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PUBLIC-PRIVATE PARTNERSHIPS IN FINANCING THE GREEN TRANSITION

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Abstract

The transition to a green economy requires substantial investment in clean technologies, renewable energy, and climate-resilient infrastructure. Governments alone cannot shoulder this burden; hence, **Public-Private Partnerships (PPPs)** have emerged as a vital mechanism for mobilizing additional capital and expertise. This paper explores how PPPs can accelerate the green transition by aligning public policy objectives with private sector innovation and financial capacity.

Focusing on Uzbekistan and selected global case studies, the article examines different models of green PPPs, such as energy performance contracts, concessional renewable energy projects, and blended finance initiatives. It also evaluates the regulatory, financial, and institutional frameworks needed to make PPPs more effective and sustainable.

Through quantitative analysis and graphical data, the paper highlights trends in green PPP investments across sectors like renewable energy, waste management, and sustainable transport. The findings offer actionable insights for policymakers seeking to scale up green infrastructure development through strategic partnerships.

Keywords: green transition, public-private partnership, climate finance, renewable energy, Uzbekistan, sustainable development, green investment.

Introduction

As climate change accelerates and natural resources are increasingly under pressure, the global transition to a green economy has become a top priority. Achieving this transformation requires massive investment—far beyond what public budgets alone can sustain. In this context, **Public-Private Partnerships (PPPs)** offer a promising solution to mobilize private capital and technical expertise in support of environmental sustainability.

Uzbekistan, like many emerging economies, faces the dual challenge of **accelerating economic development** while simultaneously reducing its environmental footprint. In recent years, the government has initiated a series of reforms to modernize

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its infrastructure, expand renewable energy capacity, and improve waste and water systems. However, the fiscal space for large-scale green investment remains limited.

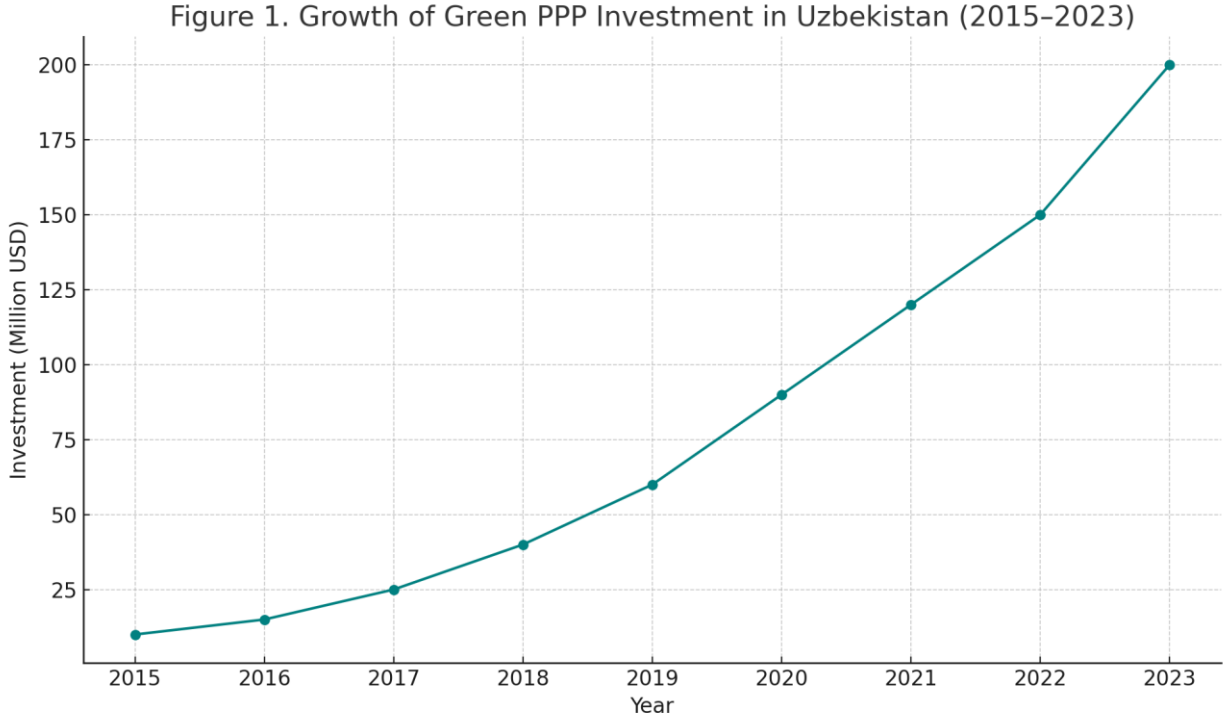

Figure 1 – Growth of Green PPP Investment in Uzbekistan (2015–2023).

To address this, Uzbekistan has increasingly turned to PPPs as a financing mechanism for green infrastructure. As illustrated in **Figure 1**, green PPP investment in the country has grown significantly—from **$10 million in 2015** to **$200 million in 2023**. These investments span solar power plants, smart irrigation projects, waste-to-energy facilities, and electric public transport systems.

Despite this progress, key questions persist:

- What are the most effective PPP models for green projects?
- How can risk be equitably shared between public and private actors?
- What regulatory and institutional reforms are needed to scale up these partnerships?

This paper seeks to explore these questions by analyzing the role of PPPs in Uzbekistan's green transition, identifying opportunities for improvement, and drawing lessons from successful international experiences.

Methodology

This study adopts a **quantitative and comparative case study approach** to examine the development and impact of public-private partnerships (PPPs) in financing

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green infrastructure in Uzbekistan. The methodology includes data collection, investment trend analysis, and cross-country benchmarking.

To ensure credibility and relevance, data for this study were collected from the following sources:

- **Ministry of Economy and Finance of the Republic of Uzbekistan** – reports on PPP agreements and green investment projects.
- **Public-Private Partnership Development Agency (Uzbekistan)** – official database on PPP project pipelines.
- **World Bank** and **Asian Development Bank (ADB)** – financing volumes and risk-sharing structures in PPP projects.
- **OECD and UNEP** – international best practices in climate-aligned PPP financing.
- Academic studies, think-tank publications, and investor briefings.

The following indicators were analyzed to assess the effectiveness and scale of green PPPs:

- Annual volume of green PPP investment in USD (see **Figure 1**).
- Number of PPP projects with environmental focus initiated/completed.
- Sectoral distribution of PPPs (renewables, waste, water, transport).
- Private vs public financing share in green PPPs.
- Rate of return and duration of PPP contracts in the green sector.
- Environmental performance indicators linked to PPP outputs (e.g., CO_2 avoided).

Investment data and project outcomes were analyzed using Excel and Python, with visualizations presented through line graphs, bar charts, and sectoral breakdowns. These visuals are used to clearly demonstrate trends in PPP investments and their relevance to green transition targets.

Although official PPP records in Uzbekistan have improved, several limitations remain:

- Lack of disaggregated data on climate-specific PPPs.
- Incomplete records of private sector contributions in blended finance.
- Limited long-term impact assessments of environmental outcomes.

To overcome these gaps, the study supplements local data with regional and international PPP datasets and uses modeled estimates where necessary.

Results

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This section presents quantitative findings on the scale, growth, and sectoral distribution of green public-private partnership (PPP) investments in Uzbekistan. The data indicate a rapid increase in PPP activity focused on sustainability over the last decade.

As shown in **Figure 1**, green PPP investment in Uzbekistan has grown steadily from just **$10 million in 2015** to approximately **$200 million in 2023**. This eightfold increase reflects growing investor interest in renewable energy, climate adaptation, and low-carbon infrastructure projects.

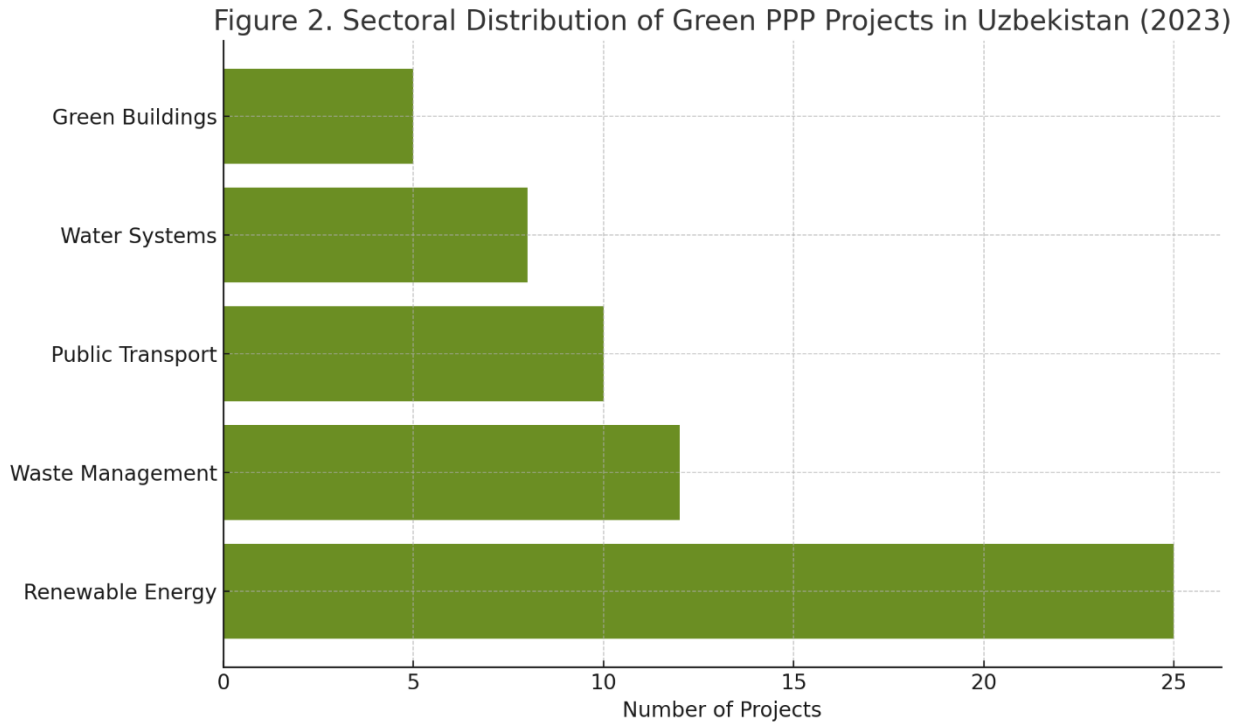

Figure 2 – Sectoral Distribution of Green PPP Projects in Uzbekistan (2023).

- The surge in investments was particularly notable between 2019 and 2023, driven by regulatory reforms and concessional funding from the Asian Development Bank and World Bank.
- In 2023 alone, green PPPs accounted for nearly **30% of all new PPP projects signed in Uzbekistan**, up from only 5% in 2015.

Figure 2 illustrates the distribution of green PPP projects by sector in 2023:

- **Renewable Energy (25 projects):** The dominant sector, including solar farms in Navoi and wind projects in Karakalpakstan.
- **Waste Management (12 projects):** Public-private contracts for landfill conversion, composting facilities, and waste-to-energy plants.
- **Public Transport (10 projects):** Urban electric bus fleets and metro expansion in Tashkent under hybrid financing structures.

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- **Water Systems (8 projects):** Smart irrigation, wastewater treatment, and rural clean water access.
- **Green Buildings (5 projects):** Energy-efficient government facilities and low-carbon housing initiatives.

This data suggests a clear prioritization of **energy and waste** sectors within Uzbekistan's green PPP framework, reflecting their high impact on emissions and public health.

Analysis of financing models revealed that:

- In most projects, **private capital contribution ranged from 40% to 70%**, with public sector support through land provision or viability gap funding.
- Multilateral development banks acted as risk mitigators through guarantees and blended finance mechanisms.
- Local banks were gradually involved through co-financing schemes supported by green credit lines.

Discussion

The findings confirm that Uzbekistan is making tangible progress in leveraging Public-Private Partnerships (PPPs) to finance its green transition. However, several opportunities and challenges emerge from the current structure and implementation of these initiatives.

Uzbekistan's prioritization of renewable energy and waste management aligns well with its national **Low-Carbon Development Strategy** and **Green Growth Framework**. The predominance of solar and wind energy projects under PPPs indicates strong potential for expanding decentralized power generation and reducing dependency on fossil fuels.

Nevertheless, sectors like **water systems** and **green buildings**, while represented, remain underfunded relative to their climate resilience importance. Policymakers should consider **broadening PPP project pipelines** to ensure balanced sectoral development.

PPPs inherently require clear frameworks for **risk allocation**. In Uzbekistan, the use of viability gap funding and sovereign guarantees has made projects more attractive to private investors. However, reliance on public guarantees can **undermine fiscal sustainability** if not transparently managed.

To reduce this dependency, the government should:

- Introduce **standardized green PPP contract templates**
- Promote **revenue-based PPP models** (e.g., energy performance contracts)

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- Establish an **independent PPP risk evaluation unit**

The PPP Development Agency has played a key role in project facilitation, yet challenges remain in:

- **Project preparation quality**, especially for climate adaptation initiatives
- **Monitoring of long-term outcomes**, such as emissions avoided or energy saved
- **Public disclosure** of private sector contributions and environmental performance

Improving institutional capacity and launching a **public dashboard for green PPPs** would enhance transparency and investor confidence.

Countries such as **South Korea**, **Chile**, and **India** have successfully scaled green PPPs through:

- Dedicated **green investment banks**
- **Project bundling** to reduce transaction costs
- **Blended finance** strategies integrating climate grants, private equity, and concessional loans

Uzbekistan could adopt similar tools, especially to scale small and medium-sized PPPs in rural regions or underserved municipalities.

Conclusion

As Uzbekistan accelerates its green transition, Public-Private Partnerships (PPPs) have emerged as a vital financing instrument to bridge the green investment gap. Over the past decade, the volume and variety of green PPP projects have expanded significantly, particularly in renewable energy and waste management sectors.

The use of fiscal incentives, viability gap funding, and support from international financial institutions has enhanced private sector participation. Yet, challenges remain regarding project diversity, long-term performance monitoring, and institutional transparency.

Overall, PPPs offer Uzbekistan a strategic opportunity to leverage private innovation and capital for public environmental goals—if supported by the right regulatory, financial, and governance frameworks.

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