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ROLE OF RISK MANAGEMENT IN CONSTRUCTION PROJECT IN AFGHANISTAN

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Abstract: *Construction is a risky industry and there is no other industry that requires proper application of business practices much as construction industry, managing risks in construction projects has been recognized as a very important management process in order to achieve the project objectives in terms of time, cost, quality, safety and environmental sustainability. This research deals with the study of construction projects risk management practices in Afghanistan building construction projects. The objectives of the research were to identify the level of use of construction projects risk management techniques in Afghanistan building projects, to test the level of awareness of different construction projects parties involved in Afghan building construction projects and to study the effect of different areas and causes of risk in meeting project objectives.*

Different literatures were assessed to show that risk management is a very important management process that helps in making projects successful. Questionnaire survey was performed on different categories of building construction companies in Afghanistan to observe their awareness and how they deal with risks in their projects. Poor Construction management is the major causes of risk which has a high probability of occurrence and a high level of impact on project objectives. It was also observed that most building constructions in Afghanistan are not completed in conformity to their original plan, i.e. they usually sustain delay, cost overrun or quality problems. Majority of the parties involved in Afghanistan building construction projects believe that the effect of risk on project objectives can be greatly minimized if construction contract risk management techniques are used.

Data collection was done through a questionnaire survey selected construction industry participants such as International, National construction companies, Government, Donors and consultant. Data were analyzed with the use of SPSS and evaluate by SWOT Analysis model. Risk factors were classified into six categories based on their source: Technical, Design Related, Construction, Social and Political, Financial and Economic, Administrative and environmental risks. The study reveals that these risk factors spread through the whole project life cycle.

It is concluded that clients, builders and government bodies must work cooperatively from the feasibility stage onwards to address potential risk in time, and contractors and subcontractors with robust construction and management knowledge must be employed early to make sound preparation for delivery out efficient and quality construction program.

Keywords: Building, Construction, Risk Management, Risk analysis, Project and Objectives.

INTRODUCTION:

Risk Management in construction projects is full of deficiencies that affect its effectiveness as a project management function and in the end, projects' performance. For many years, risk management in construction projects has been approached using a reductionist approach that produces poor results and limits the quality of project management. For example, most of the times risk is handled through the application of contingencies (money) or floats (time) that are not determined based on a comprehensive analysis of the risks that can affect a particular project, and that in many cases are clearly insufficient to cover the consequences of risks that do occur during the project realization, then, in most of the cases projects end with costs overrun and late.

There is uncertainty in everyday life, in organizations and projects (Olsson, 2007), representing a clear threat to the business, but also in itself is a significant opportunity that must be taken (Hillson, 2011). There is a connection between uncertainty and risk "The risk is the uncertainty measured, and uncertainty is a risk that cannot be measured" Hillson (2004). Risk is multifaceted concept (Wang et al. 2004), which is defined as the probability of a damaging event occurring in the project, affecting its objectives (Yu, 2002) and (Baloi and Price, 2003), however not always associated with negative results. Risk may also represent opportunities, but the fact that most of the risk usually has negative results has led individuals to only consider the negative side of risk (Baloi and Price 2003) and (Hillson 2011). By other word risk is the

systematic process of identifying, analyzing and responding to project risk, Literatures investigation is shows that risk management in construction projects is full of deficiencies that affect its effectiveness as a project management function and in the end, projects' performance. Risk is commonly defined as the possibility of loss, injury, disadvantages or destruction, risk arises when uncertainty has the potential to affect objectives. The Association of Project Management (2004) defined risk as "Any uncertain event or set of circumstances that, should it occur, would have an effect on one or more objectives". According to the literatures reviewed, risk has significant impact on a performance of any construction project i.e. it is an uncertainty that significantly affects project objectives. Risk constitutes an essential factor for consideration since it can affect both the cost-benefit analysis during the whole process of a project, and the demand, production costs, execution time, and financial variables (Picard & Andrieu 2012). Even though this study is necessary in every project, it is especially relevant when we talk about megaprojects, where these issues are a reality.

Any projects or any activities have start and end point, similar concepts are used in the engineering world to systemize projects over time, The term project life cycle is used as a management tool to improve a project's performance, literature divided the project life cycle in deferent various number but generally it is consider in six phases and starting with Pre-project phase followed by Planning and design, Contractor selection, Project mobilization, Operations, and Close-out and Termination phase. Meanwhile Risk management itself has sex steps in construction projects such as Planning, Risk identification, Qualitative risk analysis, Quantitative risk analysis, Risk response planning and Risk monitoring and control (Dey, 2012) and (Project Management Institute, 2008), furthermore, it is an expanding field which literature has shown can be used not only for control against loss, but also as a way to attain greater rewards (Dey, 2012) and (Wu & Olson, 2008). To make an effective and efficient risk management it is necessary to have a proper and systematic methodology and, more importantly, knowledge and experience of various types. As example, we should have knowledge of the unforeseen events that may occur during the execution of a project, on the actions that work well or not when one of these events happens, on ways to assess a risk or estimate the likelihood that it will occur, and so on.

In absence of an effective project risk management function has several negative consequences for participants in a project due to lack of preventive action against the risks and uncertainty that any project presents, as example, the lack of prevention against the risk of scope definition of a project, or environmental hazards or communication risks, between others, leads to delays, significant increases in costs and contractual disputes, among others.

Preliminary recent research results in Chile have shown that companies that hire construction services on a recurring basis do not systematically apply risk management practices in projects, which has resulted in negative consequences for the performance of projects (Wolbers, 2011) and (Howard and Serpell, 2012). Another research is done by Additionally, (Palma 2007) on claims and contract disputes in a number of construction projects, had reflected the occurrence of a number of risks that were not well analyzed or integrated by either parties, customers or contractors, and that were one of the main causes of some of those claims and disputes.

This research aims are to address the problems of risk management in construction projects from a knowledge-based approach and through a system perspective and it is role in construction projects in Afghanistan. Thus, a research effort whose ultimate purpose is to develop a risk management system based on knowledge, to support risk management in construction projects for companies and organizations in Afghanistan. This will provide a methodology based on best practices, an assessment tool of risk management based on this methodology, the ability to propose improvements for risk management based on the detection of gaps during evaluation, and the availability of a knowledge base that supports the risk management and has the ability to acquire knowledge from experiences obtained in the implementation of construction projects. Finally, the results of this research will allow both client and contractor first, to develop a risk management function based on best practices, and second to improve the performance of this function along the realization of new projects.

The risk management function from a knowledge-based perspective which does not exist in most of the organizations and companies in Afghanistan it is; in the best practices model that it will be developed and used as a benchmark for evaluation and improvement, and finally in that it will provide an instrument for evaluating current risk management functions applying a maturity model that will be fitted to the conditions of projects performed by Afghanistan base organizations and companies.

Implementation of construction project in Afghanistan is one of the most challenge for client and contractor, here is uncertainty in everyday life, such as security, lack of capacity, Budget, social and law problems, Instability of government and other external and internal environment. The main objective of this research is to study the impact of risk management on construction projects success in Afghanistan.

In Afghanistan at the moment there is no academic assessment of risk on construction projects it is the first time that a new academic research is being written in this case.

Infrastructure Services Department ISD is one of the technical department of Ministry of Education for construction of Schools, dormitories, Teacher Training Institutes, Islamic education buildings, kindergarten, Main office for ministry administrative... A case study is conducted in this research in ISD/MoE to find level of risk in school construction projects. The case-study is only covered World Bank funded projects under Education Quality Improvement project.

LITERATURE REVIEW:

An extensive review of international project risk assessment and management was conducted during the initial phase of the research effort. Previous research suggests that construction activity is particularly subject to more risks than other business activities because of its complexity; a construction project usually requires a multitude of people with different skills and interests and the coordination of a wide range of disparate, yet interrelated, activities. Such complexity is further compounded by the unique features of a project and many other external uncertainties. And also, in general, there is an absence of literature that has focused on the practices, results or development of risk assessment and management techniques for Afghanistan construction projects.

Madau (2009), mentioned that project control and risk management contribute to, and how it can be used effectively in ensuring project success and identify the factors that contribute to project success. The results of the questionnaire were processed and analyzed by using a spreadsheet application. The main findings indicated that project controlling and risk management have a significant influence on performance of the project and therefore on the success of the company. It was also found that effective earned value management contributes positively to the project success. By strengthening and focusing more on project controlling and risk management methods and processes, the performance of projects should improve.

Roozbeh (1995), discussed the attitude of large U.S construction firms toward risk and determined how the contractors conduct construction risk management through a survey of the top 100 contractors. The study showed that in the recent years contractors are more willing to assume risks that accompany contractual and legal problem in the form of risk sharing with the owner. The survey also found that contactors assume the risk associated with actual quantities toward the practice of defensive engineering is determined.

Shou et al. (2004), identified twenty-eight critical risks associated with international construction projects in developing countries and categorized them into three hierarchy levels (Country, Market and Project), of which 22 were evaluated as Critical or Very Much Critical based on a 7-degree rating system. The top 11 critical risks are: Approval and Permit, Change in Law, Justice Reinforcement, Local Partner's Creditworthiness, Political Instability, Cost Overrun, Corruption, Inflation and Interest Rates, Government Policies, Government Influence on Disputes and Termination of JV. The risks at Country level are more critical than that at Market level and the latter are more critical than that in Project level. For each of the identified risks, practical mitigation measures were provided and evaluated. Almost all of the mitigation measures were perceived by the respondents to the survey as effective using a 7-degree rating system.

Thomas and Toakley (1999), studied the use of risk management in the conceptual phase of the construction project development cycle in the Australian construction industry through a survey. It was found that while most respondents were familiar with risk management; its application in the conceptual phase was relatively low, even though individuals were willing to embrace change.

Li Bing et al. (1999), identified the risk factors associated with international construction joint ventures (JVs) from and ''integrated'' perspective. The risk factors were grouped into three main groups: (1) Internal; (2) Project-specific; and (3) External. The study examined the most effective mitigating measures adopted by construction professionals in managing these risks for their construction projects in East Asia. Based on an international survey of contractors, it was found that the most critical risk factors exist in the financial aspects of JVs, government policies, economic conditions, and project relationship. When entering a foreign construction market in the form of a JV, a foreign construction company could reduce its risks if it would carefully select its local partner, ensure that a good JV agreement is drafted, choose the right staff and subcontractors, establish good project relationships, and secure a fair construction contract with its client.

Theoretical framework:

In this research theory is divided in three parts; the first part is a description of a project organization structure and project phases. Its purpose is to provide a reader with general information about a construction project and projects life cycle. The second part definition of risk and uncertainty introduces concept of risk management and provides definitions of terms used in this process. Finally, discus risk in construction projects, theoretical concept of risk management process and methods used for risk assessment are presented. Some risks which occur commonly in the construction industry are, for example security, natural disaster such as floods, avalanche, erosion, land sliding, weather and planning, design issues, problems with material, accidents, labor issues, budget decencies, inflations, completion delay, etc. Risks can vary in character and have different impacts on a project. In spite of this, risk management is not widely used within the construction industry.

Theoretical model and variables:

Three independent variables and seven dependent variables are in this research, the independent variables are: Risk Identification, Risk Assessment and Risk Response for the Construction Companies, the dependent variable are: Achieve the quality standards, comply with technical Specifications, Adherence to Schedule, no lawsuits or claims, Within the planned Budget, Scope definition and Ability to keep future work.

Conceptual Research Model:

The model of this research consists of two types of variables, the independent variable and dependent as shown at the figure# 3.1

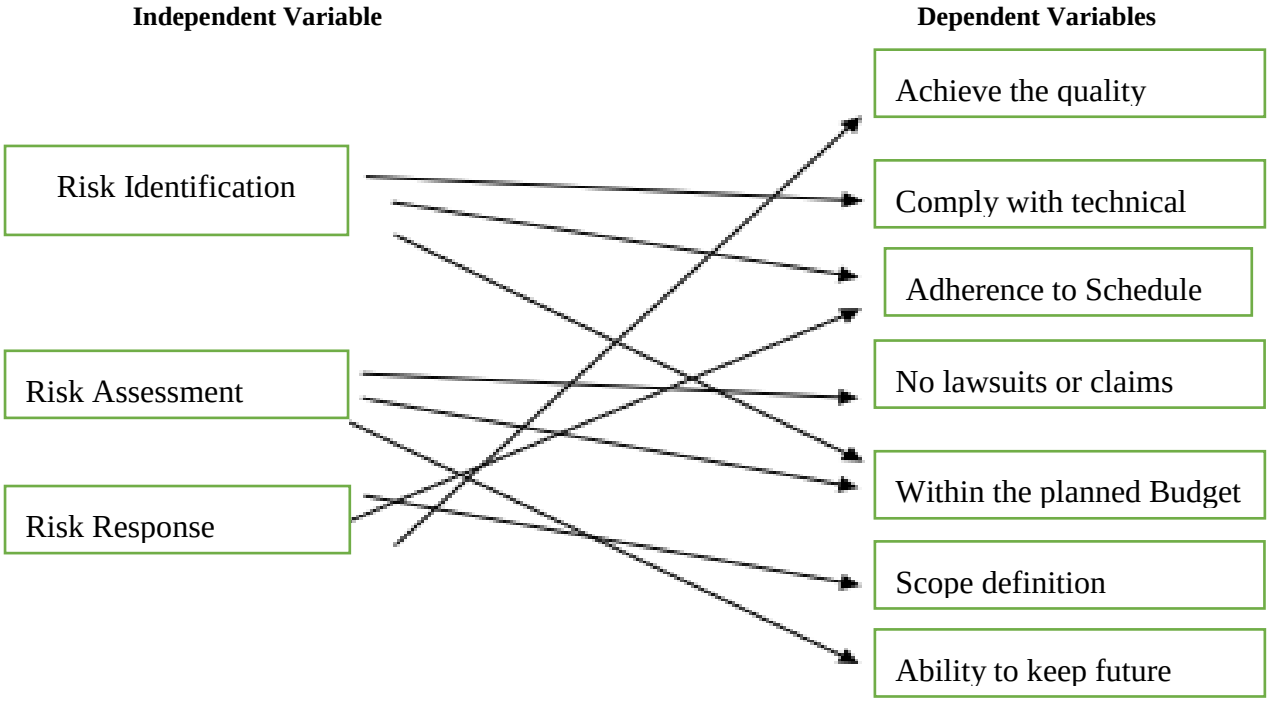

Figure 3. Theoretical Research Model

METHODOLOGY:

Main sources of data for this research are the data gathered from the literature and through a questionnaire survey from the key staff and managers of construction companies, Donor's, projects manager, sr. engineers (government) and construction projects consultant. Literature review includes books, journal articles, magazines articles, and internet articles on Risk Management in construction field practices and experience, meanwhile a case study is conducted in ISD/MoE from the World Bank funded projects. Questionnaires mostly concentrated in Risk Management in construction projects in Afghanistan, Risk consideration in construction projects, uncertainty, risk related to security, risk priority in construction projects in Afghanistan, Impact of risk in construction projects in the last two decades… The data collected from the construction industry via the questionnaire survey is then processed by the means of statistical analysis for the purpose of generalizing its findings, as much as possible, to the entire construction industry rather than the targeted sample. Following, these findings will be an input to a simple spreadsheet file developed to aid the contractors working in the construction industry in preparing effective risk management processes for their new projects in Afghanistan. The case-study is done inside the ministry of education the data is collected directly from related directorate such as Finance department, Procurement department, Infrastructure Service department, general plan department and general education departmen in the ministry of education.

Problem Statement:

In this research, I tried to define the risk management practices by literature and compare with Afghanistan project Risk management; success in construction project is indicated by its performance in the achievement of project time, cost, quality, safety and environmental sustainability objectives (Zhou et al. 2007). Despite the efforts by all players in the construction industry and in infrastructure many construction projects in Afghanistan and generally in the region and the world run a high risk poor performance by being well over budget and significantly late. The construction industry generally has poor cost and schedule performance. The industry has a reputation for time and cost overruns. One of the reasons of the bad performance is that the construction industry is one of riskiest of all business types (Clough et al. 2005).

While some degree of poor cost and time schedule performance is inevitable in construction projects, it is possible to improve risk management strategies to minimize their negative impact and thus improve the project performance. Risk management is usually starting with planning of implementation, the risks at construction project planning stage include poor scope definition, poor estimating and development of a budget based on incomplete data. The risk management practices required at this stage include risk profiling and identification, the architect and engineer selection process, construction site review and validation, needs identification and validation and preliminary budget and schedule development (Wallace and Blumkin, 2007).

OBJECTIVES:

1. To identify the level of use of construction risk management techniques in Afghanistan building projects

2. To study the effect of applying construction risk management techniques in meeting project objectives

3. Studying a case of school construction, in ISD/MoE to get in-depth information about the impacts of risk.

The last objective was modified since it was not believed to be fully achieved by the research. Hence the new specific objective is:

To study the effect of different areas and causes of risk in meeting project objectives.

RESEARCH HYPOTHESIS:

The following hypotheses were tested in this research:

1. There is an impact exists between Risk identification and project success (time, quality & Budget)

2. Risk management is not considered in construction projects in Afghanistan it caused that Afghan Government can't complete annually planned projects up to 50%.

Sample and Sampling technique:

Two sampling procedures were used due to the nature of respondents to be involved in the study. List of companies, consultant, contractors, Donor's, project manager, sr. project Engineers and clients based in Kabul. The 210 questionnaires are distributed hard copy and through email, 128 numbers is returned the questionnaires. The case study is directly done by face to face interview and documented by the related departments.

Instruments:

A questionnaire containing five sections was developed to facilitate data collection. The first section aimed to collect the background information of the respondents, e.g. their name, position, Agency, phone and email

The second section included the respondents' opinion on the impact of risk management process through the different risk factors on implementation of construction projects, e.g. Security, social, technical, financial, political, and natural disaster. The third section included and investigate the level of consideration of risk in construction projects in Afghanistan in the past 10 years and prioritization of risk consideration in construction projects. The fourth section of the questionnaire is impact of risk in cost, time and quality. The fifth section respondent will list of those factors which have direct impact in construction projects in Afghanistan.

Data Analysis:

Analysis is an interactive process by which answers are examined to see whether the results are relevant to each research question (Backstrom & Hursh-Cesar, 1981). Quantitative statistical analysis for questionnaire was done by using Statistical Package for Social Sciences SPSS.

SWOT Analysis is done to determine the relationship between the independent and the dependent variables in the research, meanwhile test the effect of risk in different phase of project cycle in construction projects in Afghanistan

SWOT Analysis:

In this research, the method is used for evaluation of data is SWOT analysis model.

Strength: this refers to the strong key advantages of your business has (best, capacity of products, quality and quantity of products)

Weakness: this refers the disadvantages of your business has (gaps, lose, avoids…)

Opportunity: elements in the environment that the business or project could exploit to its advantage (external environment, potential, strategic aspects, financial, market…)

Threat: elements in the environment that could cause trouble for the business.

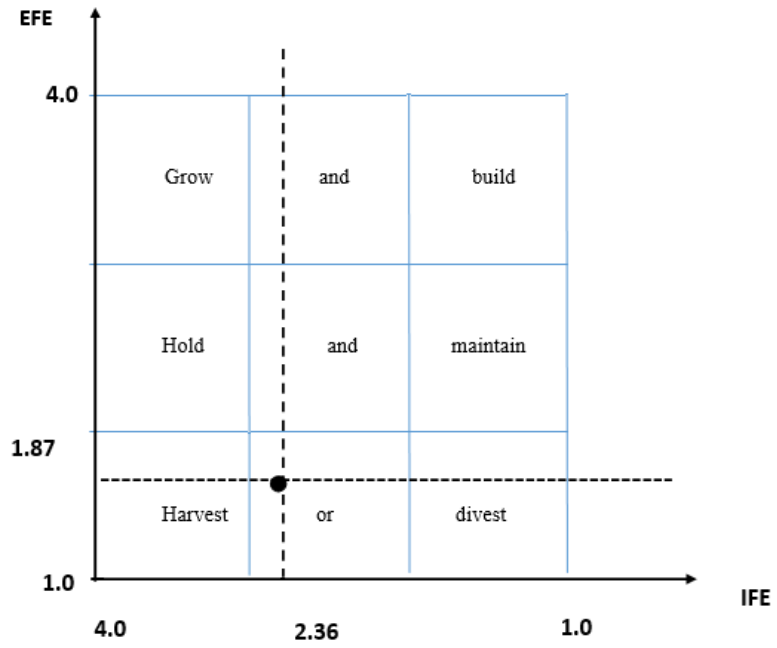

Figure 4.1: SWOT Analysis

S no	Internal strength	Weight	Rating	Weighted score
1	Existing of professional personal (T)	10%	3	0.3
2	Largest construction across the county (C)	12%	4	0.48
3	Multiplicity of donors for financial supporting (F)	10%	3	0.3
4	Good design and project planning (T)	8%	3	0.24
5	More experiences in construction (C)	11%	3	0.33
6	Change of the structure management (O)	6%	3	0.18
	Internal weaknesses	**Weight**	**Rating**	**Weighted score**
1	Strong Bureaucracy (O)	10%	2	0.2
2	Weak coordination among donors (F)	10%	1	0.1
3	Lack of transparency in laws and principles (O)	5%	1	0.05
4	Lack of on time meeting with stuff (O)	7%	1	0.07
5	Lack of strong enthusiasm among practitioners for updating themselves (O)	5%	1	0.05
6	Lack of the skilled labors in the site for constructing. (C)	6%	1	0.06
Total		**2.36**		
	Opportunities	**Weight**	**Rating**	**Weighted score**
1	Receiving high budget from donors (F)	10%	3	0.3
2	Enthusiasm among donors to support ISD (O)	9%	2	0.18
3	Enthusiasm among the people for helping of ISD engineers in the site (S)	8%	1	0.08
4	High social satisfaction from ISD (S)	6%	1	0.06
5	Schools construction is the center of senior authorities' attention of the government. (O)	6%	1	0.06
6	Improvement of techniques (T)	12%	3	0.36
	Threats	**Weight**	**Rating**	**Weighted score**
1	Political changes (S)	4%	1	0.04

2	Social challenges (S)	10%	2	0.2
3	Security challenges (S)	12%	3	0.36
4	Increasing of the price of the materials (S)	5%	1	0.05
5	Complexity and bureaucracy inside of relative organization to ISD. (O)	7%	1	0.07
6	Lack of resources (land, materials and labors) are able to increase the risk in construction projects.	6%	1	0.06
7	Work in deprived and under war areas can create the risk in construction projects.	5%	1	0.05
	Total	**1.87**		

FINDINGS:

In this study, financial risk is higher than other aspects due to so many reasons the prominent reasons that effect on this field. In Afghanistan, most of projects are funded by different donors, the donors are not transferring the budget on time to the government or contractors account, practically it had very bad affect in construction projects implementation, either some projects will terminate after contract, meanwhile lack of financial capacity and long payments process system performance bond, bank guarantee etc. The payment terms should reflect the progress of the work and the parties should have the required financial backing from a reliable source. Delay in allotment, donors not transfer the money as promised plan, deficiency of budget, inflation… the study also pointed that preliminary budget development process in most projects was done without the involvement of professionals. There were some projects that were closed before construction works, as the initially anticipated budget was not feasible. In many projects, contractors and consultants were forced to work within unfavorable client financial schedules resulting in incomplete and poor design and delay in construction works. There was strong relationship between designs done in less than two months and the occurrence of variations, change orders and design changes during construction.

The location of the site is very important and should be selected very carefully because it can lead to additional risks like political risk. The stability, material supply interruptions, mobility and access should all be considered during bid and contract agreement. The study shows site selection and site topographic survey usually don by client, the contractor is not aware during the implementation the site will change by community or land have social problem, any change in land have direct affect both in time and cost.

The research shows (1.64) that construction or implementation stage in Afghanistan is one of the most critical and challengeable phase which will affect by security, miss management, accident, injuries, unavailability of technical staff, lack of understanding of the system and the technology, transportation, environmental hazard…

The research shows project management in Afghanistan is poor (1.72) this mean managers were appointed prior to the plan and design process in most projects, this meant that most projects were conceived with inaccurate information since there was no professional input at the planning phase in most projects, the implementation technical team is hiring late and going to the site without project orientation and project risk management guidance.

Social and politics are unstable in Afghanistan, as it is showed in the table4.15 (1.67) the projects managers are not considering the external and internal project implementation strategy, most of the construction material and technical staff coming from neighbor countries, if the border closed for some time it will have direct effect in project, meanwhile risks that are especially significant when the construction is on a host government's site/country. The host country might interfere in the bidding and construction process by changing laws and standards. The contractor needs a secure environment for performing the construction and should be clearly stated in the bid as well as the contract document.

RECOMMENDATIONS:

The research project identified ineffective risk management practice at construction projects in different stage or life cycle especially during the project planning stage. The recommendations are listed as bellows:

1. Since lack of awareness was identified as a major cause for not having enough confidence for using risk management techniques, regular trainings and workshops on the subject need to be provided for the parties involved in building construction projects. All parties should be encouraged to take part and participate in

trainings and workshops and try to increase their knowledge of risk management.

2. A special attention should be given to managing Financial and Contractual areas

3. Establishing a risk management team is highly recommended in the Afghan building construction projects.

LIMITATION OF THE RESEARCH:

The scope of this research is limited to the study of risk management practice in Afghanistan construction projects. Hence, the research involved contractors, National clients (government and international DONOR's), Profitable NGO's, national and international construction companies in Afghanistan. It was difficult to have access with international DONOR's and UN agencies to collect the data only few of them, most of the managers are working in building construction companies were not willing to return the questionnaire on the set date claiming they were busy and limitation of time for collecting the data. Time limitation, the time for research and collecting the data was too short for this thesis.

CONCLUSIONS:

The purpose of this research project was to evaluate the effects of risk in construction projects in Afghanistan in consideration of different phase in project life cycle. Risk management is recognized as an important exercise in order to achieve better performance of construction projects. The complexity and risk of building projects is increasing by the day as more ideas are emerging, the primary aim of every construction project is to achieve project goals within available cost, with best possible quality and within a specified period of time. This means meeting client's requirement with minimum possible cost, with required quality and within the specified time, any action or event that may affect the achievement of these goals or objectives is a project risk. Majority of building participants are familiar with risk management in relation to safety measures against hazards. Construction projects in Afghanistan and generally in the region and the world run a high risk of being well over budget and significantly late. While some degree of cost and time schedule risks is inevitable in construction projects, it is possible to improve risk management strategies to minimize their negative impact, Afghanistan's construction industry poor construction budget and schedule performance informed the need for this study.

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