



**Build, Operate, And Transfer (BOT)
Project Development System In Saudi Arabia**

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Abstract

This paper investigates the applicability of build, operate, and transfer (BOT) delivery system in Saudi Arabia. The content analysis was employed to study the feasibility of BOT in Saudi Arabia. The study looks at issues that have positive or negative impacts on the adopting of BOT. In addition, the study identifies appropriate types of construction projects and markets, which could be possibly implemented through BOT system.

The study shows that there is a great expectant for application of BOT in Saudi Arabia. The results of this study further indicated that power generation and water desalination appear at present to be leading the push for adopting BOT delivery method. Building sufficient local expertise in contractual aspects of BOT, establishment of independent regulator and tariff reform are prerequisite for success of BOT. Finally the thesis presents a model for effective implementation of BOT projects in Saudi Arabia.

1.0 Introduction

The Kingdom of Saudi Arabia has been committed to the free market economy principle since its establishment and it has guaranteed freedom of economic activity to its people. The policy of transferring government enterprises and corporations into private sector ownership and management has gained substantial significance in recent years in the Kingdom. The objective of privatization is to enhance efficient management of the economy, increase opportunities for employment of national savings and deepen the role of the capital market in financial mediation and economic activity in general [1].

Recently, a growing number of countries have started to implement various privatization programs such as, "Build-Operate-Transfer" (BOT), "Build-Operate-Own" (BOO), "Build-Lease-Transfer" (BLT), "Build-Own-Operate-Transfer" (BOOT), and "Build-Transfer-Own" (BTO).

Build-Operate-Transfer (BOT) is a project delivery method in which a private entity, usually a consortium is responsible for financing, construction, operation and maintenance of the facility for agreed duration called concession period and at the end of the period, transfers the ownership of the facility to the Government.

The Saudi government is encouraging the private sector to participate in the development of infrastructure facilities such as railway, airports, power plants, water supply facilities, ports etc. In an attempt to reduce its spending, the Saudi government is attracting private capital in increasing volumes to overcome the financing limitations. Increased private sector participation will help in the realization of large-scale infrastructure projects with minimum burden on government. The privatization programs mentioned previously can stimulate economic activity and create substantial foreign direct investment create opportunities for local private sector in the Kingdom and help in creating stronger private sector. As a result, the feasibility of implementing BOT project delivery system in Saudi Arabia needs an investigation.

There are many objectives for this paper. First, it will study the feasibility of implementing BOT delivery system in Saudi Arabia. Second, it will identify and assess the impact of obstacles and success factors for successful implementation of BOT delivery system in Saudi Arabia. Third, this paper will identify appropriate type of construction project/markets that could be possibly implemented through BOT procurement system. Finally, this research will develop model(s) and provide recommendations and guidelines with ultimate objective of identifying the best approach of implementing BOT in Saudi Arabia.

2.0 Literature review

2.1 DEFINITION OF BOT

BOT is defined as the granting of a concession by the government to a private promoter, known as concessionaire, who is responsible for financing, constructing, operating, and maintaining the facility over the concession period before finally transferring the fully operational facility to the government at no cost.

2.2 AGREEMENTS OF BOT PROJECTS

In any BOT project, there are many inter-dependent agreements among various participants. Major participants in a BOT project include government, private company called concessionaire, lenders (Banks), equity investors, contractors, suppliers, operators and financial advisers.

BOT projects mainly consist of different agreements. These agreements are:

	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
<i>Sector</i>										
Telecommunications	6.6	13.1	7.9	10.9	19.5	20.1	33.4	49.6	53.1	214.0
Energy	1.6	1.2	11.1	14.3	17.1	23.9	34.9	46.2	26.8	177.1
Transport	7.5	3.1	5.7	7.4	7.6	7.5	13.1	16.3	14.0	82.2
Water and sanitation	0.0	0.1	1.8	7.3	0.8	1.4	2.0	8.4	1.5	23.3
<i>Region</i>										
East Asia and the Pacific	2.3	4.0	8.7	15.9	17.3	20.4	31.5	37.6	9.5	147.2
Europe and Central Asia	0.1	0.3	0.5	1.5	3.9	8.4	10.7	15.3	11.3	52
Latin America and the Caribbean	12.9	12.3	17.1	18.0	18.4	19.0	27.4	45.1	66.3	236.5
Middle East and North Africa	0.0	0.0	0.0	3.3	0.3	0.1	0.3	5.2	3.6	12.8
South Asia	0.3	0.8	0.1	1.2	4.3	4.0	11.4	13.7	2.3	38.1
Sub-Saharan Africa	0.0	0.0	0.1	0	0.7	1.0	2.0	3.5	2.3	9.6
Total	15.6	17.4	26.5	39.9	44.9	52.9	83.3	120.4	95.3	496.2

2.2.1 Concession Agreement

This agreement is regarded as the “heart” of a BOT project as it determines the commercial viability and profitability. It is an agreement between the government and the concessionaire and it includes the following:

- The concession period
- The construction duration
- Toll/ tariff structure with toll/tariff revision provisions

- Rights and obligations of both parties
- Government guarantees: The host government offers guarantees to the project promoters (concessionaire) like supporting loans, guarantees of minimum operating income etc.

2.2.2 Loan Agreement

This agreement occurs between the lenders (i.e. banks) and the concessionaire. Bank debt is the primary source of financing for a BOT infrastructure project. The debt is raised through international and local commercial banks. Lenders of debt (commercial banks) look at equity contribution as level of commitment by the concession company. BOT projects are financed on project finance basis, i.e., BOT projects are financed on forecasted cashflows and estimated revenue-generating capacity of the project.

2.2.3 Shareholder Agreement

This agreement takes place between the equity investors and the concessionaire. Equity financing, in the context of BOT is defined as financing rose by consortium members from their own capital funds. Also equity is provided in the form of capital by other equity investors. The concession company agrees to pay the investors, dividends in return.

2.2.4 Construction Contract

This contract takes place between the contractor and the concessionaire. The contractor is a key player in the consortium. The basic contractual structure of BOT comprises of single overall contract for design and construction. The fixed price turnkey contract assigns a single point of responsibility in on overall contract thereby minimizing the risk element present in BOT projects.

2.2.5 Supply Contract

It is an agreement between the supplier and the concessionaire. The supplier is often a government agency that supplies raw material such as coal to the power plant.

2.2.6 Off-take Agreement

It is an agreement between the government and the concessionaire to purchase minimum quantity of services such as electricity or water at a fixed price for a fixed time. Such an agreement will generate revenue to the concession company.

2.2.7 Operation and Maintenance (O & M Contract)

This is an agreement between the concession company and the operator. The operation phase of BOT projects presents the great management challenge and demands the highest level of attention.

2.3 FORMS OF BOT PROJECTS

2.3.1 Build-Operate-Own (BOO)

In this form, the private sector (concession company) is responsible for design, finance, construction, operation and maintenance of the facility. In BOO, the title of the ownership remains with the concessionaire. There is no transfer of ownership to government.

2.3.2 Build-Transfer-Operate (BTO)

In BTO, the private sector (concession company) constructs the facility and transfers the ownership to the government. The concessionaire operates the facility by taking a contract to operate the facility.

2.3.3 Build-Lease-Transfer (BLT)

Here, the private sector (concession company) constructs the facility and leases the facility and transfers it to the government at the end of concession period.

2.4 CHARACTERISTICS OF BOT PROJECTS

Compared to other project delivery methods, BOT projects have unique characteristics. Some of these characteristics are:

1. They are financed on a project finance basis with limited recourse where lenders provide debt to the concession company solely based upon expected cash flow/revenue generation capacity of the project.

2. Raising of finance is entirely held by the private sector without the involvement of government. The private sector is fully responsible for a design, construction, finance and operation and maintenance.
3. BOT projects are complex structures comprising multiple interdependent agreements among the various participants.
4. BOT projects are typically large-scale infrastructure projects. Transaction costs amount on average 5 to 10 % of total project cost.
5. BOT projects are associated with uncertainties and high risk.
6. BOT projects transfer the risk to the private sector.
7. BOT formula can be applied to any sector of the economy. But it has been used widely in power plant sector, transportation and telecommunications.

2.5 ADVANTAGES OF BOT PROJECTS

1. Private firms are more efficient; hence project or service can be delivered at lower cost.
2. Private firms are more innovative in selection of design and operation phases of a project or service.
3. Private sector invests directly in the development of infrastructure, thereby reducing public debt, balancing the budget deficit, and reduced role of public sector.
4. BOT projects create business opportunities for the local private sector, create employment avenues as well as attract substantial foreign direct investment.
5. BOT projects help in facilitating transfer of technology by introducing international contractors in the host countries.

2.6 DISADVANTAGES OF BOT PROJECTS

1. High transaction costs (5 – 10% of total costs).
2. Not suitable for smaller projects.
3. Success depends upon successful raising finance.
4. Projects are successful only when substantial revenues are generated during the operation phase.

2.7 COMPETITIVE TENDERING PROCESS

2.7.1 Bid Evaluation Procedures

- Pre-qualification: To shortlist a number of competitive proposals by consortia that consists of reputable and experienced contractors, operators and bankers.
- Evaluation Criteria: 2 main evaluation techniques
 - Net Present Value (NPV).
 - Score System.

2.7.2 Critical Success Factors:

The following are six factors that are vital for project promoters in winning a BOT contract.

- ◆ Entrepreneurship and leadership
- ◆ Right project identification
- ◆ Strength of consortium
- ◆ Technical solution advantage
- ◆ Financial package differentiation
- ◆ Differentiation in guarantees

2.7.3 Role of Equity:

Equity financing, in the context of BOT is defined as financing rose by consortium members from their own capital funds. The concession company agrees to pay the investor, dividends in return.

2.8 RISK SHARING/MANAGEMENT

2.8.1 Risk Allocation:

Risk should be transferred to the party best able to control it. BOT projects require distribution /sharing of risk among the parties. Both government and private sector are on learning curves and as such there are no records of successfully applied risk allocation principles. However a promoter who retains risks and offers guarantees against risk and uncertainties will have high probability of winning the concession.

2.8.2 Types of Risk

- Political risk
- Currency and foreign exchange risk
- Cost overrun risk
- Delay risk
- Tariff adjustment risk
- Market risk
- Operation risk
- Force major risk

2.9 MAJOR SOURCES OF FINANCE

2.9.1 Equity

The consortium members and other equity investors provide equity in the form of capital. The Concession Company agrees to pay the investor dividends in return. Equity in BOT infrastructure project decreases the burden placed on the project to service debt. Furthermore, equity indicates the level of commitment by the promoters to the project.

2.9.2 Debt

Debt is raised through loans from local and international commercial banks. An agreement between the lender and the concessionaire form the basis of loan agreement. The lenders (commercial banks) lend to the successful concessionaire based on the merit of the expected cash flows from the project. BOT projects are financed on limited recourse basis.

3.0 Research methodology

3.1 RESEARCH PLAN

The research plan consists of four phases:

3.1.1 Literature review

Extensive literature review was carried out to acquire in-depth understanding of issues related to Built Operate Transfer (BOT) concept. The required information was collected from different sources such as: local business magazines, journals and newspaper articles, international journals related to Construction Engineering & Management, publications and research reports prepared by various commercial banks, internet, and published BOT contracts/conditions.

3.1.2 Identification of factors that have an impact on success of BOT

This phase acquired a thorough understanding of the operating environment in Saudi Arabia. This included identification of relevant practices that have an impact, positive or negative on adopting the BOT delivery system.

3.1.3 Assessment of impact of obstacles and success factors

This was determined from content analysis of documented publications from multiple sources including local business magazines and newspapers, research reports, publications prepared by various commercial banks, official documents concerning the Saudi Arabian five year development plan, and investment rules.

3.1.4. Development of model(s) and guidelines/recommendation for implementing BOT project delivery system in Saudi Arabia

Based upon outcomes from last section, model(s) and associated parameter/conditions for implementing BOT delivery system in Saudi Arabia will be proposed. Appropriate type of construction projects/markets, which could be possibly implemented through BOT, will be identified.

4.0 identification and assessment of factors affecting bot in Saudi Arabia

4.1 POSITIVE FACTORS AFFECTING THE USE OF BOT

These factors can be grouped into five categories, which are:

Privatization Policy Factors:

It refers to government actions and operations for attracting the private sector. These actions can be described by the following:

1. Strong Government Commitment: This include:
 - Formation of the new Supreme Economic Council (SEC) to overlook the Kingdom privatization programs under the chairmanship of HRH the Crown Prince.
 - Adopting of the BOT system as an integral part of the country's privatization strategy.
 - Establishment of Saudi Arabia General Investment Authority to oversee the local and foreign investment.
 - The Saudi Arabian Government issued a landmark resolution directing the privatization of all telecommunications services currently provided by the Kingdom's Ministry of Posts, Telephones and Telegraphs (PTT).
 - Royal Commission (MARAFIQ)
2. Government Incentives and Support: This include
 - Pre-investment Assistance: The Government provides information and statistics for investment projects to facilitate the preparation of feasibility studies for the projects
 - Land: The new foreign investment law enables foreign investor to own land. Property ownership rights have been reformed so as to encourage investments.
 - Tax Reduction: A key incentive of the new foreign investment law is the reduction of tax rate from 45% to 30%.
 - Industrial Loans: The Saudi Industrial Development Fund (SIDF) provides soft loans to industrial establishments for up to 50 percent of the total cost of the project. Fully foreign owned firms are also eligible for soft loans from SIDF.

Economic Factors:

It refers to the economic climate and policies in Saudi Arabia. This can be viewed through the following:

1. Sound Macro Economic Stability:

Saudi Arabia offers a sound macro economic stability and sets a framework for a free market environment. It represents the largest economy in the whole Middle East region.

2. Stable and Free Convertible Saudi Riyal:

The Saudi Riyal maintains its fixed exchange rate of 3.75 Saudi Riyal against the US dollar. Saudi Arabia maintains fixed exchange rates, pegged to the US Dollar. Fixed exchange rates do not change over the long term, while pegged exchange rates are revalued periodically.

3. No Restrictions on Repatriation of Funds/Profits:

Saudi Arabia sets a framework for free market economy without any restrictions on capital control.

4. Efficient Capital Markets:

The Ministry of Finance and Nation Economy and Saudi Arabian Monetary Agency (SAMA), the central bank of Saudi Arabia, regulate Saudi Arabian financial system jointly.

Financial Factors:

It refers to potential source of finance, availability of finance in the form of equity and debt. This can be viewed as:

1. Availability of Soft loans:

With the new foreign investment law released in 2000, both Saudis and foreigners have equal access to soft loans from Government credit institutions.

2. Availability of Equity:

Equity can be raised in Saudi Arabia to finance infrastructure project from the ample Saudi wealth aboard. According to SAMBA approximately \$650 – 700 billion of Saudi private wealth are invested aboard. Clearly a substantial amount of this wealth can be attracted for national investment in BOT projects.

3. Tax Reduction:

Major disincentives for foreign investment in Saudi Arabia include a high tax rate of 45% on foreign partners corporate profit. This however has changed by the new law enacted in 10 April, 2000 aimed at increasing the investment both locally and foreign.

4. Demand for Infrastructure Projects:

In recent year the high population and industrial growth has dramatically boosted the demand for electrical power, water etc. For example, according to the Government 25 year electrification plan, demand for power in the Kingdom will increased from 19,573 Mega Watts in 2000 to 59,267 Mega Watts in 2020. Also the demand for water between 2000 to 2020 will increase from 1.8 billion CM. per year to 6 billion CM. per year for municipal and industrial use only. Clearly there is a rising demand for infrastructured related projects like electricity, water, telecom, roads, ports, railroads etc.

Legal Factors

It refers to the laws and regulations that have legal and business impact on the initiation and implementation of BOT delivery system. This may include sponsorship, property ownership rights etc.

1. Establishment of SAGIA

Saudi Arabia enacted a foreign investment law on April 10, 2000 and formed Saudi Arabian General Investment Authority (SAGIA). SAGIA was created to satisfy the one stop shop requirement of BOT projects.

2. Right to own land by foreign investors:

Recently the Saudi government lifted the restrictions of foreign ownership and allowed 100% foreign ownership to licensed firms of land, building and housing for employees.

3. New Foreign Investment Law:

Saudi Arabia endorsed a new foreign investment law in 2000 aimed at attracting foreign investments in the Kingdom.

Technical Factors

This refers to the availability expertise in terms of technology, management, material, equipment and human resources to undertake infrastructure projects in Saudi Arabia.

1. Availability of Large and Experienced Construction Organizations:

During the last decade, Saudi Arabia's construction sector GDP grew from SR 34.1 billion to SR 46.2 billion, showing a total increase of SR12.1 billion or a yearly average increase of SR1.2 billion. Leading Construction companies in Saudi Arabia are A.H. Al Zamil, Al-Khodari, and the Saudi Binladin Group. Saudi Arabia has large construction companies with experience in the design and execution of projects.

2. Availability of Equipment and Material:

Saudi Arabia has achieved near self-sufficiency in producing common building materials locally, Total value of building materials imported into the Kingdom declined by 7.2% to SR12.1 billion in 1999 from SR13.01 billion in 1998 and was down from its eight-year peak of SR14.93 billion in 1992. In Saudi Arabia equipment is imported from abroad. Clearly construction material and equipment are available locally to undertake construction and operation of BOT projects or can be imported easily to meet demand.

3. Availability of Cheap Labor and International Work Force:

One of the major attractions in Saudi Arabia is the availability of cheap labor to undertake the construction project. It is estimated that unskilled foreign workers represents 50 % of the expatriates in Saudi Arabia. According to the Manpower Council, the civilian labor in the kingdom was estimated at 7.2 million in 1996, of which 2.5 million or 34.7 % were Saudis, the Non Saudi Labor represented 65.3 % or about 4.7 million. The new foreign investment law allows the potential investor to sponsor the expatriate employees.

4. Availability of Modern Infrastructure:

Saudi Arabia invested billions of dollars in infrastructure projects such as well-connected roads, telecommunication, and electricity water and sanitation facilities. The existing modern infrastructure in Saudi Arabia including advanced telecommunications systems, transportation and related facilities coupled with low utilities cost provide one of the prerequisites to attract foreign investment in BOT projects.

4.2 NEGATIVE FACTORS HINDERING THE USE OF BOT

There are three factors hindering the use of BOT in Saudi Arabia.

Knowledge Problems

It refers to the lack of understanding of legal and contractual aspects of the BOT project delivery method. As part of the process, knowledge factors play a great role in the success of BOT. These knowledge problems can be grouped into three areas:

- 1 Lack of owner's awareness of BOT concept.
- 2 Lack of contractors experienced in BOT.
- 3 Lack of financing experience in BOT projects.
- 4 Management and Control:

Regulatory Problems

This refers to the existing laws and regulations of the host country impeding the procurement of construction projects, administrative process of developing BOT projects and legal framework. These problems can be classified into three main areas:

1. Absence of legislation dealing with BOT.
2. Lack of independent regulatory body.
3. Legal and regulatory framework.

Financial Considerations

These refer to those factors impacting the ability of the project to earn a reasonable rate of return. These considerations can be grouped into:

1. Service Fees:

Services in Saudi Arabia, such as electricity and desalinated water, are highly subsidized. Government will have to consider increasing tariff in order to make BOT projects commercially viable.

2. **Limited Capital Markets:**

According to the Ministry of Industry and Electricity, large investment adding up to US \$117 billion will be needed to meet the power demand. To undertake these investments significant amount of debt and equity should be raised successfully from capital markets.

3. **Market Risk:**

Commercial banks provide debt on project finance basis, i.e., based on the merit of the expected cash flow from the project. The government should incorporate a mechanism to deal with market risk by providing necessary government support, such as government guarantees.

5.0 potential sectors for application of bot in Saudi Arabia

This section focuses on “true” BOT delivery system and projects that have realistic demand projections and are acceptable to have users’ tariff. It will also present a comprehensive analysis of demand, opportunities and challenges of each particular sector.

5.1 ELECTRICITY SECTOR

5.1.1 Introduction:

Saudi Electricity Company (SEC) has the sole operational responsibility of power generation, transmission and distribution in the Kingdom. According to Ministry of Industry and Electricity the objectives of the merger of regional electricity companies into SEC was to prepare for greater privatization of the electricity utility in the kingdom. The creation of SEC is a positive step toward the construction of power plants on the BOT basis.

5.1.2 Electricity Demand and Supply

5.1.2.1 Demand for electricity:

In recent years, the high population and industrial growth has dramatically boosted the demand for electrical power in the kingdom. The annual average consumption of electricity per subscriber has increased four folds, rising from 7824 Kilo Watt-hours in 1390 to 31,320 Kilo Watt-hour in 1419. In order to meet the growing demand, the Government aims to expand the power generation capacity by 50,000 MW over next two decades.

5.1.2.2 Supply for electricity:

The shortage of electricity is impacting the various sectors of Saudi economy at a time when the Kingdom is seeking to diversify away from depending on oil, the new industrial schemes are unable to get off the ground because of shortage of power. The Saline Water Conversion Corporation (SWCC) also generates electricity from desalination plants utilizing multi stage flash (MSF) technique.

5.1.3 Privatization of the Power Sector in Saudi Arabia

A major development in the power sector in Saudi Arabia was opening up foreign investment in power generation. However the negative list prepared by SAGIA in conjunction with SEC, prohibits foreign investment in distribution and transmission. A striking characteristic of private participation in electricity has been the concentration of investments and projects in generation compared with transmission and distribution.

5.1.4 Tariff and Performance

Power tariff structure and rates play a very important role in attracting private investments in

power generation. The electricity rates were highly subsidized. The viability of a project depends upon the off-take agreement between government and the concessionaire.

5.2 WATER SECTOR

5.2.1 Introduction:

Because of high population growth and rapid urbanization, the demand for water is growing continuously in Saudi Arabia. Saudi Arabia has limited water resources and is characterized by the absence of permanent rivers and lakes thus making water extremely scarce resource in Saudi Arabia. Saudi Arabia relies on desalinated water as the main source of potable water.

5.2.2 Water Demand and Supply

5.2.2.1 Demand for water:

The high population growth rate coupled with rapid industrialization and agricultural development has contributed to high level of water consumption in the Kingdom. The population increased by 143.6% between 1970 and 1995; and it is expected to reach about 40.426 million in 2025, with about 70% urban population. The domestic water demand have increased from 446 million cubic meters (MCM) in 1980 to about 1563 MCM in 1997, and is expected to be about 2800 MCM in 2010.

5.2.2.2 Supply for water:

Middle East and North Africa countries face the most severe water shortages in the world. The total demand for potable water in Saudi Arabia is $2.3 \times 10^9 \text{ m}^3$ annually. However, the actual supply of potable water available is only $1.8^3 \times 10^9 \text{ m}^3$ /year, creating serious water shortages in most parts of the country.

5.2.3 Private Sector Participation

In Saudi Arabia, huge investments are needed to install, upgrade and expand water supply system. The capital investment needed to meet the demand for potable water and provide the corresponding sanitation services by the year 2020 will reach up to \$ 74 billion. There are various private initiatives for the construction, operation and maintenance of desalination plants in Saudi Arabia.

5.2.3.1 Desalination:

Saline Water Conversion Corporation (SWCC) was established as an independent body to oversee the construction, operation, and maintenance of desalination plants in Saudi Arabia in 1974. According to SWCC, estimates that \$ 3000 million a year need to be invested in the sector to ensure adequate supplies over the next 20 years. Saudi Arabia is the world's largest procurer of desalinated water followed by United States. The production of desalinated water has increased from 200 MCM (Million cubic meters) in 1980 to 795 MCM in 1997 and is expected to reach about 1300 MCM in 2010 and by 2020 the desalinated water production is expected to reach more than 3000 MCM.

The progress upon BOT projects for desalination in Saudi Arabia is so far has been slow. The Ministry of Agriculture and Water (MAW) grants license to any investor to build a desalination plant. The Saudi Japanese national water Project was recently granted to Japan's Sumitomo Corp for the construction of desalination plant in Jubail. Shuaiba Water Desalination Company (SWDC) is proposing to build phase III and phase IV of Shuaiba desalination plant under BOO contract with initial investment of \$1 billion. SWDC will seek a BOT contract with international investor after reaching a final agreement with the government.

5.2.3.2 Water Distribution System

The number of customers that need to be connected to municipal water supply network by 2020 will

exceed 25 million people. Recently a proposal to privatize water supply in Saudi Arabia has been suggested at the Eastern Province Chamber of Commerce & Industry. A recent development in Water sector in Saudi Arabia is Jeddah Services Company (JSC). JSC is a good example of public-private partnership to solve the problems of deteriorating infrastructure of Jeddah city. JSC is working to secure a concession of supplying water and sanitation services in Jeddah and invest US \$ 10 billion in the next 20 years to expand and upgrade the water and sewerage networks.

5.2.3.3 Waste Water Treatment

The construction of wastewater treatment plants is another potential sector for the application of BOT in Saudi Arabia. Millions of cubic meters of wastewater produced were disposed of without reuse in Saudi Arabia. In Saudi Arabia wastewater can be reused to be utilized for irrigation and other non-drinking purposes.

According to the table shown below, it is evident that there is a great potential to maximize the reuse of wastewater in Saudi Arabia.

5.2.4 Tariff And Financial Performance

In 1994, Ministry of Agriculture and Water (MAW) introduced tariffs for water supply in Saudi Arabia. The water pricing in Saudi Arabia is at level much less than the cost of production and distribution. The low tariff structure acts as barrier to the application of BOT in Saudi Arabia. The water tariff should reflect the actual costs of water production and distribution. Previously water was provided to consumers almost free or at nominal prices.

5.3 TRANSPORTATION SECTOR

5.3.1 Introduction:

Because the transportation sector in Saudi Arabia facilitates the movement and goods, it plays a very important role in enhancing the economic growth of the region. The Saudi Government made huge investment in the construction of modern integrated network of land, sea and air transport services in Saudi Arabia. The Saudi Government is inviting the private sector to expand and maintain the transport infrastructure.

5.3.2 Roads:

The Saudi government aims to link more cities and villages with main road network. According to road network expansion program, 45,000 km are to be built in Saudi Arabia with estimated investment of about SR 20.2 billion.

5.3.2.1 Potential Private Participation

The high cost of maintenance and the need for further expansion are primary motivation for seeking private financing for road network development. According to the Ministry of Communication around 5000 Km of super highways and expressways are to be built under BOT Concept.

5.3.2.2 Toll types/Rates

Basically tolls can be classified as real tolls and shadow tolls. In real toll, that the road user will pay a toll for the use of the road. Example of real toll is the king Fahd Causeway connecting the Saudi Arabia with Bahrain. On the other hand, the shadow toll doesn't require the user of the facility to pay, but instead the government pays to the concessionaire an amount based upon the number of vehicles using the facility.

5.3.3 Railways:

In Saudi Arabia, Saudi Arabian General Railway Organization (SGRO) manages the railways. The kingdom railway network consists of primarily single track, standard gauge of length 570 km from Riyadh to Dammam. The railway line is used for passenger service and moving freight transport.

The number of passengers traveled by rail increased from 117,000 to 804,000 in 1420.

5.3.3.1 Potential Private Participation

The Ministry of Communication has planned to build railway lines at a cost of SR 9.2 billion (\$ 4.5 billion) on BOT basis. A study done by Ministry of Communication, SGRO and World Bank has proposed to build 3 lines namely

- ✦ Riyadh-Jeddah
- ✦ Al-Jalamid-Al-Zouberah-Jubail
- ✦ Dammam-Jubail
- ✦ Madina-Jeddah

5.3.3.2 Current Privatization Activities

A consortium comprising Saudi, Canadian, German and Austrian companies had come forward with a proposal to implement the multibillion-riyal project on BOT basis. Moreover, an understanding between the Council of Saudi Chambers and concerned government agencies has been reached on the acquisition of right of way for the proposed railway project.

5.3.4 Airports:

5.3.4.1 Introduction

The Presidency of Civil Aviation is responsible for the construction, operation, maintenance and development of airports in Saudi Arabia. The network of air transportation comprises of 25 airports in kingdom, out of which 3 are international airports.

5.3.4.2 Potential Private Participation

The kingdom of Saudi Arabia attracts a large number of visitors and pilgrims each year. Recently the government has placed special emphasis on the tourism sector. Currently, Saudi government is turning to the private sector for the development and expansion of airports.

5.3.5 Ports:

5.3.5.1 Introduction

Saudi Ports Authority (SPA) supervises the O & M of eight main seaports in Saudi Arabia along the Red Sea and the Arabian Gulf coasts with a total of 183 berths of these 137 are of commercial ports and 46 are of industrial ports. Saudi Arabia has the largest seaport network in the Middle East region .It plays a very important role in the economy of Saudi Arabia.

5.3.5.2 Current Private Participation

All Saudi seaports are operated by the private sector. As a result The productivity has increased three fold, Operating costs were reduced from U.S. \$40/ton to less than U.S. \$1.6/ton, and Revenue increased by 21.5 %

6.0 development of model(s)

6.1 INTRODUCTION

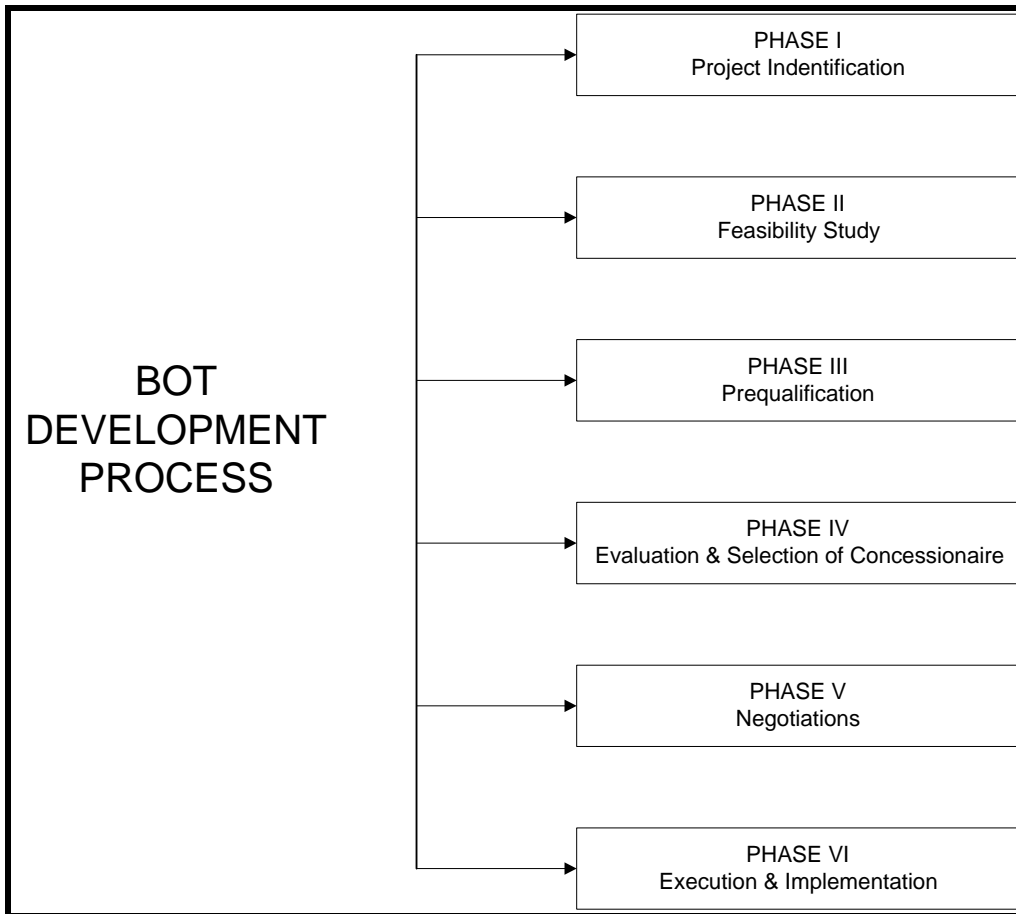
There is a growing interest in adopting BOT in Saudi Arabia. As no prior experience with BOT projects exists in Saudi Arabia, the need further increases for a model for effective implementation and promoting BOT delivery system in Saudi Arabia. This section proposes a model describing the procedural framework that the various role participants in the BOT delivery system can use for the effective implementation of BOT projects in Saudi Arabia.

6.2 MODEL DESCRIPTION

The purpose of this model is to

- ❖ Assist the government in the application of BOT in Saudi Arabia.
- ❖ Provide an overview of how to structure, design, identify, procure and implement BOT projects in Saudi Arabia.
- ❖ Identify the required actions and estimate the organization capacity required through out the implementation of BOT project in Saudi Arabia.

The model suggests a methodology to be adopted throughout the stages of BOT projects. The model is organized in 6 distant phases as shown in the following figure.



The model is applied to electricity sector.

6.2.1 Phase 1: Project Identification

- ❖ The identification of the right project is the key to the success of a BOT project.
- ❖ Saudi Arabia is currently at the initial stage of the BOT projects.
- ❖ The objective of Phase 1 is to determine the suitable projects and markets to be initiated as BOT project.
- ❖ At this level of analysis, the model evaluates the market demand of each sector.
- ❖ The relevant ministry should conduct pre feasibility study and the project economics.
- ❖ This phase could result in the list of sector specific projects that can awarded as eligible BOT basis.

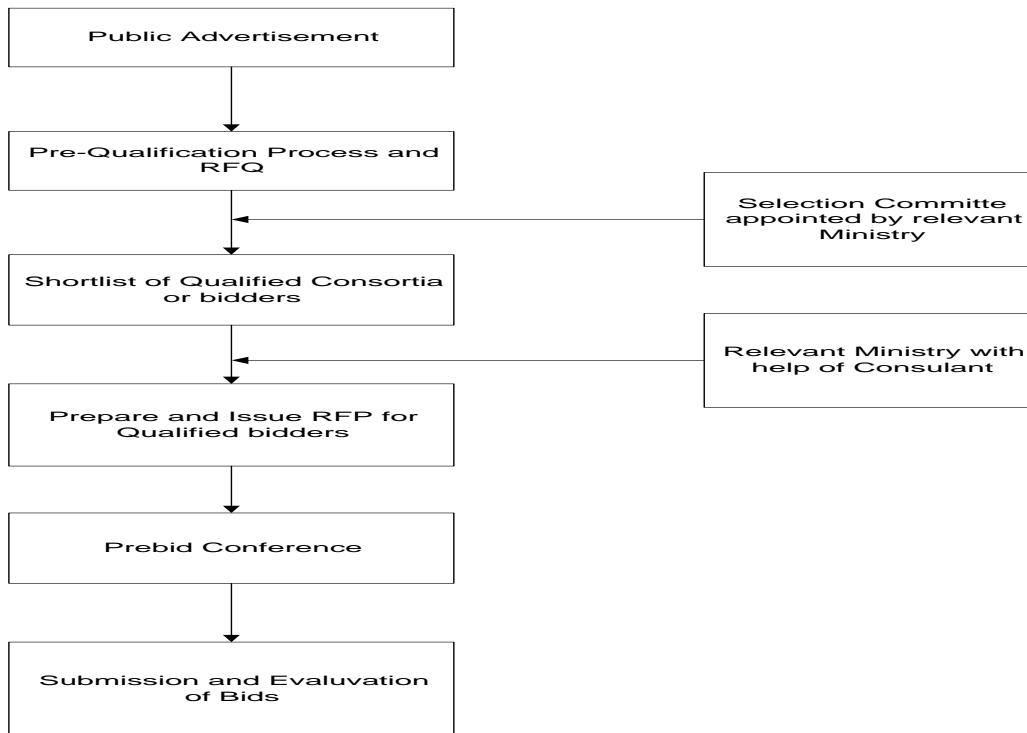
- ❖ The next step is to formulate a team or a committee with the relevant ministry to peruse BOT process.
- ❖ Because of the limited government expertise in BOT, the services of project consultant specialized in dealing with BOT project should be acquired.

6.2.2 Phase 2: Financial Viability

- ◆ The power generation project should demonstrate sufficient revenues to
 - Meet its debt obligations
 - Meet its operation and maintenance costs (O & M)
 - Earn a reasonable profit.

6.2.3 Phase 3: Pre-Qualification and Request for Proposal (RFP)

- ☞ The objective of this phase is to provide a framework for pre-qualification, and conducting transparent bidding process.
- ☞ The development stage of BOT is complex and risky and as such requires a clear, open and transparent process of competitive bidding.
- ☞ This process should be clear and explicit, as shown in the following framework.



6.2.4 Phase 4: Evaluation and Selection of Concessionaire

- ✓ The objective here is to evaluate proposals and select a bidder.
- ✓ The evaluation criteria should be decided prior to the issues of RFP.
- ✓ Bids can be evaluated from standpoint of technical and financial package.
- ✓ The technical proposal should satisfy requirements setup by the Government.
- ✓ The financial evaluation should investigate the financial aspects of the proposal.
- ✓ The following criteria could be adopted for evaluating bids
 - Shortest concession period
 - Lowest tariff/ toll level

- Lowest NPV
- Debt & Equity ratio capital structure of project
- Source of loans
- ✓ The use of above criteria depends upon the type of project and the objective of the government.
- ✓ If the government main concern is the low tariff, the concessionaire with lowest tariff could be selected.

6.2.5 Phase 5: Negotiation Phase:

- The objective here is to reach a common ground between government and private entity on complex issue such as toll rate, concession period and rate of return.
- This phase plays an important role in the selection of successful concessionaire.
- Negotiations of issues, such as financial parameters (e.g. toll rates) are fundamental.
- The government agencies or relevant ministries should establish sufficient capacity in terms of human resources required to deal with the negotiation and clarification process.
- The fact that lack of human expertise in dealing with negotiation phase can be overcome by hiring foreign consultants.

6.2.6 Phase 6: Execution and Implementation:

- This phase starts with signing of concession agreement between the concessionaire and government.
- It phase consists of construction phase, O & M phase and ultimately the transfer.
- The following procurement strategy is suggested.
 - Adopt fixed price lump sum Turnkey contract for the construction of the facility.
 - Since any delay in construction duration would directly affect the revenue, it is recommended that lump sum turnkey contract be entered to ensure fixed cost & schedule.
 - Establishment of independent body to oversee the quality if design and construction.

6.3 MODEL IMPLEMENTATION

As mentioned previously, Electricity sector has been identified and used to illustrate the model framework.

• Project Identification

- High population and industrial growth has dramatically boosted the demand for electrical power in the kingdom and there are serious problems associated with expanding power generation capacity.
- According to the Ministry of Industry and Electricity, \$117 billion will need to be invested in the countries power sector by 2020 to meet the growth in electricity demand.
- Thus there is a great potential for application of BOT in electricity projects.
- In fact the first BOT project in Saudi Arabia to be implemented is SADAF power project.
- SADAF initiated to build a cogeneration power plant for its production on BOT basis. It invited the developers to build the power plant on BOO basis

• Financial Feasibility

- SADAF is one of the largest electricity consumers in the kingdom with daily costs of SR 250,000.
- The bidder comprising CMS and local AH Al-Zamil Group provided the power prices 35-40 percent cheaper than the current supplies from the grid.
- SADAF needs uninterrupted power supply for its survival and is cheaper and financially viable.

• Pre-qualification and Request for proposal (RFP)

- SADAF prequalified six companies to build the plant on lump sum turnkey basis.
- It invited the proposals for construction of cogeneration power plant on BOO basis.

- ✚ Evaluation and Selection of Concessionaire
- SADAF invited proposals to build cogeneration power plant on BOO basis.
- Four proposals were short-listed:
 - CMS with Local AH Al-Zamil
 - US Enron
 - Local Xenel Industries
- The criteria adopted for selection of concessionaire was the lowest tariff rate
- The concessionaire with lowest tariff rate was awarded the concession.

7.0 conclusion & recommendation

7.1 GENERAL RECOMMENDATIONS

- ◆ BOT delivery method is an attractive and desirable option for undertaking infrastructure related projects such as power, transportation, water etc.
- ◆ Across all the types of infrastructure projects, power generation and water desalination appear at present to leading the push for the application of BOT delivery method.
- ◆ In assessing the obstacles for the application of BOT in Saudi Arabia, lack of adequate awareness among owners and contractors regarding the BOT concept and low service fee represent significant impediment in the way of adopting BOT.
- ◆ Establishment of BOT center can be the key to disseminate the knowledge and help in the understanding the issues involved, best practices in the design and structuring of BOT projects.
- ◆ BOT center should be established with the following objectives:
 - To disseminate information and knowledge regarding the public-private partnership practices
 - To serve as the main channel between the private sector investors and government with aim of coordinating the implementation of BOT projects.
 - To pool specialized resources and specialists to provide better understanding of fundamentals of BOT arrangements.
 - To promote BOT investment opportunities to the project promoters locally and internationally.
 - To gain better understanding on drafting concession agreements and other contractual aspects of BOT.
- ◆ For successful implementation of BOT in Saudi Arabia, significant changes to existing laws will be required. This includes the need to create independent regulatory bodies in each of the infrastructures sectors, namely Power sector, water sector, and transport sectors.
- ◆ There is a need for dealing for legislation dealing with the implementation of BOT projects. The legislation should include evaluation criteria, procurement rules of tenders/proposal, the role of government support, sectors where BOT project are allowed, etc.
- ◆ A more narrow approach is needed to investigate each type of infrastructure sectors and study to determine the applicability of BOT.
- ◆ It would be sound to explore the role of international institutions such World Bank, UNIDO in design and structuring of the BOT projects, providing training and knowledge build in various legal, financial, economic aspects of BOT.

7.2 SECTORS RECOMMENDATIONS

7.2.1 ELECTRICITY

- The Saudi government aims to expand the generating capacity by 50,000 MW by 2023. Total investment needed for expanding the power sector is estimated at SR 438,000 million (\$117 billion) 54 % percent will be needed for generation.
- BOT projects in the power sector can help Saudi government to expand, reduce government

spending, and enhance the efficiency of power sector in the kingdom.

- Saudi Arabia is keenly pursuing the restructuring of power sector leading to privatization of power sector.
- Existence of legislation dealing with the implementation of BOT projects, such as, evaluation criteria, procurement rules of tenders/proposal, the role of government support, sectors where BOT project are allowed, etc. would provide guidelines for potential private sector participation.
- A need exists to establish an independent regulatory authority to implement and reform tariff structure.

7.2.2 DESALINATION

- The desalination market is huge and represents a major investment opportunity to build, operate and maintain water desalination projects in the kingdom.
- The current desalination production is about 46% of the total domestic demand. According to SWCC, US \$ 3,000 million a year need to be invested to meet the demand over the next 20 years.
- Because of falling costs of desalinated water, desalination is the most attractive and suitable option for satisfying the potable water demand in Saudi Arabia.
- Large-scale desalination plants are particularly suitable for BOT projects because cost of desalination is US \$ 0.67 per cubic meter for a large desalination plants and US \$ 3.82 for small desalination plants.
- The potential advantage of desalination projects would not only the production of water but also to generate the much needed electricity.
- Experience in other countries such as UAE have demonstrated the feasibility and cost effectiveness of desalination projects let under BOT contract.

7.2.3 WATER DISTRIBUTION SYSTEM

- The water supply sector in Saudi Arabia remains highly subsidized.
- The current water tariffs are very low and constitute only a fraction of actual costs of production and transportation.
- An accurate assessment of consumer's willingness to pay should be undertaken.
- Consumers are willing to pay more for reliable water delivery services.
- Reform of Tariff should be based upon willingness of consumers to pay rather than cost recovery driven approach.
- The need to safeguard the interests of poor is very essential to avoid social reaction.
- The tariff system should also differentiate different consumers categories.
- Pricing should be based upon the income groups.
- Private participation in water sector in developing countries is low when compared with the other infrastructure areas such as power, transport etc.
- Management contracts could be introduced in larger scale to combat the losses.
- Management contract can be a good starting point to improve the operational and financial performance of the water supply system.
- This approach would avoid tariff increase. After gaining significant benefits from Management contracts, BOT can be adopted for water supply projects.

7.2.4 WASTEWATER TREATMENT

- Wastewater treatment plants are a major growth area and are a potential sector for application of BOT delivery method in Saudi Arabia.
- Construction and operation of Wastewater treatment plants under BOT arrangement have been successful in countries such as Kuwait and could be also be applied in Saudi Arabia.
- The Saudi government recent law requiring all treatment plants to have a tertiary wastewater treatment plant will fuel the growth of construction of wastewater treatment plants in the Kingdom with private financing.

7.2.5 ROADS

- The concept of toll roads is very popular and has been applied worldwide for the financing of road infrastructure
- BOT projects are quite common for roads and power sector.
- Different tariff structure could be applied to different types of vehicles e.g. commercial vehicle, trucks, and private cars.
- Electronic toll collection (ETC) method should be applied for speedy toll collection. These technologies are mature and many ETC systems are applied all over the world.
- Shadow toll may be applied where tolling may not be socially acceptable.
- With the fast deterioration of the roads in Saudi Arabia, ROT type project delivery methods can play significant role in the implementing the existing road network.

7.2.6 RAILWAYS

- ❑ Railway sector is underdeveloped in Saudi Arabia. As such private participation in form of BOT would contribute to the expansion of railways in the kingdom.
- ❑ BOT railway projects have the potential of being financially and commercial viable, considering the large demand for transporting people and goods.

7.2.7 AIRPORTS

- ✦ There is no airport project under BOT concept in Saudi Arabia.
- ✦ There are serious plans for private sector participation in the form of Build –Operate (BO) for the King Abdulaziz International airport.
- ✦ Airport expansion and development is being looked as part of provision of tourist related infrastructure.
- ✦ Considering the strategic national importance of airports, BO projects are more acceptable compared to BOT type projects.
- ✦ The private sector can play a role in expansion of existing airports, rehabilitation, operation and maintenance of the airports.

8.0 References

1. <http://www.tayebfc.com/documents/PRIVATIZATION.doc>