

# Risks and Mitigation Measures in Build-Operate-Transfer Projects

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**Abstract**—Infrastructure investments are important in developing countries, it will not only help to foster the economic growth of a nation, but it will also act as a platform in which new forms of partnership and collaboration can be developed mainly in East Asian countries. Since the last two decades, many infrastructure projects had been completed through build-operate-transfer (BOT) type of procurement. The developments of BOT have attracted participation of local and foreign private sector investor to secure funding and to deliver projects on time, within the budget and to the required specifications. Private sectors are preferred by the government in East Asia to participate in BOT projects due to lack of public funding. The finding has resulted that the private sector or promoter of the BOT projects is exposed to multiple risks which have been discussed in this paper. Effective risk management methods and good managerial skills are required in ensuring the success of the project. The review indicated that mitigation measures should be employed by the promoter throughout the concession period and support from the host government is also required in ensuring the success of the BOT project.

**Keywords**—BOT project, risks management, concessionaire, consortium.

## I. INTRODUCTION

SINCE 1980s in East Asian countries; the build-operate-transfer (BOT) projects have become popular and evolving vigorously. This is aligning with the need of basic infrastructure to develop the countries and lack of huge fund has urged the host government to utilize BOT type of procurement. Table 1 shows the involvement of private sector in infrastructure projects in East Asia and Pacific. Energy sector has recorded the highest investment amounting to US\$ 101,187 million followed by telecom, transport and water and sewerage.

The BOT is a type of infrastructure project which is based on granting of concession by a principal, usually a government, to a promoter, sometimes known as concessionaire, who is responsible; construction, financing, operation and maintenance of a facility over the period of the concession before finally transferring the facility, at no cost to

the principal, in a fully operational condition [2]. The facility will be operated by the concessionaire during the concession period to generate revenue to settle the debt payment and profit for the investment. Concession contract will bind the host government and promoter throughout the concession period but not just limited to initiation, implementation, operation, and maintenance, and handing over. Private sector companies are given the opportunity to build and operate the facility but the role of the host government in supporting BOT privatized projects determines its success or failure.

TABLE I  
 TOTAL PROJECTS BY PRIMARY SECTOR AND  
 SUBSECTOR FOR EAST ASIA AND PACIFIC REGION  
 (US\$ MILLION) [1]

Primary Sector	Sub Sector	Project Count	Total Investment
Energy	Electricity	381	91,766
	Natural Gas	191	9,421
<i>Total Energy</i>		<i>572</i>	<i>101,187</i>
Telecom	Telecom	71	78,145
<i>Total Telecom</i>		<i>71</i>	<i>78,145</i>
Transport	Airports	27	4,599
	Railroads	20	15,198
	Roads	194	36,162
	Seaports	101	18,824
<i>Total Transport</i>		<i>342</i>	<i>74,782</i>
Water and sewerage	Treatment plant	297	8,195
	Utility	57	20,494
<i>Total Water and sewerage</i>		<i>354</i>	<i>28,689</i>
<b>Grand Total</b>		<b>1,339</b>	<b>282,804</b>

## II. NATURE OF RISKS IN BOT PROJECTS

The existence of risk in every single project is unquestionable. The type of risks are varied; on the nature and size of the depend project. Risk in BOT project is solitary and different but somehow always related to the phases in a project namely: initiation, implementation and operational phase. In order to accomplish the objectives, the risks need to be managed wisely.

Proper measurements have to be taken into account to allow for uncertainty in the judgement which might take place during the project have to be considered. Any BOT project is subjected to influences from, within and outside organization itself. The objectives of the projects are governed by the stakeholders; possess distinctive expectation and interests in

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the project which could jeopardize the project if the risks are not properly handled and managed.

For instance, the host government always places public interest first for any project related to them. The host government would actively involve during the pre and post implementation stage by revising the design to ensure the safety of the finished product for the public. In addition to that, changes will be made to ensure that the project comply with all local regulations such as environmental safety requirement, building code and other stipulated regulations. Thus, it becomes the responsibility of the promoter of the project to explore for best solution to tackle those risks and manage it well within the context of concession contract.

### III. DEFINITION OF RISK

According to Merna and Thani, risk is characterized as the potential for unwanted negative consequences of an event or a measure of the probability and the severity of adverse effects [3]. Generally, numerous decisions would be made in BOT project based on assumptions and expectations that might be encountered during the project. Whilst, definition of risk and uncertainty by Raftery is given below [4]:

*“Risk and uncertainty characterize situations where actual outcome for a particular event or activity is likely to deviate from the estimate or forecast value.”* [4. p.5]

The given definition does not consider other important key elements that could influence the project's activities. Definitions for risk and uncertainty in BOT project could be extended by including; uncertainties in financial markets, construction problems, demand forecasts, instability in a country's economic situation, uncertainties in host government organizations, stakeholders' expectation and other external aspects of the projects. Chapman has defined risk as exposure to the possibility of economic and financial loss or gain, physical damage or injury, or delay as a consequence of the uncertainty associated with pursuing a particular course of action [5].

Further to that, Smith has provided several absolute definitions for risks for construction projects from several references as follows [6]:

- 1) Association of Project Management (2002): *‘a combination or frequency of occurrence of a defined threat or opportunity and the magnitude of that occurrence’*.
- 2) HM Treasury (2001): *‘the uncertainty of outcome, within a range of potential exposures, arising from a combination of the impact and probability of events’*.
- 3) BS 6079 ( British Standard Institutions, 1996): *‘is the uncertainty inherent in plans and the possibility of something happening that can affect the prospects of achieving business or project goals’*.
- 4) Smith (2002): *‘risk is adverse but and unknown by its nature can have both positive and negative effects’*.

Primarily, the outcome of the project implementation could be affected directly by the risks in the BOT projects. Figure 1

show a concept model of risk that has been developed by Merna and Al-Thani by including uncertainty, probability, effect and outcomes.

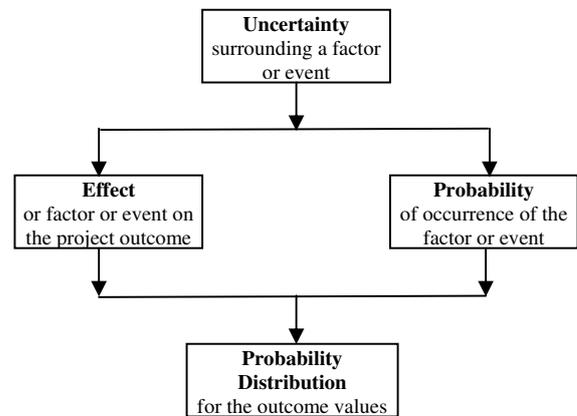


Fig. 1 The Concept of Risk [3]

### IV. SOURCES OF RISKS

Progress of a project is corresponding with the occurrence of risks. Risks have been categorized into three major captions; financing, political and technical risks [7]. The successes of a project are measured by the overall project cost, duration and quality of the final product or services delivered. Usually the risks are corresponding with these three parameters. The risks could be clustered as global and elemental risks [3].

Global risks are defined as being exerted externally to the project environment. Adversely, elemental risks originate from the sources within the project structure which are manageable within the elements of the project [3]. Nucleus element of the BOT project is the concession agreement which has been composed by a number of variables that influence the whole project cycle. Diversity in the variables could result to deviation in the objective and direction of the project. Essentially, it might jeopardize the project's output and lead to the negative impact to the investment if the promoter fails to address effectively.

Promoter should thoroughly investigate the various sources of risk before making any decision in a BOT project. Based on the literature review, major types and sources of risks have been summarized in Table 2. Appropriate mitigation solutions also have been shown to overcome the identified risks which might occur at different times during the concession period. It has become the responsibility of the promoter to assess and manage the risks with diligence to minimize or prevent any obstacle to the overall progress of the project.

Risks have a vital role in a BOT project. Delmon has stated that, there are also other sources of risk that should be considered: capital budget, construction time, construction cost, operation cost, politics and policies, market conditions, stakeholders' cooperation and credibility as well as global economic environment [8]. From the study on the impact of risk to the performance of a BOT project, Zayed and Chang concluded that an organized measure for risk management is sufficient for the concessionaire [9].

TABLE II  
SUMMARY OF TYPES AND SOURCES OF RISKS IN BOT PROJECT

No	Type of Risks	Sources	Mitigation Measures
1	Country Risk	<ul style="list-style-type: none"> <li>• Unstable government</li> <li>• Inadequate foreign reserve</li> </ul>	<ul style="list-style-type: none"> <li>• Carry out a thorough country risk profile and budgetary practices by reliable third party such as reputable management consultant or refer to the World Bank, ADB or the United Nations</li> </ul>
2	Financial Risk	<ul style="list-style-type: none"> <li>• Wrong financial assumption and packaging</li> <li>• Inadequate cash flow</li> <li>• Poor feasibility study</li> </ul>	<ul style="list-style-type: none"> <li>• Consult a top-notch financial consultant to conduct the projection or verifying the financial report of the project</li> </ul>
3	Construction Risk	<ul style="list-style-type: none"> <li>• Poor design report</li> <li>• Prolong construction schedule</li> <li>• Changes in factors of production</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure good design report and vetted by owner and consultant before the project commences</li> </ul>
4	Inadequacy in Concession Contract	<ul style="list-style-type: none"> <li>• Major terms are not included</li> <li>• Exit clause not done</li> <li>• Variation according to time or economic condition not provided</li> </ul>	<ul style="list-style-type: none"> <li>• Compare the contract with proven and similar good concession contract</li> <li>• Employ a good legal advisor who are familiar with the industry in drafting the contract</li> </ul>
5	Shareholders' Risk	<ul style="list-style-type: none"> <li>• Unsupportive shareholders</li> <li>• Loggerhead between shareholders</li> </ul>	<ul style="list-style-type: none"> <li>• Work closely with the major shareholders and know their aspirations</li> </ul>
6	Market Risk	<ul style="list-style-type: none"> <li>• Change in market trend</li> </ul>	<ul style="list-style-type: none"> <li>• Carry out a thorough market research before embarking on the project</li> </ul>
7	Changes in Key Management Personnel Risk	<ul style="list-style-type: none"> <li>• Poor working conditions and benefit</li> </ul>	<ul style="list-style-type: none"> <li>• Provide good benefits and working environment to selected key management personnel</li> </ul>
8	Operation and Maintenance Risk	<ul style="list-style-type: none"> <li>• Unreliable operations and maintenance team</li> <li>• Poor machinery and equipment installation</li> <li>• Poor technical feasibility reports and design</li> </ul>	<ul style="list-style-type: none"> <li>• Operations and maintenance agreement must have benefits or benefit reduction to operation and maintenance company</li> <li>• Provide a maintenance manual and update it regularly</li> </ul>

The concessionaire should possess the capability to minimize (limit and confine) the impact to the project outcome by understanding, analyzing and responding to the risks.

A BOT project would be classified as a success by measuring the revenue to the concessionaire over the period. The promoter should be able to get rid of a reasonably high degree of risks in maximizing the profit without any tolerance to the objective and requirements. A well experienced promoter would be able to identify and understand the associated risk with the BOT project, and inherently address it effectively.

#### V. TYPES OF RISKS IN BOT PROJECT

Apart from the risks that have been shown in the table II, there are also other innumerable risks that are associated with BOT project. These risks can be categorized as follow:

- A. Financial risks - currency risks, internet rate risk, equity risk, foreign exchange risk, commercial risk, liquidity risk, counter party risk and economic risk
- B. Political risks - sovereign risks and country risk
- C. Technical risks - construction risk and operation and maintenance risk
- D. Other risks - market risk, inadequacy of concession contract, shareholders' risk and risks associated with changes among key management personnel

Inexperienced promoter might overlook the risks in the BOT project due to lack of information and uncertainty about future condition and that also could be a risk. Consequently, alleviation measures must be established and supervised with care by means to reduce and manage the risks effectively to an acceptable level and minimizing the chances of project failure.

#### A. Financial Risk

Merna and Njiru have defined financial risk as the impact on the financial performance of any entity exposed to risk [2]. Investors and lenders are aware of certain risks and willing to face it, in order to gain the profit from their investment. The higher the risk, the higher the profit shall be gained. Developing countries in East Asia are facing obvious financial risk and the source of financial risk could be summarized as below: [10].

- 1) Currency risks
- 2) Interest risks
- 3) Equity risks
- 4) Foreign exchange risk
- 5) Commercial risk
- 6) Liquidity risk
- 7) Counterparty risk
- 8) Economic risk

#### 1) Currency Risk

The investor or lenders is aware the existence of currency risk in any BOT projects and it does occur due to funding from international banks or foreign companies; creates volatility of the exchange rates. Bing et al. have stated that

fluctuations in currency considered as an austere problem in international transactions [11].

The influence of currency risk can be minimized using several measures. Wang et al. argue that, even though the foreign firms are capable in hedging currency fluctuation in international money markets but somehow it is ineffective [Wang et al., 2000]. They should come with an agreement with the host government to determine the currency that need to be employed for payment. It has been proposed that, to mitigate the currency risk, the promoter is advised to sign a dual-currency contract using local and foreign currency [12]. Normally in East Asia, soft currency is generated from the operation, whilst the funding was given in hard currency.

One of the preferred methods in reducing the currency devaluation is by financing in local currency. It can be seen in the Shandong power project when enormous amount of Renminbi tranche (equivalent to US\$822 million) was funded by China Construction and Shandong International Trust and Investment Corporation and was first time twinned with a large US dollar tranche [13]. During the negotiation stage between host government and concessionaire/promoter, a proper agreement should be achieved in order to mitigate currency risks; host government should provide guarantee for currency mismatches to avoid any defect in project implementation and operation.

#### 2) *Interest Rate Risk*

In contrast, interest rate will affect the project in terms of borrowing and debt payments. Any fluctuation in the interest rate will definitely affect the lenders. An appropriate interest rate should be agreed upon the project. The lenders have to pay extra cost if the interest rate is far high or benefit them if the interest rate is low.

More foreign investors or private sector could be attracted by providing interest rate guarantee by the host government in a BOT project. This approach has been adopted in Indonesian BOT toll road whereby the government has guaranteed on maximum interest rate, minimum revenue guarantee, debt guarantee, tariff guarantee and minimum tariff guarantee [14].

#### 3) *Equity Risk*

Performance of the concessionaire is crucial in seeking for fund to implement a BOT project. Usually, equity risk is related with the performance of the company which is measured by the share price of the company. The higher the share price goes, in definite, benefit the shareholder but the lesser it goes will affect the prestige of the concessionaire. Capability of the company in raising capital for the BOT project is reflected on the share price.

It has been believed that, the equity investors and other long term investors will only agree to provide the amount of funding for BOT project upon the promoter has proven their financial capability of the project over its entire lifespan [15]. It is very difficult to attract domestic capital of debt and equity especially in East Asia when it is involving huge amount of investment in an infrastructure project. Nevertheless, the competence in carrying out detailed and comprehensive feasibility study, economic and risk assessment study, ensure the promoter to be in better position in obtaining domestic equity finance for funding the BOT project.

#### 4) *Foreign Exchange Risk*

Fluctuations in foreign exchange are considered another major risk which might affect the BOT project during the construction and operation. Foreign companies who are interested to invest in another country should aware of the opportunities and threats associated with international currency transactions before they proceed.

The Malaysian government has managed to reduce the foreign exchange risk by providing guarantees. The said guarantees was to absorb the shortfall when (1) the adverse exchange rate movements exceeds 15 percent on its offshore debt (2) adverse interest rate movements exceeds 20 percent on its floating rate offshore debt [2,7]. This approach was adopted in North-South Highway project and it benefited the promoter.

#### 5) *Commercial Risk*

Commercial risk is described as a risk that can jeopardize the financial performance to the project. In spite of that, commercial risk in BOT project is characterized differently; Merna and Njiru have classified into three categories, risks related to the completion, during operation and risks related to input or output of the project [2].

Supply and off-take agreement between the supplier and the government is very crucial in mitigating the risk. In the agreement, the related parties will agree upon the required amount of input for instance coal in power plant project and the output generation is the electricity. This will allow the supplier to stock the materials upfront at lower price and the promoter able to generate the required output within the stipulated cost, not burdening the public by increasing the tariff. Apart from that, it will secure long term revenue for the promoter by selling the output to the client

#### 6) *Liquidity Risk*

Most of the BOT project, the revenues are generated from the operation. To ensure the success of the BOT project, it should able to generate sufficient amount of revenue to settle the debt within the stipulated time frame. An amount of profit that can be generated from the operating facility is determined by conducting analysis on the projected revenue during operational phase. The failure to generate the required revenue will cause to liquidity risk.

#### 7) *Counterparty Risk*

Inadequate support in terms of financial from the lender at specific time is defined as counterparty risk. It also can be interpreted as a credit risk. According to Lam and Chow, credit risk as the risk that the counterparty (partner of the joint venture) to any financial transaction is not being able to fulfill its commitment on the due date [16]. The debt capacity of the promoter will reduce when the credit risk arises. In a concession contract, transactions between two or more parties contain a risk that one party will default on an obligation of the commitment. Failure in financing the required cash flow for the BOT project is the most common issue that arises.

#### 8) *Economic Risk*

This risk mostly related to the facility's operation which consist of materials supply, labour supply, equipment availability, inflations, tariffs, fiscal policies and exchange rates [17]. Project cash flow is affected by any financial aspects that relate to the economic parameters. Increment in

the supply and maintenance cost, eventually will increase the operation cost, thus reduce the revenue. This could be seen as a threat to the promoter

### *B. Political Risk*

#### *1) Sovereign Risk*

Sovereign risk is a risks related to the provision of loans to foreign government and commonly used in banking world [3]. The risk is governed by the political environment of the country where the investment will take place, specifically, the location of BOT project commence. Sovereign risk occurs when the political environment is unstable and will affect the investor or promoter of the project.

For instance in East Asia, some of the BOT project faced difficulties due to political instability such as in Thailand due to frequent change in political leaders. Apart from that, countries which are governed by different ideologies such as Libya and Saudi Arabia are also facing sovereign risk. A BOT project might face serious risk when there are changes in government's policy and regulations due to changes in ruling government as can be learned from past experience.

The changes in bureaucracy level due to reshuffling might posses impact on the decision making process in a concession contract. By providing some kind of guarantee by the host government, the risk shall be prevented. In addition to that, the concession contract agreement should be based on the international order systems to safeguard the promoter.

#### *2) Country Risk*

Country risk is totally different from the sovereign risk. It related to overall investment climate in a specific country. The aspects that can contribute to country risk are socio-economic condition, internal or external conflicts that inflicting the country, corruptions, ethnic tensions, policy and legal aspects. Before any BOT project implementation, the promoter should necessary conduct a thorough country risk profile and budgetary practices by a reliable third party (reputable management consultant or a good political analyst or both) to minimize the risk. Decision could be made based on the study and they should also seek assistance by referring to World Bank or Asian Development Bank.

Nowadays, in East Asia, consortiums are established to undertake most of the BOT project. These consortiums consist of Engineering Procurement and Construction, (EPC) contractors, Operation and Maintenance, (O&M) contractors and will be responsible for the feasibility study till implementation of the whole project and operation for a stipulated period of time. Every foreign investment is subjected to country risk due to unstable government and its component, and inadequate foreign reserves.

### *C. Technical Risk*

Technical risk could be classified into construction risk and O&M risk. Essentially, technical risk is the most common and well understood form of risk. Technical risk is the subject of close surveillance. To minimize the technical risk, the concessionaire is responsible to evaluate the risk in detail to ensure the project will be constructed accordance to the design specification and host government's requirements and functioning well. Thus, well reputed and established

consultant together with an experience contractor should be hired to implement the BOT project without any tolerance to the standard codes and practice.

#### *1) Construction Risk*

Unknown ground conditions, delay in procuring of construction materials, and price escalation of raw materials for construction such as an increase in the price of steel, copper or aluminum are the problems related to construction risk which occur during construction phase. In addition to that, poor design report, prolong construction schedule and changes in factor of production also contribute to construction risk.

In the North-South Highway project in Malaysia has caused the promoter to bear the increment in the project cost. The initial estimated cost was US\$1.2 billion but due to hassles encountered during construction phase such as land acquisition problem and poor road design, the cost escalated to US\$1.8 million [2,7,18]. The increment was almost fifty percent higher than estimated cost, this scenario was not unusual in East Asia since the local contractors are still learning and relying on the expertise of foreign based contractors which can be costly in term of consulting fees. It is essential to made available the design report and to be vetted by the owner and consultant before any BOT project commence. Preferably, to have a third independent party to audit and comment the design and construction methodology which would help to minimize the construction risk.

#### *2) Operational and Maintenance Risk*

During this phase there are several associated risks. One of them is when the performance of facility is not to the required level due to technical problems. Selection of inefficient machineries and equipments during the implementation phase and poor workmanship during installation phase could cause the poor performance. The spare parts for the selected machinery and equipments for the facility are to be ensured that they are easily available at affordable cost. Throughout the concession period, the machinery and equipments will undergo some routine service due to wear and tear process, to optimize the performance. New available technology should be incorporated to ease the operation phase. Sometimes, initial cost is very high but in long run it will benefit the consortium.

The operation and maintenance team requires specialized technical skills and abilities in operating the facility. Inefficient team would lead to unnecessarily high cost of operating and resulting lesser revenue to the consortium. It is very important that a proper agreement should be established to ensure the interest of the operator is secured. The efficiency of the facility's operation could be increased by providing maintenance manual and update it on a regular basis together with standard operating procedure.

### *D. Other Risk*

Apart from the discussed risk previously, there are also other risks associated to the BOT project. Market risk is based on the demand of the facility upon the completion the project. Thus, the promoter has to carry out extensive market research before embarking on the project. The revenues are generated upon completion of the project and very much depending on the end user. Poor feasibility study could cause the BOT

project fail if there is no demand or failed to attract consumers.

Significant risk occurs to the promoter when there is inadequacy in the concession's contract. This problem occurs during the tendering stage whereby some promoters simply tender in without properly understanding the major terms and conditions of the project as stipulated by the host government. The standard terms should be adopted during constructing the construction contract, operation and maintenance contract and other ancillary documents and agreed by both parties. Therefore it is always recommended to call upon renowned tenders to bid or negotiate the project.

Exit clause is very crucial in a BOT project. Disputes might occur in later stage due to unforeseen clauses of the project if the exist clause was not done properly and variation according to time or economic condition is not provided in the contract. Therefore, conflicts are reduced by referring the concession contract with the similar and proven contract. Good legal advisor who are familiar with the industry should be employed by concessionor and concessionee to check thoroughly the contracts before accepting it. The contract should benefit both parties without burdening the consumers.

Personnel in key management of concession are very crucial and consist of a range of expertise. An ideal concessionaire organization must hire highly skilled and competent management personnel. They will be the backbone of the consortium as their involvement not just limited to project initiation, negotiation, implementation and project management or during transfer to the principal. They are familiar not only with the BOT process but with all contractual terms of the concession contract and actual project management as well. These personnel must be sustained to ensure the management team always efficient and productive. Poor working conditions and benefit could lead them to leave the organizations. In East Asia, very few promoters are providing benefits to their key management personnel in terms of employee share ownership scheme, profit sharing etc. This will enhance the productivity and level of performance of the team and sustain them.

## VI. PROJECT RISK MANAGEMENT IN BOT

The study has revealed that risk management is very important tools in mitigating the risks in a BOT project. It always has been the main objective for the lender and investors in ensuring a good return on their investment. Thus, the successful of the project implementation and operation is measured by the generated revenue or returns on the investment. Continuing risk evaluation through the whole life span of the project is essential to manage and operate the stakeholders' asset. Chances of a project's success could be maximized by conducting risk management. Basically the risk management was never intended to eliminate the risks completely but to identify and foresee the risks to control it to a manageable level and proper mitigation measurement are adopted to maximize the revenue of the project.

### *Risk Management Technique*

Identification and appropriate allocation of risks to the parties that have the greatest control over those risks are the process to the success of a BOT project. A number of studies have revealed many suggestions on classifying all risk that could be met in a concession contract [11,19,20]. From the studies, it has been proven that the existence of different types of risks in a concession contract. The most meaningful aspect is to tackle and allocate the risks effectively to assure smooth project implementation.

Previous study has indicated that lenders or investors are exposed to higher risk for the BOT project due to high front end development costs, lengthy negotiation process and multiparty involvement [9]. Similarly, the promoter is also facing equal significant weight risk over the concession period. This has not being shown in the study and in spite of that how those risks are being mitigated.

An allocation has been provided in the concession contract which requires the promoter to allocate risks to the party who is best able to manage it. Four basic steps have been proposed to manage the risks systematically [6]:

- 1) Identify the risk sources
- 2) Quantify their effect (risk analysis)
- 3) Develop management responses to risk
- 4) Provide for residual risk in the project estimates

Overall risk reduction depends on the capability of the concessionaire to identify and formulate mitigation measures in risk management. This capability will generate confidence among the lenders and government to the concessionaire. Tiong argues that the promoter gained high profits when the host government reluctant to provide any financial guarantee [21]. The promoter realized that they need to manage the risk by taking all mitigation measure to prevent any impact to the project. Even though the profits of BOT project are controlled by the host government, but there are some BOT projects make good returns to the stakeholders. This is not limited to the entrepreneurial capability of the concessionaire but also their ability to install early warning system through mitigation measures in the system.

The success of the BOT project depends on the concessionaire's strategies. The adopted strategies are using an advanced well proven technology and contracting out the responsibilities, that enabled them to understand the nature of the risks and how to response to it in an effective manner. In addition to that, the success of employed risk management system which could reduce the risks to an acceptable level to all stakeholders is deniable. Successful risk management's key principles have been identified [22]:

- 1) Clearly identified and visible senior management support for the project
- 2) Explicit policies which are clearly communicated to all
- 3) The adoption of a transparent and repeatable framework of activities
- 4) The existence of a culture that supports and understands the concepts of controlling risk

- 5) Fully embedded management process which are consistently and rigorously applied and are clearly linked to the achievement of the objectives
- 6) Implementation of effective plans and regular reviews to ensure the benefits of the processes are realized and lessons are learned for future projects

A well structured risk management framework within the promoter's organization is fundamentally important to support the entire process of risk management during the project initiation and implementation. Employed comprehensive risk management system in the concessionaire will be the guideline for any decision making to all initiated action plan during the life cycle development of the project.

#### VII. CONCLUSION

Every BOT project is subjected to multiple risks. Thus it has become the responsibility and liability of the promoter to mitigate the risks to ensure the success of a BOT project by recruiting a strong management team. The promoter requires support and cooperation from the host government and investor to assist them in accomplishing the project. The host government should play more active role by providing guarantees for a BOT project that will benefit the public. It always recommended to the lender and investor to conduct feasibility studies before they finance a BOT project, similarly to the promoter before they embark on the project. It can be concluded that a comprehensive risk management for any BOT project should be conducted and the mitigation plan must be followed strictly in ensuring the success of the project.

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