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Hybrid Annuity Model:
Implications in Nepalese Highways

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Abstract:

This research paper explores the potential implications of implementing the Hybrid Annuity Model (HAM) in the development of highways in Nepal. Drawing upon existing literature, case studies from other countries, the paper evaluates the suitability of HAM within the context of Nepal's infrastructure needs and socio-economic conditions. It also offers policy recommendations for the adoption and implementation of HAM in Nepalese highway projects.

Keywords: *HAM; BOT; PPP;*

Introduction

Nepal, a landlocked country in South Asia, faces significant challenges in infrastructure development, particularly in its road and highway network. The country's rugged terrain, limited financial resources, and institutional capacity constraints have hindered the expansion and maintenance of its road infrastructure, posing obstacles to economic growth and regional connectivity. In current context, investment in capital expenditure is very crucial for the development and prosperity of Nepal. Mainly, there exists two problems, lack of sufficient budget for the capital expenditure and lack of government capacity for

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capital expenditure. Thus, increase in development budget and capital expenditure has become a national challenge. In developing countries like Nepal, it is very difficult to arrange financial resources for construction, operation and maintenance of physical infrastructures. Nepal needs to invest as much as 10% of GDP on infrastructure (current at just 5% of GDP) which creates around USD 13-18 billion investment gap in infrastructure. According to National Planning Commission Nepal, financing requirement for achieving sustainable development goal is estimated to be USD 18 billion till 2030.

High-quality road infrastructure is crucial for Nepal's socio-economic development, facilitating trade, tourism, and access to essential services. However, traditional procurement models have proven inadequate in meeting the growing demand for infrastructure investment. In this context, innovative financing mechanisms such as the Hybrid Annuity Model (HAM) offer promising solutions to bridge the infrastructure gap and catalyze development.

Government of Nepal has made various effort to implement public private partnership in road transport infrastructure. However, due to various technical, financial and market risk, private sectors are not ready to participate in BOOT model. Government tried to attract private sectors in following projects, but did not succeed in these transportation infrastructure project.

- **Kathmandu-Terai/Madhesh Fast Track Road Project**

This project was first mega road project with length 72km, four lane expressway intended to be implemented in BOT model. This was solicited project which was identified by the government of Nepal. First attempt was made in 2008 to call the bidders through expression of interest and Request for Proposal (RFP). Three companies were shortlisted for this project under BOT model. However, none of them participated in RFP stage citing not having sufficient funds to match the investment cost and profit showing a need of viability gap funding. Again, government of Nepal published Expression of Interest (EOI) notice for PPP/BOT model. Three companies submitted for the EOI and two of them were shortlisted for RFP. In 2015, IL&FS Company was selected based on the lowest evaluated substantially responsive bidder. No contract was awarded because of reluctancy of IL&FS to implement project on given condition. Responsive bidder demanded government guarantee for minimum traffic. However, contract was silence in viability gap funding and finally the project was bailed out. Later, it was given to Nepal army for construction and was funded fully by government.

- **Kathmandu Kulekhani Hetauda Tunnel Highway**

This project was unsolicited project with length of 58 km four lane expressway. The NPB Company limited was formed with more than 1000 promoter shareholders. However, the company couldn't mobilize required finance from domestic market and tried for foreign direct investment (FDI). This project also failed due to lack of funding and lack of government participation.

Literature Review

The literature on infrastructure development and public-private partnerships (PPPs) underscores the importance of innovative financing models to address the funding shortfall and enhance project efficiency. The Hybrid Annuity Model (HAM) has emerged as a viable alternative to traditional procurement methods, offering a balanced risk-sharing mechanism between the public and private sectors.

Infrastructure development, particularly in the transportation sector, plays a crucial role in fostering economic growth, enhancing connectivity, and improving the quality of life for citizens. Traditional methods of infrastructure financing and project delivery often face challenges such as funding constraints, inefficient project execution, and inadequate risk allocation. In recent years, governments worldwide have explored alternative financing models, including public-private partnerships (PPPs), to address these challenges and accelerate infrastructure development.

- **Importance of Innovative Financing Models**

Infrastructure projects require substantial investments in capital, resources, and long-term planning. However, many governments, including Nepal, often face limitations in mobilizing adequate funds through traditional budgetary allocations alone. Innovative financing models such as PPPs offer a mechanism to leverage private sector resources, expertise, and efficiency to supplement public investments in infrastructure development (Grimsey & Lewis, 2004).

- **Role of Public-Private Partnerships (PPPs)**

PPPs involve collaborations between the public and private sectors to finance, develop, and operate infrastructure projects. By sharing risks and responsibilities between the two sectors, PPPs aim to harness the strengths of both parties while mitigating their respective weaknesses. PPPs offer several potential advantages,

including improved project efficiency, enhanced risk management, and access to additional sources of financing (World Bank, 2019).

❖ Hybrid Annuity Model (HAM) as an Innovative Financing Mechanism

The Hybrid Annuity Model (HAM) represents a hybrid approach to infrastructure financing, combining elements of both traditional procurement methods and PPPs. Under HAM, the government provides partial financial support to private sector partners through annuity payments, while the private sector assumes responsibility for project execution, operation, and maintenance (Mohan et al., 2017).

❖ Implications of HAM in Infrastructure Development

HAM offers several potential implications for infrastructure development:

Enhanced project bankability: HAM's risk-sharing mechanism and government support make projects more attractive to private investors, enhancing project bankability and accelerating infrastructure delivery (Bhattacharya & Prasad, 2016).

Improved risk allocation: HAM allows for a more equitable distribution of risks between the public and private sectors, thereby reducing the financial burden on the government and enhancing project viability (Flyvbjerg et al., 2003).

Stimulated private sector participation: HAM incentivizes private sector investment in infrastructure projects by providing revenue certainty and mitigating investment risks (Mukherjee et al., 2018).

Enhanced project transparency and accountability: HAM projects typically involve clear contractual arrangements, performance metrics, and regulatory oversight, promoting transparency and accountability in project delivery (Naidu & Arockiasamy, 2020).

❖ Challenges and Considerations

Despite its potential benefits, HAM implementation faces several challenges and considerations:

Regulatory complexities: HAM projects require a supportive regulatory environment and clear legal frameworks to govern contractual arrangements, revenue mechanisms, and risk allocation (Adhikary et al., 2019). Financial viability: HAM projects must demonstrate financial sustainability and attract

sufficient private sector investment to ensure project success over the long term (Gurtoo & Singh, 2018).

Capacity constraints: Effective implementation of HAM projects necessitates robust institutional capacity, stakeholder coordination, and project management expertise within government agencies (Sundararajan & Sen, 2019).

The Hybrid Annuity Model: Key Concepts and Components

The Hybrid Annuity Model (HAM) is a form of public-private partnership (PPP) that combines elements of both traditional engineering, procurement, and construction (EPC) contracts and build-operate-transfer (BOT) concessions. Under HAM, the government provides partial financial support in the form of annuity payments, while the private sector assumes responsibility for project execution, operation, and maintenance.

Key components of the HAM framework include

Government involvement and support mechanisms: The government plays a crucial role in providing financial support, regulatory oversight, and policy frameworks to facilitate private sector participation.

Private sector participation: Private companies are responsible for project design, construction, financing, operation, and maintenance, bringing technical expertise and efficiency to project execution.

Revenue model and risk allocation: Revenue generation in HAM projects is a combination of annuity payments from the government and user fees (tolls, fares, etc.). Risks associated with the project are allocated between the public and private sectors based on their respective capacities to manage them effectively.

Long-term perspective and sustainability: HAM projects typically involve long-term agreements between the government and private entities, ensuring the proper operation and maintenance of infrastructure assets over their lifecycle.

Implications of HAM in Nepalese Highways

Nepal's infrastructure deficit poses significant challenges to economic growth and regional connectivity. The Hybrid Annuity Model (HAM) offers several potential implications for the development of highways in Nepal:

Enhanced project bankability: HAM's risk-sharing mechanism and government support make projects more attractive to private investors, enhancing project bankability and accelerating infrastructure delivery.

Improved quality and efficiency: Private sector involvement brings technical expertise, innovation, and efficiency to project execution, leading to improved quality of infrastructure and timely completion.

Sustainable financing: HAM's revenue model ensures a steady stream of income for private investors through annuity payments, reducing reliance on government funding and enhancing project sustainability.

Socio-economic benefits: Well-developed highways facilitate trade, tourism, and access to essential services, driving economic growth, job creation, and poverty reduction.

Capacity building and institutional strengthening: HAM projects require strong regulatory frameworks, institutional capacity, and stakeholder coordination to ensure successful implementation, contributing to long-term capacity building and institutional strengthening in Nepal.

Case Studies and Examples

While there are currently no specific case studies of HAM projects implemented in Nepal, examples from other countries provide valuable insights into the potential implications of HAM in Nepalese highways. Case studies from India, the Philippines, and Colombia demonstrate how HAM projects have been successfully implemented to address infrastructure challenges and promote economic development.

Case Study	Country	Project	Key Features	Implementation Process	Benefits
Eastern Peripheral Expressway (EPE) Project	India	Access-controlled expressway around NCR	Design, Build, Finance, Operate, and Transfer (DBFOT) basis under HAM. Total project	Competitive bidding process for concessionaire selection. Construction commenced in May 2015 and	Reduced travel time and congestion. Improved connectivity and regional development.

Case Study	Country	Project	Key Features	Implementation Process	Benefits
			cost: INR 11,000 crores Concessionaire responsible for design, construction, financing, operation, and maintenance.	completed in May 2018. Toll collection began upon completion.	Economic benefits through increased trade and transportation efficiency.
Kalyan-Bhiwandi-Shilphata (KBS) Road Widening	India	Road widening project in Maharashtra	Widening of existing road to six lanes under HAM. Total project cost: INR 1,200 crores. Concessionaire responsible for design, construction, financing, operation, and maintenance.	Competitive bidding process for concessionaire selection. Construction carried out in phases to minimize disruptions. Toll collection began upon completion.	Improved traffic flow and reduced travel time. Enhanced safety features and infrastructure quality. Facilitated smoother movement of goods and passengers.
Manila-Cavite Expressway (CAVITEX) Project	Philippines	14-km expressway connecting Manila to Cavite	Hybrid financing structure combining toll revenue and government support under HAM. Total project	PPP agreement signed between government and private sector consortium. Construction completed in phases.	Improved connectivity between Manila and Cavite. Reduced travel time and

Case Study	Country	Project	Key Features	Implementation Process	Benefits
			cost: USD 1.1 billion. Concessionaire responsible for design, construction, operation, and maintenance.	Toll collection commenced upon completion.	congestion. Economic benefits through increased trade and tourism. Enhanced road safety features.
Bogota-Girardot Road Widening Project	Colombia	Widening of highway between Bogota and Girardot	60-km road widening project under HAM. Total project cost: USD 845 million. Concessionaire responsible for design, construction, operation, and maintenance.	PPP agreement signed between government and private sector consortium. Construction carried out in multiple phases. Toll collection began upon completion.	Reduced travel time and congestion. Enhanced safety features and infrastructure quality. Improved connectivity and economic development along the corridor.

Policy Recommendations

To harness the potential of the Hybrid Annuity Model (HAM) for highway development in Nepal, the following policy recommendations are proposed:

1. Develop a comprehensive regulatory framework: Nepal should establish clear guidelines, regulations, and institutional mechanisms to govern HAM

projects, ensuring transparency, accountability, and legal certainty for investors.

2. Strengthen institutional capacity: The government should enhance the capacity of relevant agencies, such as the Department of Roads (DoR) and the Investment Board Nepal (IBN), to effectively manage HAM projects and facilitate private sector participation.
3. Promote stakeholder engagement: Effective stakeholder engagement and public consultation are essential for building consensus, addressing community concerns, and ensuring the equitable distribution of project benefits.
4. Prioritize project selection and planning: Nepal should prioritize strategic highway projects with high economic and social returns, conducting thorough feasibility studies, risk assessments, and cost-benefit analyses to inform project selection and planning.

Government of Nepal can do trail for the feasibility of HAM model in Nepal. The trail road for implementation under the Hybrid Annuity Model (HAM) could be the Daunne tunnel Project. Connecting the city of Narayanghat with Butwal, a major town in the western region of Nepal, this highway plays a crucial role in facilitating trade, tourism, and transportation between the two areas.

Here's why the Daunne Tunnel is suitable for the HAM:

Strategic Connectivity: The Daunne Tunnel project aims to improve connectivity between Narayanghat and Butwal, two important cities in Nepal. This improved connectivity can enhance trade, tourism, and economic activities in the region.

Cost and Complexity: Tunnel construction projects are often complex and require substantial investment. By utilizing the HAM model, the financial burden on the government can be reduced as private investors finance a portion of the project. This can expedite the construction process and ensure timely completion.

Revenue Generation: Once operational, the Daunne Tunnel can generate revenue through toll collection. Private investors may find this revenue stream attractive, increasing their interest in participating in the project under the HAM model.

Risk Sharing: The HAM model allows for the sharing of risks between the government and private sector. Risks associated with construction delays, cost overruns, and maintenance can be allocated appropriately, ensuring efficient project delivery.

Implementing the Daunne Tunnel project under the HAM model would require collaboration between the government and private investors. The government would provide necessary approvals, regulatory support, and land acquisition, while private investors would undertake the construction, operation, and maintenance of the tunnel under a long-term agreement.

In conclusion, the Daunne Tunnel project connecting Narayanghat and Butwal holds significant potential for implementation under the Hybrid Annuity Model in Nepal. By leveraging private sector participation, the HAM model can expedite infrastructure development and contribute to regional economic growth and development.

Conclusion

The Hybrid Annuity Model (HAM) holds significant potential for accelerating highway development in Nepal, offering a balanced approach to risk-sharing, project financing, and efficiency improvement. By leveraging private sector expertise and investment, Nepal can overcome its infrastructure challenges, drive economic growth, and improve the quality of life for its citizens. However, successful implementation of HAM requires strong regulatory frameworks, institutional capacity, and stakeholder engagement. Through strategic policy interventions and concerted efforts, Nepal can harness the benefits of HAM to transform its highway infrastructure and unlock new opportunities for sustainable development.

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