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BOT Contracts: Applicability in Pakistan for Infrastructure development

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Abstract

Pakistan is a developing country. It is lacking infrastructure almost in every field, like rail and road, water supply, sewage, waste disposal and oil and gas transportation network. Infrastructures projects are usually mega-projects, which are normally owned and financed by federal/provincial governments. Due to lack of resources governments are unable to start such infrastructure project on a faster pace to meet the demands. To counter the paucity of funds in public sector, many governments have engaged the private sector to develop their infrastructure. These public-private partnerships have different forms of contracts i.e. Build-Own-Operate (BOO), Build-Operate-Transfer (BOT) and Build-Lease-Transfer (BLT). In developing countries like Pakistan these types of contracts can play important role in infrastructure development. Unfortunately this concept is not very popular in Pakistan. Apart from benefits, BOT contracts may be complicated due to its long term contractual obligations and multi party involvement. For that purpose legal, economical and technical framework needs to be developed on large scale for successful execution of BOT projects. Keeping in view the above requirements a model has been developed for successful implementation of BOT projects in Pakistan. To counter the associated risk in BOT projects a risk management model is also proposed.

Keywords: BOT; BLT; Infrastructure development; BOT regulation; Pakistan;

1. Introduction

In the present fast growing world, mega infrastructure projects are the dire need of the time. Developed countries had already established their infrastructure and have ample resources to undertake new projects and to properly maintain older one. But in developing countries infrastructure need to be developed fully. Asian development Bank (ADB) estimates that over $1 trillion will be needed over the next decade to meet Asia's infrastructure investment. Energy and transport will require a combined total of $450 billion, followed by telecommunications, water supply and waste disposal. Countries with major infrastructure requirements are Bangladesh, People's Republic of China, India, Indonesia, Pakistan, Philippines and Thailand. But with tight country budgets, governments have found themselves either unwilling or unable to finance the growing number of new infrastructures. Developed infrastructure plays very important role in country's economy and development, while the process of execution of such projects generate economic activity in the country. Besides uplifting economy, they facilitate general public therefore federal and provincial governments, development authorities, private investors and local governments all over the world are considering BOT financing options for construction of various infrastructure projects [1]. BOT is a method of private-public partnership, which is different from complete privatization or nationalization. In privatization, government owns an entity first and then transfer (sells) it to the private sector. In contrast, in BOT projects private sector bears the cost of project first, then owns it for certain period before handing it over to the government at no cost. This is the fundamental attraction of BOT. It not only takes spending off the government's balance sheet but also provides services to end user (general public) in its operational phase. Two most notable examples are the Suez Canal and the Panama Canal (Both the Suez Canal and the Panama Canal had a 99-year concession). Such arrangements have become particularly popular since the 1950s and have been labeled Build-Operate-Transfer (BOT) [2]. Walker and Smith listed 111 known BOT projects over 31 countries by early 1995. The Channel Tunnel is a BOT

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project granted by the governments of the United Kingdom and France. Dulles Toll Road Extension, costing US$250 million started in 1988, was reportedly the first BOT highway in the United States. The first privatized (BOT project) airport terminal in Canada is Terminal 3 of Lester B Pearson International Airport in Toronto, completed in 1991. In the far eastern countries like Malaysia and Philippine BOT contracts played very important role in infrastructure development [3].

Based on the original BOT concept, diverse variations have evolved in many countries**.** Few of them are listed here.

BOO(build-own-operate),
BLT(build-lease-transfer),
BOOM(build-own-operate-maintain),
BOOT(build-own-operate-transfer),
BOOTT(build-own-operate-train-transfer),
BTO(build-transfer-operate),
DBFO(design-build-finance-operate),
DBO(design-build-operate),
DBOM(design-build-operate-maintain),
DOT(design-operate-transfer),
ROO(rehabilitate-own-operate),
ROT(rehabilitate-operate-transfer),
DOT(develop operate transfer) and
PPP(public private partnership) [4].

But for country like Pakistan, where strong public private partnership is yet to develop, simple BOT models are more feasible. A schematic BOT arrangement is shown in Figure 1 [2]. The contract period for such projects is normally 20 to 30 years, which may be varying depending upon the type and nature of project and risk involved in execution and operation of project [5].

BOT allows governments to reallocate scarce resources from infrastructure to other priorities, such as rural development, poverty reduction, education and health. If BOT projects are conducted in a fully transparent manner and are properly structured, these will promote open competition, provide the lowest possible project cost, and transfer most risks to the private sector

Objectives of this work are limited;

1. To highlight the importance and need of BOT contracts for infrastructure development.

2. To elaborate the structure of BOT contracts, major parties, their function and tailoring of BOT/BOO(T) contract structure compatible to the Pakistani system of project development.

3. To develop procedural model of BOT projects/contracts in Pakistan.

4. To propose Risk Management model to manage associated risks to the projects faced by the various parties involved in the process.

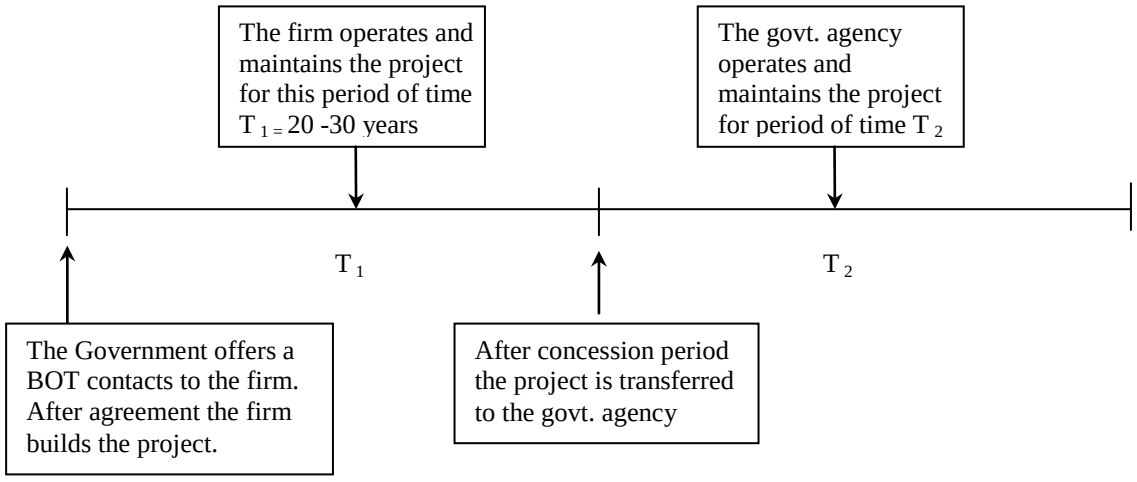


Figure 1: Structure of BOT contract ($T_{1 \text{ and }} T_2$ times in years) [2]

2. History of BOT project in Asia

In the mid 1980s, many Asian countries turned to privatization of infrastructure to overcome bottlenecks which threatened to constrain economic growth and development. Getting private sector management and capital into transport, power, water and sewage, and telecommunications services, was seen as a solution for obtaining and maintaining infrastructure more quickly and more cheaply than traditional, state-run methods. According to Otta, and Hartley, this reflected concepts of 'public choice' thinking on public administration, by which considerations are given to the private sector to be possibly the most efficient supplier of facilities or services [6]. The major objectives in a BOT projects is to obtain infrastructure facilities with a greater efficiency and speed, without the state undertaking financial responsibility. On the basis of that, governments in the region latched on to the BOT concept as an important option in privatization that would help to enhance economic growth and development. However, the experience in Thailand, Malaysia, Indonesia, China and South Asia, in the period 1985-1996, suggested that attaining the goals of privatization via the BOT method is extremely difficult, with many projects failing to achieve the ends intended. With specific reference to the Asia BOT experience, the World Bank reports suggested about private investment in infrastructure that there is little action in most countries. Neither the governments nor the private sector are satisfied with progress to date [7]. This experience must raise questions as to the nature of BOT projects in their implementation, and suggests much more caution is in order over the adoption of this approach.

In theoretical treatment as well as empirical analysis, BOT projects are generally considered equally along with other methods of privatization, but then given little detailed inspection. This lack of differentiation has contributed to BOT projects popularity with developing country governments, as it suggests that a BOT might be as easily undertaken as finding a buyer for potential profits. However, infrastructure BOT concessions have several distinct differences that make them particularly complex in design, finance, and management.

In addition, due to 'natural monopolies' characterized by limited competition in 1980s, as suggested by Hartley and Parker, without competition such arrangements offer no clear advantages to the traditional state-run monopoly in attempting to achieve the goals of privatization. Infrastructure monopolies require significant regulation to balance public and private interests. Regulation of monopolies like utilities is well-studied. But the process of turning them into private-sector operations, and at the same time developing regulatory mechanisms, to the satisfaction of all parties involved, is hardly addressed by privatization advocates beyond simple recommendations to do so. Without these mechanisms, however, political risks in a project are much higher.

Experience in Asia about BOT projects suggests that governments have often not understood these complexities. As a consequence, with a high frequency in Asia during the 1985-1996 period, BOT projects did not achieve the declared goals of privatization. Many projects became mired in political controversy, legal battles, strict regulations and policies, fights between vested interests, and unending policy debates, a large number of BOTS never proceeded to the physical development stage. Urgently-needed projects became extremely long in gestation (in some cases a full decade), defeating the goals of more efficient expedition of the project. In many projects which did proceed, complex contractual and policy issues were left to be resolved after the project was built. The high frequency of disputes between governments and project sponsors in Asia led one economist to re-label the concept 'Build-Operate-Litigate' [8]. In many other, more successful cases, the BOT privatization was simply a method of enrichment of the private sector at the state's cost, the government transferring a valuable asset, a concession, to private investors, at no risk to them, for little or nothing in return to the state. Only in a very few cases have the conditions been present to facilitate both governments and sponsors achieving their goals in the BOT privatization. The most frequent solution to many project problems has been for governments to directly or indirectly provide project and investor subsidies, absorbing the risks and financial burdens of the BOT projects in contravention to their original goals. Such experiences suggest that the costs and difficulties of achieving the goals of BOT privatization in a developing country might very well outweigh the benefits promised. The BOT successes, and the various measures of success, must be contrasted with the significant number of projects that never got off the ground, and not a few which, once under way, proved disruptive political and financial liabilities of government. This experience is significant in the overall debates over privatization and the nature of public and private interests in infrastructure development. There is adequate evidence in the world that concessionized infrastructure can work. However, the severe financial problems and political disputes surrounding of the world's largest BOT, the England-France Eurotunnel, demonstrates the difficulty of such

projects even in a mature environment, here investors and financial institutions are more able to absorb the problems [9].

3. Structure for BOT/BOOT projects

BOT projects are usually, but not necessarily, public infrastructure projects which employ a particular form of structured financing. As these projects are generally long live projects, therefore it is also demanded that the political and government system must be stable enough to ensure the return/pay back of the investors to minimize their financial risks. As the productive life of a project varies depending upon the type of project and structure therefore sometimes it makes complication in formulation of policies and regulations of BOT so that all the parties remain in benefit. The contractual arrangements between these parties, and risk assessment can be complex. Since BOT projects are ultimately transferred to the government after the payback period (concession period), hence the public of the country is actually the beneficiaries or the end user of these projects. The key stakeholders of the BOT projects are:

3.1 Government Agency

Government agency or Line Ministry is the most important participant and initiator in the BOT or BOOT projects usually termed as primary party. The Government department or the agency is the statutory body to initiate, approve, monitor and control the projects indirectly to safe guard the public funds and interest. The government's co-operation is critical in large projects. It may be required to assist in obtaining the necessary approvals, authorizations and consents for the construction and operation of the project. Government or the government agency initiate the project, conduct the tendering process and evaluation of tenderers, and will grant concession to the sponsor, and where necessary, the off take agreement [10]. The government agencies perform following functions in BOT projects.

- Identify, advertise, tender and award the contract to a suitable sponsor to carry out one or more functions (e.g., construction, operation and maintenance of the relevant infrastructure);
- Grant to the sponsor the "concession", that is the right to build own and operate the facility to realize payments from that person to whom services are provided;
- Grant a long term lease or sell the site to the sponsor, and to resume land and property after completion of concession period;
- To provide undertakings, indemnities or guarantees to financiers and others in relation to its or others parties liabilities.
- Acquire most or all of the property, which can be further leased to same or another operator with another contract;
- To monitor overall project development process from initialization to construction and then operation according to terms and conditions already described in tender document;

3.2 Sponsor

Sponsor can be a party or consortium of interested groups (typically including a construction group, an operator, a financing institution, and other various groups) which, in response to the invitation by the Government Agency, prepares the proposal to construct, finance, and operate the particular project. The sponsor may take the form of a company, a partnership, a limited partnership, a unit trust or an unincorporated joint venture.

3.3 Construction Contractor

Construction contractor may also be one of the sponsors. It will take construction and completion risks, that is, the risk of completing the project on time, within budget and to specifications. There can be sizeable risks and the lenders will wish to see a construction company with a balance sheet of sufficient size and strength with access to capital that gives real substance to its completion guarantee.

Generally the infrastructure design is dictated by the experienced utility. The construction risk is then taken by the construction company. Further, depending upon the nature of the infrastructure, the commissioning risk is often attributed to the construction company. The sponsor will aim to require the construction company to enter into a fixed price fixed time construction contract. However, this is rarely fully achieved, as there are normally some cost/timing issues which are not taken by the construction company and can lead to variations in cost or timing

3.4 Operation and Maintenance Contractor

Operator will be expected to sign a long term contract with the sponsor for safe operation and

timely maintenance of the facility. Operator may also inject equity into the project but usually they tend to accept little risk in the form of up-front capital or expenditure. An operator simply anticipates making a profit from operating the infrastructure more efficiently than an equivalent government run project.

3.5 Financial Institutions

In a large project there is likely to be a group of banks providing the loans to the sponsor. The banks will require a first security over the infrastructure created. The same or different banks will often provide a stand-by loan facility for any cost overruns not covered by the construction contract.

As the financing of BOT / BOO(T) structure project is a form of project finance, debt financiers will undertake a review of all core project documents to assess the allocation of risks and how that allocation impacts upon their credit approval. There has been some difficulty in attracting debt financiers to infrastructure projects, mainly because of the long term nature of the repayment of the bank loan, and the large number of infrastructure projects currently in the market place. Debt financiers have traditionally seen themselves as short term financiers, as evidenced by the fact that there is little long term debt in Pakistan.

3.6 Equity Investors

Investors or sponsor are often referred to as "equity investors" or the "equity providers". It is not unusual for equity investment to be approximately 20% of the cost of the project. Equity funds are, however, expensive compared to the cost of debt. An equity investor may require a return of 18% to 20% in today's market to compensate it for assuming the major risks inherent in an infrastructure project. As a result it may be cost-efficient for equity to be much less than 20% of the project cost. The sponsor may be a company, partnership, a limited partnership, a unit trust, an unincorporated joint venture or a combination of one or more. It is always necessary to ensure that proposed investors in an infrastructure project have sufficient powers to enter into the relevant contracts and perform their obligations under those contracts.

3.7 Other Parties (Legal, Technical and Engineering Consultants)

Other parties such as insurers, equipment suppliers, fuel suppliers and engineering and design consultants will also be involved. Most of the parties will also involve their lawyers and financial/tax advisers.

In combination 1 there are only government agency and the sponsor, in which sponsor is solely responsible to finish the project and operate it with in the time frame prescribed by the government. If the project of small scale and lesser finances are involved then government agency can also coordinate with sponsor for scheduled maintenance of the project described in the tender document. In 2nd combination, three parties are involved in the project. Government possesses contractual relationship with sponsor but can have functional links with the contractors and the sub contractors to monitor project development process as shown in the Figure 3 (a).

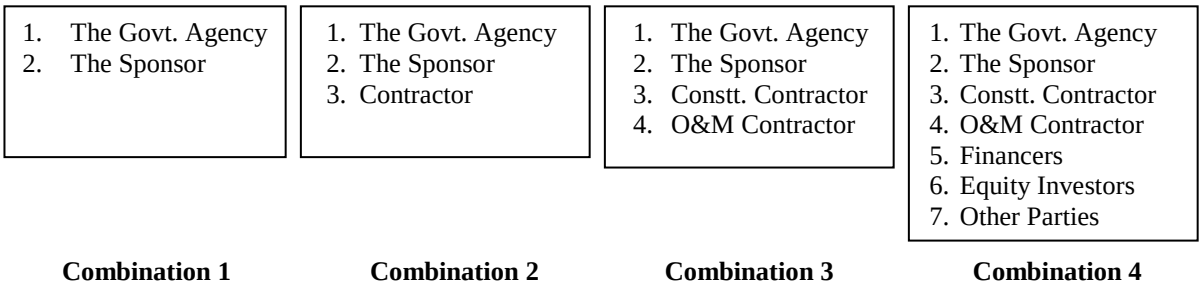


Figure 2: Combination of different parties involved in the BOT contracts.

However, in combination 3 and 4 government agency, sponsor, contractor (construction and maintenance) and other parties work together according to their own interests. In these cases the risk of the project is shared by all parties including government. Usually the huge size project with long construction and operation life can be considered under these types. To complete the construction in time and to operate the project will be

the responsibility of the sponsor, contractor, and financers. Government can have functional links with the sub-contractors and to undertake the monitoring process as shown in the Figure: 3(c & d).

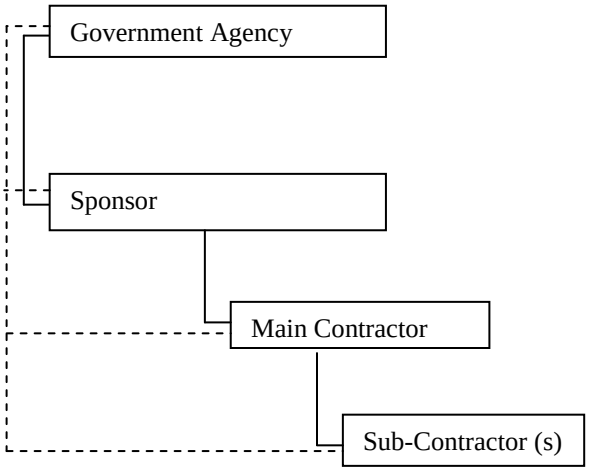


Figure 3 (a): Contractual/organizational and functional relationship for case 1

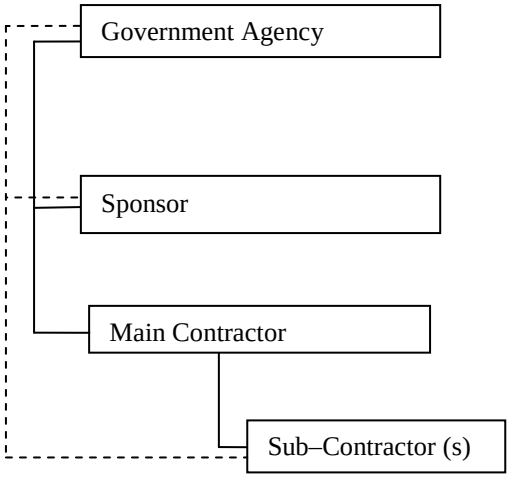


Figure 3 (b): Contractual/organizational and functional relationships for case 2

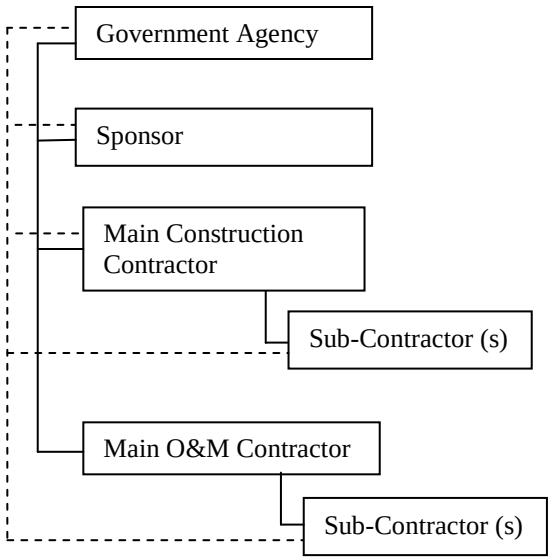


Figure 3 (c): Contractual/organizational and functional relation for case 3

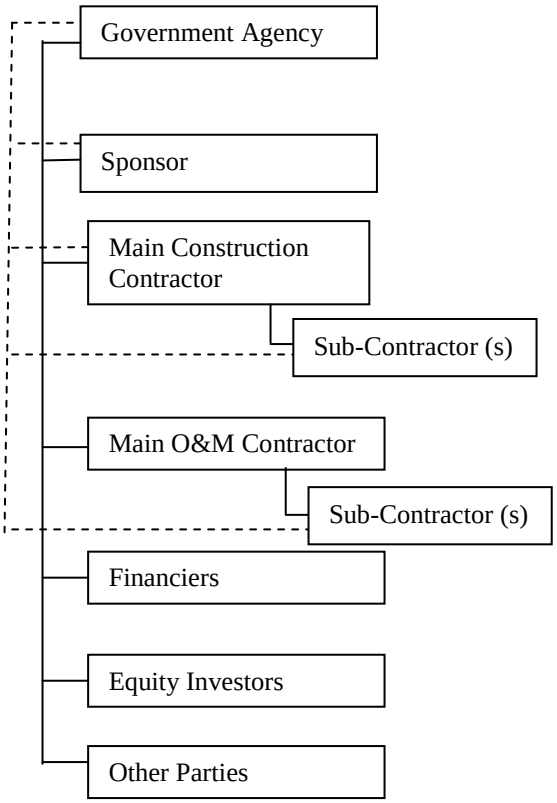


Figure 3 (d): Contractual/organizational and functional relationships for case 4

4. Applicability of BOT/ BOO(T) projects in Pakistan

Various options are available for private sector participation in infrastructure and public service provisions, which vary in their role regarding ownership, management financing, risk sharing, duration, and contractual management with the users. These options may be classified into three groups: (a) Those retain public ownership of the assets while contracting out management, operation, and investment, (b) Those involve partial or temporary ownership of assets by the investor. (c) Those involve major private ownership. The first group includes service contracts, management contracts, lease arrangements, and concessions. The second group includes BOOT and its variation like BOT and BLT. RTO (rehabilitation-transfer-operate) is another example of this class. The third type include BOO where private sector build own and operate the facility. Tax system may be different during and after the concession period. It is to note that in Build-Own-Operate-Transfer (BOOT) agreement private sector organization is also empowered with the right of property development during the concession period [15]. In most cases all above options to some extent promote commercial viability, operational efficiency, increased competition, improved cost recovery, and performance-based compensations.

Concept of BOT applicability requires to be further developed in Pakistan. Any infrastructure project which is not feasible to be financed under the Consolidated Fund, can be considered to be financed/developed by private investors on BOO/BOT/BOOT or other variants like build, own and operate or transfer/lease to the public sector after a concession period. This strategy shall increase the cash flow in the market and can overcome the current resource crisis in the country like power shortage and transportation problems in mega cities such as Karachi and Lahore. Some potential areas are specified under the Ministerial Structure of Pakistan (Figure 4) where private sector can consider investing their capital under BOT contracts. These potential projects which may be wholly or partly funded by the private sector can include but are not limited to the following areas of infrastructure development.

- Power plants
- Airports
- Highways
- Ports
- Telecommunications
- Warehouses, housing, markets
- Railways
- Transport systems
- Solid waste management
- Water supply and drainage
- Land reclamation
- Industrial parks & other

These projects can be initiated at different levels i.e. Level 1: Federal government public sector projects (under quota). Level 2: projects on provincial level with development programs and level 3 represents the projects on local level .Due to political and socio-economic system the chances/success of projects are less in Level 3. [11]

4.1 Procedural Model to implement BOT Contracts in Pakistan

For effective/successful implementation of BOT projects in Pakistan a model is developed (Figure 5) which may be successfully implemented in a multilayered type system such as Pakistan. The theoretical success can be checked by mathematical models, however, practical implementation of such model may be best checked by trial and error method due to the reason of various scheduled and unscheduled uncertainties involved in a system such as Pakistan. Salient features of this model are listed below.

(i) Identification of Projects: Project will be identified by the line ministry, it shall be the responsibility of concerned ministry to find the potential area where BOT project can be executed keeping in view the priority of public interest and benefits.

(ii) Coordination: The Board of Investment of Pakistan (BOI) will function as the promoting, facilitating and coordinating agency for servicing the Line Ministries/Line Agencies under the overall supervision of the Ministry of Finance. However, the final authority of selection and approval shall vest on the relevant line Ministry and the Cabinet.

(iii) Preliminary Screening: Once the clearance from the Ministry of Finance and Planning shall be obtained the line Ministry will present a Cabinet Memorandum including formal Project Proposal seeking approval of the Cabinet to proceed with the Project.

(iv) Formal Approval: Formal approval will be given by the cabinet and cabinet will also constitute CASC (Cabinet Appointed Steering Committee). Members of CASC shall include Secretary to the Treasury, the

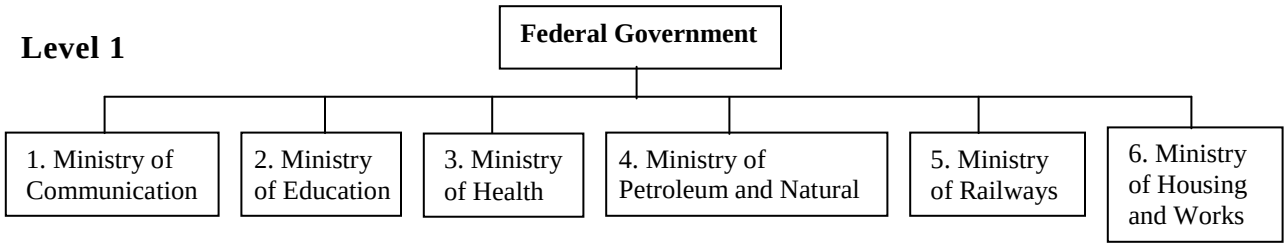
Secretary of the relevant line Ministry/Ministries and Chairman/BOI.

(v) Project Committee (PC): The Project Committee will be constituted by CASC, once the Cabinet in principle approves the project. The formal member of Project committee may include representatives from;

1) Concerned Ministry
2) Ministry of Finance
3) Ministry of Planning
4) BOI
5) Relevant State Agency/ies
6) Environmental Authority/Ministry etc.

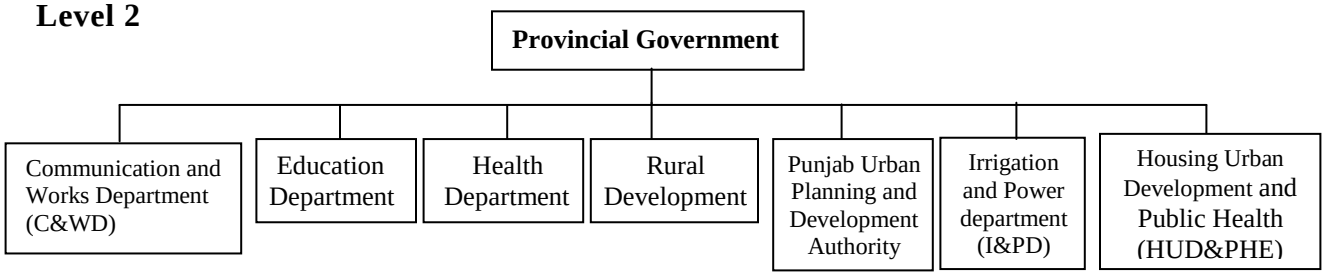
(vi) Request for Proposals (RFP)/ Invitation for Expression of Interest (EOI): The Project Committee will be mainly responsible for steering the preparation of the Request for Proposal (RFP) documents and submit them for the approval of the CASC.

Level 1



1. Ministry of Communication: (Potential project or investment areas w.r.t current situation) Motorways and Express ways, Underground metro, development sea and of river routes
2. Ministry of Education: Educational Institution (Higher education infrastructure and operations)
3. Ministry of Health: Hospitals, health centers and polyclinic
4. Ministry of Petroleum and Natural Resources: Cross country pipelines, Oil and gas pipelines networks, development of new oil fields, Distribution network
5. Ministry of Railways: Bullet train, New railway track
6. Ministry of Housing and Works: Housing schemes and residential parks, community centers, sports clubs etc
7. Ministry of Water and Power: Power distribution network, power station, reservoirs

Level 2



1. Communication and Works Department (C&WD): Highways and dual intercity carriage ways, ring roads in major cities, farm to market roads, mains and distributions, underground and subways.
2. Education Department: School and colleges,
3. Health Department: Health facility and services projects
4. Rural Development: Water and sanitation projects
5. Punjab Urban Planning and Development Authority (PUDA): Urban development projects
6. Irrigation and Power Department (I&PD): Irrigation and power projects
7. Housing Urban Development and Public Health Engineering (HUD&PHE): Low income housing schemes, public health and waste disposal projects.

Level 3

District or Local Government

Community development and facilitation projects, health care projects, water supply and waste disposal, town markets, schools, sports complexes and etc.

Figure 4: Procedural Model to identify and implement BOT projects at different levels in Pakistan.

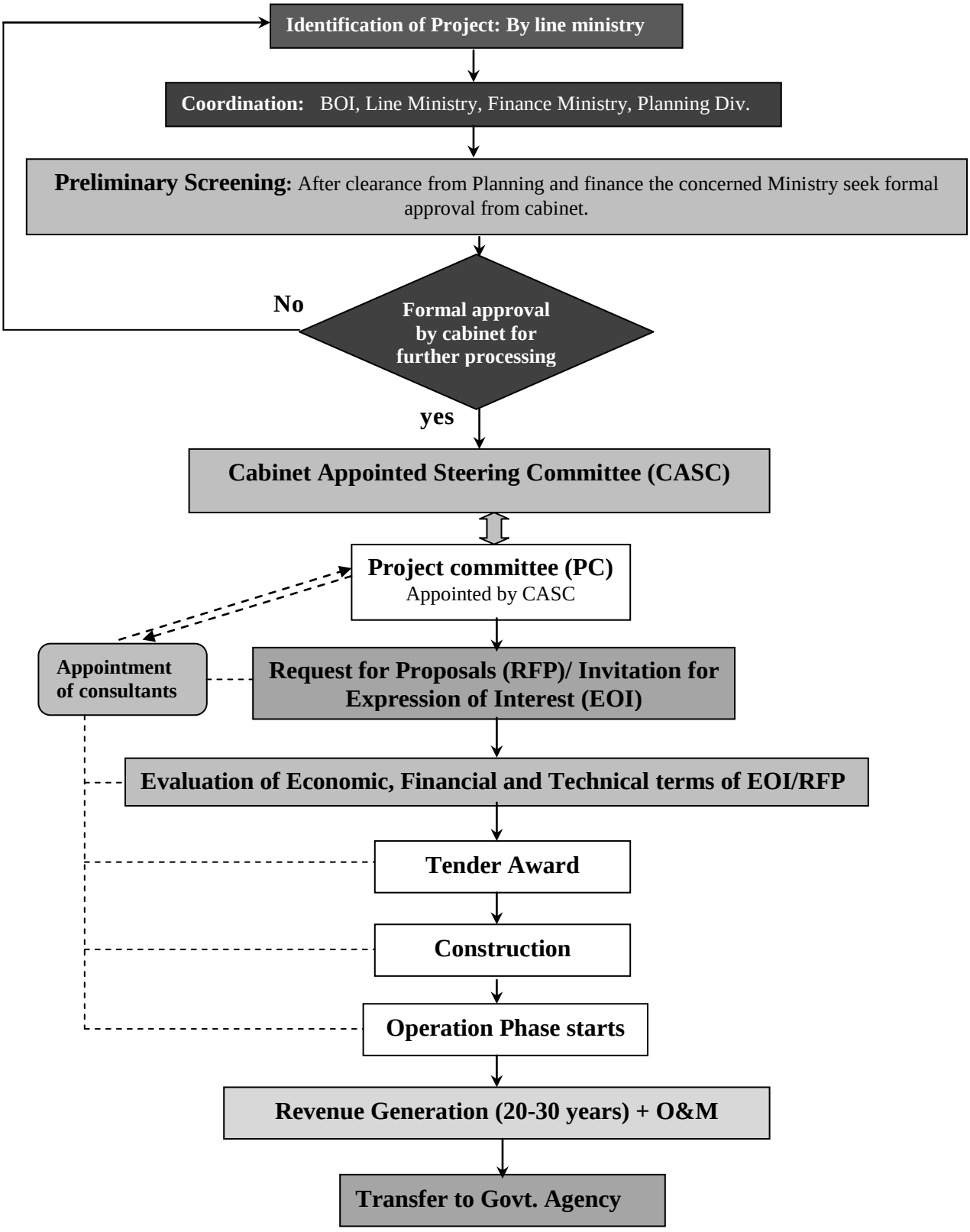


Figure 5: Schematic Model for implementing BOT contracts in Pakistan

(vii) Evaluation of proposal: Consultants may also be appointed to evaluate the project proposal received in response of the advertisement. Consultants in coordination with the Project Committee will finally evaluate the proposals and send their recommendations to the CASC for its approval.

(viii) Construction: Usually design and construction is the responsibility of the sponsor; however that can be conducted by separate contractor. In case a separate construction contractor is appointed the risk pertaining to completion of project is shifted to the contractor. Quality of construction is the main issue which cannot be overlooked.

(ix) Commissioning: After completion the project will be handed over to the sponsor, which shall start the operation in coordination with consultants and project committee.

(x) Regulation of revenue collection: Project will be regularized by the government sector; the revenue collection process will be strictly controlled and monitored by the government agency.

(xi) Operation and maintenance: Operation and maintenance will be insured by the party, by whom the project is awarded on BOT basis. However, with the consent of project committee a sub-contractor can also be engaged for O&M of the project which will be strictly controlled and monitored by the public sector agency.

(xii) Transfer of project to government agency / Lease / New contract: After the concession period the sponsor is bound to shift proprietary ownership to the government agency, however government agency, himself is authorized to either lease the project to another period usually less than concession period to same or different operator. If the project is running successfully, government can assign the further operation to the same operator, but in this case Government has to change/negotiate the tax and earning system for this extended operation of the facility.

5. Risks management in BOT / BOOT projects

Once the procedural model is run, arises different relationships between different parties involved in the project. As in Pakistan the private sector is not developed enough to take mega projects by their own therefore, investors, lenders, operators, suppliers, consultants and sponsors may be involved in the process with their specific functions as shown in the figure 6. Financial risk will be at the top in a system like Pakistan. Moreover, the complexity of project finance for BOTs commonly involves competing and conflicting interests between various bankers, as both lenders and shareholders. Projects frequently involve foreign and local commercial financial institutes; bilateral and multilateral institutions such as the ADB and industrialized country export credit and related insurance agencies [8].

The Governments role can be important in this regard to give the guarantees for the debt return. To avoid the complication, projects can be centralized and a separate department / franchise can be established to smoothen the process.

The wide range of options in BOT/BOOT contracts allows flexibility and the potential to move from less risky arrangements to riskier arrangements involving a larger share of private investment. However, because of its risky nature, there have been failures as well as successes. Risk analysis and management in an appropriate way is very much desirable for successful implementation of BOT projects. Various Risk analysis and management models are suggested by various researchers including one proposed by Prasanta K. Dey and Stephen O. Ogunlana [12]. The application of risk analysis tools and techniques (RATTs) to BOT projects depends on an understanding of the contents and contexts of BOT projects [13], but they are complicated enough to be implemented in an environment like Pakistan. As credibility and confidence among the parties grow, joint ownership or mixed companies is a risk sharing arrangement that helps to attract more private sector involvement. A simpler Risk Management model is proposed given in figure 7 to be implemented BOT projects which includes [14];

1. Risk identification;
2. Risk classification;
3. Risk breakdown structure;
4. Risk probability and impact factor;
5. Risk analysis;
6. Monte Carlo simulation;
7. Identification of critical risk;
8. Risk management strategy;
9. Risk monitoring process.

In the process of risk identification, all documents are reviewed, previous BOT projects are studied, market is analyzed and geopolitical conditions of the country are studied in detail. After that risk are classified followed by the Risk Breakdown Structure (RBS). In risk probability and impact factor calculations and, different statistical rules (beta, gamma, log, normal, skewed normal and etc.) are followed compatible to the data

collected in step 1 to find probability and impacts of different risks likely to be encountered in the process. Afterward, risk analysis is made which include qualitative and quantitative risk analysis. For quantitative risk analysis simulation and modeling technique can be used. Sensitivity risk analysis, decision tree diagram and EMV are calculated according to requirement and circumstances. Monte Carlo technique can also be used in modeling and simulation for the identification of critical risk [16]. Market based, state-of-the-art software are available for this purpose. Risky project 1.3.3 [17] is recommended due to its simplicity and multi-functionality. It performs following:

- Sensitivity analysis
- Success rate of completion
- Critical risks affecting cost
- Critical risks affecting duration of project
- Critical activities.
- Most probable duration

- Most probable cost of the project
- Most probable date of completion of project.

After simulation and modeling, the project contract is reviewed once again and the project acceptability is checked looking organizational strength and risk values of the project. Once the project is selected for execution under BOT the critical risks are highlighted and strategy is set by the Government to eliminate, mitigate distribute or transfer risk to another party. Depending upon the type of project, location and circumstances, the course of action is set by the organization or participant (consultant, contractor, client or owner) participating in the construction process. The main contractors can also adopt the risk transfer strategy by sub letting the part or full project to the sub contractors. After implementing risk management model, the performance of model is monitored and corrections and timely upgradations can be made. Results are finally placed in data bank system so that results and data can be used for other projects.

- ✓ Distribution of risk between participants of the project;
- ✓ Risk transfer;
- ✓ Contingency budget;
- ✓ Risk reduction;
- ✓ Risk avoidance;

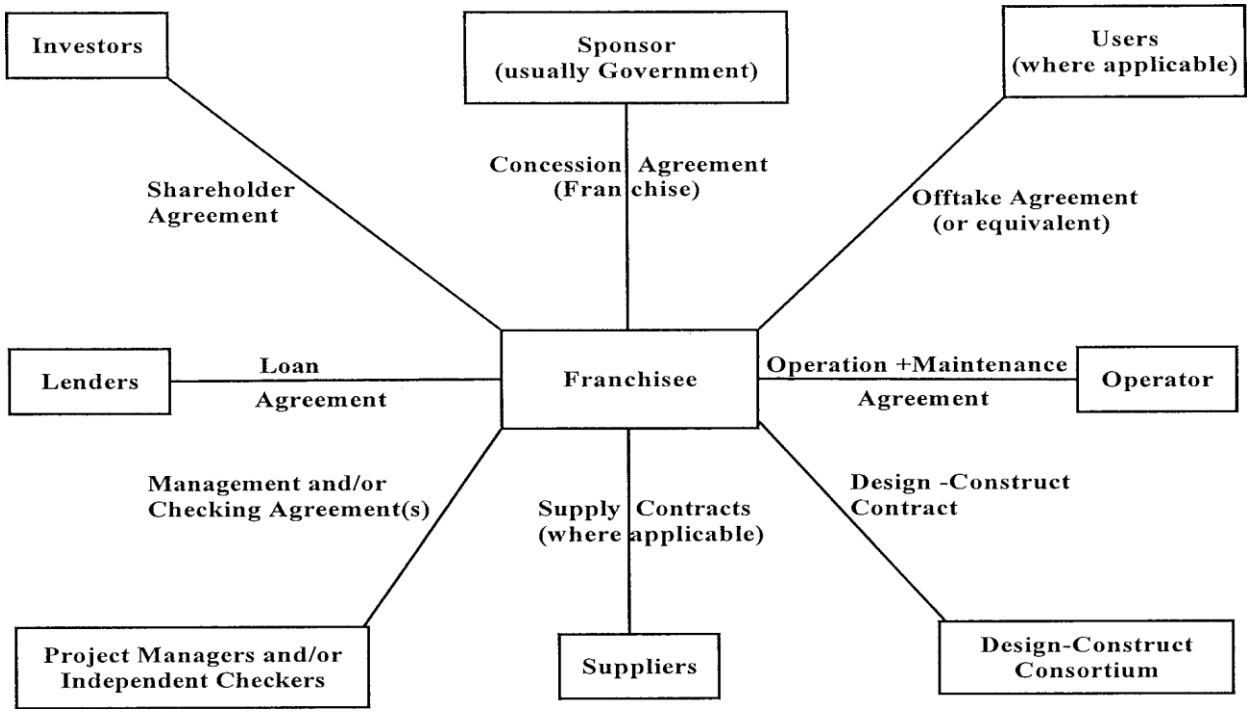


Figure 6: Basic relationships in a typical BOT-type project

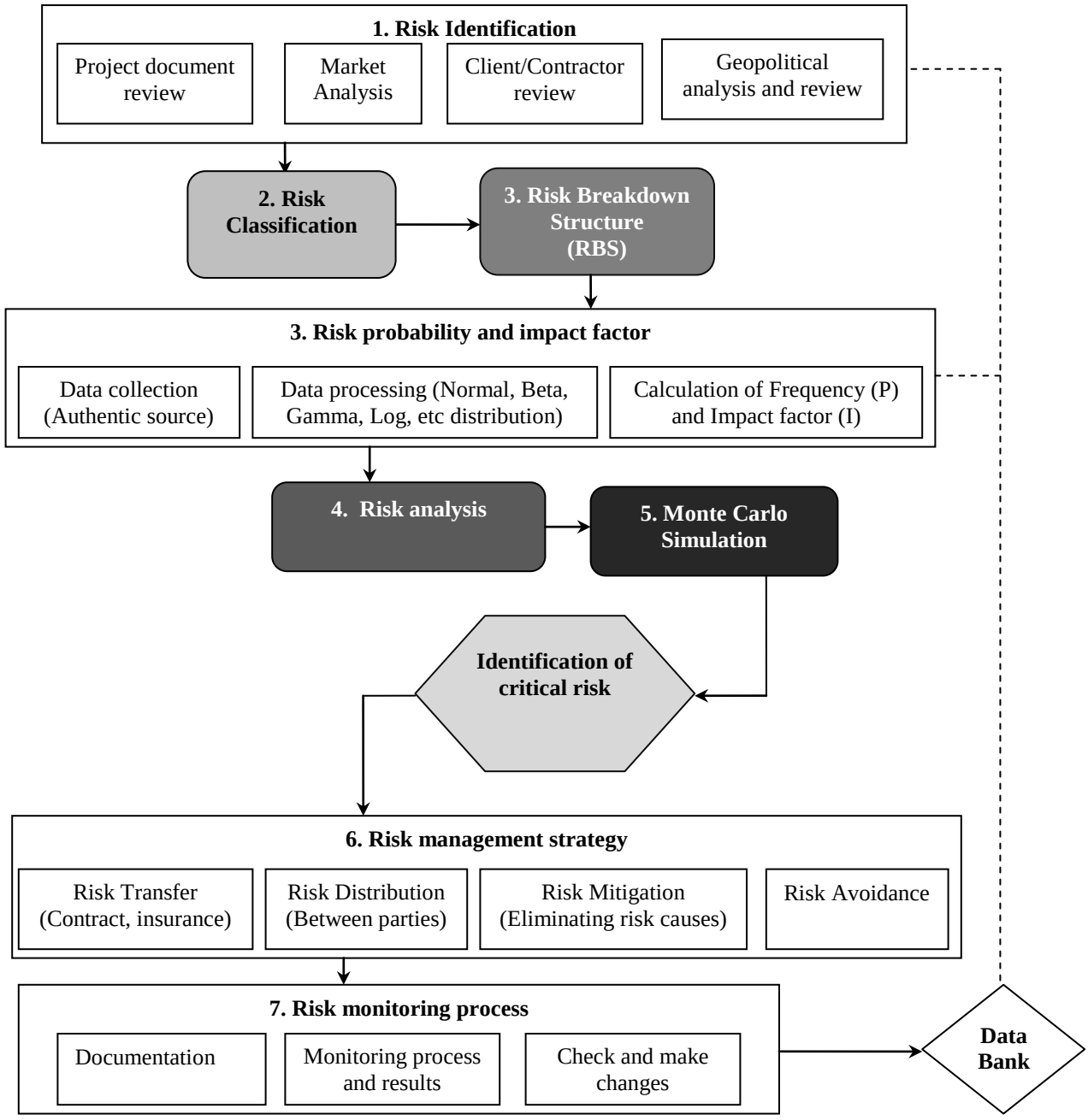


Figure 7: Risk Management Model for BOT projects [14]

6. Conclusions

1. The Success of public private partnership in the form of BOT and BOOT mainly depends upon political stability, government structure and their long term policies.

2. In Pakistan, the implementation of BOT projects shall be ideal in level 1 (federal govt.). Due to socio-economic influences and political interference at district government level, the implementation of BOT projects at level 3 will becomes more complicated.

3. Government must gradually shift its role as principal financier and shall attract private sector investment for infrastructure development through ease of lengthy procedures and sharing risk of investors. If the sponsor provides efficient services and facility to the end user, then must be

allowed to continue to operate the facility beyond the concession period but with different tax system.

4. The theoretical workability and applicability of BOT model given in this work can be checked by mathematical models, however, practical implementation of such model in Pakistan may best be checked by trial and error method due to the involvement of various scheduled and unscheduled uncertainties in the system and of the environment of the system itself.

5. Risk involved in the system in implementation of such BOT model can be resolved and managed for the parties involved in the process through risk management model given in figure 7.

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List of Abbreviations

- BLT- build-lease-transfer
- BOO- Build-Own and Operate
- BOOM- build-own-operate-maintain
- BOI- Board of Investment
- BOT- Build-Operate and Transfer
- BOOT- Build-Own-Operate and Transfer
- BOOTT- build-own-operate-train-transfer
- BTO- build-transfer-operate
- CASC- Cabinet Appointed Steering Committee
- Constt. - Construction
- Div. - Division
- DBO- design-build-operate
- DBFO- design-build-finance-operate
- DBOM- design-build-operate-maintain
- DOT- design-operate-transfer
- EMV- Expected Monetary Value
- EOI- Expression of Interest
- Govt. - Government
- O&M- Operation and Maintenance
- PC-Project Committee
- PPP- public private partnership

- PUDA- Punjab Urban Planning and Development Authority
- PWD- Public Works Department
- RATT- Risk analysis tools and techniques
- RFP - Request for Proposals
- ROO- rehabilitate-own-operate)
- ROT- rehabilitate-operate-transfer