



A Review of Water Supply Services on PPP Mode in Maharashtra

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ABSTRACT:-

24-7 supply is achieved when water is delivered continuously to every customer of the service 24 hours a day, every day of the year, through a transmission and distribution system that is continuously full and under positive pressure throughout all of its pipelines and networks. Of course, very occasionally, in times of exceptional circumstances, there may be short interruptions to this continuity of supply. However, any service which routinely fails to provide continuity "24 hours a day, every day of the year" must be considered intermittent. Under PPP water is not privatized but the service is put in private hands. There has been a significant rise in the investments by the private sector in the area of water related service worldwide but in India this sector is new. There are various phases in development of PPP projects, in which different risks come into play. Risk management deals with handling risks involved in projects and it is an ongoing process that continues throughout the life cycle of the concession period of PPP project. In connection with topic of study, various papers available in literature are reviewed. In this study various aspects of risk management will be studied and mitigation of these risks will be done.

Key Words: - Risks, Consequences, PPP, PHEDs.

1. Introduction:-

Government of Maharashtra (GoM) has undertaken "Sujal-Nirmal Abhiyaan" project for up gradation of water systems of small & medium towns under which government insisted various urban local bodies in the state to participate. This ULB improvement program includes funding various municipal councils in the State to increase serviceability of the system. The program comprises of works such as carrying out Consumer survey, water audit, energy audit, providing and

Installing flow meters, Geographic Information System (GIS) development & mapping and hydraulic modeling for towns in

the State. The funds disbursement is planned on a first-come first-serve basis.

2. Objectives of Paper:-

- To identify the factors that contribute towards risk, and study different measures to overcome risk by studying previous projects.
- To identify the Risks associated with Urban Water Supply for PPP.

3. Literature Review:-

Identifying Measures of Effective Risk Management for Public-Private Partnership Infrastructure Projects in Developing Countries, Khwaja Mateen Mazher, Albert PC Chan, Rafiq M Choudhry, Hafiz Zahoor, David J Edwards, Ahmed M Ghaithan, Awsan Mohammed, Mubashir Aziz, Sustainability 14 (21), 14149, 2022 .

The inadequate risk management of public-private partnership (PPP) projects is a principal cause of project distress or failure. This research seeks to identify and empirically validate measures of effective risk management (ERM) in the context of PPPs in a developing country, a subject that has received scant attention in the extant literature. The research is based on a comprehensive literature review, expert interviews and a questionnaire survey. Mean score ranking and factor analysis were employed to rank and group the identified measures, respectively. Tests were performed to determine the respondents' agreement and establish the reliability and validity of the survey instrument. Analysis results indicate that all identified measures are important, are distributed over the entire project's life cycle and exhibit a multi-organizational focus.

Major Findings from the above paper Findings:-

- To identify and empirically validate measures of effective risk management (ERM) in the context of PPPs in a developing country, a subject that has received scant attention in the extant literature.
- The findings will enable a better understanding of factors that influence the quality and outcomes of risk management efforts and promote sustainable infrastructure development via PPPs.

Investment possibility based models for public–private partnerships in water projects, Emad Elwakil, Mohamed Hegab, Canadian Journal of Civil Engineering 47 (4), 461- 469, 2020.

One of the key issues that govern the success to invest is creating prospects for the return of investment. However, this is often hampered by a lack of research in determining the region or the area that has the potential for such a project delivery method, and the ability to repay the loan has not been considered. Developing positive cash flow projects depends on the inclination and ability of the customers to pay for the offered services. The aim of this paper is to (i) investigate the effect of Gross National Income (GNI) and the percentage of the population with access to potable water on selection of candidate countries for public–private partnership (PPP) investment in water projects and (ii) model the relationship between (GNI) and the percentage of the population with access to potable water and candidate countries. Four models have been developed to categorize the countries into investment groups. Data used in this paper, as well as the percentage of their respective populations that have access to potable water, were collected from 195 countries.

Following are the Findings:-

- Investigate the effect of Gross National Income (GNI) and the percentage of the population with access to potable water on selection of candidate countries for public–private partnership (PPP) investment in water projects and (ii) model the relationship between (GNI) and the percentage of the population with access to potable water and candidate countries.
- Model the relationship between (GNI) and the percentage of the population with access to potable water and candidate countries.

Risk management of public-private partnership charging infrastructure projects in China based on a three-dimension framework, Yunna Wu, Zixin Song, Lingwenying Li, Ruhang Xu, Energy 165, 1089-1101, 2018.

As electric vehicles present booming development in China, insufficient supply

of charging infrastructure has become a serious issue which hinders the development of electric vehicles. Under this circumstance, public-private-partnership mode is introduced to attract private capital so as to promote the construction of charging infrastructure. Nevertheless, the public-private-partnership charging infrastructure project, with characteristics of high investment, many participants and long payback period, possesses high risks including political risks, economic risks, technical risks and participants risks for all the project participants. To better implement the project, this paper proposes a risk management framework to control risks.

Findings –

- This paper proposes a risk management framework to control risks. First, a comprehensive risk index system is established using Delphi method.
- a three-dimension model including probability, losses and uncontrollability are employed for risk assessment in which analytic hierarchy process method is used for weight determination and grey fuzzy method is employed for assessment

A SWARA-COPRAS approach to the allocation of risk in water and sewerage public–private partnership projects in Malaysia, Alireza Valipour, Nordin Yahaya, Norhazilan MD Noor, Iman Valipour, Jolanta Tamošaitienė, International Journal of Strategic Property Management 23 (4), 269-283, 2019.

In a situation of growing water demand, inadequate public funding, poor asset condition and lack of maintenance in developing countries, public-private partnerships (PPPs) play an important role in the development of infrastructure, such as water supply and sewerage services. The purpose of this study is to develop a quantitative approach to appropriate risk allocation, with attention directed to the impact of positive and negative factors in water and sewerage projects. The paper presents a hybrid SWARA-COPRAS approach to examine risk allocation, particularly for PPP water supply and sewerage projects in the context of Malaysia.

Findings –

- The paper presents a hybrid SWARA-COPRAS approach to examine risk allocation, particularly for PPP water supply and sewerage projects.
- The proposed method enables decision makers to utilize qualitative linguistic terms in the allocation of risk between the public and private sector, and to select the best strategy for risk allocation in a contract.

A holistic review of research studies on financial risk management in public–private partnership projects, Isaac Akomea-Frimpong, Xiaohua Jin, Robert Osei-Kyei, Engineering, construction and architectural management, 2020 .

Globally, the management of financial risks has gained much attention in the public–private partnerships (PPP) market in recent years. Existing studies rank financial risks among the topmost risk factors that determine the success or failure of a PPP project. As essential for managing financial risks, a

systematic review of previous studies on financial risk management of PPP from 1995 to 2019 (inclusive of both years) has been presented in this paper. Design/methodology/approach -The paper undertakes a systematic analysis of 49 relevant and available studies on financial risk management of PPP projects.

Findings from this paper are as:-

From the results, high-interest charges, increased construction costs and increased market risks are some of the key financial risks hampering the success of PPP projects. Techniques used to assess financial risks include Monte Carlo Simulation (MCS) and Net Present Value (NPV). Financial risks control adopted by project managers include minimum revenue guarantee and real option pricing. Extremely limited studies on financial risk management in PPP projects in developing economies was revealed.

4. PPP in Urban Water Supply in India:-

4.1 Water Supply Sector in India:-

In India, urban water supply services in the country are largely managed at the level of the state government and local governments. The water supply services are managed by either one of the following institutions, i.e., state-level Public Health and Engineering Department (PHEDs), Urban local bodies (ULBs), or city level water supply. The entire water system from source to the consumer end is managed by one of these agencies. Water services can be unbundled into several components, including raw water production and treatment, bulk water supply and retail distribution.



Source Augmentation



Water Treatment



Storage Reservoir



Distribution

Figure1:- Value chain of the water supply sector

The entire process represented in above figure 1 is referred to as the value chain for water supply services. The unbundling of water supply services is being increasingly experimented with such as

- Separating waste water responsibilities from water supply.
- Separating bulk water production and treatment from water distribution, or waste water treatment and discharge from collection.
- Separating water transmission from distribution.

4.2 Trends of PPP in the water supply sector in India

In our country the need for water supply and sanitation services is increasing day by day due to increase in population. The water supply services are managed by the state and local governments. The overall services provided in the country for this sector are very inadequate. There are large infrastructural gaps and the operations of the water supply have high levels of inefficiencies. The per capita availability of water in most urban centers of the country is

lesser than what is needed. Only 50% of the urban population is directly connected to the distribution network. The existing infrastructure suffers from high degree of operational inefficiencies. Approximately 40-50% of the water pumped into the system is not available for consumption, since it is lost in transmission and theft. On an average only 24% of all connections in the country are metered. Due to poor collection practices by the utilities have resulted in low cost recovery rates at 20-30% of operation and maintenance (O&M) cost. The cost of production of these services is too high as compared to the low level recoveries resulting in limited fund availability with service providers for routine maintenance. This eventually causes poor infrastructure coverage poor access and low quality of services. Additionally the service providers have been incurring huge losses on their services.

The improvement in the service delivery levels have implied huge investments for augmentation, improvements in physical infrastructure, and significant scaling up of operational efficiencies in the system. In order to meet both these requirements, various ULBs and parastatal agencies in the country have explored the option of PPP for both the development of infrastructure and operation and maintenance of the same. PPP efforts made in the country have met a different degree of success. While some of the PPP initiatives completely failed, there have been recent instances of successful implementation of the same.

4.3 Need for PPP:

Governments in most developing countries face the challenge to meet the growing demand for new and better infrastructure services. As available funding from the traditional sources and capacity in the public sector to implement many projects at one time remain limited, governments have found that partnership with the private sector is an attractive alternative to increase and improve the supply of infrastructure services.

Due to lack of government funding it has been the main reason for considering PPP option for a project. However, lack of government funding may not be the main reason for deciding a PPP option for the implementation of a project. There are additional costs for PPP projects – usually the cost of borrowing money is higher for the private sector than for the public sector and there are administrative costs for the management of PPP contractual regimes. Transaction costs of PPP projects are also substantial. PPP projects may also impose many explicit and implicit liabilities on the government.

5. Urban Water Supply Sector Risks for PPP:-

Following are the various types of risks associated with the Urban Water Supply for PPP

5.1 Institutional Risks

5.1.1 Consequences of Policy Risk

Vested political and business interests

Influence the focus of policy. Policy decisions to source water from surface water and groundwater can create opportunities for corruption from the construction of treatment plants and procurement of chemicals. Policies that fail to study connection fees and tariffs for low income households can hamper the Poor's access to piped water supply.

5.1.2 Consequences of Legal Framework

The absence of a legal framework for managing contracts, along with ill-defined responsibilities and risk-sharing arrangements, can pose corruption risks.

5.1.3 Consequences of Regulation

Lack of capacity to balance the needs of customers and the industry can weaken the sector's viability. Repetitive procedures for obtaining clearances have no time limit for the final decision. These can work against efficiency and provide opportunities for staff to ask for bribes.

5.2 Organizational Risk

5.2.1 Consequences of Planning

Absent or inefficient water delivery arising

From inadequate planning can result in the purchase of expensive water from water providers. Limited capacity for informed participation by customer groups, industry and professional associations, and other civil society organizations in sector planning processes can weaken responsiveness of sector plans

5.2.2 Consequences of Financial Management

Inadequate financial management capacity (Computerized planning, executing, monitoring, and reporting) in sector agencies and utility companies can impair sector performance and optimal resource uses. Unpredictable budget execution can lead to unplanned reallocations and reduce resources available for priority expenditures.

5.2.3 Consequences of Procurement Planning

The absence of procurement professionals and competent engineers can lead to loose contracts, legal disputes, and non-delivery of Services. Technical specifications suit favored contractors, which can preclude competitive procurement. Large capital projects present opportunities for large-scale procurement, which can create vulnerability to leakages when transparent procurement processes are not used.

5.2.4 Consequences of Human Resources

Conflict of interest with regard to staff appointments, especially senior level appointments with decision-making authority for the sector, can interfere in the performance of staff duties and lead to actions that favor certain contractors and political patrons. Corruption allows promotion of unqualified personnel.

5.3 Sector Operations

5.3.1 Consequences of Water Harvesting & Storage:-

Poor water reservoir management that leads to inefficient and unreliable water supply can provide opportunities for corruption.

5.3.2 Consequences of Water Treatment

Lack of compliance with water quality Standards and ill-maintained water treatment facilities can provide opportunities for water utilities and wastewater companies to bribe law enforcers in return for ignoring such violations.

Diversion of inputs such as chemicals for water treatment for resale or other unauthorized uses can provide illegal income for utilities personnel.

5.3.3 Consequences of Distribution

In return for side payments, pumps or tanks are located where they benefit the elite and other favored groups. Preferential treatment by water utilities leads to inequitable access to water supply. Private vendors preserve their monopoly over provision of water supply to specific

5.3.4 Consequences of Customer Interface

Water connection: Undue connection delays can provide opportunities for utility staff to ask for bribes to install water connections. Utility staff may also ignore or conceal illegal connections in exchange for side payments from customers.

Meter reading: Meter tampering and broken meters seals can pose risks from inaccurate billing of used water supply and provide opportunities for corruption.

Payment & correction of Bills: A high incidence of billing disputes or bill corrections can create opportunities for bill collectors to extract side payments.

Repair service: Poor maintenance of complaints records and undue delay in attending to complaints can push customers to pay unofficial fees to hasten resolution of complaints.

Meter installation and replacement: Delays in installing water meters and replacing defective meters can provide avenues for consumers to offer side payments to utilities personnel in return for a flat water consumption rate for a prolonged period.

Disconnection: A high level of receivables and defaults in bill payments can contribute to corruption risks.

Reconnection: Delays even after rectification of cause for disconnection can provide opportunities to extract bribes from customers in return for preferential treatment in the restoration of water supply.

In order to calculate the cost of each risk, it is first necessary to quantify the consequences of that risk. The identification of consequences of risk needs an intensive investigation. Separate workshops for the consequences are recommended for identification of risks themselves.

Conclusion:-

From this paper it can be understood that the need for water supplies services is increasing. The existing infrastructure has high operational inefficiencies. To improve this scenario several PPP initiatives are being planned and proposed in the water supply sector from mid-1990 to late 2000. This initiative further led to successful implementation of ongoing and projects in the recent past. The current trend shows that the center and the state governments are encouraging and promoting development of water supply services on a PPP mode. There are various benefits of PPP projects to public sector, private sector and general public. A suitable PPP structure can be determined and implemented successfully if step-by-step steps activities described above are undertaken throughout the process and then put into operation. The in-depth study of Consequences with respect to Institutional Risks, Organizational Risk and Sector Operations has been studied.

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