

CONSTRAINTS IN ADOPTION OF BUILD OPERATE AND TRANSFER (BOT) PROJECTS IN DEVELOPING COUNTRIES – FACT FINDINGS FROM PAKISTAN

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ABSTRACT: Build Operate and Transfer (BOT) is a popular choice of infrastructure development for both government as well as private sector entity worldwide. The conditions of contract in BOT models look attractive during pre-contract stage to all stakeholders. However during post-contract period these attractions diminish, because, the BOT contract conditions are associated with various constraints. The potential impacts of these constraints are different for different stakeholders. That is why; BOT contract adoption is complicated particularly in developing countries. This paper presents the factual results about the type, nature and intensity of various constraints faced by stakeholders in Pakistan during adoption of BOT contract. The findings presented in the paper are based on a detailed survey which narrate that economical, social and political are primary, whereas, technological and physical are secondary constraints in adoption of BOT contracts in Pakistan.

Key words: BOT, Constraints, Projects, Developing countries, Pakistan.

INTRODUCTION

Build operate and transfer (BOT) contracts has been gearing up popularity tremendously in recent times in both developed and under developed countries. The details about BOT projects, contracts and conditions of contract can be found in Ahmed *et al.* (2007), Antonio and Miroslaw (2007), Yiannis and Demos (2005), Weng (2005), Andreas (2004), Ye and Tiong (2003), John and Isr (2003), Kumarsway and Zhang (2001), Irem and Tallat (2000), Wang (2000) and Tiong and Alem (1997).

Augenblick and Custer (1990) presented a detailed report about approach of BOT projects execution in developing countries including Pakistan, Turkey, Costa Rica, Thailand, Phillipines, Malaysia, Ivory Coast, Indonesia and Guenia. They explored the fact that implementation and execution issues of the BOT projects are common in developing countries.

The first major BOT project offered in Pakistan was the Hab River Project. The contract of the project was signed in 1989. Since then different BOT infrastructure projects has been offered in Pakistan. The details of BOT projects implementation procedures and contract conditions in Pakistan can be seen in Khan *et al.* (2008) & Augenblick and Custer (1990).

The major stakeholders involved in BOT projects include owner, sponsor and contractor cum consultant. The details about the role of these stakeholders in BOT projects of developing countries can be seen in Khan *et al.* (2008) & Augenblick and Custer (1990).

In developing countries the governments do not have enough finances to carry out the infrastructure

development. Therefore, the BOT models were initially proposed by its developers for government sector owners in developing countries. Meanwhile, the successful experience of BOT projects by government sector owners open its ways for private sector owners also, where, it was learnt that the BOT not only boosts the economic growth but also provides assistance in generating opportunities to stakeholders. Because, BOT is an option for financing the infrastructure projects without direct utilization of finances by both government and private sector owners. Hence, BOT projects have the potential to serve the government and private sector with equal effectiveness.

The build operate and transfer (BOT) approach to develop infrastructure projects and facilities of public interest such as bridges, airports, power plants, detention facilities, parking facilities etc is an alternative for a country that lacks the appropriate funds to undertake on its own projects of this scale (Yiannis and Demos, 2005). The research and development on BOT has proved it as an accepted, recognized and successful module of infrastructure development. But in Pakistan, the economy is still unable to have any potential benefit from it. Pakistan even being the member of World Trade Organization (WTO) unlike China is unable to utilize the available multinational financing opportunities for BOT projects in infrastructure development (Khan, 2008). As, to address the complexity of BOT projects, innovative project management theories and techniques are required (Weng *et al.* 2005).

Today, the Pakistan construction industry has lot of prospects of BOT projects in the fields of power, irrigation, transportation, real estate, highways, high rise buildings and urban development. However, the industry

is not gaining any attention from local or foreign investors since last few years in BOT projects. The possible reasons for non interest of investors in BOT projects in Pakistan are required to be explored. Hence, the main objective of the research is to highlight the constraints in adoption of the BOT projects in Pakistan in context of assessing its implementation and application shortcomings.

MATERIALS AND METHODS

The objectives of research have been achieved by adopting methodology discussed below:

Review of the international literature was carried out including BOT projects up to date status, statistics, success, challenges, research and development worldwide for development of a standardize BOT model and possible constraints effecting it. The developed BOT model performa is shown in Table 1.

Table-1. Performa for BOT model

PART - A
Type of stakeholder organization i.e. Owner, sponsor, contractor cum consultant
Please rank following BOT projects based on order of preference to participate in Rank 1 to Rank 10 (Scale used; Rank 1 = Minimum success potential, Rank 10 = Maximum success potential).
Infrastructure Development, Power, Real Estate, Energy, Oil & Gas, Transportation, Irrigation, Telecommunication, Water Treatment, Housing
PART - B
Please discuss possible nature of constraints those can be faced by your organization in above ranked projects
Type of Constraints i.e Physical, Political, Social, Economical, Ecological, Technological

Detailed survey was carried out for the assessment and evaluation of various parameters established in BOT performa. The list of stakeholders interviewed is listed in Table 2. The stakeholders were divided into three broad groups based on their role in BOT projects i.e owner, sponsor and contractor cum consultants. Minimum three top management

professionals of each stakeholder were interviewed for the identification of constraints. Stakeholders selected for survey include those organizations that have been working in all provinces of Pakistan including government sector owners, local and foreign; banks, contractors and consultants.

Table-2. List of BOT stakeholders interviewed during research

Potential BOT Stakeholders	Name of Organizations
A. Owners	
Government Owners	1. Water and Power Development Authority (WAPDA) 2. National Highway Authority (NHA) 3. Pakistan Railways 4. Irrigation and Power Department 5. Lahore Development Authority
Private Owners	1. Bahria Developers 2. EDEN Developers 3. Tricon Developers 4. EDEN Builders 5. Saigol Group
B. Sponsors	
Banks Local	1. Habib Bank Limited 2. Muslim Commercial Bank 3. Meezan Bank 4. United Bank Limited 5. Allied Bank Limited
Banks Foreign	1. Dubai Islamic Bank 2. Bank Alfalah 3. Standard Chartered 4. Al-Faysal Bank 5. Barclays Bank
Investment Banks	1. Dawood Capital Management 2. First Dawood Investment Bank

Insurance Companies Public Sector	3.	Jahangir Siddiqui Investment Bank
	1.	National Insurance Corporation
	2.	Pakistan Reinsurance Company Limited
	3.	Postal Life Insurance
Insurance Companies Private Sector	4.	State Life Insurance Corporation Limited
	1.	Adamjee Insurance Company Limited
	2.	Agro GENERAL Insurance Company Limited
	3.	Alpha Insurance Company Limited
	4.	EFU General Insurance Company Limited
	5.	Union Insurance Company of Pakistan Limited
C. Contractors cum consultants		
Contractors Local	1.	Descon Engineering
	2.	HabibRafiqPvt Limited
	3.	SKB Engineering and Construction
	4.	BanuMukhtar Contracting Pvt Limited
	5.	Izhar Construction Pvt Limited
Contractors Foreign	1.	OMV
	2.	Schlumberger
	3.	Petronas
	4.	EMAAR
	5.	Dong Feng
Consultants Local	1.	NESPAK
	2.	Associated Consulting Engineers (ACE)
	3.	Republic Engineering Consultants (REC)
	4.	Pakistan Engineering Services (PES)
	5.	AAA Associates
Consultants Foreign	1.	MMP Pakistan
	2.	Halcrow Pakistan
	3.	SMEC International
	4.	Atkins

Based on the interviewing database obtained from the Part – A of the performa rating of different projects was carried out using statistical data analysis. The database obtained from Part – B of the performa was also statistically analyzed for identification and rating of different constraints foresee by stakeholders.

RESULTS AND DISCUSSION

Figure 1 shows a comparison of potentials and priorities determined from stakeholders in BOT projects of Pakistan.

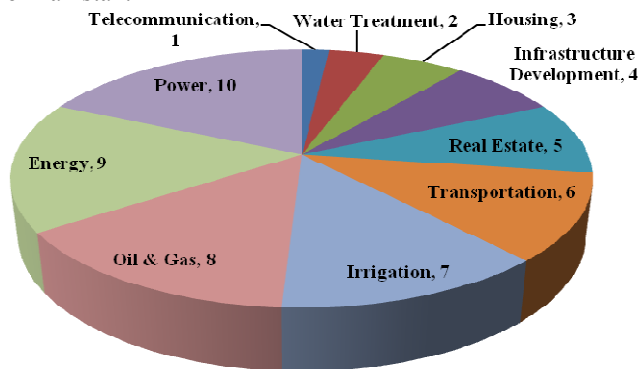


Fig-1: Stakeholders participation priorities and potential fields in BOT projects

It can be seen in Figure 1 that in Pakistan power and energy sectors has maximum potential to be offered as BOT projects from perspective of private owners, sponsors and contractors cum consultants. The possible reason of high priority given to power & energy sectors by stakeholders are associated high profits against investment. This is due to electrical shortfall as well as lack of alternate energy sources currently faced by Pakistan. Normally, the budget of power and energy projects are quite high, therefore, contractor cum consultants do enjoy more profits while executing such projects. It has been observed that even private owners of Pakistan working in different specializations do show their interest to invest as sponsor in power and energy sector BOT projects. Moreover, the sponsors indicate high potential of public financial participation in these projects also. The sectors i.e oil & gas, irrigation, transportation, real estate and infrastructure development also show reasonable potential of BOT success in Pakistan. Since last two decades, oil & gas has been recognized globally as one of the most profitable business sector by stakeholders, therefore, its listing among the top BOT priorities is understandable. The priority of irrigation sector BOT projects in Pakistan is logical as agriculture contribute maximum in economic growth of Pakistan. Pakistan, being a developed country always

shows substantial potential of BOT projects in transportation, infrastructure development and housing. It is depicted that the water purification and telecommunication are the two sectors in which BOT projects have less success potential. The reasons are good natural water quality and surplus telecommunication infrastructures in Pakistan.

Figure 2 presents summary of political constraints in success of BOT projects identified by the stakeholders with respect to their respective impacts in Pakistan.

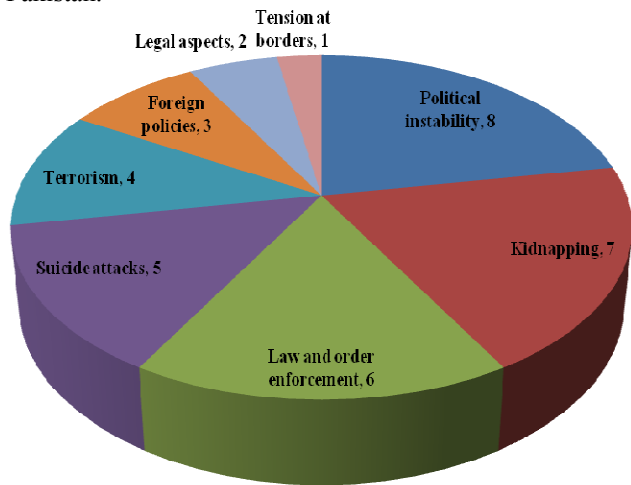


Fig-2: Political constraints rated by stakeholders in BOT projects success

The political instability is rated as most crucial political constraint in the BOT projects success. As historically in Pakistan, the funding of running construction projects was stopped after the change of power in provincial and federal governments. Further, the decisions about recommencement of such projects took substantial time. Pakistan being a developed country does not have sufficient skilled and qualified human resource for specialized projects like dams, renewable energy projects, motorways, oil/gas exploration, mining etc. Expatriate specialized engineering professionals are always required for such projects in the capacity of team leaders/ project managers. However, it has been observed in the past that number of expatriates was kidnapped. Moreover, a local stakeholder of one province working in other province is also afraid from the kidnapping threat. The population of Pakistan is increasing day by day and provision of law and order facilities everywhere become difficult day by day. Therefore, inadequacy of law and order enforcement remains one of the vital concerns in the minds of stakeholders. The suicide attacks, terrorism and foreign policies are other major political constraints in success of BOT projects in Pakistan. The constraints like legal aspects or tension at borders do not show significant rating to effect success of BOT projects in Pakistan.

Figure 3 shows summary of economical constraints in BOT projects success in Pakistan identified through stakeholders with reference to their respective impacts.

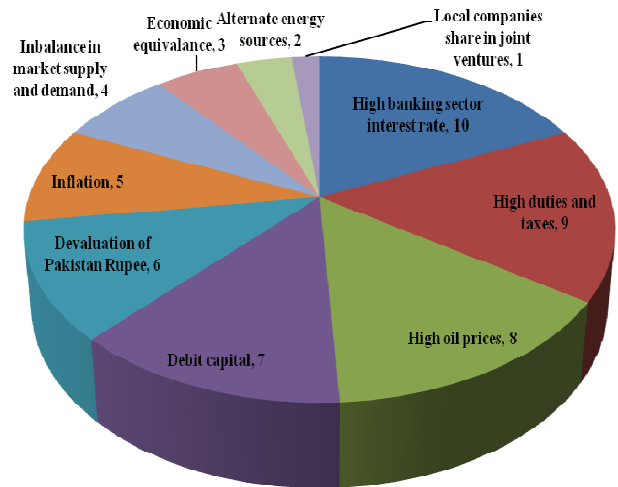


Fig-3: Economical constraints rated by stakeholders in BOT projects success

Banks and insurance companies are key financial sponsors of BOT projects. The present interest rate (above 15%) charged by the banking system of Pakistan for financing a BOT project is one of the maximum in the world in comparison with less than 1% interest rate charged by banks in developed countries i.e USA, Japan, China etc. The high values of interest rate employed in Pakistan lessen the attention of foreign owners and contractors cum consultants in Pakistan to participate in BOT projects. However, from sponsor's perspective they found BOT projects in Pakistan highly viable. The duty and tax rates charged in Pakistan on import of construction machinery and plants are quite high in comparison with India, China, UAE, Bangladesh and Srilanka. Today in the race of international competition various countries like China, UAE, Turkey have provided tax free system to gain attention of local and foreign owners and contractors cum consultants in their countries. Thus, in these circumstances high duties and taxes is one of major constraint in success of BOT projects. The high oil prices, devaluation of Pakistan Rupee and in balance in supply and demand are other crucial economic constraint in BOT projects success. The budgetary elements involve in economic equivalence, alternate energy sources and establishment of joint ventures have lesser influence in success of BOT projects in Pakistan.

Figure 4 presents summary of social constraints in success of BOT projects identified by the stakeholders with respect to their respective impacts.

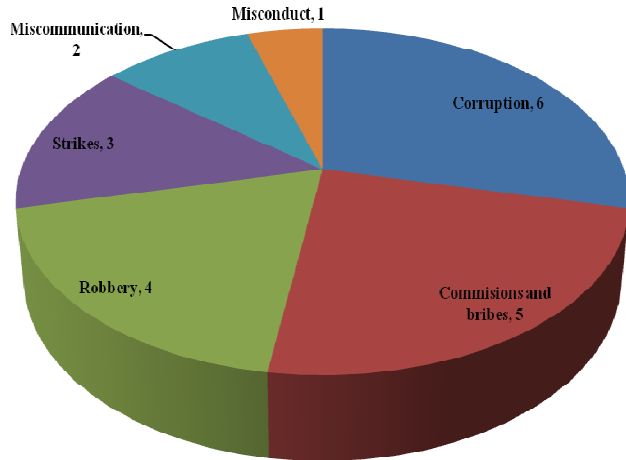


Fig-4: Social constraints rated by stakeholders in BOT projects success

In society of Pakistan, corruption followed by commission/bribes, robbery and strikes are vital social constraint in achievement of BOT projects success in Pakistan. The social constraints arising from personal gestures like miscommunication or misconduct has lesser influence in success of BOT projects.

Figure 5 shows summary of technological constraints in BOT projects success in Pakistan identified through stakeholders with reference to their respective impacts.

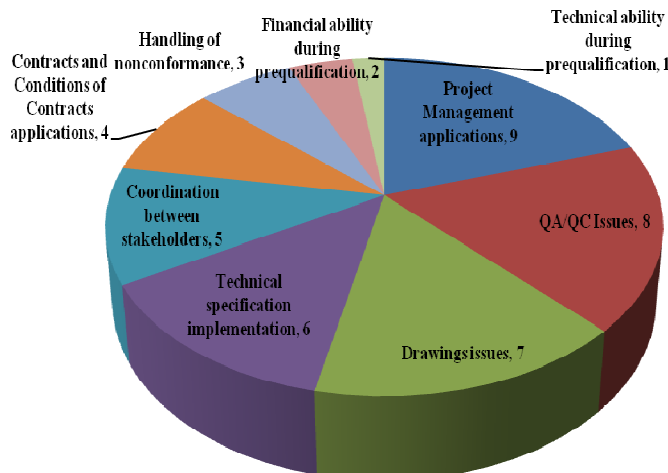


Fig-5: Technical constraints rated by stakeholders in BOT projects success

The insufficiency of project management applications in Pakistan is leading technological constraint in BOT projects life cycle as shown in Figure 5. The prerequisite of BOT projects management is to achieve the projects scope and budget within allocated time. However, the research has shown that issues originating from quality assurance/control, drawings, technical specifications, coordination and contracts play major hurdle in success

of BOT projects implementation. The possible reason is the inexperience of stakeholders in execution of BOT projects in Pakistan. The impact of constraints like nonconformance or prequalification (technical and financial) does not play any significant role in the success of BOT projects.

Figure 6 presents summary of physical constraints in success of BOT projects identified by the stakeholders with respect to their respective impacts.

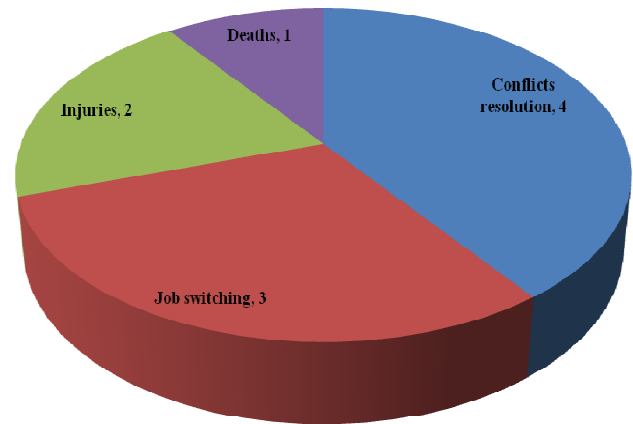


Fig-6: Physical constraints rated by stakeholders in BOT projects success

It has been observed that conflict resolution and switching of jobs by human resource of the stakeholders are two prominent constraints in the success of BOT projects. Both of these physical constraints in society of Pakistan can be attributed to the psychology of the human resources as well as lack of professionalism. The identified physical constraints like occasional injuries or deaths of human resources do not have significant influence in the success of BOT projects.

Figure 7 shows summary of ecological constraints in BOT projects success in Pakistan identified through stakeholders with reference to their respective impacts.

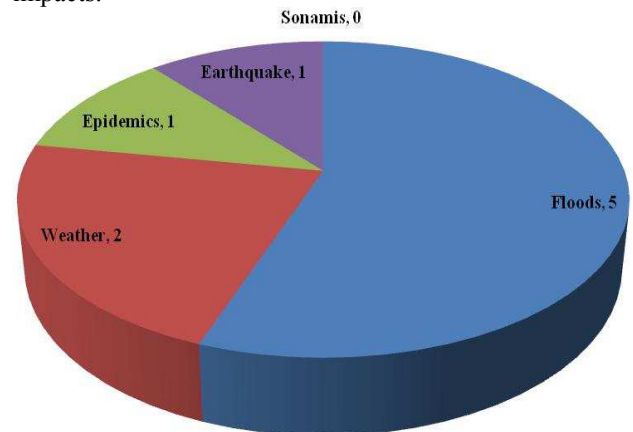


Fig-7: Ecological constraints rated by stakeholders in BOT projects success

It has been found that the seasonal floods are the only significant ecological constraint in the success of BOT projects in Pakistan. Rest of the identified constraints like weather, epidemics or earthquakes does not play major role in the success of BOT projects in Pakistan.

Based on the findings of above discussion it can be narrated that the political and economical are the leading constraints in adoption of BOT projects in Pakistan. Both these constraints were further analyzed based on effectiveness and criticality rating system using criteria established in Table 3.

Table-3. Rating system for criticality/effectiveness of political and economical constraints

Rating Score	Criticality	Effectiveness
0	Not Applicable	Not Applicable
1	Not Critical	Not Effective
2	Fairly Critical	Fairly Effective
3	Critical	Effective
4	Very Critical	Very Effective
5	Extremely Critical	Extremely Effective

Figure 8 shows a comparative analysis between criticality and effectiveness of political constraints in adoption of BOT projects in Pakistan using rating system of Table 3.

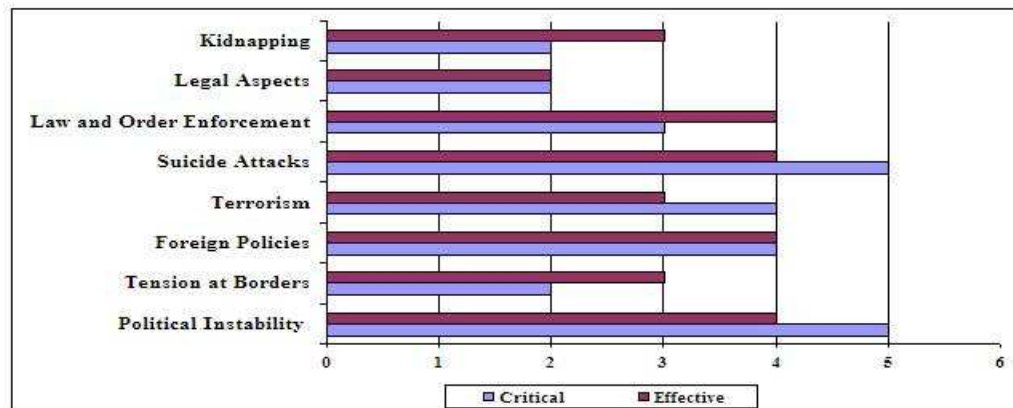


Fig-8: Critical and effectiveness rating of political constraints of BOT Projects in Pakistan

The trend found in Figure 8 narrates that political instability & suicide attacks can be rated as major political constraints in term of criticality and law/order, suicide attacks, foreign policies & political instability can be rated as major political constraints in view of effectiveness.

Figure 9 presents an analytical comparison between criticality and effectiveness of economical constraints in adoption of BOT projects in Pakistan using rating system described in Table 3.

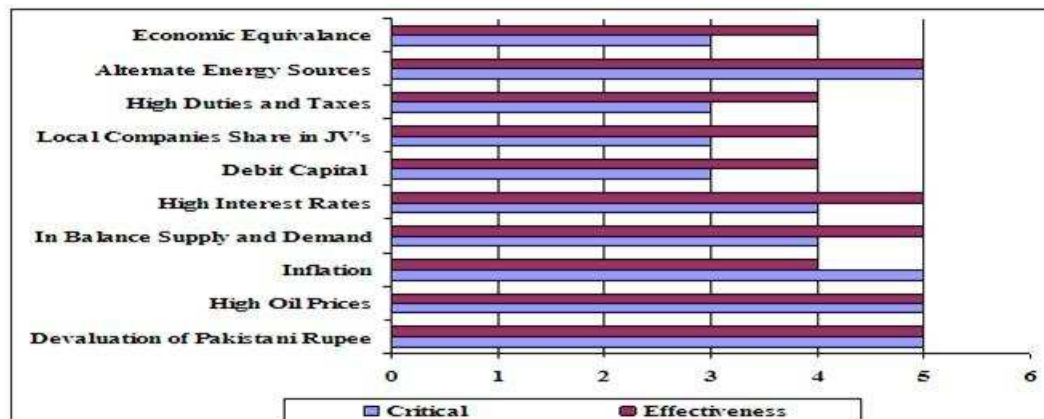


Fig-9: Critical and effectiveness rating of economical constraints of BOT Projects in Pakistan

Figure 9 depicts that devaluation of rupee, high oil prices, lack of alternate energy resources can be rated as major economical constraints in term of criticality. The inflation, devaluation of rupee, high oil prices & lack of alternate energy resources can be rated as major political constraints in view of effectiveness.

Conclusions: The concept of BOT in Pakistan is still new, so it should be introduced to the construction industry and organizations in Pakistan through presentations, lectures, seminars etc. Further, the success factors of BOT projects based on the international case studies and research should be brought in the information of Employers launching BOT projects.

The stakeholders of successfully commenced BOT projects should be referred to others for the sharing of the success experience. In addition, the benefits earned from the BOT projects should be highlighted in media to gain the attention of local and foreign investors.

The political and economical are most vital constraints faced by stakeholders during planning as well as in construction phase of BOT projects in Pakistan. Therefore, the identified BOT constraints in this research should be addressed by policy makers of Pakistan to encourage the participation of potential BOT stakeholders in future prospective projects. Further, the way out to mitigate the challenges and risks encountered in BOT projects should be established to ascertain BOT future success in Pakistan.

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