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## Classification of Integrated Models for Financing Forestry in Uzbekistan

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### ABSTRACT

This study is devoted to developing a classification of integrated models that can be applied to financing the forestry sector in Uzbekistan. It examines a multi-vector financing system comprising state budget funds, international financial institutions, private sector investments, green bonds, environmental payments, and revenues generated from forestry activities. The proposed model is aimed at enhancing the ecological sustainability of the sector, addressing climate change challenges, mitigating desertification processes, and ensuring the rational use of forest resources. In addition, expenditure directions, financial control mechanisms, and implementing entities are clearly classified for each financing source. The findings of the study contribute to improving the effectiveness of diversified and sustainable financial instruments in the development of forestry and provide a foundation for the sector's long-term self-financing capacity.

**Keywords:** Forestry sector, financing model, integrated financing, ecological sustainability, climate change, international grants, green bonds, donor organizations, public-private partnership, carbon market, environmental payments, forest fund leasing, diversification, financial oversight, sustainable development.

### Introduction

Uzbekistan's forest resources play a strategic role in ensuring ecological sustainability, mitigating the adverse effects of climate change, increasing biocarbon potential, and protecting natural ecosystems. Nearly 30 percent of the country's territory consists of desert and semi-desert zones, which necessitates the implementation of comprehensive measures in afforestation, sustainable silviculture, soil erosion control, and the expansion of green areas. The effectiveness of these processes largely depends on the availability of a stable and diversified financing system.

In recent years, Uzbekistan has gradually introduced various financial instruments to support the development of the forestry sector, including state budget funding, resources from international financial institutions (such as GEF, FAO, ADB, and AIIB), grants, concessional loans, public-

private partnership (PPP) mechanisms, green bonds, and instruments related to the carbon market. However, existing financial flows do not fully meet the long-term needs of the forestry sector. Consequently, the development and classification of integrated financing models, as well as the identification of their performance criteria, have become a pressing research task.

### Analysis results

Integrated financing models are formed through the combination of distinct financial mechanisms tailored to various areas of forestry activity, including forest establishment and restoration, combating desertification, agroforestry systems, biodiversity conservation, ecotourism development, and the formation of carbon credit markets. The classification of these models is based on criteria such as financing sources, financial instruments, risk-sharing mechanisms, the degree of state participation, and economic efficiency.

**Table 1. A Proposed Integrated Financing Model for the Forestry Sector of Uzbekistan**

| <b>№</b> | <b>Financing Source</b>                           | <b>Main Expenditure Areas</b>   | <b>Form of Financial Control</b>   | <b>Implementing Entities</b>                                    |
|----------|---|---|--|---|
| <b>1</b> | State budget                                      | Wages, service costs, infrastructure development, seedling planting       | Oversight by the Ministry of Finance and independent audit organizations | Forestry Agency, regional forestry departments                  |
| <b>2</b> | Revenues from forest fund leasing                 | Agroforestry technologies, service and operational equipment              | Local-level monitoring mechanisms  | Territorial forestry enterprises                                |
| <b>3</b> | International grants and donor funds              | Sustainable development projects, technical assistance, training programs | Project-based reporting and evaluation approach                          | FAO, UNDP, GIZ, ADB, independent audit organizations            |
| <b>4</b> | Environmental payments and penalties              | Valuation of ecosystem services, restoration activities                   | Regulatory and legal compliance-based control                            | State Committee for Ecology, independent audit organizations    |
| <b>5</b> | Green bonds and environmental impact bonds (EIBs) | Digital monitoring systems, carbon capture technologies                   | Supervision by investors and rating agencies                             | Forestry Agency, Ministry of Finance                            |
| <b>6</b> | Revenues from seedlings and forestry services     | Modernization of forest nurseries, development of export channels         | Self-financing and internal control mechanisms                           | Forestry enterprises, seedling centers                          |
| <b>7</b> | Private sector investments                        | Innovative greenhouses, ecotourism, forest-based products                 | Contract-based regulation and control                                    | Investors, independent audit organizations, Ministry of Economy |

Through the proposed model, the principles of diversification, sustainability, and effectiveness in financing the forestry sector are strengthened. Each financial flow is allocated in a targeted manner and regulated through its corresponding financial control mechanism. In addition, cooperation with international donors and investors is ensured on the basis of openness, transparency, and a results-oriented approach. At the same time, the involvement of the private sector enhances service quality, accelerates the adoption of innovations, and increases flexibility in responding to user needs.

### **Conclusion and suggestions**

By gradually implementing this integrated approach, Uzbekistan's forestry sector can move away from a predominantly state-dependent financing model toward a multi-source, self-financing system that is both environmentally and economically sustainable. This approach not only contributes to maintaining ecological stability but also strengthens the national position in combating climate change and further consolidates cooperation with international financial institutions.

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