|| Volume 2 ||Issue 2 ||Sept 2017||ISSN (Online) 2456-0774
INTERNATIONAL JOURNAL OF ADVANCE SCIENTIFIC RESEARCH
AND ENGINEERING TRENDS

Comparative Study of Public Privet Partnership (PPP) & Engineering, Procurement, Construction (EPC) Contracts

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Abstract— **The purpose of this report is to identify and examine the critical success and failure factors for Public Private Partnership projects (PPP) and Engineering Procurement Construction (EPC) contracts and comparisons between them. The report provides a brief description of PPP and EPC and the area in which it is adopted internationally as well as nationally. Also types of PPP contracts and types of EPC contracts. The success and the failure factors available in PPP and EPC projects will be described and identified. In further study there will be comparison between the PPP and EPC contracting on the basis of different criteria, such as critical success factors and critical failure factors, conditions of contracting, risk allocation in the PPP and EPC construction contracting etc.**

Keywords: *- PPP, EPC, Critical Factors, Safety Measures, Quality Assurance, Critical Issues.*

I INTRODUCTION

PPP (Public Private Partnership):

The idea of cooperation between public entity and private organisation in order to meet the growing needs of society and country has been developing through centuries. The experience gained in the area of PPP clearly indicates that the main reasons for partnerships are risk sharing and the ability of the private sector to deliver, finance, maintain, and operate a project at lower costs than the public sector.

A public–private partnership (PPP) is a government service or private business venture which is funded and operated through a partnership of government and one or more private sector companies. These schemes are sometimes referred to as PPP, P3 or P^3. PPP involves a contract between a public sector authority and a private party, in which the private party provides a public service or project and assumes substantial financial, technical and operational risk in the project.

In some types of PPP, the cost of using the service is borne exclusively by the users of the service and not by the taxpayer. In other types (notably the private finance initiative), capital investment is made by the private sector on the basis of a contract with government to provide agreed services and the cost of providing the service is borne wholly or in part by the government. Government contributions to a PPP may also be in kind (notably the transfer of existing assets). In some other cases, the government may support the project by providing revenue subsidies, including tax breaks or by removing guaranteed annual revenues for a fixed time period.

Important PPP Models

- *Build-Own-Operate (BOO)*
- *Buy-Build-Operate (BBO)*
- *Build-Own-Operate-Transfer (BOOT)*
- *Build-Operate-Transfer (BOT)*
- *Build-Lease-Operate-Transfer (BLOT)*
- *Design-Build-Finance-Operate (DBFO)*

EPC (Engineering, Procurement and Construction)

EPC, which is an acronym that stands for engineering, procurement and construction. It is a common form of contracting arrangement within the construction industry. Under an EPC contract, the contractor designs the installation, procures the necessary materials and builds the project, either directly or by subcontracting part of the work. In some cases, the contractor carries the project risk for schedule as well as budget in return for a fixed price, called lump sum or LSTK depending on the agreed scope of work.

Need for EPC

- Guaranteed Price
- Guaranteed Timeline for Completion
- Specified Level of Performance
- Single Point of Responsibility
- Post-Commissioning Services
- Flexibility and Certainty
- Higher Supervision and Control

Principal Elements of EPC Structure

- Cost, Time & Quality
- Single Point of Responsibility
- Fixed Completion Date
- Performance Specifications
- Monetary Liabilities for Delay/Defaults
- Performance Guarantee
- Defect Liability

II WHY RECENTLY IN NEWS

The Ministry of Road Transport and Highways has decided to adopt the Engineering Procurement and Construction (EPC) mode for National Highways which are not viable on PPP basis. The 12th Five Year Plan envisages construction of 20,000 km of 2-lane National Highways projects through EPC mode.

- The Government has adopted the EPC mode of construction to ensure implementation of projects to specified Standards with a fair degree of certainty relating to cost and time and with a view to enabling a transparent, fair and competitive roll out of National Highway projects.
- The EPC mode is different from the conventional Item Rate Contracts. Experience has shown that such contracts are prone to excessive time and cost over runs.
- The EPC mode assigns the responsibility for investigation, design and construction to Contractors for a lump sum price awarded through competitive bidding, wherein provision for index based price variation is made.
- The new initiative has been adopted to resolve the hindrances in the construction of National Highways on a fast track and to ensure seamless construction of National Highways in the country.
- The Ministry of Road Transport and Highways is entrusted with the responsibility for construction and maintenance of National Highways (NHs) in the country. All roads other than the National Highways in the States fall within the jurisdiction of respective State Governments. In order to assist the State Governments in the development of State roads, the Ministry also provides financial assistance out of the Central Road Fund (CRF) and Inter-State Connectivity and Economic Importance (ISC & EI) schemes.

III CASE STUDIES & OBSERVATIONS

Case Studies

- Four Laning and Strengthening of Pune-Solapur (NH-9) from km. 14.000 to km. 40.000 on Build, operate & Transfer (B.O.T) Basis.
- Six Laning of Pune-Satara Section of NH-4 from km. 725.000 to km. 865.350 (length 140.350 km.) in the State of Maharashtra to be Executed
- Rehabilitation and upgrading to Two-lanes with paved shoulders of the existing road from Km. 101.000 to Km. 161.570 (approximately 60 km) on the End of Malshej Ghat to Start of Ane Ghat section of National Highway No. 222 (new National Highway No. 61) in Maharashtra on EPC Basis.
- Rehabilitation and Up gradation of junction with NH-211 to Manwath (Tadborgaon) section of NH-222 (Km 342.000 to Km 444.000) to 2 Lanes with paved shoulders (Design Length =100. 275 KM) in Maharashtra under NHDP Phase-IV" on EPC basis.

Observations

a) Success Stories

There is no issue like cost over-run or time over-run case study 1 project. The time management was very effective by the concessioner and client was also very co-operative during construction and during the concession period.

Case study 3 is example of good Client-Contractor relationship. Even PWD office (Client) is very co-operative towards the students and civilians.

There are some issues in this project about land acquisition in Gulunchwadi area. Also there is change of scope in this project. Despite of all these issues project is right on time. Respective correspondences are attached in the annexure. These issues could have been avoided if Client have forecasted the same. In spite of that the project is almost 90% successful in all aspects.

b) Failure Stories

The main reason to delay for Case Study 2 project is lack of experience of concessioner. Also the project area is highly governed by the political personalities. This leads to change in scope of the project and ultimately cost and time over-run of the project. This project is still in the construction phase.

Slow speed of work is the major issue of Case Study 4 project. From the conversation with the respective engineer it reveals that concessioner/ EPC contractor misunderstood the project with PPP projects and work like the PPP contracting. This leads to delay in the project. Also the organization is not much helpful in nature as it comes to the record of project. But the main issues can be cleared with the help of Monthly Project Report (MPR).

IV RECOMMENDATIONS

- All this could have been minimized if there was some system to short listing the eligible concessioner depending upon their previous work record and their experience in particular field. Money/Equity is equally important in the short listing criterion but this should not be the only criterion to appoint the concessioner for such big and important project.
- Forecasting of project work should have been done by client before commencing of project.
- If Client- Contractor relations are good then there are more chances of success instead of failure of project.
- These relations can be maintained more in EPC than PPP projects, also there is more transparency in EPC projects than PPP. So in future there should be more EPC projects has to be implemented in India.

V CONCLUSION

- Like every project implemented by government, whether it may be PPP or EPC, each have their particular Strengths and Weaknesses.
- Before the selection of contracting system or method other parameters have to be considered and depending upon them the contracting method should be adopted.
- In the last, whether it is PPP or EPC method of executing the work, the ultimate aim has to development of the nation and its growth.

REFERANCES

[1] Aleksandrs Geroniks, Pēteris Lejnieks; "Critical success factors for private public partnership (PPP) implementation in Latvia"; SSE Riga Student Research Papers 2015 : 11 pp 176-185

[2] Alis Kahwajian, Shukri Baba, Omar Amudi and Mohammed Wanos; "Identification of Critical Success Factors (CSFs) for Public Private Partnership (PPP) Construction Projects in Syria"; Jordan Journal of Civil Engineering, Volume 8, No. 4, 2014,pp 250-270

[3] Ashwin Mahalingam; "PPP Experience In Indian States: Bottlenecks, Enablers And Key Issues", pp 1-8

[4] Ayda Nayer A. Rawash1, Khaled El Hagla and Ali Bakr ; "Heuristic Approach for Risk Assessment Modelling: EPCCM Application; Engineer Procure Construct Contract Management"; Journal of Modern Science and Technology Vol.2 No.1 March 2014,pp 49-70

[5] Christof von Branconi, Christoph H. Loch; "Contracting for major projects: eight business levers for top management"; International Journal of Project Management 22, 2004, pp 119-130

[6] Esther Cheung; "Critical Success Factors For PPPs in Infrastructure Developments: Chinese Perspective"; Journal Of Construction Engineering And Management, ASCE, 2009,pp 1-6

[7] Gepp, Khomul & Vollmar; "Success Factors Of Standardization : An Empirical Study", Annals of DAAAM for 2012 & Proceedings of the 23rd International DAAAM Symposium, Volume 23, No.1, ISSN 2304-1382 ISBN 978-3-901509-91-9, CDROM version, Ed. B. Katalinic, Published by DAAAM International, Vienna, Austria, EU, 2012 Make Harmony between Technology and Nature, and Your Mind will Fly Free as a Bird Annals & Proceedings of DAAAM International 2012,pp 1-8

[8] Jan Píchaa, Aleš Tomekb, Harry Löwittc ; "Application of EPC contracts in international power projects, Procedia Engineering", Creative Construction Conference 2015 (CCC2015)

[9] Joanna Węgrzyn; "The Perception of Critical Success Factors for PPP Projects in Different Stakeholder Groups", Entrepreneurial Business and Economics Review, 2016, Vol.4, No. 2,pp 1-14

[10] Kaher Tahat; "Knowledge Management: Public Private Participation (PPPs) in the Kingdom of Saudi Arabia: “a Case study in water sector”"; Procedia - Social and Behavioral Sciences 147; 2014; pp 527 – 534

[11] Karan Kuma "Public Private Partnership in Indian Railways", Centre of Civil Society, 2007,pp1-4

[12] Mary Beth Corrigan , Jack Hambene, William Hudnut III, Rachelle L. Levitt, John Stainback, Richard Ward, Nicole Witenstein ; "Ten Principles for Successful Public/Private Partnerships Washington, D.C "; Urban Land Institute, 2005,pp1-11

[13] Mohamed A.H.; "Investigating the Critical Success Factors for PPP Projects In Kuwait", 2011,pp 1-8

[14] Timothy J. Murphy; "The case for public-private partnerships in infrastructure"; Canadian Public Administration/Administration Publique Du Canada Volume 51, No. 1 (March/Mars 2008), pp. 99–126

[15] Unknown; "Success Stories and Lessons Learned: Country, Sector and Project Examples of Overcoming Constraints to the Financing of Infrastructure"; Overcoming Constraints to the Financing of Infrastructure; Prepared by the Staff of the World Bank Group for the G20 Investment and Infrastructure Working Group, February 2014; pp 6-12

[16] Unknown; "Analysis of Critical Success Factors (CSFs) and Critical Risk Factors in implementation of PPP road projects in A.P",pp 1-12.

[17] V. K. Srivastava; "Public Private Partnerships in road projects: Critical Success Factors in the Indian context", Southern African Transport Conference (SATC), July 2011, pp 1-8.