



Effects of project risk management strategies on project performance

Thilakarathna, R. D. G. N. M^a and Mathivathany, S^b

^{a,b}*Department of Economics and Management, Faculty of Business Studies,
Vavuniya Campus of the University of Jaffna, Sri Lanka*

^ahansithilakarathna978@gmail.com

^bmathivathany@vau.jfn.ac.lk

Abstract

Risk is an unavoidable phenomenon that may potentially interfere with the successful completion of a project. It may affect positively or negatively to the cost, quality and duration of any of the projects. In traditionally, project managers consider negative risk management strategies, but lack of consideration is about positive risk management strategies. From the initial stage through completion, Project should have an adopted and updated risk management process to respond to the risk. The research aims to identify the risk management strategies and their effects on project performance by especially referring to the road construction projects of the road development authority in Sri Lanka. The researcher adopted the qualitative method and used interviews with responsible professionals and documentary reviews to collect necessary data and information. The research results mainly identified types of risks, risk management practices in the road construction project and risk management strategies. The financial risk was very high in the road construction project and lack of risk management practices and strategies. Professionals from the RDA should be adapted proactive and efficient action with responsible and tactful risk management teams.

Keywords: project performance, risk management strategies and road construction project

Introduction

Project risk can be defined as “an uncertain event or condition that if it occurs, has a positive or negative effect on one or more project objectives such as scope, schedule, cost and quality. A risk may have one or more causes and, if it occurs, it may have one or more impact” (PMI, 2013). In road construction projects often confront many uncertainties due to factors such as the presence of interest groups, resource availability, the physical, economic and political environments, statutory regulations. such risks have a significant effect on the outcomes of a road construction process. According to Wijekoon and Attanayake (2012), cost overruns are predominant in road construction projects in Sri Lanka. Moreover, most of the projects suffer from time overrun compared to the original (planned) project duration (Pathiranage&Halwatura,



2010). Furthermore, there is no one best way to deal with risk and different handling methods would have to be employed depending on the type and nature of the risk (Perera, Dhanasinghe, & Rameezdeen 2009). Therefore, definitely, it should have robust risk management strategies to confront encountered risk. By examining road construction projects in Colombo district, the researcher attempts to explore an exact answer for bellow mentioned research questions.

- What are the risks of road construction projects?
- What are the risks management strategies use in road construction projects?
- How does a risk management strategy influence on road construction projects' performance?
- How to establish better risk management strategies that will enhance project performance?

Thus researcher selected the outer circular highway project, central expressway project, port access elevated highway project owned by RDA in Sri Lanka to implement the research work. In Colombo districts, as the capital of Sri Lanka, many road construction, mostly highway and expressway projects, are implementing around all over the city through RDA. A number of projects were a failure to perform within the planned schedule and budget. Most of the projects are exceeded the allocated duration and budget. Therefore, it can adversely affect the performance for the road construction project because the project's success should be measured in terms of completing the project within the constraints of scope, time, cost, quality, resources, and risk (PMI, 2013). This study's primary purpose is to establish effective project risk management strategies on project performance in Sri Lanka. Specific objectives are to identify the risk on road construction projects, find out risk management strategies in road construction projects, determine the effect of risk management strategies on the performance of road construction projects, and establish better risk management strategies that will enhance the project performance.

Literature Review

Every project manager's desire is to execute and complete a project within the set budget, time, quality, and customer satisfaction requirements (Sibomana, 2015). Various project teams had different chances of managing the various risk (Gitau, 2015). Some significant risks could occur in more than one phase of the project life cycle, stressing the necessity of handling these risk factors



as a prerequisite for project success. Failure to involves parties in assessing, analyzing and responding to associated risks jeopardizes the success of the project. In the construction projects management context, risk management is a comprehensive and systematic way of identifying, analyzing, and responding to risks to achieve the project objectives. The risk management framework for construction projects can be improved by combining qualitative and quantitative methodologies to risk analysis (Banaitiene & Banaitis, 2012). Most construction employees involved in risk management are not fully aware of the available risk management technique applied in highway projects. Construction risk management must be given adequate attention to ensure a successful project that meets the expectation of project goals and objectives (Singh & Chugh, 2016). Controlling the project risks facilitates achieving the main projects 'objectives, such as on-time delivery and the products' satisfactory quality. Hence, every reasonable measure should be taken to implement risk management more effectively (Perera et al., 2009).

If the risk has a significant impact on the project, the best solution is to avoid it by changing the project's scope, or worst scenarios, cancel it (Gajewska & Ropel, 2011). Sibomana (2015) pointed out that risk avoidance, risk transfer, and risk retention were mostly performed; in the client's program phase; in the planning phase, jointly by the client and the consultant; in the procumbent and production phases mostly by the contractor. Gitau (2015) stated that the various project team members had different chances of mitigating the various risks, but the client had the best chance in managing most of the risks. Mitigation measures can be worked out in advance to ensure the probability of successfully completing the project within the stipulated time and cost. Therefore, it can be concluded that to eliminate/mitigate the risk in the project a proper recording, tracking and analysis is necessary (Patil & Gaikwad, 2015). Risk-sharing had proved to be more effective with dealing with utility agencies, neighborhood relations, and difficulty obtaining permits. The employer and the contractor shared those risks, including adverse weather conditions, changes imposed by the engineer, and inflation. (Perera et al., 2009) When risk cannot be transferred or avoided, the best solution is to retain the risk. In this case, the risk must be controlled to minimize the impact of its occurrence (Gajewska & Ropel, 2011).

Methodology

For is research, a qualitative research method has been chosen to provide an effective risk management strategyfor construction projects. Due to the limitation of the time, the researcher has targeted only three ongoing projects



of the RDA. Further to collect data, interviews were chosen to obtain the most accurate answers to facilitate further analysis.

Population and Sample Size

Table 1. Population and Sample size

Category	Central Expressway		Outer Circular Highway		Port Access Elevated Highway	
	Population Size	Sample Size	Population Size	Sample Size	Population Size	Sample Size
Project Directors	2	2	1	-	1	1
Engineers	7	1	2	1	1	1
Consultants	-	-	3	2	-	-

Results and Discussions

Primary data were collected from eight respondents of the selected projects of the RDA by using the interview method. Here the researcher analyzes all the gathered data under the descriptive method, and presented all the data by using the tabular and pictorial forms that make it easy to understand and analyze the result.

Effects of risks on project performance and strategies for risk management

75% of the respondents said due to the political, financial, foreign funds and compensation problems, lack of risk management methods, document failures, insufficient budget, public and labor safety, estimated time and cost will increase, and the project's quality decrease. According to the interviewer response, risk effects on performance; , respectively for the duration 100%, cost 62.5% and quality 50%.The use of insurance is the most common strategy which is used by RDA projects. Transfer the construction and design risk for the contractor by signing an agreement. Do the environmental analyses at the initial stage coordinate with NBRO, CEA and SLLRDC and risk analysis after the project is implemented. There are sixteen strategies found by the researcher, which is used by the RDA road construction project. Those are depicted bellow.

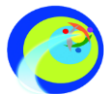


Table 2. Risk Management Strategies Used by RDA

Strategies used by RDA Projects	OCH	CEP	PAEH
Insurance	•	•	•
Use of agreements	•	•	•
Environmental analysis	•	•	•
Risk Analysis	•	•	•
Meeting	•	•	•
Transfer Responsibility of Construction and Design risk for the contractor	•	•	•
Follow the standard	•	•	•
Use of unsolicited proposal during the selection of contractors		•	
Observation			•
Surveys			•
Checklist analysis			•
Inspection			•
Lesson learned from previous projects			•
Allow training for the laborers			•
Follow the safety methods	•	•	•
Tolerance of the risk	•	•	•

Risk management documents in construction projects

There is low maintenance of the risk documents in road construction projects of RDA. An environmental assessment plan is commonly used in RDA projects as a Risk assessment document in the initial stage.

Table 3. Use of Documents for the Risk Management in RDA Construction Project

Documents	Frequency	Percentage
Environmental Assessment Plan	6	100%
Project Management Plan	3	50%
Cost Management Plan	4	66.67%
Quality Management Plan	4	66.67%
Safety Plan	4	66.67%
Bidding Document	2	33.33%
Risk Register	2	33.33%
Feasibility Reports	4	66.67%

Influence of strategies on project performance and difficulties when applying the strategies

Risk management strategies are effects on cost, duration and quality of the project. Mitigate and transfer actions are mostly used by RDA to manage the project risks. The researcher identified mostly used strategies in road construction projects of RDA as follows:

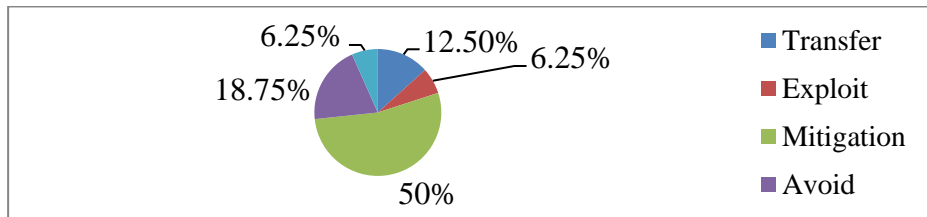


Fig 1. Risk Management Strategies used in Road Construction Project of RDA

Relationship between project risk management strategy and project performance

Everyone else said that there is a positive relationship between project risk management strategies and project performance. From them, 62.5% of respondents strongly agreed with the statement and 37.5% of the respondent agreed to the statement. Project risk management strategies are positive effects on project performance.

Conclusions and Recommendations

Road construction projects in RDA Sri Lanka have a number of risks for the project time, cost and quality, and the inevitable development of an appropriate risk management strategy to deal with them. In RDA road construction project has a traditional view of the project risk. Respondents did not give more weight for Positive risk or opportunities. However, according to research findings, some risks can also be an opportunity for the project, such as, foreign funds, dealing with utility agencies, and using new technologies. Furthermore, they did not follow the exact method for the identifications of project risk. Due to the political conditions and financial failure, the duration is exceeded most of the time than the estimated time in the RDA projects. RDA project does not follow the exact risk management process and does not maintain sufficient risk management documents in the projects. 100% of the project used an Environmental assessment plan to state the risks. The project safety manager is the person responsible for managing the risk, but it is also limited to the labor safety. The use of insurance is the most common action used by RDA projects. RDA Transfer the construction and design risk for the contractor by signing and agreements. Mitigate, transfer and avoid actions are the most used strategies by RDA to manage the project risks.



RDA should maintain the relevant risk management documents through the project life cycle. Thus it can be used as a lesson learned for future projects. Risk identification and analyzing should be beginning at the initial stage of

the project and it should be a continuous process initiated through the end of the project. When signing an agreement with stakeholders, especially between foreign funds agencies, expert judgment is an essential and tactful method. Instead of the project's traditional view, risk management strategies need to adopt a modern view of the project risk management strategies that mean strategies should be established to both positive and negative risk. RDA can use accept and exploit strategies to retain foreign country supports continuously. Acquire the native contractors and laborers to the project works will reduce the cost and it will benefit the country's economic stability. Finally, there must be a proactive and iterative risk management framework that focuses on both negative and positive project risk with the participation of knowledgeable, tactful and active professionals or experts to the handle of project risk for the enhancement of effective and efficient projects performance. From this study, the project team can clearly understand the importance of both negative and positive risk management strategies to confront project risks. The study also revealed the essence of maintaining the relevant project management documents on project progress. Thus project team can improve their project documenting the process as well. Through this study, RDA can identify their current level and issues of the project risk management process and they can improve that process according to this study revealed. Moreover, RDA can develop their perspective of project risk management strategies, increase the use of expert judgment, and create the project team with the commitment of tactful and active participants. Finally, this will be good guidance to adopt and implement the modern view instead of the traditional view of the project risk management process in RDA.

References

- Banaitiene.N, & Banaitis.A (2012), Risk Management – Current Issues and Challenges, *Risk Management in Construction Projects*, 430-448.
- Central Expressway, Economic Feasibility Analysis report (2016), available at <http://www.cep.rda.gov.lk>
- Central Expressway, Environmental Assessment and Review Framework (EARF) Final Report -2016, available at <http://www.rda.cep.gov.lk>
- Gajewska.E, & Ropel.M (2011), Risk management practices in a construction project-a case study. Goteborg: Chalmers University of Technology.
- Gitau.L.M. (2015), The effects of risk management at project planning phase



3rd Research Conference on Business Studies (RCBS) – 2020
on performance of construction projects in Rwanda

- Pathiranage.Y.L, & Halwatura.R.U (2010), Factors influencing the duration of road construction projects in Sri Lanka, 43(4), pp. 17-30, doi: [http://doi.org/10.4038/engineer.43\(4\),69-97](http://doi.org/10.4038/engineer.43(4),69-97)
- Patil.N.V, & Gaikwad.P.G (2015), Risk management in road construction, *International Journal of Modern Trends in Engineering and Research (IJMTER)*, 2(7), 851-856
- Perera.B.A.K.S, Dhanasinghe.I, Rameezdeen.R (2009), Risk management in road construction: the case of Sri Lanka, *International Journal of Strategic Property Management*, 13(2), 87–102.
- PMI (2013), Project Management Body of Knowledge (PMBOK Guide) (5th ed.). Pennsylvania USA: Project Management Institute Inc.
- Road Development Authority: Annual Report (2016), Available at <http://www.rda.gov.lk>.
- Sibomana. A (2015), Effects of Risk Management Methods on Project Performance in Rwandan Construction Industry; A case study of multi-story buildings construction project of RSSB
- Singh.R.R, & Chugh.G (2016), Various Risks Involved in Highway Projects, *IJIRST –International Journal for Innovative Research in Science & Technology*, 3(6), 131-135
- Wijekoon.S.B, Attanayake.A.M.C.T.K, (2012), Study on the cost overruns in road construction projects in Sri Lanka. *International Conference on Sustainable Built Environment, Sri Lanka, Paper No 69*. 14-16 December 2012, Sri Lanka: University of Peradeniya.