

## CHALLENGES FACED IN PPP AND HAM MODEL AND THE NEED FOR AN ALTERNATIVE

A. Jain, F. Khan, P. Gupta, K. Gupta and S. Yadav\*

National Institute of Construction Management and Research, Pune, India

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\*Corresponding author's email: [smitayadav@nicmar.ac.in](mailto:smitayadav@nicmar.ac.in)

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**Abstract** — Public Private Partnership Model (PPP) by Ministry of Road Transport and Highways (MORTH) renewal was undertaken by introduction of the hybrid annuity model (HAM) wherein government decided to share the risk of financing by contributing 40% towards the project. With the launch of this scheme more than fifty percent projects got green signal in 2016-17 under the HAM scheme. This work compares these two models by undertaking a questionnaire survey from the key stakeholders involved in such projects and identifies challenges & risk faced and issues pertaining to delays and success of the proposed model. The outcome from the work highlights that funding has been a major challenge faced by PPP projects and thus innovation into the model is necessary. There also seems to be a lack of transparency in the entire process which makes it riskier for the private investor. It is also concluded from the work that financial risk is predominant whether it is a PPP or HAM model and thus a search for a new sustainable model that is sustainable is essential.

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**Keywords:** Public Private Partnership, Hybrid Annuity Model, BOT, Challenges, Procurement, Delay

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### 1.0 INTRODUCTION

A Public-Private Partnership (PPP) is a long-term agreement between two or more public and private sectors. The objective of PPP's is to share risk and establishing innovative, lasting relationships between the partners i.e. public and private sectors. Financing arrangement by the private partner is another important aspect of PPP. The typical tasks involved in a PPP consists of financing, constructing and managing the project, wherein the government ensures payments directly or through other means such as the users over the life of the project. However, the system is losing its popularity with huge funding necessary to be raised by the public entity due to which large numbers of projects off late are being stalled, adding to the non-performing assets (NPS's) for the government. To overcome these obstacles innovation into the model was necessary of which emerged the Hybrid Annuity Model (HAM).

The amalgamation of the Built Operate Transfer (BOT) Annuity and Engineering Procurement and Construction (EPC) model has resulted into the present HAM model. The model is designed such that in the first five years, 40% of the project cost will be catered by the government authority through annual payments (annuity). The balance 60% of the amount has to be raised by the developer in the form of equity or loans during the construction stage. This 60% of the money is to be recovered by the developer by creating essential assets and its performance. The toll rights in this arrangement are kept with the government authority and thus they owe the responsibility of revenue collection. The developer thus has no control over revenue collection under this arrangement. The advantage of this model is that it allows liquidity to the developer wherein financial risks are borne by the public authority and the construction and maintenance risks are the responsibility of the private developer, similar like the BOT (toll) model. This model was basically introduced to revive the existing PPP model in highway construction.

This work focuses on determining the flexibility of HAM model over the existing PPP. Determine the major working difference between the HAM and PPP model and understand the risk involved in HAM over PPP and its sustainability in the long run.

## 2.0 LITERATURE REVIEW

Since the last 30 years PPP models have been vastly used to accomplish the sustainability goals. PPP is said to be a contractual arrangement between the public and private sector to fulfil the creation of infrastructure facilities and handle the distribution of risks and rewards between the parties [1]. Different types of risks are identified in the PPP projects which include the project risk that deals with design, execution, financing and ownership. It also has market level risks for e.g. the demand and the investment risk. The allocation, transfer, management and mitigation of risk is the key that builds the trust between the public and private partner [2]. It is observed that in comparison to the developed countries, it is the government officials from the developing nations that are unaware with the management of the PPP projects thus increasing their risks [3]. PPP projects involve long term collaboration, in such situation if the developing government doesn't have a structured organisation set up and strong technical and management ability; it shall be the private partner who will need to shoulder more risks under the projects [4]. Higher risk which is associated with the poor political decisions and interventions as well as disproportion of contractual risks has lead to judicious financing by the private players [5]. Research works have scrutinized the collective risk impact and its variation over project phases and have suggested on the proper regulation and measures to lessen the risk. Data taken of around 30 projects in India have divided risks into categories namely financial risk, operation and maintenance risk, revenue risk, political risk and time and cost overrun during construction [6]. Parties responsible for the risk under different PPP modes have also been identified by various experts. The challenges in implementing PPP taking into account the various factors causing hindrance are also available in literature. A total of 122 responses were collected by authors to affirm that the higher toll rates, negotiation delays, deficiency in the guidelines and procedures of PPP formation, political hindrance and uncertainty over the objectives and criteria's to evaluate are some of the constraints for its implementation in Malaysia[7]. Reports also enforce that if the private sector does not financially contribute creation of World class infrastructure facilities and to obliterate the present infrastructure deficiencies shall be impossible for the country like India[8]. The investments for such impending growth cannot be met by the public sector alone. In India however it is noted that the participation of private sector in financing infrastructure has not been encouraging though Worldwide PPP has been used as a tool to develop the basic infrastructure. For the basics success of the PPP model it can be concluded that the steady macroeconomic framework, firm regulatory structure, policies that are investor friendly, project revenues that are maintainable, transparent and consistent policies, effective regulation and liberalization of labour laws, and efficient corporate governance are the essential necessities. Various experiences in PPP projects and the barriers faced have been discussed in projects by the research authors. The barriers listed include no trust amongst the public and private sector, absenteeism of political willingness, the non-existence of an institutional environment, and deficiency in detailing project requirements by the public sector and badly designed and planned PPP projects[9].

It is noticed that enhancement in time efficiency, better convenience, improved reliability and cost saving along with easy availability of information can be made available with an effective PPP. An effective PPP creates considerable value to the Government and its citizens in these aspects. However, to develop Indian infrastructure effectively through PPP there are many issues that requires understanding, identification, and solutions. Various studies imply the impact of PPP on Indian infrastructural projects and have discussed the advantages and disadvantages of its adoption. It has been concluded that not mere PPP, but an effective PPP is the requirement of the country [10]. Many experts have focused on the financial and economic aspects of PPP projects. According to them meeting the financial requirements of infrastructure projects along with tackling the risk inherent to building infrastructure and economic downturn is difficult for the private sector. They compared the EPC and PPP module of contracts in terms of cost comparison and proposed hybrid model for effective development of infrastructure. They also introduced the concept of shadow tolling wherein the road user need not pay for facility and the concessionaire records the counts of number of vehicles plying the road and government pays according to rates decided. Also, a proposal of raising these funds by levying an additional tax on petrol and diesel was recommended. Shadow toll

has many benefits and the major is the traffic risk, since the government pays for the users, the private partners may see an increase in the usage of the road and security of the mechanism [11].

The pace of infrastructure growth and construction of National Highways needed a boost and therefore HAM was introduced in 2016 by Government of India. Salient Features of HAM models are as follows [12].

1. Bid Award-Award to given to the bidder quoting lowest NPV for project life cycle cost.
2. Financial Support-The payments to the concessionaire to be done in five equal instalments according to the physical progress of the work which constitutes 40% of the bid project cost. The remaining 60% of the project cost to be borne by the concessionaire via a mix of debt and equity.
3. Escalation Formula-Proposed to include an escalation formula in the project to be affected by inflation indexed (through a Price Index Multiple) (PIM), this index in the ratio of 70:30 is the weighted average of Consumer Price Index (CPI) and Wholesale Price Index (WPI).
4. Annuity Payments-The balance of the 60% of the final bid project cost to be made available to the concessionaire in the form of semi-annual annuity payments by the public authority on project completion. These payments should also include the interest in the form of reducing balance on the final cost to construction.
5. Operation and Maintenance Payments (O&M)–The authority to also release the O&M payments to the concessionaire along with annuity, this amount needs to be subjected to prime index multiple as per the inflation of the country. The concessionaire till the end of the project period is to remain responsible for the operation and maintenance.
6. Toll Collection –The money collected through toll collection is the responsibility and income of the public authority.

According to CARE Ratings, (November 2017) around 48 projects with an effective length of 12,000 km and bid project cost of Rs.49,000crores were awarded by NHAI during January 2016 to March 2017. The projects were launched to address the special purpose vehicle (SPV's) challenges during execution phase and aid liquidity of sponsors during initial period by adopting the model concession agreement (CA) of HAM [13].

In Live Mint (ePaper) (2017) - R. Shankar Raman, L&T's (whole time Director and Chief financial officer) has mentioned that as the government functionaries realised that the build, operate, transfer (BOT) model wasn't the key to the country's ambitious highway construction targets, the changes in the form of HAM was essential for sustainability[14]. Though government authorities are over ambitious of this alternative, Infrastructure major L&T believes that with the existing financial stress in this sector this model may not turn out to be a sustainable solution.

In the article he stated of Road and Transport Minister of India (Mr. Nitin Gadkari), who wanting to re-energise the sector, has hurriedly pushed the decision of bearing the traffic risks on the public authorities as he felt this was too intense to be borne by the developers. Thus, to manage the risk he introduced the HAM which is half way between an annuity and a full-blown build, operate and transfer (BOT). However, this wasn't really addressing to all the issue faced in this sector and was only a solution to feel the gaps in the existing model therefore its sustainability in the near future may be doubtful. Besides he has also expressed that the major setback for HAM could be financial stress faced by the developers presently and thus raising such amount of money now could be difficult for them, then some 10 years back.

### 3.0 PROBLEM IDENTIFICATION

HAM being the latest model implemented in the highway sector in India, there are very few projects and data available of projects successfully having implemented the same. Though the model is favourable for contractors as it mitigates the risk associated with the project, in the long run it may not be as effective as it seems because of the various financial and economic aspects related to it. At present more than 115 highway projects have been awarded under HAM by the National authority of India (NHAI). However it is observed that 34 of these projects awarded under HAM are stuck, unable to increase the pace of execution. In many of these the reason has been funding and land acquisition wherein in some it is observed that the government is not even able to provide the mobilisation advance for the project [15]. Thus this work tries to identify the risk associated with the present models, the challenges faced and also explore the opportunities for a sustainable option to create infrastructure facilities in India.

### 4.0 METHODOLOGY

The analysis was done on the basis of questionnaire. Convenient sampling technique (non-probability) was used for selecting the respondents. Sampling was done on the basis of availability and ease of data collection while also paying close attention to the suitability of participants. Thus the target population for this study were 14% clients, 20% consultants and 66% contractors currently engaged in execution of PPP or HAM models wherein almost 53% of these are in execution of HAM model. Around 49 respondents were surveyed under the study; however though the given set of population is small in number consisted of experts in the area.

### 5.0 ANALYSIS

#### 5.1 JOB PROFILE OF THE RESPONDENTS

The respondents were surveyed about the job profile they hold in the organization. The accuracy and correctness of the information under the survey can be gauged from the job profile the stakeholders are engaged in. The responses are shown in figure 1.

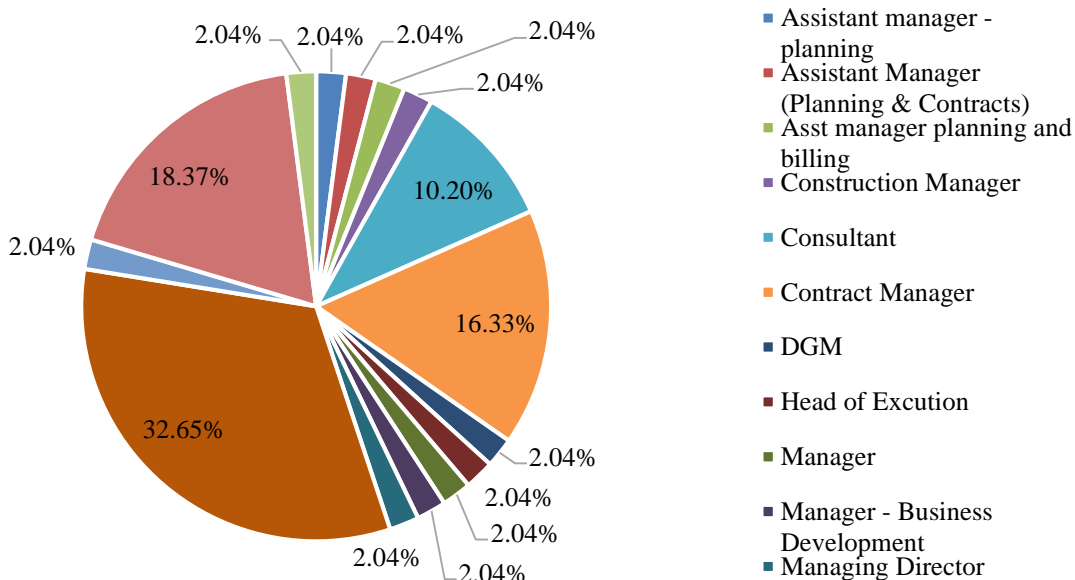


Figure 1 Job Profile

Inference: Out of the 49 responses, the majority of them are project managers with maximum responses (32.65%), Site Engineers (18.37%), Contracts Managers (16.33%), Consultants/Architects (10.20%) and

rest being equal contributor (2.04% each) as depicted in figure 1. Thus it can be concluded that the data analysed can be relied upon as a large population consisted of project managers under the scheme.

### 5.2 YEARS OF EXPERIENCE

Further to this it was evaluated the experience the respondents carried in the Industry in terms of years. The responses are plotted in figure 2.

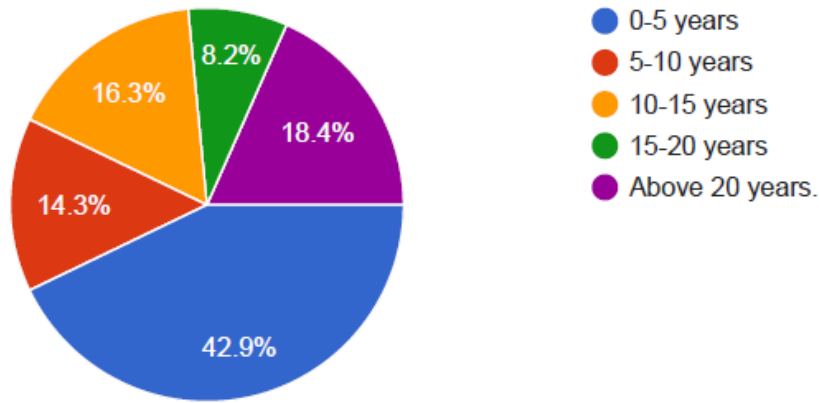


Figure 2 Experience in Years

Inference: From figure 2 it can be observed that most of the respondents are experienced and have worked in various PPP projects, 21 respondents i.e. (42.9%) have work experience of 0-5 years, 7 respondents (14.3%) have 5-10 years, 8 respondents (16.3%) have 10-15 years, 4 respondents (8.2%) have 15-20 years, 9 respondents (18.4%) have above 20-year experience. Thus again implying the reliability of the data gathered.

### 5.3 CHALLENGES IN PPP MODEL

The respondents were further surveyed regarding the various challenges they face while implementing the PPP model. The responses are summarized in figure 3.

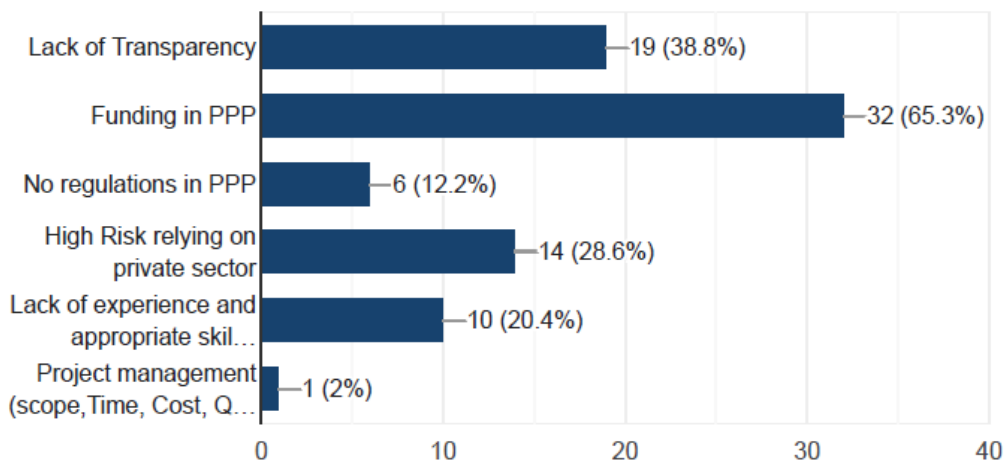


Figure 3 Challenges in PPP

Inference: From figure 3, it is observed that funding in PPP model (65.3%) and lack of transparency (38.8%) are the dominating factors followed by high risk relying on private sector (28.6%) and lack of experience (20.4%). Thus it can be noticed that prominent risk faced is on account of the funding required for the project. Acquiring such huge funds was becoming difficult to the private players and thus the enthusiasm to participate in such projects had reached the death stage. Thus, to overcome this hurdles Government announced an investment alternative in which the private player investment under the project was relaxed to the tune of 40% of the project cost thus giving rise to the HAM model.

5.4 RISK FACED DURING A PPP PROJECT IMPLEMENTATION

The respondents were also surveyed about the various risks they face while implementing a PPP project by making them rate major project risks on a scale of 1 to 5; with 1 being the maximum and 5 being the least. The averages of all the responses are plotted in figure 8.

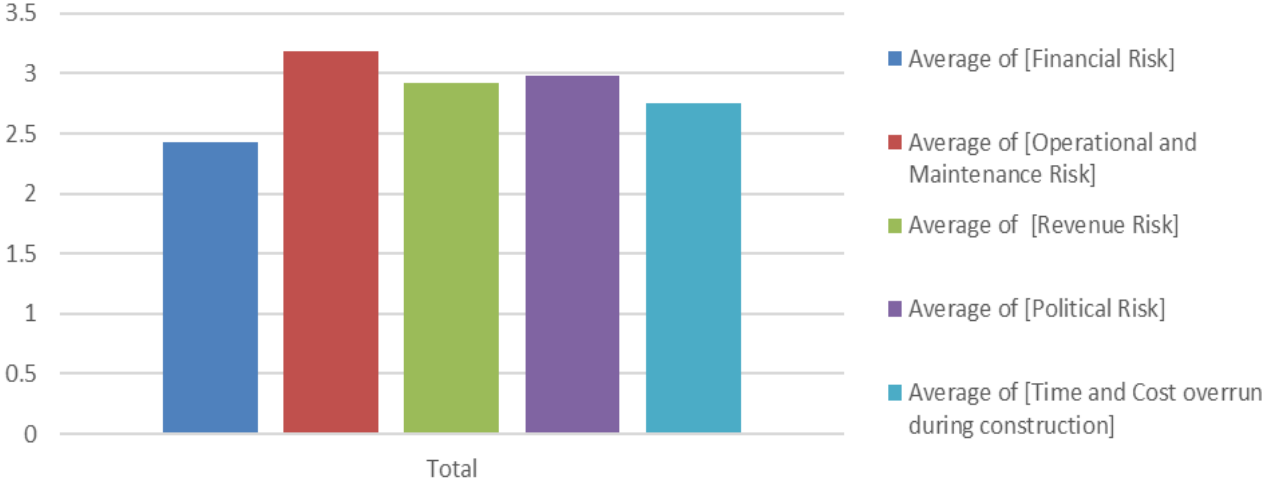


Figure 4 Issues in Implementation of PPP Model

Inference: From figure 8 it can be inferred that financial risk is the most strongly rated risk faced in implementation of any of the PPP project but at the same time other risks cannot be under estimated and thus operation and maintenance risk, political risk and time and cost overruns also dominate during execution and needs to be addressed. All these risks were presently becoming the responsibility of the private player and bearing such huge risk to the lone private players was abstaining them to participate and thus part of risk transfer was an alternative undertaken wherein part of financial and operation and maintenance risk was borne by the public authority under the HAM model.

5.5 PROCUREMENT PROCESS

One of the under-rated factors which usually lead to delay of projects is the procurement process. In this work, the respondents were asked about the transparency and competitiveness of the procurement processing this sector which is plotted in figure 5.

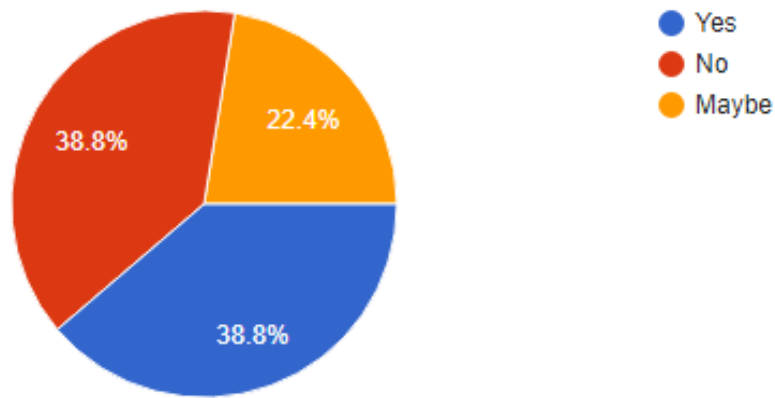


Figure 5 Transparency in Procurement Process

Inference: According to figure 4, around 39% respondent believed that the procurement process is transparent whereas equal amount of people feel that transparency needs to be established in the system. Few of the respondents were not sure of the mechanism and chose not to answer the same as there have been various projects wherein the prequalification criteria and selection of the participants has never been on fair footing basis or publicly announced.

#### 5.6 DELAY IN PPP PROJECTS

The respondents were further inquired regarding the delay in the PPP projects and whether the delays in the PPP projects are more than the usual projects. The responses are plotted in figure 6.

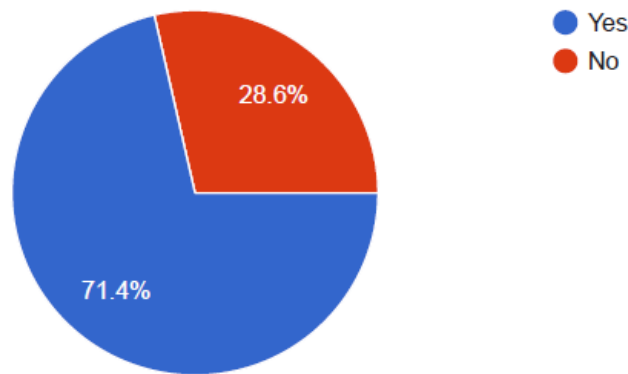


Figure 6 Delay in PPP Projects

Inference: From figure 5, it can be observed that around 71.4% respondent feels that PPP projects delays while the remaining 28.6% feel that PPP projects complete on time. It can be inferred that usually PPP projects delays and major factors can be funding in PPP models as well as lack of transparency. Literature also infers to delays on account of land acquisition by the public authorities being another major cause.

#### 5.7 NUMBER OF HAM PROJECTS UNDERTAKEN BY COMPANIES

Hybrid Annuity Model (HAM) is a newly introduced model and only limited projects are awarded and completed under this as compared to other PPP models. Thus, respondents were asked about the number of HAM projects they are currently working on; to gather information about their experience on HAM. The responses are shown in figure 7.

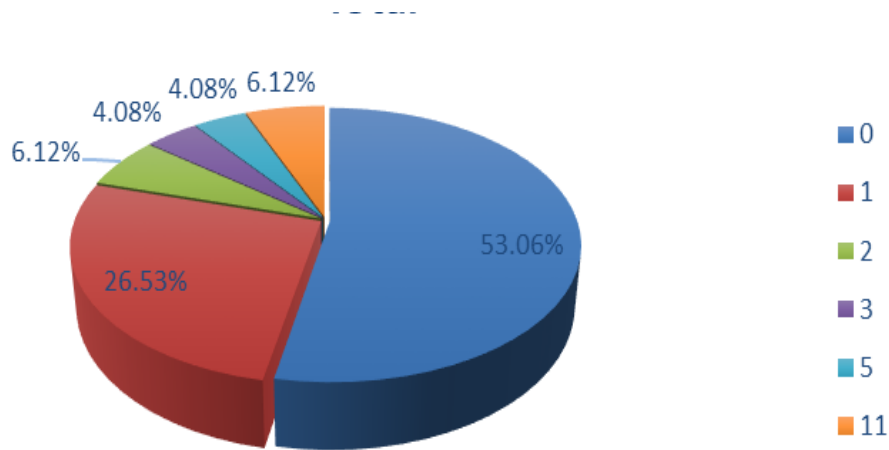


Figure 7 Number of HAM Project Undertaken

Inference: As depicted from figure 7 around half of the respondents are working on HAM projects and thus the gathered information is trustworthy in terms of issues and challenges faced by this model.

### 5.8 ISSUES FACED IN PPP OR HAM MODEL

The respondents were further surveyed about the issues they are faced while going for PPP or HAM model. They were asked to rate certain commonly faced issues on a range of 1 to 5; with 1 being the most prominent and 5 being the least important. The averages of all the responses are plotted in figure 8.

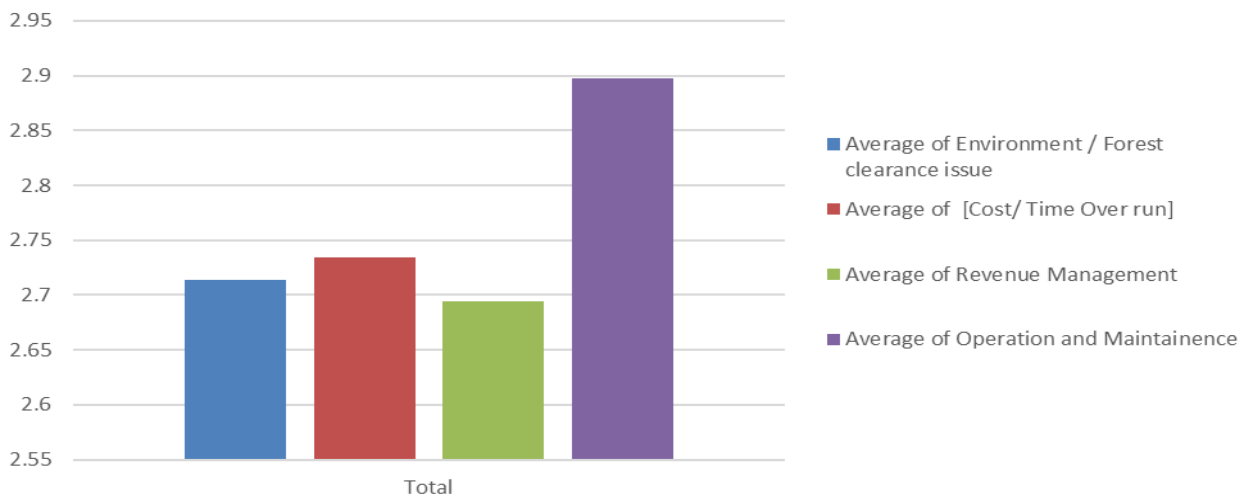


Figure 8 Issues in PPP or HAM Model

Inference: From figure 8 it is observed that revenue management is the most strongly rated issue faced in any of the PPP or HAM model while operation and maintenance is the lowest rated issue. Cost and time overrun is also observed to be one of the issues faced under the HAM. This analysis also corroborates to the present report published by Live Mint [15] in which obstacles on account of financial outlay has been observed as a prominent cause of delay under the project.

### 5.9 DELAY IN FUNDING IN HAM PROJECT



With the increasing number of HAM projects, funding can be an important issue because in long term it could be challenging for the government to allot funds to all the projects in short span of time. Thus, the respondents were inquired about their opinion regarding the delay in funding in HAM projects which is as shown in figure 9.

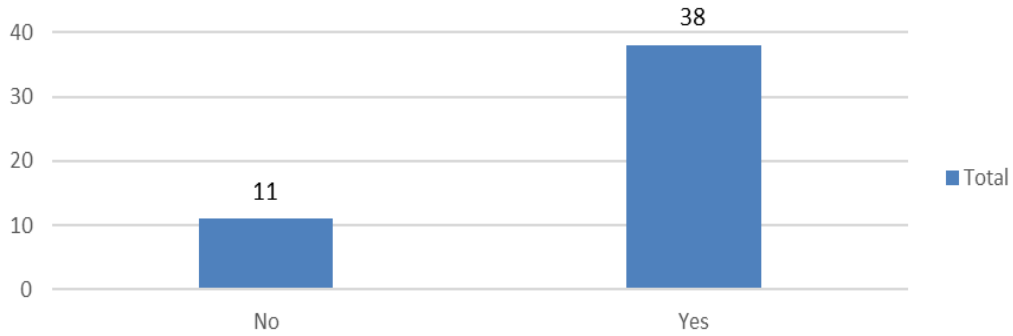


Figure 9 Challenge of Funding

Inference: From figure 9 it can be noticed that out of 49 respondents, 38 respondents feel funding as a challenge for government in short span of time and also consider this a reason for delay in projects. Thus, recommending a better financial arrangement to be undertaken by the stakeholders, for successful implementation of the HAM.

After an announcement of 115 projects under the scheme it is noticed that around 34 projects are facing challenges in terms of funding and in years to come this may also face the same death knell as PPP [15].

#### 5.10 DELAY

The respondents who feel that funding will be a challenge for government in short span of time and believe it to be a cause for delay were further inquired about the delay time (in percentage) by which their project may get delayed according to their experience and profile. The responses are plotted in figure 10 and 11.

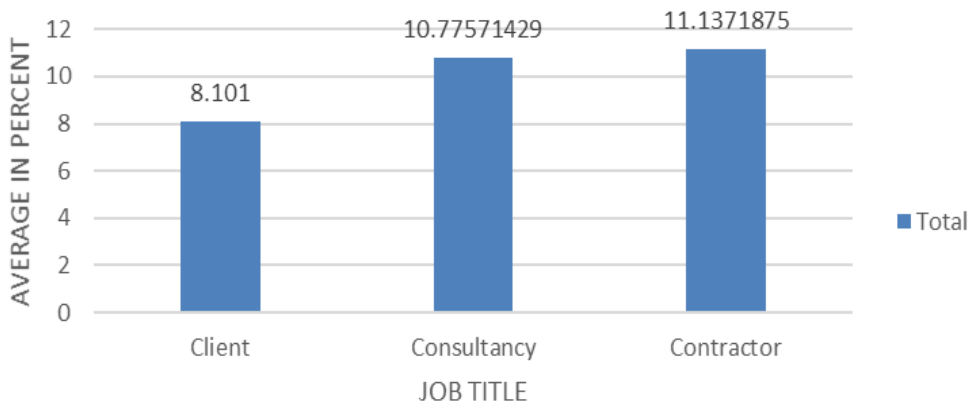


Figure 10 Delay in Percentage w.r.t Job Title

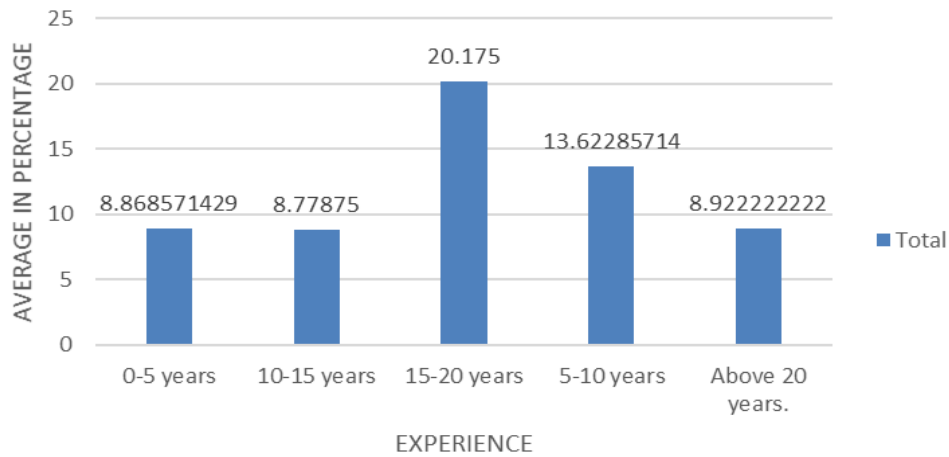


Figure 11 Delay in Percentage w.r.t Expertise Level

Inference: From figure 10 it can be observed that all the respondents feel there could be an average 8 to 11 % delay in implementation if finances are not arranged on time. This however has differed as per the experience of the respondents, wherein respondents with an experience of 15-20 years believe that an average of around 20% delay due to the financial challenges can be faced by the government as seen in figure 11.

#### 5.11 ARRANGEMENT OF REMAINING 60% OF MONEY

The respondents were also asked to mention their sources of funds for the remaining amount of money which will get paid after the completion of the project on annuity basis.

Inference: According to the responses gathered it can be said that all the respondents are dependent on the loans from banks or other financial institutions as their source of fund for remaining 60% of the money.

#### 5.12 NEED FOR NEW ALTERNATIVE MODEL

The respondents were further surveyed if there is any other model as an alternative to existing model, which may have sustainability in this sector. The responses were as shown in figure 12.

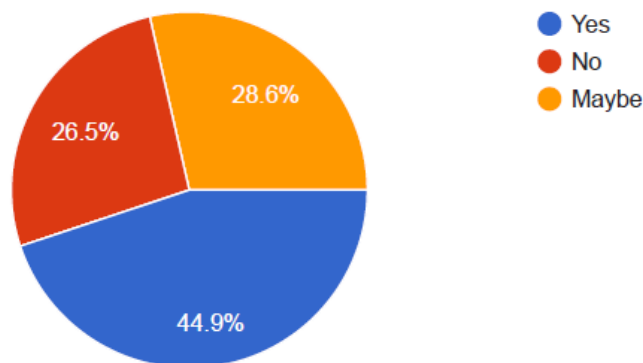


Figure 12 Opinion on requirement of New Model

Inference: From figure 12 it can be seen that nearly 45% of the respondents feel that there is a need of a new model other than PPP and HAM, or there needs a modification in the existing HAM or PPP Models.

### 5.13 PARAMETERS FOR MODIFICATIONS

The respondents who feel that there is a need of a new alternative model or a need to modify the existing models were further asked about the parameters on which the modifications should be done. The responses are plotted in figure 13.

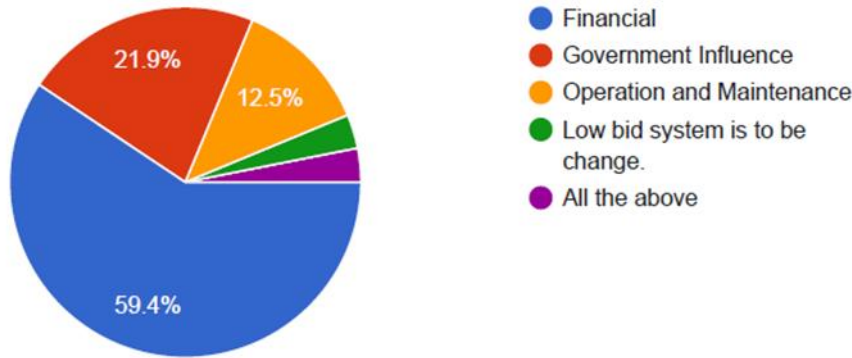


Figure 13 Parameters for Modifications

Inference: From figure 13 it can be seen that according to nearly 60% of the respondents, necessary modifications should be done on financial parameters in order to make the existing model more efficient and effective.

Thus, an alternative model like TOT could be tried in this sector. Under TOT model, the pre-construction and construction risks, the project financing risk and initial operational risk of a project are totally borne by the government prior to handing over the completed projects to the private parties. Risks associated with pre-development works, land acquisition, resettlement and rehabilitation, environmental and regulatory approvals, time and cost overruns, and high cost of funds during the construction phase are managed by the government as the government undertakes completion of construction and initial operation of the projects solely at its own risk. After handover of the projects, the consortium assumes the projects' finance, availability and market risks. Since the handed over projects are completed and in operation, the cost of finance is relatively less. The consortium has to ensure delivery of services at the required quality standards, which entails availability risk. The government can apply penalties if the consortium defaults on its service obligations. Market risk involves traffic risk, which falls on the consortium.

### 6.0 CONCLUSION

The roads and highways play an important role in development of the country. Various steps have been implemented by Indian government to enhance the present state of road network in the country. Public Private Partnership (PPP) has been the officially accepted methodology by the Government of India for expansion of road network amongst which the BOT (Toll), BOT (Annuity), EPC, HAM are the most commonly used model for awarding the projects. However, the model suffers from various inadequacies and need improvements for effectiveness which are listed below.

From this work, firstly it can be deduced that delay in PPP project is due to various factors among which prominently influential factors are funding through government and lack of transparency.

Secondly, financial risk is the most strongly rated risk faced in implementation of any PPP project. Thirdly, funding of HAM projects can be a challenge for government in short span of time and can also be considered as reason of delay in such projects and can lead to overall project delay of around 20%.

Due to inefficient revenue management necessary modifications should be done on financial parameters in order to make the existing HAM model more effective. The alternative model which can be taken into consideration is Toll Operate Transfer (TOT).

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