



INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X

Impact factor: 4.295

(Volume 3, Issue 6)

Available online at www.ijariit.com

Financial Modeling of Public Private Partnership in Wastewater Treatment

Anas Mehmood

Student

Azad Institute of Engineering and
Technology, Lucknow, Uttar Pradesh
anasmehmood97@gmail.com

Amit Yadav

Student

Azad Institute of Engineering and
Technology, Lucknow, Uttar Pradesh
amity592@gmail.com

Aquib Anwar

Student

Azad Institute of Engineering and
Technology, Lucknow, Uttar Pradesh
aquibanwar513@gmail.com

Anand Singh

Student

Azad Institute of Engineering and Technology, Lucknow,
Uttar Pradesh
anandsingh94as@gmail.com

Maaz Allah Khan

Assistant Professor

Azad Institute of Engineering and Technology, Lucknow,
Uttar Pradesh
maazallah@rediffmail.com

Abstract: This article basically determines the assets in which water resources are polluted the environment by anthropogenic sources like agricultural and household formation. As matter of fact, Public think that the environmental impact of wastewater pollution has increased day by day many conventional wastewater treatment techniques like chemical adsorption. Hence the activated sludge is applied to remove the pollution but there are still some limitations which have high operation costs. The use of waste water treatment in public and private works as a different medium is receiving increased interest so that its low operation and maintenance costs. As per as the water treatment is concerned it is easy to have a good effectiveness and ability for degrading contaminant. Hence, this paper reviews is the use of waste water treatment technologies to remove contaminants from wastewater like a high oxidant which represent the main pollutants in wastewater as per as a financial modeling of the public private partnership of wastewater treatment.

Keywords: Financial Modeling, Wastewater Treatment.

INTRODUCTION

Basically, the water treatment system is low utilized to treat and dispose of household wastewater in public and private sections where sewerage systems contain the loop and the system are unavailable. Septic tanks, aerobic treatment units, and toilet are mostly used in the sectors. As matter of fact, On-site wastewater treatment systems are a cost effective and long term option for meeting public health and environmental health goals. If we assume approximately 200 L of wastewater per day a total of approximately 31 tons of nitrogen 8.4 tons of phosphorus and faecal coliform organisms will be discharged then nutrition and pathogen will go into the atmosphere.

Impacts on Environmental and Public private Health

- As matter of fact environmental impacts due to nutrients that may disrupt ecosystem balance
- Poor performance of sensitive water bodies and create algae
- The failure in causes of streams, lakes, rivers, wetlands, and groundwater contamination due to the release of nutrients and pathogens into the environment
- Resultant if failing the onsite public and private water treatment is degradation of soil and water quality.
- Hence feasibility, procurement, implementing the resource plays a vital role as per as the treatment procedure is concerned.

The Outputs of Municipal Treatment of Water in Public and Private Modelling

Many technologies will offer to compliment a complete treatment solution:

- Meet the water demands of a growing population
- The Output threat which will diminish the sources Of available fresh water supplies
- Basically, Water confidence treat challenging source of water in regulatory requirements
- We Provide high performance water treatment at the lowest life-cycle cost

Process of Public Private Partnership Financial Model

- The Leaders will be allowed for long term changes
- And Investors had to calculate the values of their investment
- Budgeting tool off taker will calculate the refinancing gain
And termination sums.

Another Effect of Public or Private Structures in Wastewater Treatment

- On the basis of design and construction
- Public or private structures, wastewater services have to effect with different framework conditions as regards planning, construction, financing, and operation.
- In recent years there has been a push for privatisation on the water sector
- High performance and efficiency is not the legal or organisational form
- Major areas of other related tasks are reviewed as well as water treatment also

Types of Concessions in Private Public Modelling

- BUILD OPERATE TRANSFER
- The Private investors are provided good concession finance and its maintenance.
- On the basis concession time, the investor collects tool from users as a return to their investments
- In the end, facility is transferred to the public authority
- BUILD OWN OPERATION
- It is basically similar to a operate transfer but their ownership is condition work in a regular manner.
- BUILD TRANFER THEN OPERATE
- The private sector parties build a facility
- They transfer it to the public authority after the construction of water treatment programme.

- **PUBLIC PRIVATE PARTNERSHIP WATER TREATMENT SOLUTIONS**
- Cost of insurance directly related to the prevailing cost + contingency amounts
- Deduction and excess will refer who contribute to the water treatment pays
- Insurance market capacity and market participants will be considered as solutions

- **EQUIPMENT USED IN THE TREATMENT**
- The laboratory scale waste water treatment plant is designed for 50 lit/hr capacity and restricted four steps such as primary settling with cascade flow of water which has 20 liters capacity, aeration has 20 liters tank capacity whereas agitation has also 20liters and filtration unit of 20 liters.

Profile and assets network used in financial modelling of water treatment

- Sewage treatment plant and network
- Power plants water desalination plants
- Bridges road streetlights & signs
- School hospital govt. buildings

Headers of PUBLIC PRIVATE PARTNERSHIPS MODELING

- If we increase the public debt then 100 probability is funded initiative emerged and this will affect all the private sector of sanitation.
- As matter of fact, momentum is the only prospectus which will lead the distribution between public and the private sanitation
- The public private partnership provides the facility which could be more efficient for the infrastructure sector like rail transport, hospitals, airports etc.

Steps related to Risk used in the financial modelling of public private water treatment

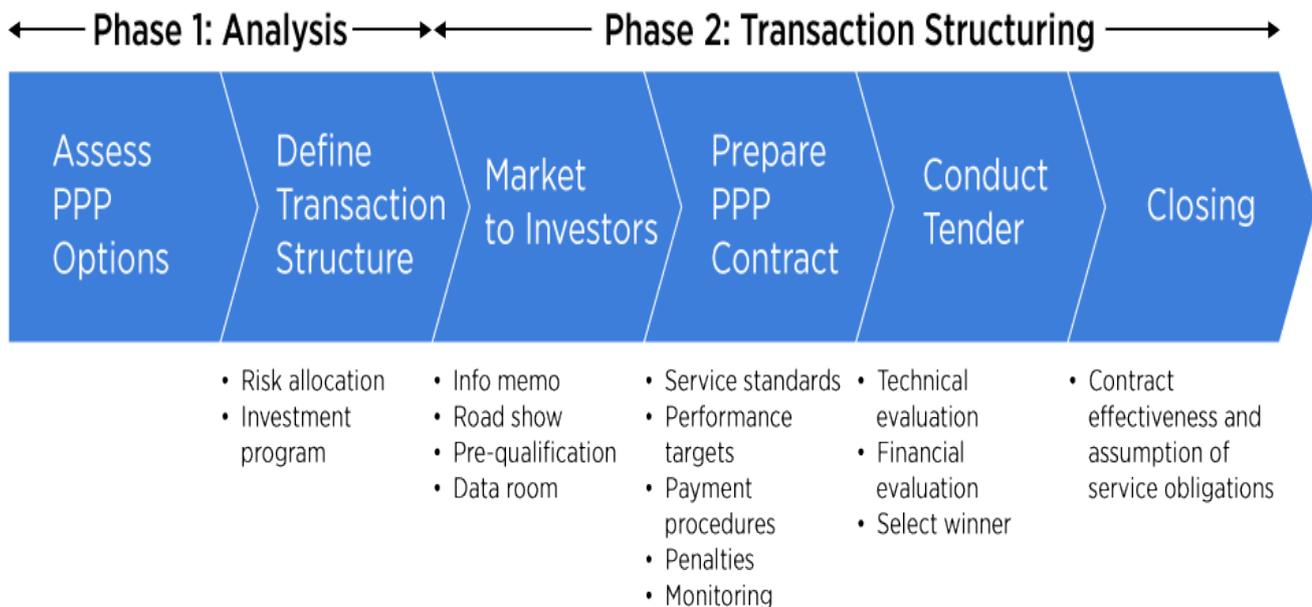
- POLITICAL AND LEGAL RISK- basically it depends on government with some rules and their guarantees.
 - Depends on civil disturbance or act of war or forces
 - Change of government policy
- TECHNICAL RISK- these are the risk which will concatenate the behaviour of construction which deals the quality of water quantity of water cost and delay etc.
- COMMERCIAL RISK- it will arise because of the uncertain demanding level due to the possible improvement for consideration of infrastructure.
- ECONOMIC OR FINANCIAL RISK- this is affected due to the economic growth and population risk of interest rate exchange rate etc. some changes cannot use due to the private sector circumstances

Settlements of Sampling

- As a matter of facts, the Municipal wastewater treatment will be collected about 40-50 cm below the ground level as matter of fact the collection of surface impurities like oils then Before sampling, 30 L polythene bottles will be rinsed at 0.1N of chromic acid, then washed 2 times with distilled water. A separate sample will be collected in bottle to measure the Dissolved oxygen.

Waste water sampling

- Basically, the wastewater has been collected in different cities and the canals at which the surface water quality changes as season to season and it will easily pollute. Due to this samples were collected from canals throughout the year on a monthly basis. Samples were collected during the first week of each month approximately between 7.30 am to 8.30 am but in a condition of clean plastic bottle sand brought to the laboratory for analysis.



Remedial conditions, construction and the operations which effect of public or private structures in of wastewater treatment plants

- Organised in public or private structures, wastewater services have to cope with different framework conditions as regards planning, construction, financing, and operation.
- Basically, this leads quite often to different modes of management. In recent years there has been a push for privatisation of the water sector in general
- Hence reasons for which are manifold, ranging from access to external know-how whereas capital to synergistic effects through the integration of wastewater treatment into other tasks of similar or equal nature.
- As we Discussed are various models of public/private partnership (PPP) in wastewater treatment, encompassing, for example, the delegation of partial tasks or even the proportional
- The entire transfer of ownership of treatment facilities to private third parties.
- Decisive for high performance and efficiency is not the legal or organisational form
- As matter of fact but rather the clear and unmistakable definition of tasks which are to be assigned to the different parties

- The customers and all other partners involved, as well as of clear-cut interfaces.
- On account of the (of course legitimate) profit-oriented perspective of the private sector
- Basically, some decision-making processes in relation to project implementation (design and construction) and to operational aspects will differ from those typically found in the public sector.
- This only applies to decisions on investments, financing and on technical solutions too.
- On the other hand, core competencies in wastewater treatment should not be outsourced, but remain the public bodies' responsibility, even with 'far-reaching' privatisation models.
- Such core competencies are all efforts geared to sustainable wastewater treatment as life-supporting provision for the future
- As a contribution to the protection of health and the environment and to the development of infrastructure.
- Basically Major areas of wastewater treatment and other related tasks are reviewed. The paper concludes with a list of questions on the issue of outsourcing.

Studies of Public Private Partnership: Tripura Water Project

The Challenge

- In the small, industrial town of Tripura, located in the Coimbatore district of Tamil Nadu, the textile industry has rapidly expanded over the past decade.
- It is currently the largest exporter of knitwear in India and accounts for 75% of India's knitwear exports.
- This burgeoning textile industry faced a number of challenges in further enhancing its competitiveness in the market.
- It is Essential requirements such as steady water supply, good sewage systems, and adequate infrastructure were a distant dream, and the lack of these requirements acted as a barrier to the expansion of this industry.
- The growth of leather and textile industries resulted in huge demand for water which could not be met in a water scarcity region.
- Besides, discharge of effluents contaminated ground water.
- As the industries caused pollution to the needed water, the resulted depletion of ground water forced industries and local communities dependent on water tanker facility.
- Basically, In the meantime, the absence of water treatment facility deteriorated the ground water quality.

The Public Private Partnership (PPP) Modeling

- In 1990, after Tripura Exporters Association (TEA) and the people of who live that side. The government of Tamil Nadu gives this water supply project at cost Rs.4, 000million.
- Due to financial problem of water resource the project had to convert on the public private partnership with Infrastructure Leasing & Financial.
- In August 1994 an organisation was signed between the government of Tamil Nadu TEA, which laid format for the formulation, development, and implementation of that project.
- According to a report "the first integrated water supply proposed to be a contraction in India at water sector."

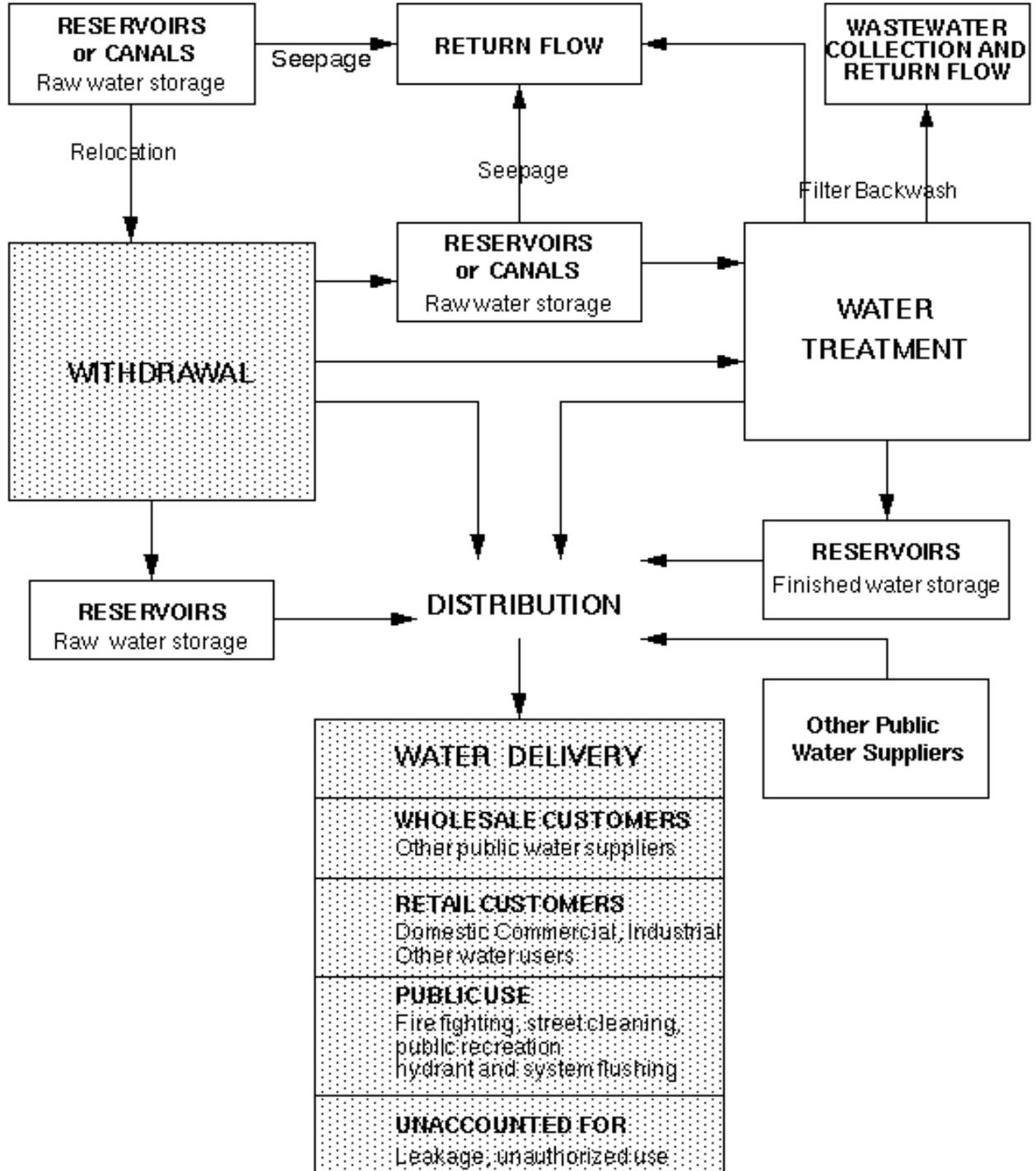
Research Studies and the Back Theory of the Project

It is very much beneficial that the role of IL&FS, a private company, was to ensure the development of the project, by conducting and documenting studies, implementing frameworks and procedures, making institutional arrangements and proposing financial strategies to undertake the project

During the process of developing the project, TEA, IL&FS along with the Government of Tamil Nadu made the New Area Development Corporation Ltd. (NTADCL) the lead agency for the project.

- The scope of the project has to be cover water and waste water treatment and was split into three different contracts:
- As matter of fact, the two contracts were given to an engineer, procure and construct (EPC)
- Basis and one on operating as well as manage (O&M) basis. With respect to water supply
- This scheme was designed to supply and meet "an ultimate demand of 126 million litres of water per day (MLD) from industries and 93 MLD from households".
- A water treatment plant was constructed and distribution systems were put in place to ensure an efficient distribution of water.
- The project also takes the provision of the tertiary treatment facility to treat domestic sewage so it can be reused or recycled.

- The construction of the water treatment plant began in October 2002, and the majority of mechanical work was completed by December 2004.
- Hence it was finally made operational in February 2006 because of delay due to flooding.
- With respect to an improved sewage system, it comprised of a collection system, pumping stations
- Two sewage treatment plants and basic sanitation facilities such as septic tanks and water closets.
- The sewerage system aimed to serve 639,500 inhabitants of the town by 2030.



Consumptive use occurs as evaporation from open reservoirs and conveyances. Reservoirs include open and covered reservoirs, tanks and towers.

Unique Aspects of the Project

- First Water & Sanitation Project in the country to be implemented in a PPP format.
- First water project in India to be funded on a Project Finance, non-recourse basis.
- Largest private investment in the Urban Infrastructure sector.
- Leverages State support by 19 times (Rs.550 million of state financing helps raise over Rs.10000 million for the project).
- Provides a viable model for implementing other projects in the sector.
- Tamil Nadu is the first State in the country to set up a PPP based institution in the sector, namely Tamil Nadu Water Investment Company.

Beneficiaries of the Project

- Industries – 115 MLD
- TM Domestic – 33.7 MLD
- Way side Villages – 36.3 M
- 192 Rural habitations served – 4,50,000 (2001 population census)
- Tripura Municipality – 4,50,000 (2001 Population census)
- Industrial Units covered – 900
- Households with Sewerage Connections – 22,300 (2005) / 31,000 (2014) □ Way side Villages – 36.3 M

Important Beneficiaries of Project

- Tripura Municipality – 4,50,000 (2001 Population census)
- Industrial Units covered – 900 ANΔ Households with Sewerage Connections – 22,300 (2005) / 31,000 (2014)



REFERENCES

1. Er. Maaz Allah Khan, Head of Department(civil), Azad institute of Engineering and technology
2. BOOK MRAK.OGI
3. Water Quality & Treatment: A Handbook on Drinking Water (Water Resources and Environmental Engineering Series), by American Water Works Association (Author), James Edzwald (Author).
4. MWH's Water Treatment: Principles and Design, by John C. Crittenden
5. www.wikipedia.org
6. www.circ.in
7. Fundamentals of Water Treatment Unit Processes: Physical, Chemical, and Biological, by David Hendricks,
8. Water Quality & Treatment: A Handbook on Drinking Water (Water Resources and Environmental Engineering Series), by American Water Works Association (Author), Wastewater Engineering: Treatment and Resource.
9. Handbook of Water and Wastewater Treatment.
10. Technologies by Nicholas P. Cheremisinoff.
11. Water Chemistry. By Snoeyink and Jenkins.
12. Director of Tirupur waste water treatment plant.