



Hybrid Annuity Model (HAM) for Sanitation

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Report

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The paper provides the brief overview of Hybrid Annuity Model as an emerging public-private investment model in sanitation sector. It describes the emergence of HAM in the Road and Transport sector and then discusses its emerging use in the sanitation sector. It summarizes advantages and challenges in adopting this model in the sanitation especially FSSM sector.

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1. Hybrid Annuity Model (HAM) for Sanitation

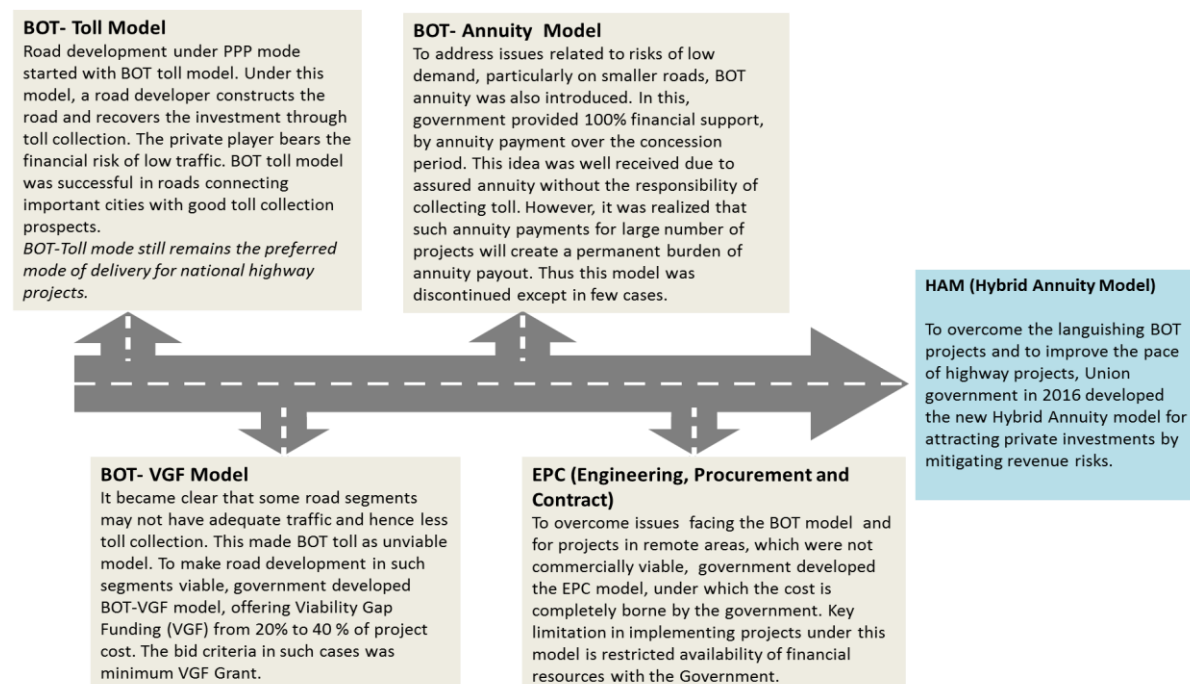
In recent years, Government of India has placed great emphasis on sanitation. While many city and states have become ODF, there are significant infrastructure gaps in transport and treatment of waste in our cities. The government faces the challenge of mobilizing adequate financial resources. While the private sector is actively involved in emptying and transport of waste, there is an absence of private sector involvement in funding the treatment infrastructure. The Government of India, with aim of reducing infrastructure gap in treatment system and leveraging private investment, has adopted a new approach of Hybrid annuity Model (HAM) to set up Sewerage Treatment Plants (STPs) in Varanasi and Haridwar under the Namami Ganga Programme.

This paper reviews the potential of Hybrid Annuity Model for the sanitation sector. It describes the emergence of HAM in the Road and Transport sector and then discusses its emerging use in the sanitation sector. It summarizes advantages and challenges in adopting this model in the sanitation sector.

2. What is Hybrid Annuity Model (HAM)?

HAM has emerged as a mix of the previous models – BOT-Annuity and EPC Model. The Government pays 40% of the capital cost of the project during the construction period and 60% of the payment is paid as annuities along with interest over the operation period. Initial payment of 40% is made in equal installments during construction phase, whereas the remaining 60% is paid as an annuity amount over the Operation and Maintenance period of 15 years. The developer will also receive O&M payments bi-annually along with annuity payments. This new model reduces the financial risks on the concessionaire during project implementation phase. Compared to the EPC projects, the shift to HAM would also ease initial cash flow pressure on the government (MORTH, GoI, 2016). The diagram below shows how the various PPP models have been evolved in the transport sector.

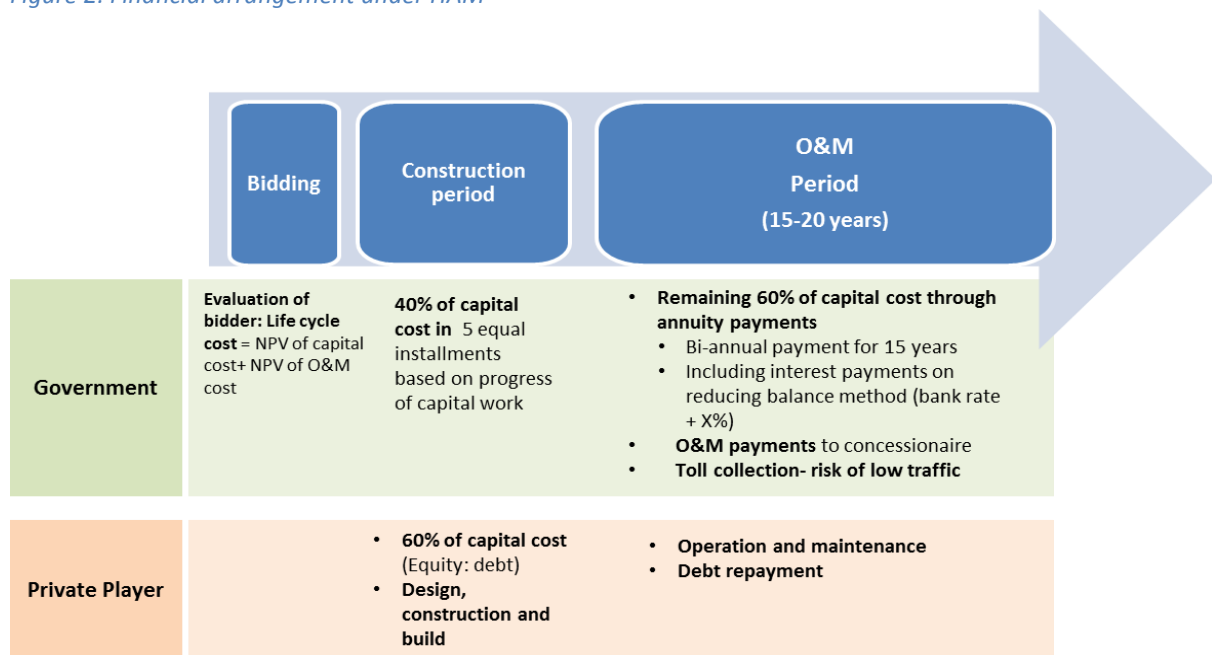
Figure 1: Different PPP models in highway development



2.1 Key features of Hybrid Annuity Model (HAM)

- **Bid Parameter:** Life cycle cost of project = Net Present Value(NPV) of the project cost + NPV of O&M cost for the 15 years concession period
- **Revenue collection and O&M payments:** Toll collection is the responsibility of government and O&M payment will be made to the concessionaire which will be inflation indexed.
- **Secured cash flows in form of annuity payments:** Bi-annual annuity payment is made by government for 15 years including interest payments (@ Bank rate + x%) on reducing balance method and agreed O&M.
- **Risk Allocation:** Private partner bears the construction and maintenance risks as in BOT (Toll) projects. Government bears all the revenue/traffic risk as well as the inflation risk.
- **Sharing of Capital cost:** 40% of the bid project cost shall be payable to the concessionaire by the authority in five equal installments linked to physical progress of the project. Concessionaire has to initially bear the balance 60% of the project cost through a combination of debt and equity.

Figure 2: Financial arrangement under HAM



Till 2018, total of 52 National highway projects with aggregate length of around 3200 Km and involving cost of around Rs. 51,800 crores have been already awarded through this model. (MoRTH, GoI, 2018, p. 14). Lately, Maharashtra government has decided to tweak the HAM model to make it more attractive for contractors to bid for projects. Under the revamped model, the government has said that it would release 60% of the funds in the first two years instead of the earlier 40%, and the payment tenure for the rest amount has also been cut from 15 years to 10 years. In October 2017, the Maharashtra cabinet cleared a move to construct around 10,000 Km of roads under a revamped HAM model. (The Economic Times, 2017)

3. From Transport to Sanitation HAM

The success of hybrid annuity model in the transport sector has influenced the government to adopt HAM in sanitation sector as well. The existing mechanisms of financing projects in sanitation sector have not yielded desired results with over designed infrastructure, ineffective and unaccountable O&M of the assets resulting in discharge not complying with prescribed effluent standards. Thus the need was felt to implement new financial model that will improve resource allocation and ensure performance, efficiency and sustainability in new sewage treatment projects.

The hybrid annuity model has been taken up under the National Mission for Clean Ganga (NMCG), Government of India for setting up sewerage treatment projects. This financial model was taken up as part of PPP Project to ensure long term financial sustainability of projects and also to ensure long term O&M of STPs.

Under this model, the development, operation and maintenance of the sewage treatment plant (STP) will be undertaken by a Special Purpose Vehicle (SPV). For financing, 40% of the capital cost quoted would be paid on completion of construction while the remaining 60% of the cost will be paid over the life of the project as annuities along with operation and maintenance (O&M) expenses.

An important feature of this model is that both the annuity and O&M payments are linked to the Key Performance Indicators (KPIs) for ensuring performance of the assets for better accountability, ownership and efficiency of the STP.

3.1 STPs awarded under HAM

India's first STPs under Hybrid annuity mode are being developed in Haridwar (Uttarakhand) and Varanasi (Uttar Pradesh). A tripartite agreement was signed between the National Mission for Clean Ganga (NMCG), state level executing agencies Uttar Pradesh Jal Nigam and Uttarakhand Pey Jal Nigam and the Concessionaires.

This new Hybrid Annuity-PPP model in sanitation attracted considerable interest from private players. More than 30 firms participated in the pre-bid meetings of Varanasi and Haridwar projects. The selection of firms was based on the lowest bid of the project cost for developing and operating the treatment infrastructure for a period of 15 years. The 50 MLD STP in Varanasi was awarded to a consortium led by Essel Infra Projects Limited at an estimated cost of Rs 153 crore and 82 MLD STP in Haridwar was awarded to HNB Engineers Private Ltd at an estimated cost of Rs 171 crore. The tripartite agreement was signed by the National Mission for Clean Ganga (NMCG), the nodal agency for Namami Gange programme, the private firms and respective state water authorities on 11th October 2017 (PIB, 2017). Implementation and successful running of these projects would ensure that no untreated sewage waste water goes into river Ganga.

Figure 3: Hybrid annuity model based Sewage Treatment Plant



The various other Sewage Treatment Plant (STP) projects that have already been approved by government under Namami Ganga Programme are listed in the table below. Apart from this, State government of Rajasthan under “Sewerage and Waste Water Policy- 2016” has approved to set up three STPs under HAM in Udaipur.

The Andhra Pradesh government under Swachha Andhra Corporation plans to set up cluster-based Faecal sludge and Septage Treatment Plants (FSTP) in their 78 ULBs. These FSTP’s are expected to be funded under a Hybrid Annuity Model. Under this model, government is expecting 50% of capital investment from private sector, who will Design, build and operate the FSTP for the next 10 years. The government will payback remaining 50% of the capital investment to the private sector over the 10 years of O&M period in the form of annuities (plus reduced interest rate) along with fixed O&M cost.

Table 1: List of STP projects approved under HAM

Sr. No.	States	STP Cities	STP capacity	Approved Project Cost (Rs. In crore)			Tentative year of completion	Status as on January 2018
				Capital	O&M	Total		
Under Namami Ganga Programme								
1	West Bengal	Bally	40 MLD	90	75	165	2020	Bid document under preparation.
		Kolkata	26 MLD				-	Under tendering Process
		Howrah	65 MLD	92	93	185	2020	
		Kamarhati and Baranaga	60 MLD	92	80	172	2020	
2	Uttar Pradesh	Farrukhabad - Fategarh	35 MLD	107	106	213	2019	Bid document under preparation.
		Allahabad	Naini (42	302	466	768	2021	Tender to be

Sr. No.	States	STP Cities	STP capacity	Approved Project Cost (Rs. In crore)			Tentative year of completion	Status as on January 2018
				Capital	O&M	Total		
			MLD), Jhusi (16 MLD) & Phapamau (14 MLD)					floated
		Unnao	13 MLD	47	55	102	2020	Bid document under preparation.
		Shuklaganj	6 MLD	28	37	65	2020	
		Mathura	30 MLD	144	60	204	2020	Tendering-NIT published
		Mirzapur	17 MLD	50	65	115	2020	Bid document under preparation.
		Ghazipur	21 MLD	43	47	90	2019	
3	Bihar	Bhagalpur	65 MLD	136	118	254	2020	Under tendering Process
		Patna-Kankarbagh	50 MLD	376	202	578	2021	
		Patna-Digha	100 MLD	563	261	824	2021	

Source: Compiled by C-WAS, CEPT based on the data gathered from Monthly progress report of Namami Gange Programme as on 31st January 2018 and for Rajasthan and Andhra Pradesh based on their policy document and RFP document respectively.

3.2 Key Features of Varanasi STP on Hybrid Annuity Model: RFP clauses

In January 2016, the GOI approved a hybrid annuity model for implementation of STP projects under the Namami Gange programme. Subsequently, the UP Jal Nigam under NMCG issued a Request for Proposal (RFP) to invite interested private players to Design, Finance, Build, Operate and Transfer (DFBOT) 50 MLD STP at Ramana, Varanasi on a PPP basis, through a hybrid annuity model. The key features of the Project as set out in the RFP are as follows:

- **Project Brief:** The objectives that NMCG and the Jal Nigam wish to achieve through the Project are to Intercept the raw sewage flowing into river Ganga and divert and treat it at the Varanasi STP; Implement viable technologies and international best practices for development and O&M of the STP; demonstrate large scale PSP and mobilization of private sector investment to further the national aim of rejuvenation of the river Ganga.
- **Technical details:** The 50 MLD Varanasi STP shall be designed to receive and treat all combinations of Sewage influent flows and loads arriving at the Varanasi in accordance with the Influent Standards specified. Process requirements are preliminary treatment, secondary biological treatment, effluent pumping station, sludge digestion, thickening, dewatering and storage unit, transportation of residual grit and digested sludge from STP to Waste disposal site.
- **Finance details:** 40% of the Bid Project Cost of the Project will be reimbursed to the Concessionaire during the Construction Period, which will be linked to Construction Milestones. From the COD, the Capex Annuity, the O&M Charges and the Power Charges at actuals will be paid on a quarterly basis to the Concessionaire. If the Concessionaire consumes more than the Guaranteed Energy Consumption, it will be liable to pay damages to the Jal Nigam.
- **Bid Evaluation criteria:** The bid will be evaluated based on four components of (a) Capex cost (b) the O&M Charges for the first month after COD; (c) the Guaranteed Energy Consumption for each year of the O&M

Period; and (d) the Land Requirement. Bid price will be calculated using formula: Bid Price = Bid Project Cost + (O&M Charges x 180) + Power Charges+ Land Price

- **Special Purpose Vehicle (SPV):** The Selected Bidder is required to incorporate a Special Purpose Vehicle to implement the Project and such Special Purpose Vehicle will be required to execute the Concession Agreement with the Jal Nigam and NMCG. The SPV will enter into a tripartite memorandum of agreement (MoA) with participating state governments and concerned urban local bodies (ULBs) for taking up individual projects.
- **Performance based Contract:** O&M payment are linked to KPI Adherence Report during the O&M Period. Under the contract, three KPI are defined which are Availability of the Facilities and the Associated Infrastructure on every day, treated Effluent discharge quality standards, treated digested sludge quality standards.
- **Escrow account for payment:** NMCG, the Jal Nigam and the Escrow Bank shall enter into the Escrow Agreement NMCG will set up a revolving escrow account for the Project and all payment will be paid to the Concessionaire through this escrow account. Minimum escrow balance: Before COD, NMCG will maintain fund equivalent to construction payment due to the concessionaire for the next milestone. After COD, NMCG will maintain funds equivalent to Capex Annuities, O&M Charges and the estimated Power Charges required to be paid to concessionaire for the next two years.
- **Disposal of treated Effluent and Sludge:** All rights and interest in the STP by-products and treated effluent discharged will be with private player. The concessionaire shall dispose STP By-Products at waste disposal site identified by Jal Nigam. All cost in connection with setting up and maintaining waste disposal site will be borne by Jal Nigam. The Concessionaire shall be required to set up a sludge handling facility at the Site and is free to sell the Digested Sludge and maintain proper records of revenues earned from such sale. Treated effluent can be discharge into river Ganga or sell by private player.

Source: http://jn.upsdc.gov.in/site/writereaddata/UploadTender/corrigendum/pdf/C_201707071208178298.pdf

4. Experience of using HAM in other sectors:

HAM is also being explored in other sectors, Eg. Housing and infrastructure development. Government of Jharkhand (Urban Development and Housing Dept.) has issued Request for Qualification (RFQ) cum Proposal document for construction of 40,000 dwelling units for EWS on Hybrid Annuity Model on PPP basis under PMAY scheme. (Government of Jharkhand , 2017)

The Andhra Pradesh Government has decided to adopt the Hybrid Annuity Model (HAM) for the infrastructure projects in Amaravati. Construction of roads, bridges, drinking water, sewage and power in the 3 zones of the capital region of Andhra Pradesh is proposed under HAM. The HAM has 3 major modifications in its implementation in their projects. The O&M period is reduced to 10 years instead of 15. Secondly, the share of the project cost will be 49% by the state government, and 51% by developers (as opposed to earlier 40% and 60% in the road projects). The government will have an increased share, because the projects will not be making high revenues. The state government is also willing to provide guarantees for any shortfall in repayment of annuity (The Pioneer, 2017). Recently, the bids have been called to develop trunk infrastructure (development- estimate for investigation, design and construction of roads, drains, culverts, watersupply, sewerage, STP, utility ducts for power & ICT, reuse waterline & avenue plantation compatible with trunk infrastructure in layouts for land pooling schemes in zone-12a area) costing Rs. 4,595 crore in LPS villages in the Amravati capital city. The successful bidder will have to invest 51% of capital cost and undertake performance based O&M for a period of 10 years on Hybrid Annuity Model (The Hindu, 2018).

5. Advantages of HAM

The HAM model will not only attract the private sector investment for infrastructure projects but will also incentivized O&M when linked to performance based payments.

- Less upfront finance requirement for the government agencies. They are required to mobilize only 40 % of initial funding upfront. The private player arranges for the other 60% of project cost.
- Financing risk during O&M period is fully borne by Government. Any shortfalls in the O&M cost to be met by the government. Escrow account mechanisms can be used to ensure timely payments to private contractors.
- The responsibility of all environmental and land clearances rests with the government, so there are less delays in project commencement and therefore the private sector risks of delayed construction phase are reduced.
- Assured annuity payments provide comfort to potential lenders /financing institutions to provide debt to private contractors.
- The model incorporates inflation-adjusted project cost over time especially for projects with longer than one-year implementation period and for O&M expenditure. This helps to mitigate the inflation risks.
- Performance linked annuity payments also creates the appropriate incentives for the private sector providers.

6. Key challenges of using HAM

- As the private concessionaire has to mobilize 60% of costs, it is likely that the total project cost will be higher as it incorporates both their high returns on equity as well as their higher interest on debt as compared to government. This is likely to increase the total project cost.
- The HAM approach may limit the entry of small bidders, as they may not be able to mobilize adequate capital to meet 60% of costs for initial Capex investment required in this model. Financing institutions may be reluctant to provide loans for small developers with small /weak balance sheets.
- A key challenge in using the HAM model in sanitation sector relates to the need for long term commitment of government funds over a period of 10 to 15 years. The local governments, which are the key stakeholders in such projects, can at most meet the O&M costs over time. It is difficult for them to mobilize the capital costs which are generally met through capital grants from national and state governments. Most importantly, for both state and local governments, long term fund commitments to meet the annuity payments may become difficult. This risk can affect the bid prices and drive up the overall project costs.

7. Way forward

By adopting hybrid annuity model, it will be possible to attract and promote the private sector investment in the sanitation sector. This may seem as a promising arrangement, though its success depends on long term commitment of both government and private sector. Under the Namami Ganga programme there is a huge scope to replicate the hybrid annuity model for setting up STP's, as there is a payment assurance given by Government of India through proper institutional arrangement.

However, the question of adopting Hybrid annuity model in other sewage treatment projects remains valid with limited revenue potentials from sale of treated water and sludge, low or non-existent of user charges to even recover O&M expenses, limited financial capacity of local government to ensure timely payment to private sector, rigid contract and unbalanced risk management.

Thus, while the hybrid annuity model appears to be a step in right direction to leverage private sector investment and participation in sanitation sector, government will have to ensure appropriate institutional models to ensure long term sustainability of such investments.

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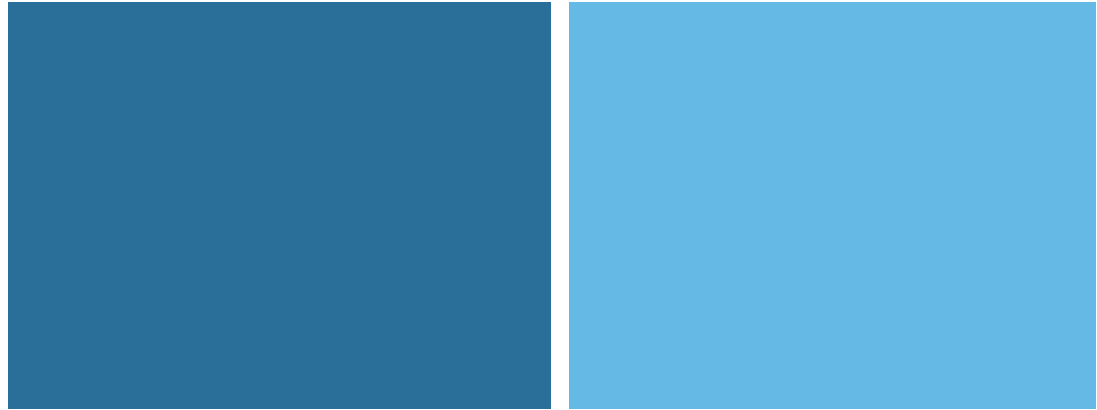
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The Center for Water and Sanitation (C-WAS) at CEPT University carries out various activities – action research, training, advocacy to enable state and local governments to improve delivery of services. In recent years C-WAS has focused its work on urban sanitation.

