effective project integration management can ensure the successful project management.

2.4.5 Effect of Project Scope Management on Success

The project scope management is a difficult task, but it will really help the organization to have successful projects. Project scope management, which includes the processes that are involved in defining and controlling what is included and what is not included in a project. It is very essential that the project team and the stakeholders have the same understanding that what will be the product that will be produced and also what are the processes that the project team will be using to produce them.

Schwalbe(2007)states that the first step in project scope management is scope planning. The project's size, complexity, importance, and other factors will affect how much effort is spent on scope planning and the main output is a project scope management plan and the tools and techniques are template forms, standards as well as expert judgment.

According to Schwalbe (2007) the next step in project scope management is to define the work required for the project further. Good scope definition is very important to project success because it helps to improve the accuracy of time, cost and resource estimates, it defines a baseline for performance measurement and project control and it aides in communicating clear work responsibilities.

2.4.6 Effect of Project Human Resource Management on Success

According to HR management expert, John M. Ivancevic (2010), "Human resource management is the process of linking the human resource function with the strategic objectives of the organization in order to improve performance."

"Human resource management (HRM) is the effective management of people at work. HRM examines what can or should be done to make working people more productive and satisfied."- John M. Ivancevic (2010). The effective human resource management can be the difference between success and failure for the projects.

2.4.7 Effect of Project Communication Management on Success

Communication is a process in which information is transmitted from a source to a receiver through various channels (JPIM, 2000). Communication means act of transferring information, exchange of information, message which is either written or verbal, and an idea of conveying thoughts effectively (Kerzner, 2001).

A good definition of project communication is "Project communication management includes the process required to ensure timely and appropriate generation, collection, distribution, storage, retrieval and ultimate disposition of project information" (PMI, 2008). Project Communications Management includes the processes required to ensure timely and appropriate generation, collection, distribution, storage, retrieval and ultimate disposition of project information.

Communication is an important skill for project managers to accomplish effective project management (Analoui, 1993). This skill is vital because part of management is motivating people to perform their assigned duties to the best of their ability (Perret, 1982; Scott, 1989). "Effective communication is the key to success for the individual as well as for the project" (Verma, 1996). By using communication skills, the project manager helps to plan, direct, control and coordinate their operations throughout the project life cycle (Verma, 1996). The effective project communication management can determine the extent of the project's success or failure.

2.4.8 Effect of Project Procurement Management on Success

Procurement refers to the aspects of project management related to obtaining goods and services from external sources. It does not refer to other internal organizations within your own company. The definition of project procurement management from the PMBOK is “the processes necessary to purchase or acquire the products, services, or results needed from outside the project team”.

The effective procurement process will aid in saving time, maintaining a sound budget and event saving money while managing and lowering risk.

2.4.9 Effect of Project Risk Management on Success

Risk management is a management system that is used to identify and quantify all the inherent risks that influence the business or project performances, so a decision maker can make a suitable decision on how to manage risks." (Flanagan and Norman, 1993).

According to the PMBOK (2002), the risk management can be defined as "It is the systematic process of identifying, analyzing and responding to project risk. It includes maximizing the probability and consequences of positive events and minimizing the probability and consequences of adverse events to project objectives."

Harwood (2004) defines risk management as the process in which we select from possible choices to decrease the effects of the risk. It involves the assessment of compromise between changes in risk, anticipated returns and progressive freedom. The general aim of risk

management in a project is to recognize, evaluate, think and manage probable issues with it, as a result of which, removing or lessening any damaging effect on its objectives.

Risk Management is defined or called as an art and science of analyzing, identifying, and responding to risk throughout the life of the project and for the best interest of meeting project objectives (Schwalbe, 2006).

"Project risk management, as one of the key disciplines of project management, is defined as the systematic process of identifying, analyzing and responding to risk as project-related events, or managerial behavior, that is not definitely known in advance, but that has potential for adverse consequences on a project objective" (Project Management Institute, 2004 cited in Kutsch and Hall, 2009).

The best practices in project risk management provide companies with an organized risk management approaches, tools, techniques and processes integrated to the project management processes within the organization. The practices are in place to assist organizations in achieving their objectives.

The effective project risk management can contribute to the overall success of the project because it points out the threats and opportunities which are either eliminated or utilized. It results in better business outcomes through more informed decision making activities achieved from corrections made after the risk management activities. It can also recognize and forecast the uncertainties and possible occurrences is provided. The best project risk management can influence innovation and positive thinking for the organization.

2.4.10 Effect of Project Stakeholder Management on Success

Singleton (2007) defined stakeholders as organizations or individuals who are actively involved in projects and whose interests may be negatively or positively affected in the courses of completion or execution of these particular projects.

Stakeholder management is the process of identifying and engaging with all parties who have a stake in a project or firm’s success. The management of competing stakeholders has emerged has as an important weapon in the successful implementation of projects. 'There are

many ways to measure project success (and failure). Stakeholders often view and measure projects as either a complete success or a complete failure without recognizing that projects may not be successful from their perspective but a success from another perspective.

2.5 Project Success Criteria and Project Success Factors

Muller and Turner (2007) defined the two components of project success in relation to the use of project management as follows:

- Project success factors are the elements of a project that can be influenced to increase the like hood of success; these are independent variable that makes success more likely.
- Project success criteria are the measures by which judge the successful outcome of a project; these are dependent variable which measure project success.

We often hear or read about various success stories. But what is success and what criteria should organizations use to identify success? What factors lead to a successful project? The purpose of this study is to define project success criteria, clarify their difference with success factors and analyze their importance in project management methodology. One of the vaguest concepts of project management is project success. Since each individual or group of people who are involved in a project have different needs and expectations, it is very unsurprising that they interpret project success in their own way of understanding (Cleland & Ireland, 2004).

"For those involved with a project, project success is normally thought of as the achievement of some pre-determined project goals" (Lim & Mohamed, 1999) while the general public has different views, commonly based on user satisfaction. A classic example of different perspective of a successful project is the Sydney Opera House project (Thomsett, 2003), which went 16 times over budget and took 4 times more to finish than originally planned.

"In the same way that quality requires both conformance to the specifications and fitness for use, project success requires a combination of product success (service, result, or outcome) and project management success" (Duncan, 2004).

The difference between criteria and factors is fuzzy for many people. The Cambridge Advanced Learner's Dictionary describes a criterion as "a standard by which you judge, decide about or deal with something" while a factor is explained as "a fact or situation which influences the result of something".

Lim & Mohamed applied those definitions to project success and illustrated the difference. It is clear now that critical factors can lead to a series of events which ultimately meet the overall success criteria of the project, so they should not be used as synonymous terms. Project success can be seen from two different perceptive, the micro and macro viewpoint (Lim & Mohamed, 1999). This can help in better understanding of what project success means to different people.

2.5.1 Project Success Criteria

According to Crawford (2002) project success is an important project management issue, it is one of the most frequently discussed topics and there is a lack of agreement concerning the criteria by which success is judged (Pinto and Slevin 1988; Freeman and Beale 1992; Shenhar, Levy and Dvir 1997; Baccarini 1999).

A review of the literature further reveals that there is, in fact, a high level of agreement with the definition provided by Baker, Murphy, and Fisher (1988), that project success is a matter of perception and that a project will be most likely to be perceived to be an “overall success” if: …….the project meets the technical performance specifications and/or mission to be performed, and if there is a high level of satisfaction concerning the project outcome among key people on the project team, and key users or clientele of the project effort.

There is also a general agreement that although the schedule and budget performance alone are considered inadequate as measures of project success, they are still important components of the overall construct. Quality is intertwined with issues of technical performance, specifications, and achievement of functional objectives and it is the achievement against these criteria that will be most subject to variation in perception by multiple project stakeholders.

Many lists of success criteria have been introduced in the previous decades by various researchers. Primal success criteria have been an integrated part of project management theory given that early definitions of project management included the so called ‘Iron Triangle' success criteria - cost, time and quality. (Atkinson, 1999). Atkinson continues that "as a discipline, project management has not really changed or developed the success measurement criteria in almost 50 years".

To meet the urgent need of modernizing the out of date success criteria, he suggests the ‘Square Route' (3) success criteria instead of the ‘Iron Triangle', where he groups the criteria that other academics have proposed. The main change is the addition of qualitative objectives rather than quantitative, namely the benefits that different group of people can receive from the project. These benefits are seen from two perspectives, one from the organizational view and one from the stakeholders view.

It is obvious that each part will have benefit differently from projects. For example, one organization can gain profit through achieving strategic goals when a project is completed and at the same time these goals have a serious environmental impact in the stakeholders' community. This means that a successful project must bargain between the benefits of the organization and the satisfaction of end users. The fourth corner of the ‘Square Root' is the Information System which includes the subjects of maintainability, reliability and validity of project outcomes.

Belassi and Tukel (2001) are of the opinion that criteria for measuring project success/failure can grouped into two groups: the factor and system response groups. The identified factor groups are: factor related to project manager, factor related to project team members, factor related to the project itself, the organization handling the project and the factor related to the external environment in which the project takes place. The diagram below shows this in more detail.

2.5.2 Success Factors

Murphy, Baker and Fisher (1974) used a sample of 650 completed aerospace, construction, and other projects with data provided primarily by project managers on the factors contributing to project success. Theirs has been the most cited, used, extensive and

authoritative research in the area of project success factors. They found ten factors that were found to be strongly linearly related to both perceived success and perceived failure of projects, while twenty-three project management characteristics were identified as being necessary but not sufficient conditions for perceived success Baker, Murphy, and Fisher (1988).

Pinto and Slevin (1987, 1988) and Morris and Hough (1986, 1987) also did an important work on project success factors in the 1980s. While Morris and Hough (1986, 1987) drew primarily on literature and case study analysis of major projects, Pinto and Slevin (1987, 1988) based their findings on the opinions of a usable sample of 418 PMI members responding to questions asking them to rate the relevance to project implementation success of ten critical success factors and four additional external factors (Slevin & Pinto 1986).

Therefore, one can conclude that there are umpteen number of factors that may have a bearing on project success. They may differ from one project to another. The following section describes the role of a project manager in achieving project success.

As mentioned earlier; "success factors are those inputs to the management system that lead directly or indirectly to the success of the project or business" (Cooke-Davies, 2002, p185). Some project managers "intuitively and informally determine their own success factors. However, if these factors are not explicitly identified and recorded, they will not become part of formal project management reporting process, nor they become part of the historical project data" (Rad & Levin, 2002, p18). Belassi & Tukel (1996, p144) classified these factors into 5 distinct groups according to which element they relate to.

2.5.2.1 The Organization

Top management support is the principal success factor for many independent research groups (Tukel & Rom, 1998, p48) (CHAOS Report, 2001, p4) (Cleland & Ireland, 2002, p210) (Tinnirello, 2002, p14), which means that no project can finish successfully unless the project manager secures true support from the senior or operational management. It is extremely difficult to work in a hostile environment where nobody understands the benefits that the project will deliver to the organization. Stakeholder management and contract strategies (number of and size of the contracts, the interface between the different contracts

and the management of contracts) are separate success factors which are also considered part of organization issues (Torp, Austeng & Mengesha, 2004).

2.5.2.2 The Project Manager

Having a project manager is not going to guarantee the success of a project. He must have a number of skills to use during the project to guide the rest of the team to successfully complete all the objectives. In the 2001 CHAOS report (The Standish Group International, 2001, p6), business, communication, responsiveness, process, results, operational, realism and technological skills are mentioned as some of the most important skills a project manager should have to deliver success. However, the more recent research by Turner and Muller (2005, p59) has concluded that "the leadership style and competence of the project manager have no impact on project success". It is very interesting to investigate why a highly respectable professional body for project managers published such a contradictive position.

A possible answer could be found in the fact that project manager's results are difficult to prove and even more difficult to measure. If the project is successful, senior management will probably claim that all external factors were favorable. On the contrary, if it turns to be a failure, project manager easily becomes the scapegoat.

2.5.2.3 The Project Team

Project managers are very lucky if they have the option to choose their project team. More often, their team is inherited to the project from various sectors of the organization. It is vital to have a good project team to work with, with the core skills that can be evolved to core competences and capabilities for the whole organization.

All members of the project team must be committed to the success of the project and the overall mission of the company. Apart from their skills and commitment, project team members should have clear communication channels to access "both the functional manager and the project manager within a matrix organization. Effective management of this dual reporting is often a critical success factor for the project" (PMBOK Guide, 2004).

2.5.2.4 The Project Itself

The type of a project underlines some factors that are important to success. For example, if a project is urgent, the critical factor in that case is time. The size, value of a project and its

uniqueness of activities can be a puzzle for the project manager who is used to planning and coordinating common and simple activities (Belassi & Tukel, 1996, p144).

2.5.2.5 The External Environment

External environment can be the political, economic, socio-culture and technological (PEST) context in which the project is executed. Factors like the weather, work accidents or the government's favorable or unfavorable legislation can affect the project in all of its phases. Note that if a client is from outside the organization, he should also be considered as an external factor influencing the project performance (Belassi & Tukel, 1996, p145). Competitors should also be accounted as external factors which can undermine project success because the original project could be overshadowed by a more glamorous and successful project launched by another organization.

2.6 What is a Critical Success Factor?

Critical success factor is an element of organizational activity which is central to its future success. Critical success factors may change over time, and may include items such as product quality, employee attitudes, manufacturing flexibility, and brand awareness (PAPID BI).

Critical success factors are normally identified in such areas as production processes, employee and organization skills, functions, techniques, and technologies. The identification and strengthening of such factors may be similar.

Critical Success Factors (CSF's) are the critical factors or activities required for ensuring the success your business. Critical Success Factors have been used significantly to present or identify a few key factors that organizations should focus on to be successful.

As a definition, critical success factors refer to "the limited number of areas in which satisfactory results will ensure successful competitive performance for the individual, department, or organization".

2.6.1 How are CSFs important to an organization?

Identifying CSF's is important as it allows firms to focus their efforts on building their capabilities to meet the CSF's, or even allow firms to decide if they have the capability to build the requirements necessary to meet Critical Success Factors (CSF's).

CSFs are the essential areas of activity that must be performed well if an organization is to achieve the mission, objectives or goals for the project. By identifying the critical success factors (CSF's), an organization can create a common point of reference to help other organization direct and measure the success of the project. As a common point of reference, CSFs help every organization in the team to know exactly what's most important. And this helps people perform their own work in the right context and so pull together towards the same overall aims.

2.6.2 Being Practical about Critical Success Factors

Before starting the project looking at CSFs it is important to realize that the specific factors relevant for an organization will vary from business to business and industry to industry. The key to using CSFs effectively is to ensure that the definition of a factor of an organization's activity which is central to its future will always apply.
Therefore, success in determining the CSFs for a project is to determine what is central to its future and achievement of that future.

2.6.3 Types of Critical Success Factor

There are four basic types of CSF's as follow:

- Industry CSF's: resulting from specific industry characteristics;
- Strategy CSF's: resulting from the chosen competitive strategy of the business;
- Environmental CSF's: resulting from economic or technological changes; and
- Temporal CSF's: resulting from internal organizational needs and changes.

In this dissertation, the critical success factors are figured out as a temporal CSF type.

2.6.4 Developing Critical Success Factor – CSF's

According to (PAID BI), in an attempt to find out good CSF's, a number of principles could help to guide writers. These principles are:

- Ensure a good understanding of the environment of the project. – It has been shown that CSF's have five primary sources, and it is important to have a good understanding of the environment, the industry and the company in order to be able to

write them well. These factors are customized for companies and individuals and the customization results from the uniqueness of the organization.

- Build knowledge of competitors in the industry – While this principle can be encompassed in the previous one, it is worth highlighting separately as it is critical to have a good understanding of competitors as well in identifying an organization's CSF's Knowing where competitors are positioned, what their resources and capabilities are, and what strategies they will pursue can have an impact on an organization's strategy and also resulting CSF's
- Develop CSF's which result in observable differences – A key impetus for the development of CSF's was the notion that factors which get measured are more likely to be achieved versus factors which are not measured. Thus, it is important to write CSF's which are observable or possibly measurable in certain respects such that it would be easier to focus on these factors. These don't have to be factors that are measured quantitatively as this would mimic key performance indicators; however, writing CSF's in observable terms would be helpful.
- Develop CSF's that have a large impact on an organization's performance – By definition, CSF's are the "most critical" factors for organizations or individuals. However, due care should be exercised in identifying them due to the largely qualitative approach to identification, leaving many possible options for the factors and potentially results in discussions and debate. In order to truly have the impact as envisioned when CSF's were developed, it is important to identify the actual CSF's, i.e. the ones which would have the largest impact on an organization's (or individual's) performance.

2.6.5 Key point of CSFs for a project

Critical success factors (CSFs) are the areas of a business or project that are absolutely essential to its success. By identifying and communicating these CSFs, an organization can help ensure its business or project is well-focused and avoid wasting effort and resources on less important areas. By making CSFs explicit and communicating them with everyone involved, an organization can help keep the business and the project on track towards common aims and goals.

CHAPTER-THREE

RESEARCH METHODOLOGY

The main purpose of this chapter is to describe the current research approach with a view to selecting the most appropriate methodology, including research strategy, method of data collection and measurement, ranking the result with percentage distribution method and relative importance index (RII) method and questionnaire design and development. The nature of this research suggests that a quantitative methodology is the most appropriate method based on this research requirement. A quantitative methodology also aligns with the fact that the majority of research in the construction management.

This dissertation aims to figure out the critical success factors for construction project management by using a quantitative survey in the area of Dam Construction in Myanmar. The main information of this dissertation was gathered from five dam projects. The adopted methodologies to accomplish this dissertation are the following techniques: review of literature related to critical success factors, questionnaire for gathering data from each of the respective projects. This chapter provides the information about the research strategy and design, research population and sample, questionnaire design, the process of data collection.

3.1 Research strategy

There are two types of research strategies such as quantitative and qualitative research (Naoum, 2007). Quantitative approaches seek to gather factual data and to study relationships between facts and how such facts and relationships accord with theories and the findings of any research executed previously, where qualitative approaches seek to gain insights and to understand people's perception of "the world" whether as individuals or groups (Fellows and Liu, 2008). In this research, a quantitative approach is selected to understand the factors that can ensure the success of project management in construction projects and to investigate how the knowledge areas of project management were adopted properly by project managers to come up successful projects in Myanmar. The required quantitative data will be obtained from questionnaires.

3.2 Research population and Sampling

The population in this study includes the project managers or those who have abundant experiences in the dam construction projects. The targeted population consists of 23 governmental agencies that they are involved in the management of dam construction projects. The population members got their experiences through their extended career in consulting firms, local institutions or ministries, implementing agencies, international agencies whom are involved in implementation of the dam construction projects in Myanmar. The targeted sample was the i) governmental institutions, ii) semi-governmental institution and iii) international non-government organization in those five dam construction projects in Myanmar.

3.3 Research location

The research was carried out in the areas of construction projects in Myanmar, which consists of five dams as follows:

- Shwelaung dam construction project (Bago region),
- Salu dam construction project (Bago region),
- The irrigation network construction project of Yenwe (Bago Region)
- Myogyi multi-purpose dam construction project (Shan State)
- Minhlay (Dam/Lake) reconstruction project (Mandalay Region)

3.4 Data collection

The questionnaire survey was chosen to be the method of collecting data in this research, since the questionnaire is probably the most widely used data collection technique for conducting surveys. Questionnaires have been widely used for descriptive and analytical surveys in order to find out the facts, opinions and views (Naoum, 2007). It enhances confidentiality, supports internal and external validity, facilitates analysis, and saves resources. Data are collected in a standardized form from samples of the population. The standardized form allows the researcher to carry out statistical inferences on the data, often with the help of computers. The used questionnaire has some limitations such as: it must contain simple questions, no control over respondents and respondents may answer generally (Naoum, 2007).

3.5 Questionnaire design and development

The good design of the questionnaire is a key to obtain good survey results and warranting a high rate of return. The questions of the research questionnaire are constructed based on:

- Literature review of ten knowledge areas based on Project Management Body of Knowledge (PMBOK).
- The general knowledge for project management from previous studies, to obtain many basic important thoughts which can be useful for creating questions.

The questionnaire comprised of three parts to accomplish the objectives of this research, as follows:

1) Part I: General information about the population.

This part mainly designed to provide general information about the respondents in terms of the age, gender, type of institutions, educational level, and occupational level, number of employees in the areas and experience of the respondent.

2) Part II: General Success Factors of Project Management

One of the objectives of this research is to investigate factors that ensure the success for project management process in construction project. So, the previous studies were used to build a comprehensive list of critical success factors affecting the project management process. 21 factors that ensure the success of project management process in construction projects are selected. The factors, which are considered in the questionnaire, are summarized and collected according to previous studies as shown in Table 3.1.

Table 3- 1 General success factors of project management

No	General Factors
1.	Competence of the project manager
2.	Competence of project team members
3	Support from the agency administering
4	Clarity of project goals
5	Top management support
6	Motivation of project team members
7	Effective communication between project stakeholders

No	General Factors
8	Effective coordination of project activities
9	Compliance with the rules and procedures
10	Systematic control over the project execution
11	Access to organizational resources
12	SMART planning
13	Competence and adequate support from a project consultant
14	Project manager commitment to the goals
15	Project manager's technical capabilities
16	Control systems
17	Definition of work and its field
18	Budget performance
19	Schedule performance
20	Employer satisfaction
21	Task-orientation

3) Part III: Success Factors in Ten Knowledge Areas of Project Management according to PMBOK

One of the objectives of this dissertation is to evaluate the current practice and efficiencies of the managers on the knowledge areas management in the construction project. Therefore, the tasks of each knowledge areas were used to build a comprehensive list of practical approaches to figure out the critical success factors of these five dam construction projects based on the managers' experiences and perspectives.

3.6 Data measurement

The level of measurement can influence type of analysis. There are four levels of measurement associated with the quantitative data and these measurements are as follows:

- Nominal
- Ordinal
- **Interval**
- Ratio (scale)

In this dissertation, interval data are used. This data is continuous and has a logical order, data have standardized differences between values, but no natural zero. Items measured on a Likert scale – rank your satisfaction on a scale of 1-5.

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Neutral
- 4 = Agree
- 5 = Strongly Agree

3.7 Data Processing

The quantitative data are being used in this dissertation. Quantitative analysis is "concerned with numerical measurement and mathematical models to the test hypotheses, support the view of the positivist paradigm that there is an objective reality that can be accessed and measured (Saunder et al, 2006). Data will be analyzed by using the SPSS-16 windows program and Microsoft Excel 2010 operating system.

Due to sample size restrictions, the types of quantitative methods in this research area are limited. The questionnaire quantitative data analysis was done by using the following the quantitative data analysis procedures outlined below.

1) Data tabulation (frequency distributions & percent distributions)
2) Descriptive data
3) Data disaggregation
4) Statistical method for ranking data

1) Data tabulation

These procedures gives a comprehensive picture of what the data looks like and assists the researcher in identifying patterns. The best ways to do this are by constructing frequency and percent distributions. A frequency distribution is an organized tabulation of the number of individuals or scores located in each category. This will help to determine:

- If scores are entered correctly
- If scores are high or low
- How many are in each category
- The spread of the scores

2) Descriptive data

A descriptive refers to calculations that are used to "describe" the data set. The most commonly descriptive used are:

- **Mean** – the numerical average of scores for a particular variable
- **Minimum and maximum values** – the highest and lowest value for a particular variable
- **Median** – the numerical middle point or score that cuts the distribution in half for a particular variable

3) Data disaggregation

After tabulating the data, this procedure continues to explore the data by disaggregating it across different variables and subcategories of variables. Crosstabs allow you to disaggregate the data across multiple categories. The procedure can also disaggregate the data by subcategories within a variable. This allows to take a deeper look at the units that make up that category.

4) Statistical method for ranking data

The main objective of this dissertation is to rank the critical success factor of dam construction project. Therefore, it requires adequate method to rank those success factors. The Relative Importance Index (RII) is used to rank in this dissertation because this method is possible to cross-compare the relative importance of the factors that the project practitioners have faced in the field work.

CHAPTER-FOUR

DATA ANALYSIS

The main objective of this study is to figure out the common success factors or critical success factors of the dam construction projects in Myanmar and to assess the relative importance of those factors from the viewpoint of project practitioners. The present condition of a project management level in Myanmar is quite low and inadequate. More than half of the development projects are not able to finish within the time and cost schedule. This study investigates five dam construction projects that encountered success in Myanmar in order to understand the reason for these success factors and to make recommendation that help achieve the further dam construction projects in Myanmar.

The questionnaires are developed based on the well-known general success factors and the ten knowledge areas of Project Management Body of Knowledge (fifth edition). The respondents were asked to fill up the questionnaires in accordance with the level of agreement based on their experiences.

The survey was sent via email to the Irrigation department for 30 respondents. Fifteen respondents out of 30 answered and filled up the questionnaires and then they sent back by email. Eight respondents were asked to answer the questionnaires by using telephone conversation (Viber). The total respondent of this survey is 23 out of 30 respondents. Therefore, the respondent ratio of this survey was 77%.

This chapter discusses the results that have been deduced from a field survey of 23 questionnaires that responded out of 30 questionnaires. This chapter is organized by three sections. Section one describes the profiles and all necessary information about the respondents, section two is to identify and rank the most common success factors affected on project management process in dam construction projects with the percentage frequency distribution method and the relative importance index (RII) method. In the last section, the assessment on the common critical success factors between the two method is described from analytical point of view.

4.1 General characteristic of the respondents

Respondents include project supervisor 3, field work manager 5, general manager 5, project manager 6 and executive manager 4. All of them are project practitioners of the five dam construction projects. The demographic characteristics of the respondents are as in the table 4-1:

Table 4- 1 Demographic characteristics of the respondents

Characteristics	Frequency	Percentage
Age		
<30	1	4
30-40	5	22
40-50	11	48
<50	6	26
Sex		
Male	9	39
Female	12	52
Educational Level		
Undergraduate	0	Nil
Diploma	2	9
Graduate	13	57
Post Graduate	8	35
Other	0	Nil
Type of organization		
NGOs' project	0	Nil
Government project	23	100
Semi-governmental project	0	Nil
Private project	0	Nil
Occupational level		
Supervisor	3	13
Fieldwork Manager	5	22
General Manager	5	22
Project Manager	6	26
Executive Manager	4	17
Field of specialization		
Infrastructure	13	57
Irrigation network construction	9	39
Mechanical	0	Nil
Number of employees		
Up to 100	19	83
101 - 200	3	13
201 -300	0	Nil
Over 300	0	Nil

4.1.1 Age

The question is a standard survey question. No respondent is younger than 30 years of age. The respondent ratio for this question is 77% (23 respondents out of 30 respondents). The distribution respondent's age in the survey can be seen in the figure 4-1:

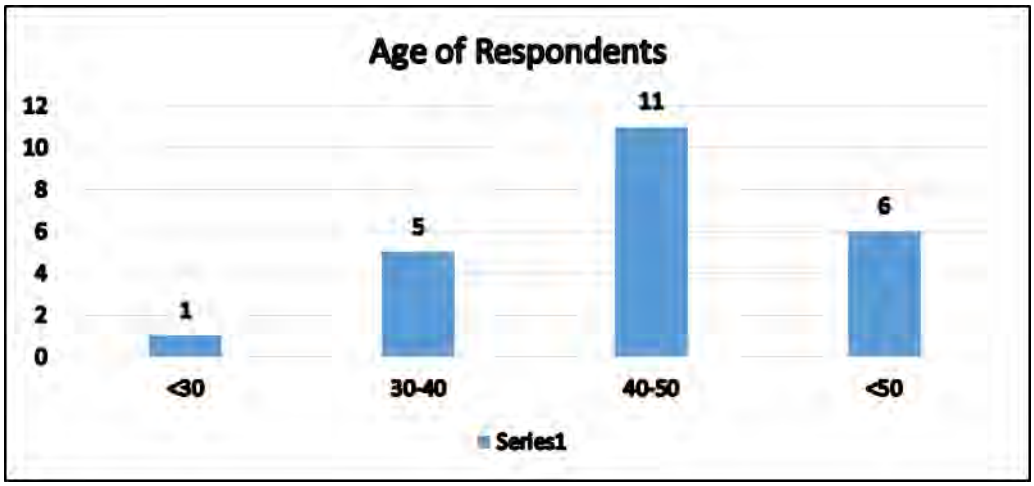

Figure 4- 1 Age distribution

4.1.2 Gender

The question is a standard survey question. The respondent ratio for this question is 70% (21 respondents out of 30 respondents). The gender distribution of respondents in the survey is as shown in figure 4-2:

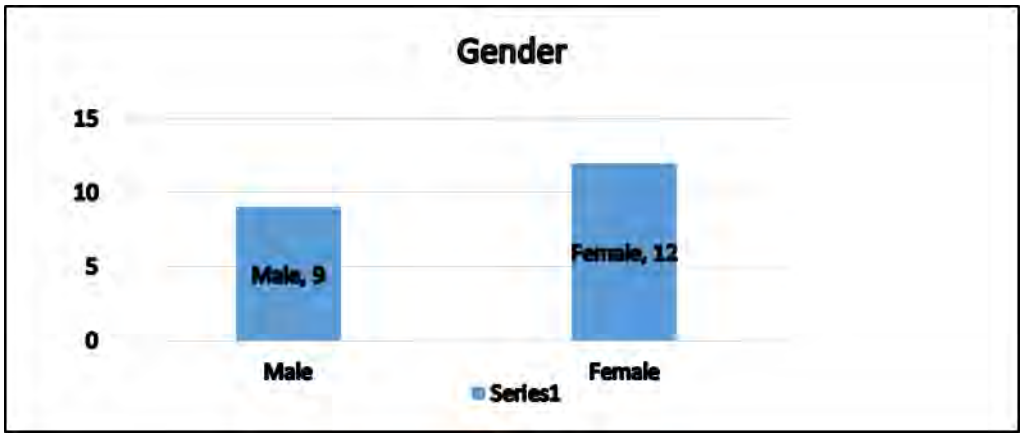

Figure 4- 2 Gender distribution

4.1.3 Educational level

The question is based on the demography of the respondents. The figure 4-3 mentions the educational level of the respondent and the respondent ratio is 70% (21 respondents out of 30). The results are as follows:

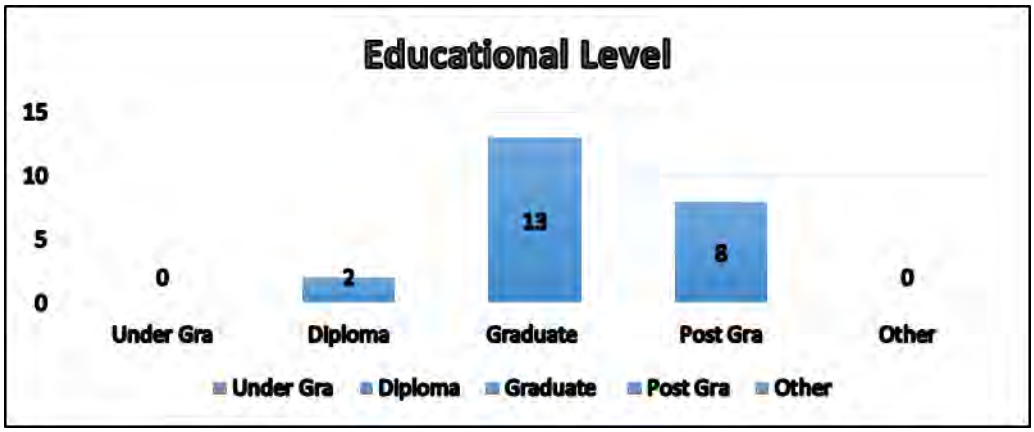

Figure 4- 3 Educational level distribution

4.1.4 Occupational Level

All respondents in this survey are from governmental organization. NGOs, semi-governmental organization and private organization are contacted to get the data. However, all of them did not respond for this dissertation. The questionnaire for occupational level have to base on the governmental organization ranks. The respondent ratio of this question was 77%. The results are as in the following figure 4-4:

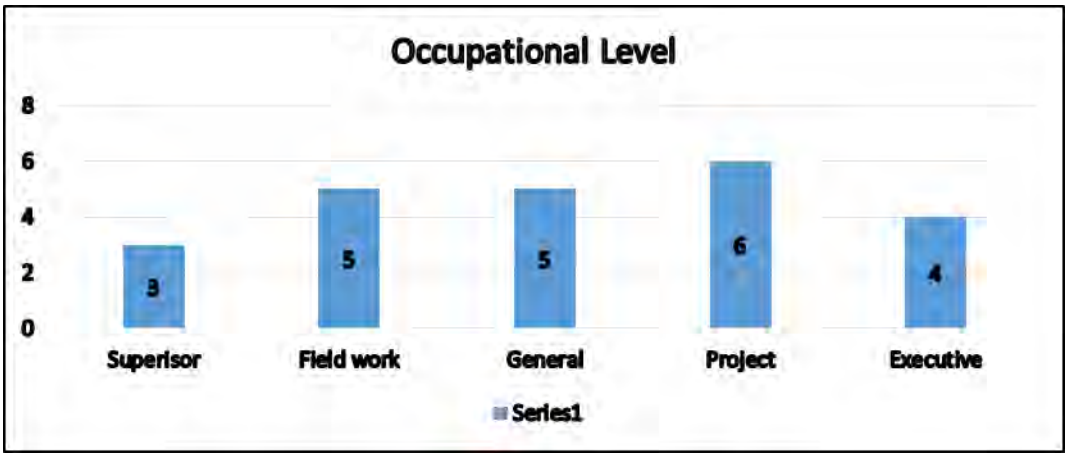

Figure 4- 4 Occupational level distribution

4.1.5 Field of specialization

This question is based on the working environment of the respondents. The research is focusing on the five dam construction projects in Myanmar. Therefore, the nature of this question such as infrastructure, irrigation network and mechanical fieldwork is based on the dam construction. The results are as in figure 4-5:

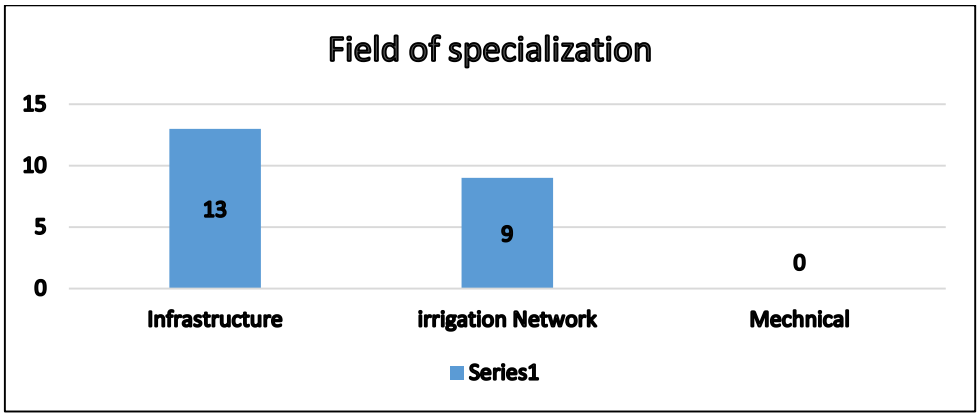

Figure 4- 5 Distribution of field of specialization

4.1.6 Number of employees

This question has the purpose to get the number of employees working on the each of dam construction project to identify how the project are large and how many employment can create. This question is based on the five dam construction projects and the respondent ratio of this question is 73% (22 respondents out of 30). The results can be seen in the following figure 4-6:

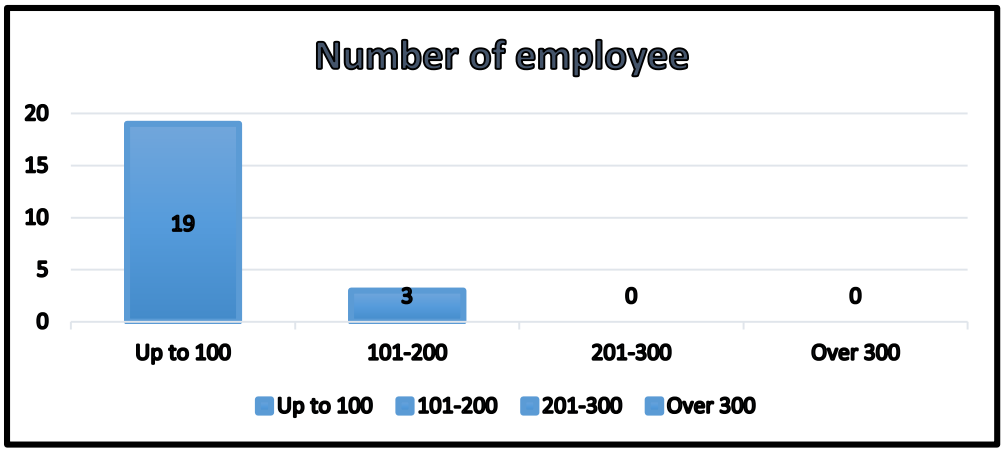

Figure 4- 6 Number of employee distribution

4.2 The assessment of critical success factors with percentage distribution method

In this section, the general factors and the factors based on ten knowledge areas of PMBOK will be assessed by using percentage distribution method and the Relative Importance Index (RII) method to identify the critical success factors. Moreover, this research is aimed to identify the knowledge of project managers regarding with the ten knowledge areas of project management and how they apply those knowledge areas in dam construction project.

The tables mentioned below are used to identify the critical success factors by using frequency distribution method based on 11 questions. Each and every questions figure out to collect the empirical experiences and views of project practitioners. The result is outlined a trend, indicating how successful the project manager generally are with their work. The statement and results are presented below. The maximum values are highlighted with gray color.

4.2.1: General success factors of project management

In this question, the factors are selected from the previous studies and earlier published books regarding with project management. The respondents give feedbacks the important level of each factor based on their empirical experiences and the results are as in the table 4-2:

Table 4- 2 Frequency distribution statement on general success factors of project management

Statement	*Strongly Disagree*	*Disagree*	*Neutral*	*Agree*	*Strongly Agree*
Competence of the project manager	0%	0%	4%	39%	57%
Competence of project team members	0%	0%	4%	48%	48%
Support from the agency administering	0%	0%	22%	35%	43%
Clarity of project goals	0%	0%	22%	26%	52%
Top management support	0%	0%	13%	61%	26%
Motivation of project team members	0%	0%	13%	39%	48%
Effective communication between stakeholders	0%	0%	17%	26%	57%
Effective coordination of project activities	0%	0%	9%	39%	52%
Compliance with the rules and procedures	0%	0%	43%	17%	39%
Systematic control over the project execution	0%	0%	22%	22%	57%
Access to organizational resources	0%	0%	13%	22%	65%

Statement	*Strongly Disagree*	*Disagree*	*Neutral*	*Agree*	*Strongly Agree*
SMART planning	0%	0%	17%	17%	65%
Adequate support from a project consultant	0%	9%	39%	26%	26%
Project manager commitment to the goals	0%	0%	9%	48%	43%
Project manager's technical capabilities	0%	0%	17%	35%	43%
Control systems	0%	0%	13%	39%	48%
Definition of work and its field	0%	4%	17%	39%	39%
Budget performance	0%	0%	4%	26%	70%
Schedule performance	0%	4%	4%	22%	70%
Employer satisfaction	0%	26%	30%	22%	22%
Task-orientation	0%	0%	17%	48%	35%

4.2.2: Success factors on project integration management

This question is aimed to get the views of project practitioner regarding with the project integration management. The respondents answer and evaluate the important level of the factors based on their empirical experiences and the results are as in the following table 4-3:

Table 4- 3 Frequency distribution statement of success factors on project integration management

Statement	*Strongly Disagree*	*Disagree*	*Neutral*	*Agree*	*Strongly Agree*
Develop project charter	0%	4%	22%	48%	22%
Develop project management plan	0%	0%	4%	30%	65%
Direct and manage project work	0%	0%	13%	26%	61%
Monitor and control project work	0%	0%	4%	35%	61%
Perform integrated change control	0%	4%	13%	48%	35%
Close project or phase	0%	0%	13%	57%	30%

4.2.3: Success factors on project scope management

The respondents are asked for the data on project scope management. Every respondent strongly agree with the factors and the results can be seen in table 4-4:

Table 4- 4 Frequency distribution statement of success factors on project scope management

Statement	*Strongly Disagree*	*Disagree*	*Neutral*	*Agree*	*Strongly Agree*
Plan scope management	0%	0%	30%	22%	48%
Collect requirement	0%	0%	4%	22%	74%
Define the scope	0%	0%	9%	26%	65%
Create WBS	0%	0%	4%	30%	65%
Validate Scope	0%	0%	17%	26%	57%
Control Scope	0%	0%	13%	30%	57%

4.2.4: Success factors on project time management

In this question, the respondents answer and evaluate the important level of the project time management factors based on their own experiences. All the respondents give feedbacks as "strongly agree" and the results are as shown in table 4-5:

Table 4- 5 Frequency distribution statement of success factors on project time management

Statement	*Strongly Disagree*	*Disagree*	*Neutral*	*Agree*	*Strongly Agree*
Plan schedule management	0%	4%	26%	22%	48%
Define activities	0%	0%	9%	26%	65%
Sequence activities	0%	0%	9%	30%	61%
Estimate activity resources	0%	0%	4%	22%	74%
Estimate activity duration	0%	0%	0%	43%	57%
Develop schedule	0%	0%	0%	30%	70%
Control schedule	0%	0%	9%	35%	57%

4.2.5: Success factors on project cost management

For this question, the project practitioners are asked for the important level on the factors of project cost management and the data will be identified by using the frequency distribution method to rank the important level. The results are as in the table 4-6:

Table 4- 6 Frequency distribution statement of success factors on project cost management

Statement	*Strongly Disagree*	*Disagree*	*Neutral*	*Agree*	*Strongly Agree*
Well-defined cost plan	0%	4%	4%	17%	74%
Estimation of project cost	0%	4%	0%	4%	91%
Determine the required budget	0%	0%	4%	13%	83%
Control cost	0%	0%	4%	17%	78%

4.2.6: Success factors on project quality management

The respondents are asked to identify the important level of the factors of project quality management based on their own experiences in the field work. The level of factors will be ranked by using the frequency distribution method and the results are as shown in table 4-7:

Table 4- 7 Frequency distribution statement of success factors on project quality management

Statement	*Strongly Disagree*	*Disagree*	*Neutral*	*Agree*	*Strongly Agree*
Identifying the quality requirement for the project	0%	13%	17%	26%	43%
Auditing the quality requirement	0%	0%	26%	35%	39%
Quality control measurement	0%	0%	4%	30%	65%
Monitoring and recording the result of executing the quality activities to access performance	0%	0%	13%	26%	61%
Quality checklists	0%	0%	4%	13%	83%

4.2.7: Success factors on project human resource management

The purpose of this question is to get the feedbacks of project practitioner regarding with the project human resource management. The respondent answer and evaluate the important level of the factors based on their empirical experiences and the results are as in the table 4-8:

Table 4- 8 Frequency distribution statement of success factors on project human resource management

Statement	*Strongly Disagree*	*Disagree*	*Neutral*	*Agree*	*Strongly Agree*
Identifying project roles, responsibilities and required skill	0%	4%	9%	26%	61%
Clear organizational chart and position descriptions	0%	4%	13%	39%	43%
Confirming human resource availability	0%	0%	4%	30%	65%
Develop project team	0%	0%	9%	26%	65%
Management project team	4%	0%	17%	22%	61%

4.2.8: Success factors on project communication management

In this question, the factors are organized based on the factors of project communication management. These factors will be perceived by frequency distribution method to identify the rank and the results are as in the table 4-9:

Table 4- 9 Frequency distribution statement of success factors on project communication management

Statement	*Strongly Disagree*	*Disagree*	*Neutral*	*Agree*	*Strongly Agree*
Communication requirement analysis	0%	9%	30%	17%	43%
Application of communication technology	0%	0%	26%	43%	30%
Application of communication model	0%	0%	22%	30%	48%
Application of information management system	0%	4%	17%	26%	52%
Control communication	0%	4%	4%	30%	61%

4.2.9: Success factors on project risk management

This question is aimed to get the overviews of project practitioner regarding with the project risk management. The respondent answer and evaluate the important level of the factors based on their empirical experiences and the results are as in the below table 4-10:

Table 4- 10 Frequency distribution statement of success factors on project risk management

Statement	*Strongly Disagree*	*Disagree*	*Neutral*	*Agree*	*Strongly Agree*
Plan risk management	0%	4%	22%	17%	57%
Identify risks	0%	0%	9%	17%	74%
Project risks register	0%	0%	26%	39%	35%
Perform qualitative risk analysis	0%	0%	17%	35%	48%
Perform quantitative risk analysis	0%	0%	9%	43%	52%
Plan risk responses	0%	0%	17%	17%	65%
Risk probability and impact assessment	0%	9%	22%	22%	52%
Project risks categorization	0%	4%	9%	35%	52%
Strategies for positive risks or opportunities	0%	0%	35%	13%	52%
Strategies for negative risks or threats	0%	9%	26%	26%	39%

4.2.10: Success factors on project procurement management

Here, the project practitioners are asked to evaluate the important level on the factors of project procurement management and the data are identified by using the frequency distribution method to rank the important level. The respondents answer the question based on their owned evidences in the field work. The results are as shown in the table 4-11:

Table 4- 11 Frequency distribution statement of success factors on project procurement management

Statement	*Strongly Disagree*	*Disagree*	*Neutral*	*Agree*	*Strongly Agree*
Procurement evaluation techniques	0%	4%	26%	22%	48%
Procurement negotiations	0%	4%	22%	30%	43%
Procurement performance review	0%	9%	26%	30%	35%
Inspection on the procurement	0%	4%	17%	30%	48%
Procurement audit	0%	0%	26%	26%	48%
Payment system	0%	0%	17%	35%	48%

4.2.11: Success factors on project stakeholder management

The question is based on the factor of project stakeholder management. The respondents evaluated the level of importance with their own experiences and the data will be ranked with the frequency distribution method and the results are as in the table 4-12:

Table 4- 12 Frequency distribution statement of success factors on project stakeholder management

Statement	***Strongly Disagree***	***Disagree***	***Neutral***	***Agree***	***Strongly Agree***
Identify stakeholders and interest Levels	0%	0%	26%	26%	48%
Management stakeholders engagement	0%	0%	22%	39%	39%
Control stakeholders engagement	0%	0%	17%	39%	43%
Conduct stakeholder analysis	0%	0%	9%	26%	65%
Well-defined stakeholder management plan	0%	0%	9%	17%	74%
Effective communication between project stakeholders	0%	0%	22%	13%	65%
Evaluate the attributes of the stakeholders in the construction project	0%	0%	22%	17%	61%

4.2.12 Critical success factors in percentage frequency distribution

This research is undertaken on the basis of project managers and the stakeholders' empirical evidences and field experiences in the five dam construction in Myanmar. Therefore, the survey will be an assessment of how the project managers and project stakeholders are familiar with the theories and how they are handling the knowledge area in their field work. There are two criteria to identify the common success factors in this research. First, the factor which strongly agrees by project stakeholders. Second, the percentage of this factor which is strongly agree must be 70% and over. According to the above criteria, there are 12 common success factors, especially in five dam construction projects can be figured out as in the following table 4-13:

Table 4- 13 Frequency distribution statement of top 12 most critical success factors in five dam construction projects

	Statement	***Strongly Disagree***	***Disagree***	***Neutral***	***Agree***	***Strongly Agree***
1	Estimation of project cost	0%	4%	0%	4%	91%
2	Determine the required budget	0%	0%	4%	13%	83%
3	Quality checklists	0%	0%	4%	13%	83%
4	Control cost	0%	0%	4%	17%	78%
5	Collect requirement	0%	0%	4%	22%	74%
6	Estimate activity resources	0%	0%	4%	22%	74%
7	Identify risks	0%	0%	9%	17%	74%
8	Well-defined stakeholder management plan	0%	0%	9%	17%	74%
9	Well-defined cost plan	0%	4%	4%	17%	74%
10	Budget performance	0%	0%	4%	26%	70%
11	Schedule performance	0%	4%	4%	22%	70%
12	Develop schedule	0%	0%	0%	30%	70%

4.3 The assessment of critical success factors with Relative Importance Index (RII) method

The relative importance index (RII) method is a statistical method to determine the ranking of different causes and factors. As this dissertation is designed to determine the important factors to make sure the successful projects, the relative important index (RII) method is used to identify the critical success factors. The RII five point scale, ranging from 1 (not important) to 5 (extremely important) is transformed the importance indices (RII) for each factor as follows:

$$RII = \frac{\sum W}{A * N}$$

RII = Sum of weights (W1 + W2 + W3 + ……+ Wn) / A x N

Where,

- W = weights given to each factor by the respondents and will range from 1 to 5 where '1' is less significant and '5' is extremely significant.
- A = highest weight (i.e. 5 in this case), and
- N = total number of respondents

4.3.1: General success factors of project management (RII)

In this question, the factors are organized based on the well-known general success factors of project management. Each factors' RII perceived by all respondents is computed for overall analysis. The most critical success factors are able to identify by ranking the factors in the RII results as in Table 4-14.

Table 4- 14 Statement of general success factors in RII method

Factors	Importance of success factor					RII
	1	*2*	*3*	*4*	*5*	
Budget performance	0	0	1	6	16	0.9304
Schedule performance	0	1	1	5	16	0.9130
Competence of the project manager	0	0	1	9	13	0.9043

Factors	Importance of success factor					RII
	1	***2***	***3***	***4***	***5***	
Access to organizational resources	0	0	3	5	15	0.9043
SMART planning	0	0	4	4	15	0.8957
Competence of project team members	0	0	1	11	11	0.8870
Effective coordination of project activities	0	0	2	9	12	0.8870
Effective communication between project stakeholders	0	0	4	6	13	0.8783
Motivation of project team members	0	0	3	9	11	0.8696
Systematic control over the project execution	0	0	5	5	13	0.8696
Project manager commitment to the goals	0	0	2	11	10	0.8696
Control systems	0	0	3	9	11	0.8696
Clarity of project goals	0	0	5	6	12	0.8609
Support from the agency administering	0	0	5	8	10	0.8435
Task-orientation	0	0	4	11	8	0.8348
Top management support	0	0	3	14	6	0.8261
Definition of work and its field	0	1	4	9	9	0.8261
Project manager’s technical capabilities	0	0	4	8	10	0.8174
Compliance with the rules and procedures	0	0	10	4	9	0.7913
Competence and adequate support from a project consultant	0	2	9	6	6	0.7391
Employer satisfaction	0	6	7	5	5	0.6783

4.3.2: Success factors on project integration management (RII)

Here, the project practitioners are asked to evaluate the important level on the factors of project integration management and the data are identified by using RII to rank the important level. The 23 respondents answer the question based on the empirical evidences that they faced in the field work. The results are as shown in table 4-15:

Table 4- 15 Statement of Success factors on project integration management in RII method

Factors	Importance of success factor					RII
	1	*2*	*3*	*4*	*5*	
Develop project management plan	0	0	1	7	15	0.9217
Monitor and control project work	0	0	1	8	14	0.9130
Direct and manage project work	0	0	3	6	14	0.8957
Close project or phase	0	0	3	13	7	0.8348
Perform integrated change control	0	1	3	11	8	0.8261
Develop project charter	0	1	5	11	5	0.7478

4.3.3: Success factors on project scope management (RII)

The respondents are asked to evaluate the level of importance of the factor of project scope management in this question. By analyzing the data with RII method, the results can be seen in the table 4-16:

Table 4- 16 Statement of success factors on project scope management in RII method

Factors	Importance of success factor					RII
	1	*2*	*3*	*4*	*5*	
Collect requirement	0	0	1	5	17	0.9391
Create WBS	0	0	1	7	15	0.9217
Define scope	0	0	2	6	15	0.9130
Control Scope	0	0	3	7	13	0.8870
Validate Scope	0	0	4	6	13	0.8783
Plan scope management	0	0	7	5	11	0.8348

4.3.4: Success factors on project time management (RII)

The question is based on the factor of project time management. The respondents evaluate the level of importance with their own experiences and the data are ranked with RII and the results are as in the table 4-17:

Table 4- 17 Statement of success factors on project time management in RII method

Factors	Importance of success factor					RII
	1	*2*	*3*	*4*	*5*	
Estimate activity resources	0	0	1	5	17	0.9391
Develop schedule	0	0	0	7	16	0.9391
Define activities	0	0	2	6	15	0.9130
Estimate activity duration	0	0	0	10	13	0.9130
Sequence activities	0	0	2	7	14	0.9043
Control schedule	0	0	2	8	13	0.8957
Plan schedule management	0	1	6	5	11	0.8261

4.3.5: Success factors on project cost management (RII)

For this question, the project practitioners are asked for the important level on the factors of project cost management and the data are identified by using RII to rank the important level of each factor. The results are as in the table 4-18:

Table 4- 18 Statement of success factors on project cost management in RII method

Factors	Importance of success factor					RII
	1	*2*	*3*	*4*	*5*	
Estimation of project cost	0	1	0	1	21	0.9652
Determine the required budget	0	0	1	3	19	0.9565
Control cost	0	0	1	4	18	0.9478
Well-defined cost plan	0	1	1	4	17	0.9217

4.3.6: Success factors on project quality management (RII)

The respondents are asked to identify the important level of the factors of project quality management. The level of factors is identified by using RII and the results are as shown in table 4-19:

Table 4- 19 Statement of success factors on project quality management in RII method

Factors	Importance of success factor					RII
	1	*2*	*3*	*4*	*5*	
Quality checklists	0	0	1	3	19	0.9565
Quality control measurement	0	0	1	7	15	0.9217
Monitoring and recording the result of executing the quality activities to access performance	0	0	3	6	14	0.8957
Auditing the quality requirement	0	0	6	8	9	0.8261
Identifying the quality requirement for the project	0	3	4	6	10	0.8000

4.3.7: Success factor on project human resource management (RII)

This question is aimed to collect the data from project practitioners regarding with the project human resource management factors by showing the important level of each factor. And then those data are ranked by using the RII method. The results are as in the table 4-20:

Table 4- 20 Statement of success factors on project human resource management in RII method

Factors	Importance of success factor					RII
	1	*2*	*3*	*4*	*5*	
Confirming human resource availability	0	0	1	7	15	0.9217
Develop project team	0	0	2	6	15	0.9130
Management project team	1	0	4	5	14	0.8957
Identifying project roles, responsibilities and required skill	0	1	2	6	14	0.8870
Clear organizational chart and position descriptions	0	1	3	9	10	0.8435

4.3.8: Success factor on project communication management (RII)

The question is based on the factors of project communication management. The respondents evaluated the level of importance with their own experiences and the data are ranked with RII and the results are described in the table 4-21:

Table 4- 21 Statement of success factors on project communication management in RII method

Factors	Importance of success factor					RII
	1	*2*	*3*	*4*	*5*	
Control communication	0	1	1	7	14	0.8957
Application of communication model	0	0	5	7	11	0.8522
Application of information management system	0	1	4	6	12	0.8522
Application of communication technology	0	0	6	10	7	0.8087
Communication requirement analysis	0	2	7	4	10	0.7913

4.3.9: Success factor on project risk management (RII)

The project risks can create the success or failure of the projects. The project risk management is very important issue for every projects. This question is designed to know how the project manager control the project risks. The returned questionnaires are analyzed and ranked by using RII method and the results are as in the table 4-22:

Table 4- 22 Statement of success factors on project risk management in RII method

Factors	Importance of success factor					RII
	1	*2*	*3*	*4*	*5*	
Identify risks	0	0	2	4	17	0.9304
Perform quantitative risk analysis	0	0	2	10	12	0.9217
Plan risk responses	0	0	4	4	15	0.8957
Project risks categorization	0	1	2	8	12	0.8696
Perform qualitative risk analysis	0	0	4	8	11	0.8609
Risk probability & impact assessment	0	2	5	5	12	0.8609
Plan risk management	0	1	5	4	13	0.8522
Strategies for positive risks or opportunities	0	0	8	3	12	0.8348
Project risks register	0	0	6	9	8	0.8174
Strategies for negative risks or threats	0	2	6	6	9	0.7913

4.3.10: Success factor on project procurement management (RII)

The procurement management issue is more or less ignored in some project. However, the inefficient management of procurement management may effect on the achievement of project goals. According to the PMBOK, the following factors are designed to know the important level of procurement management in the target survey area. The results are as shown in the table 4-23:

Table 4- 23 Statement of success factors on project procurement management in RII method

Factors	Importance of success factor					RII
	1	*2*	*3*	*4*	*5*	
Payment system	0	0	4	8	11	0.8609
Inspection on the procurement	0	1	4	7	11	0.8435
Procurement audit	0	0	6	6	11	0.8435
Procurement evaluation techniques	0	1	6	5	11	0.8261
Procurement negotiations	0	1	5	7	10	0.8261
Procurement performance review	0	2	6	7	8	0.7826

4.3.11: Success factor on project stakeholder management (RII)

In this question, the respondents are asked for the important level on the factors of project stakeholder management and the data are identified to rank the important level of those factors by using RII. The results are as in the table 4-24:

Table 4- 24 Statement of success factors on project stakeholder management in RII method

Factors	Importance of success factor					RII
	1	*2*	*3*	*4*	*5*	
Well-defined stakeholder management plan	0	0	2	4	17	0.9304
Conduct stakeholder analysis	0	0	2	6	15	0.9130
Effective communication between project stakeholders	0	0	5	3	15	0.8870
Evaluate the attributes of the stakeholders in the construction project	0	0	5	4	14	0.8783
Control stakeholders engagement	0	0	4	9	10	0.8522
Identify stakeholders and interest Levels	0	0	6	6	11	0.8435
Management stakeholders engagement	0	0	5	9	9	0.8348

4.3.12 Critical success factors in relative importance index (RII) method

In accordance with the main purpose of this study, the critical success factors are identified by ranking the important level of the each success factor. The top 12 most important level of success factors among 82 factors are selected as the critical success factors based on the RII method. The critical success factors are as shown in table 4-25:

Table 4- 25 Statement of the top 12 most critical success factors in RII method

Factors	Importance of success factor					Weight	RII
	1	*2*	*3*	*4*	*5*		
Estimation of project cost	0	1	0	1	21	111	0.9652
Determine the required budget	0	0	1	3	19	110	0.9565
Quality checklists	0	0	1	3	19	110	0.9565
Control cost	0	0	1	4	18	109	0.9478
Collect requirement	0	0	1	5	17	108	0.9391
Estimate activity resources	0	0	1	5	17	108	0.9391
Develop schedule	0	0	0	7	16	108	0.9391
Budget performance	0	0	1	6	16	107	0.9304
Identify risks	0	0	2	4	17	107	0.9304
Well-defined stakeholder management plan	0	0	2	4	17	107	0.9304
Develop project management plan	0	0	1	7	15	106	0.9217
Create WBS	0	0	1	7	15	106	0.9217

4.4 The common critical success factors on the two methods

The top 12 most important level of success factors are selected as the critical success factors of project management in five dam construction projects by using the percentage distribution method and relative important index method. Here, the ten common critical success factors are able to be identified from those each 12 success factors. The ten common success factors are very crucial to the successful project management in dam construction in Myanmar. The ten common success factors of project success, which can be considered as critical for projects executed under the regime of dam construction projects in Myanmar. The two uncommon factors of each method are shown in bold and italic and highlighted with gray color. The common critical success factors can be seen in the below table 4-26:

Table 4- 26 Common critical success factors in the two method

No	Percentage frequency distribution method		Relative importance index (RII) method
1	Estimation of project cost		Estimation of project cost
2	Determine the required budget		Determine the required budget
3	Quality checklists		Quality checklists
4	Control cost		Control cost
5	Collect requirement		Collect requirement
6	Estimate activity resources		Estimate activity resources
7	Identify risks		Develop schedule
8	Well-defined stakeholder management plan		Budget performance
9	***Well-defined cost plan***		Identify risks
10	Budget performance		Well-defined stakeholder management plan
11	***Schedule performance***		***Develop project management plan***
12	Develop schedule		***Create WBS***

4.4.1 Common critical success factors

The ten common critical success factors are as follows:

- Estimation of project cost
- Determine the required budget
- Quality checklists
- Control cost
- Collect requirement
- Estimate activity resources
- Develop schedule
- Budget performance
- Identify risks
- Well-defined stakeholder management plan

According to the current study, ***estimation of project cost and the determine the required budget*** have been identified as the two top most important factors of project success –21 and 19 respondents in 23 (91% and 83%, respectively) indicate that this aspect is "strongly agree" for the successful realization of their project and the relative important index (RII) of this factor is 0.9652 and 0.9565 respectively. These two factors are closely related to the success of the project, which are crucial for the successful completion of any project. This provides an additional empirical evidence in support of previous research indicating that the effective estimation of the required budget and the certain amount of budget will be able to ensure the successful completion of projects and it will become the most critical component for the dam construction projects.

It is not surprising that the strict compliance with the rules and procedures established by the respective ***quality checklist*** are denoted as "strongly agree" by 19 respondents (83%) and the relative importance index (RII) of this factor is 0.9565. The project practitioners' experience showed that many other projects – although generally achieving their goals – have been considered as unsuccessful due to poor quality raw materials, machines and equipment. Therefore the respondents evaluate this factor as the important ones in the project management.

Another critical factor is the ***control cost*** and it is indicated fourth position according to the RII method and the percentage frequency distribution method. The 18 respondents (78%)

among 23 show the important level of this factor as "strongly agree". Evidently, the budget issues are very influential on the success of project management in Myanmar. It is very obvious in this study.

In this study, ***collect requirement factor*** is shown that the fifth important factors in the dam construction when it is ranked using RII method and its value is 0.9391. According to the percentage frequency distribution method, the position of this factor is same as in RII in ten common critical success factors and 17 respondents in 23 (74%) indicated this factor as "strongly agree". The poor management for collecting requirement in the dam construction project may occur the negative effect on the environment and on local people and then this project will lead to failure.

According to the research survey, ***the estimated activity resources factors*** of project time management factors are the sixth most important level in targeted survey areas by analyzing the RII method and its rank value is 0.9391. 17 respondents (74%) in 23 indicated the important level of this factor as "strongly agree" and it stands in sixth position in critical success factor in ranking with the percentage distribution method. This factor is the process of estimating the type and quantities of material, human resources, equipment or supplies required to perform each project activity. The effective estimated activity resources factors can ensure to complete the project activities within the accurate cost and time frame.

The develop schedule which is one of the factors of project time management really concern with the project management success in the dam construction management of targeted survey areas. It stands for the twelfth position when it is ranked by using the percentage frequency distribution method. 16 respondents (70%) among 23 describe the important level of this factor as "strongly agree". The position of this factor in the RII ranking method is seventh and its value is 0.9391. ***The develop schedule*** is the process of analyzing activity sequences, durations, resource requirements, and schedule constraints create the project schedule model. Therefore, this factor is very important for entering schedule activities, durations, resources, resource availabilities and the effective development schedule may generate a schedule model with planned dates for completing project activities.

About half of the dam construction projects in Myanmar usually have to extend the project duration due to the deficit of the budget during the implementation period. Therefore, four

factors which are budget related issues were indicated as the common critical success factors for successful project management by project practitioners in the survey areas. ***The budget performance factors,*** one of the project cost management factors is also indicated as critical success factors. It stands for eighth position in RII method and its value is 0.9304. In accordance with the percentage distribution method, its position is tenth and 16 respondents (70%) among 23 described as "strongly agree" for its importance level.

When the respondents are asked about ***the identify risk factor***, the returned answers are indicated in high importance level for project management success. 17 respondents (74%) among 23 described as "strongly agree" for its importance level in project management success and it stands for the seventh position in the percentage frequency distribution method. In the relative importance index method, it stands for ninth position and its value is 0.9304. The ***identify risk factor*** is the process of determining which risks may affect the project and documenting their characteristics. The benefits of effective identify risk factor are the project practitioners can anticipate the project activities and events that may effect on the objective of the project.

The well-defined stakeholder management plan stands for tenth position on an important level in the relative important index (RII) method and its value is 0.9304. In accordance with the percentage frequency distribution method, it stands for eighth position and 17 respondents (74%) among 23 described as "strongly agree" for the important level of this factor. ***The well-defined stakeholder management plan*** is the process of developing appropriate management strategies to effectively engage stakeholders throughout the project life cycle. According to survey results, this factor makes ensure a clear, actionable plan to interact with project stakeholders to support the project's interests.

CHAPTER-FIVE

CONCLUSION AND RECOMMENDATIONS

In the past it was believed that if a project's completion time exceeds its due date, or expenses overran the budget, or its results did not satisfy a company's preset performance criteria, the project was considered to be a failure. At present it is understood that determining whether a project is a success or failure is far more complex.

Project management is a valid and legitimate approach to management and has increasingly become an important tool of choice for the realization of objectives across industries, developments and economic sectors. It involves managing resources in order to successfully achieve specific project goals and objectives through the completion of specific tasks. The main challenge of project management lies in achieving all of the project goals and objectives while utilizing the allocated resources, manage and handle to the project knowledge areas to successfully overcome the project constraints.

The purpose of the study was to assess the quality of project management practices by determining the factors regarding with the well-known success factors and project knowledge areas management that facilitate project success in the dam construction project in Myanmar. The study also indicates that attention must be paid to the ten common critical success factors of five dam construction projects to obtain the project success for further dam construction projects in Myanmar. These common critical success factors are:

- Estimation of project cost
- Determine the required budget
- Quality checklists
- Control cost
- Collect requirement
- Estimate activity resources
- Develop schedule
- Budget performance
- Identify risks
- Well-defined stakeholder management plan

5.1 Limitations of the Study

There are some limitations in this study as the population of the respondents are only 23. In order to get a more accurate result, the questionnaires should be distributed to a more population of respondents who are experienced project managers. Also, all the questionnaires were distributed via emails to respondents. Some of the "Not Sure" answers might be caused by the respondents not understanding the meaning of the term used in the questionnaire, yet do not want to clarify.

Therefore, the findings cannot be generalized to the entire dam construction project management in Myanmar and it will require further research in order to have a clear and a broader picture of the factors that affect the success of a project. This study can be enhanced by further targeting different dam construction projects in Myanmar and by increasing the sample size to improve the reliability of the study. This study can be used to find out the relationship of project success factors and actual project success in dam construction in Myanmar, but of course it will certainly need more time and financial resources.

5.2 Recommendation for Further Study

Indeed the complexities of project management present some challenges for the success of projects in the dam construction project in Myanmar. This study, therefore, recommends that at every phase of the project life cycle, the critical success factors based on the effective knowledge areas management should be addressed and it will be a better project management experience.

For the future study, there are some important additional recommendations:

- Future projects should have sound plans to cover the project cost during the implementation projects. This will help avoid unrealistic project time planning.
- Proper scheduling should be made in collecting the requirements of future projects. Tools such as interviews, facilitated workshops, group creativity techniques, questionnaires, surveys and observations can be used to determine early start as well as late start dates of project activities. This will also help in determining the critical activities in the project which will need much attention if the project is to be finished within time and cost schedule.

- Future project should take into account on the quality of project by way of monitoring and recording results of executing the quality activities to assess performance and recommend necessary changes.
- There should be proper risk planning in future project such as identification and assessment of all risk elements for proper analysis to determine their influence on the project is important for the success of the project. This could help to think through how these risk elements can be managed for a successful result.
- Finally, the future project should be aware of the follow up activities to manage stakeholder effectively and the project practitioners have to keep communication with stakeholders and then build a relationship by developing the proper stakeholder management plan. In addition, the future projects should adapt the stakeholder assessment methodology in order to choose the right stakeholders for the right level of engagement and to avoid the risk of making mistakes that could cause the mismanagement of construction stakeholders.

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Annex: (Questionnaire)

Application to conduct survey in Dam construction projects in Myanmar *(Sample)*

Director General
Irrigation Department
Ministry of Agriculture and Irrigation
Nay Pyi Taw

Date:

Dear Sir,

RE: Application to conduct research in Dam Construction Projects in Myanmar

My name is Kyu Khin Gar, deputy staff officer of Planning Department under the Ministry of National Planning and Economic Development. I'm currently undertaking Master degree in Governance and Development in BRAC University. To conduct the research in the governmental department, I wish to seek your kind permission and approval to conduct research with the government authorities.

My research area is dam construction projects with the focus of critical success factors, especially in the knowledge areas management to find out the some factors to ensure the project success.

Your cooperation and kind permission in this matter is highly appreciated. Please do not hesitate to contact me if any issue in the application requires clarification.

Yours Sincerely,

Kyu Khin Gar
Master Degree Candidate
Governance and Development Programme,
BRAC University

Part I: General information

Survey Question 1,

Please give your personal information by ticking one of the boxes provided below:

No	Respondent's information		Frequency
1.	Age	<30	☐
		30-40	☐
		40-50	☐
		<50	☐
2.	Sex	Male	☐
		Female	☐
3.	Educational Level	Undergraduate	☐
		Diploma	☐
		Graduate	☐
		Post Graduate	☐
		Other	☐
4.	Type of organization	NGOs' project	☐
		Government project	☐
		Semi-governmental project	☐
		Private project	☐
5.	Occupational level	Supervisor	☐
		Fieldwork Manager	☐
		General Manager	☐
		Project Manager	☐
		Executive Manager	☐
6.	Field of specialization	Infrastructure	☐
		Irrigation network construction	☐
		Mechanical	☐
7.	Number of employees	Up to 100	☐
		101 - 200	☐
		201 -300	☐
		Over 300	☐

Part II: General Success Factors of Project Management

Survey Question 2,

Based on your overall experience in the Dam construction project management field in Myanmar, please evaluate the quality or degree of relevance of the following general project success factors.

To what extend do you think the following factors are critical to success of successful Project Management.

(1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5=Strongly Agree)

No	General Factors	1	2	3	4	5
1.	Competence of the project manager	☐	☐	☐	☐	☐
2.	Competence of project team members	☐	☐	☐	☐	☐
3	Support from the agency administering	☐	☐	☐	☐	☐
4	Clarity of project goals	☐	☐	☐	☐	☐
5	Top management support	☐	☐	☐	☐	☐
6	Motivation of project team members	☐	☐	☐	☐	☐
7	Effective communication between project stakeholders	☐	☐	☐	☐	☐
8	Effective coordination of project activities	☐	☐	☐	☐	☐
9	Compliance with the rules and procedures	☐	☐	☐	☐	☐
10	Systematic control over the project execution	☐	☐	☐	☐	☐
11	Access to organizational resources	☐	☐	☐	☐	☐
12	SMART planning	☐	☐	☐	☐	☐
13	Competence and adequate support from a project consultant	☐	☐	☐	☐	☐
14	Project manager commitment to the goals	☐	☐	☐	☐	☐
15	Project manager's technical capabilities	☐	☐	☐	☐	☐
16	Control systems	☐	☐	☐	☐	☐
17	Definition of work and its field	☐	☐	☐	☐	☐
18	Budget performance	☐	☐	☐	☐	☐
19	Schedule performance	☐	☐	☐	☐	☐
20	Employer satisfaction	☐	☐	☐	☐	☐
21	Task-orientation	☐	☐	☐	☐	☐

Part III: Success Factors in Ten Knowledge Areas of Project Management according to PMBOK

Survey Question 3

Based on your overall experience in the Dam construction project management field in Myanmar, please feedback the following factors.

To what extend do you think the following factors are critical to the success of *Project Integration Management.*

(1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5=Strongly Agree)

No	*Project Integration Management Factors*	1	2	3	4	5
1.	Develop project charter	☐	☐	☐	☐	☐
2.	Develop project management plan	☐	☐	☐	☐	☐
3.	Direct and manage project work	☐	☐	☐	☐	☐
4.	Monitor and control project work	☐	☐	☐	☐	☐
5.	Perform integrated change control	☐	☐	☐	☐	☐
6.	Close project or phase	☐	☐	☐	☐	☐
7.	You have opinion for other factors, please describe ▪ …… ▪ …… ▪ ……					

Survey Question 4,

Based on your overall experience in the Dam construction project management field in Myanmar, please feedback the following factors.

To what extend do you think the following factors are critical to the success of *Project Scope Management.*

(1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5=Strongly Agree)

No	***Project Scope Management Factors***	**1**	**2**	**3**	**4**	**5**
1.	Plan scope management	☐	☐	☐	☐	☐
2.	Collect requirement	☐	☐	☐	☐	☐
3.	Define scope	☐	☐	☐	☐	☐
4.	Create WBS	☐	☐	☐	☐	☐
5.	Validate Scope	☐	☐	☐	☐	☐
6.	Control Scope	☐	☐	☐	☐	☐
7.	You have opinion for other factors, please describe ▪ …… ▪ …… ▪ ……					

Survey Question 5,

Based on your overall experience in the Dam construction project management field in Myanmar, please feedback the following factors.

To what extend do you think the following factors are critical to the success of *Project Time Management.*

(1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5=Strongly Agree)

No	***Project Time Management Factors***	**1**	**2**	**3**	**4**	**5**
1.	Plan schedule management	☐	☐	☐	☐	☐
2.	Define activities	☐	☐	☐	☐	☐
3.	Sequence activities	☐	☐	☐	☐	☐
4.	Estimate activity resources	☐	☐	☐	☐	☐
5.	Estimate activity duration	☐	☐	☐	☐	☐
6.	Develop schedule	☐	☐	☐	☐	☐
7.	Control schedule	☐	☐	☐	☐	☐
8.	You have opinion for other factors, please describe ▪ …… ▪ …… ▪ ……					

Survey Question 6,

Based on your overall experience in the Dam construction project management field in Myanmar, please feedback the following factors.

To what extend do you think the following factors are critical to the success of *Project Cost Management.*

(1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5=Strongly Agree)

No	***Project Cost Management Factors***	**1**	**2**	**3**	**4**	**5**
1.	Well-defined cost plan	☐	☐	☐	☐	☐
2.	Estimation of project cost	☐	☐	☐	☐	☐
3.	Determine the required budget	☐	☐	☐	☐	☐
4.	Control cost	☐	☐	☐	☐	☐
5.	You have opinion for other factors, please describe ▪ …… ▪ …… ▪ ……					

Survey Question 7,

Based on your overall experience in the Dam construction project management field in Myanmar, please feedback the following factors.

To what extend do you think the following factors are critical to the success of *Project Quality Management.*

(1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5=Strongly Agree)

No	***Project Quality Management Factors***	**1**	**2**	**3**	**4**	**5**
1.	Identifying the quality requirement for the project	☐	☐	☐	☐	☐
2.	Auditing the quality requirement	☐	☐	☐	☐	☐
3.	Quality control measurement	☐	☐	☐	☐	☐
4.	Monitoring and recording the result of executing the quality activities to access performance	☐	☐	☐	☐	☐
5.	Quality checklists	☐	☐	☐	☐	☐
6.	You have opinion for other factors, please describe ▪ …… ▪ …… ▪ ……					

Survey Question 8,

Based on your overall experience in the Dam construction project management field in Myanmar, please feedback the following factors.

To what extend do you think the following factors are critical to the success of *Project Human Resources Management.*

(1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5=Strongly Agree)

No	***Project Human Resources Management Factors***	**1**	**2**	**3**	**4**	**5**
1.	Identifying project roles, responsibilities and required skill	☐	☐	☐	☐	☐
2.	Clear organizational chart and position descriptions	☐	☐	☐	☐	☐
3.	Confirming human resource availability	☐	☐	☐	☐	☐
4.	Develop project team	☐	☐	☐	☐	☐
5.	Management project team	☐	☐	☐	☐	☐
6.	You have opinion for other factors, please describe ▪ …… ▪ …… ▪ ……					

Survey Question 9,

Based on your overall experience in the Dam construction project management field in Myanmar, please feedback the following factors.

To what extend do you think the following factors are critical to the success of *Project Communication Management.*

(1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5=Strongly Agree)

No	***Project Communication Management Factors***	**1**	**2**	**3**	**4**	**5**
1.	Communication requirement analysis	☐	☐	☐	☐	☐
2.	Application of communication technology	☐	☐	☐	☐	☐
3.	Application of communication model	☐	☐	☐	☐	☐
4.	Application of information management system	☐	☐	☐	☐	☐
5.	Control communication	☐	☐	☐	☐	☐
6.	You have opinion for other factors, please describe ▪ …… ▪ …… ▪ ……					

Survey Question 10,

Based on your overall experience in the Dam construction project management field in Myanmar, please feedback the following factors.

To what extend do you think the following factors are critical to the success of *Project Risk Management.*

(1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5=Strongly Agree)

No	***Project Risks Management Factors***	**1**	**2**	**3**	**4**	**5**
1.	Plan risk management	☐	☐	☐	☐	☐
2.	Identify risks	☐	☐	☐	☐	☐
3.	Project risks register	☐	☐	☐	☐	☐
4.	Perform qualitative risk analysis	☐	☐	☐	☐	☐
5.	Perform quantitative risk analysis	☐	☐	☐	☐	☐
6.	Plan risk responses	☐	☐	☐	☐	☐
7.	Risk probability and impact assessment	☐	☐	☐	☐	☐
8.	Project risks categorization	☐	☐	☐	☐	☐
9.	Strategies for positive risks or opportunities	☐	☐	☐	☐	☐
10.	Strategies for negative risks or threats	☐	☐	☐	☐	☐
11.	You have opinion for other factors, please describe ▪ …… ▪ …… ▪ ……					

Survey Question 11,

Based on your overall experience in the Dam construction project management field in Myanmar, please feedback the following factors.

To what extend do you think the following factors are critical to the success of *Project Procurement Management.*

(1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5=Strongly Agree)

No	***Project Procurement Management Factors***	**1**	**2**	**3**	**4**	**5**
1.	Procurement evaluation techniques	☐	☐	☐	☐	☐
2.	Procurement negotiations	☐	☐	☐	☐	☐
3.	Procurement performance review	☐	☐	☐	☐	☐
4.	Inspection on the procurement	☐	☐	☐	☐	☐
5.	Procurement audit	☐	☐	☐	☐	☐
6.	Payment system	☐	☐	☐	☐	☐
7.	You have opinion for other factors, please describe ▪ …… ▪ …… ▪ ……					

Survey Question 12,

Based on your overall experience in the Dam construction project management field in Myanmar, please feedback the following factors.

To what extend do you think the following factors are critical to the success of *Project Stakeholder Management.*

(1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5=Strongly Agree)

No	***Project Stakeholder Management Factors***	**1**	**2**	**3**	**4**	**5**
1.	Identify stakeholders and interest Levels	☐	☐	☐	☐	☐
2.	Management stakeholders engagement	☐	☐	☐	☐	☐
3.	Control stakeholders engagement	☐	☐	☐	☐	☐
4.	Conduct stakeholder analysis	☐	☐	☐	☐	☐
5.	Well-defined stakeholder management plan	☐	☐	☐	☐	☐
6.	Effective communication between project stakeholders	☐	☐	☐	☐	☐
7.	Evaluate the attributes of the stakeholders in the construction project	☐	☐	☐	☐	☐
8.	You have opinion for other factors, please describe ▪ …… ▪ …… ▪ ……					