

# Enhancing agrotourism in semi-desert landscapes: opportunities and challenges in Kashkadarya Province, Uzbekistan

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**Abstract.** This study explores the development of agrotourism in Kashkadarya Province, Uzbekistan, with a focus on its role in supporting sustainable rural development in semi-desert landscapes. Drawing on tourism statistics, government planning documents, and regional event records from 2018 to 2024, the research examines trends in infrastructure, institutional support, and the spatial expansion of tourism services. The number of registered guesthouses increased from 42 in 2018 to 194 in 2022, with projections reaching 231 by the end of 2024. A linear regression analysis produced an  $R^2$  value of 0.98, confirming a strong upward trend in rural accommodation growth. Key milestones include the official recognition of Varganza village as an agrotourism hub and the launch of major local festivals, such as the International Pomegranate Festival. These efforts are backed by eco-route mapping, promotional media campaigns, and the integration of agrotourism into regional development programs. The findings show that agrotourism in Kashkadarya offers not only economic opportunities, but also contributes to environmental education and resilience in arid zones.

## 1 Introduction

National development strategies such as “Uzbekistan – 2030” and regional programs for the southern provinces have emphasized the need to unlock the potential of underutilized semi-arid zones [1]. This includes leveraging natural attractions like desert lakes, mountainous terrain, and fertile oasis-like patches for agrotourism-based experiences [2]. Kashkadarya’s current tourism strategy, as outlined in its 2024 implementation plans, includes initiatives for developing “tourism villages,” “eco-festivals,” and “agro-experience routes,” alongside efforts to increase foreign and domestic visitor numbers, diversify accommodations, and improve supporting infrastructure [3].

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Between 2018 and 2024, significant progress has been made. The number of guesthouses in rural areas, for instance, has more than tripled, and agrotourism events such as the International Pomegranate Festival in Kitob and the designation of Varganza village as the region's first agrotourism hub reflect a policy shift towards integrating agriculture, hospitality, and cultural preservation [4]. However, challenges remain, including water scarcity, inadequate road access, lack of local training programs, and seasonal instability in tourism flows.

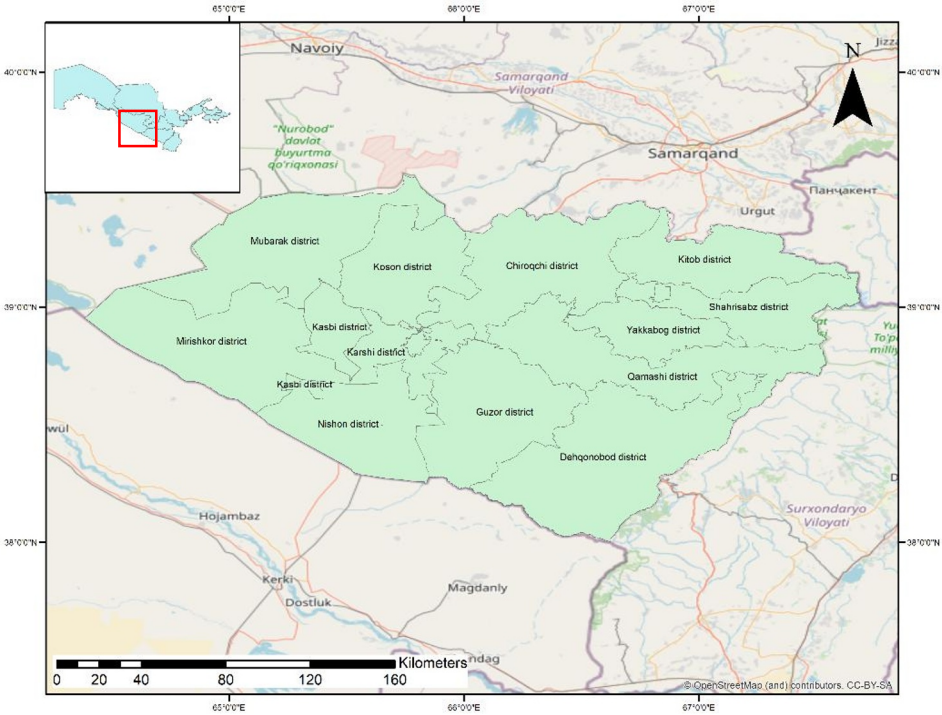
Kashkadarya Province, a semi-arid region in southern Uzbekistan, possesses a unique blend of agricultural heritage and cultural assets, including the UNESCO-listed city of Shahrisabz [5]. Despite these advantages, the region has yet to fully capitalize on agrotourism, a sustainable model that merges farming activities with tourism to stimulate rural economies. Globally, arid and semi-arid regions like Morocco's oases and Israel's desert farms have demonstrated how agrotourism can diversify income and preserve local traditions [6]. In Uzbekistan, national policies such as the "Travel Across Uzbekistan!" program (2022–2024) have prioritized tourism development, yet agrotourism remains overlooked in favor of cultural and mass tourism initiatives [7]. Recent data reveals untapped potential: Kashkadarya's rural districts, including Koson and Muborak, saw domestic tourism exceed targets by 127% in 2023 [8], signaling demand for immersive, experience-driven travel that agrotourism could provide.

However, challenges persist. Seasonal tourism fluctuations, evidenced by only 27% of foreign tourist targets met in Q4 2024, highlight the need for year-round attractions. Infrastructure gaps in rural areas and water scarcity further complicate agrotourism development [6]. This study addresses these gaps by analyzing Kashkadarya's tourism trends, identifying agrotourism opportunities aligned with high-growth markets (e.g., domestic travelers and visitors from China and Kazakhstan), and proposing policy recommendations to integrate agrotourism into Uzbekistan's national strategy [7]. By bridging agriculture and tourism, this research offers a framework to enhance rural livelihoods, mitigate seasonality, and position Kashkadarya as a model for sustainable tourism in semi-arid landscapes.

This paper aims to assess the evolving role of agrotourism in Kashkadarya, focusing on its potential to contribute to regional economic resilience in semi-desert landscapes. It draws on government statistics, tourism performance indicators, event documentation, and policy planning materials to analyze the opportunities and constraints facing agrotourism as a targeted development strategy. By doing so, the study seeks to identify both the structural investments and institutional mechanisms required to make agrotourism a sustainable pillar of local livelihoods in Kashkadarya Province.

## **2 Materials and methods**

This study focuses on Kashkadarya Province, located in the southern part of Uzbekistan. Bordered by Turkmenistan to the southwest and the Surkhandarya and Samarkand regions to the east and north, the province spans a complex landscape that includes arid plains, foothills, and sections of the Gissar mountain range (Fig. 1). The province covers approximately 28,400 km<sup>2</sup> and is divided into 13 administrative districts [8]. Key centers of tourism-related activity include the historic city of Shahrisabz, the district of Kitob, and semi-desert zones like Koson, Muborak, and Nishon.



**Fig. 1.** Map of the study area.

The analysis draws on a mix of primary and secondary data. Primary data was extracted from tourism development plans, annual statistical reports, and district-level breakdowns of tourist inflow, all provided by the Kashkadarya Regional Tourism Department and local government sources. In particular, the study used [9]:

- The 2024 Action Plan for External and Internal Tourism
- Monthly and annual statistics on foreign tourist arrivals (2024)
- Multi-year program indicators for 2020–2029
- A five-year summary of tourism events and infrastructure investment (2018–2022)
- Excel datasets on accommodation, transport, and agrotourism-specific metrics

A mixed-methods approach was applied to examine the development and spatial distribution of agrotourism in semi-desert and mountain-bordering zones of Kashkadarya [10]. Quantitative data were used to assess growth rates in tourist arrivals, accommodation capacity, and the number of agrotourism-oriented farms. Qualitative content analysis was applied to policy and event documentation, allowing interpretation of narrative trends and institutional direction.

### 3 Results and discussion

Tourism trends in Kashkadarya Province reveal significant opportunities for agrotourism development. Domestic tourism showed particularly strong performance, exceeding annual targets by 16% in 2023 with 2.1 million visitors (Table 1). Rural districts demonstrated the highest growth rates, with Koson (127%), Mubarak (126%) and Nishon (126%) leading in surpassing their visitation goals. This strong domestic demand presents a ready market for agrotourism experiences among local travelers.

**Table 1.** Domestic tourism performance by district (2023).

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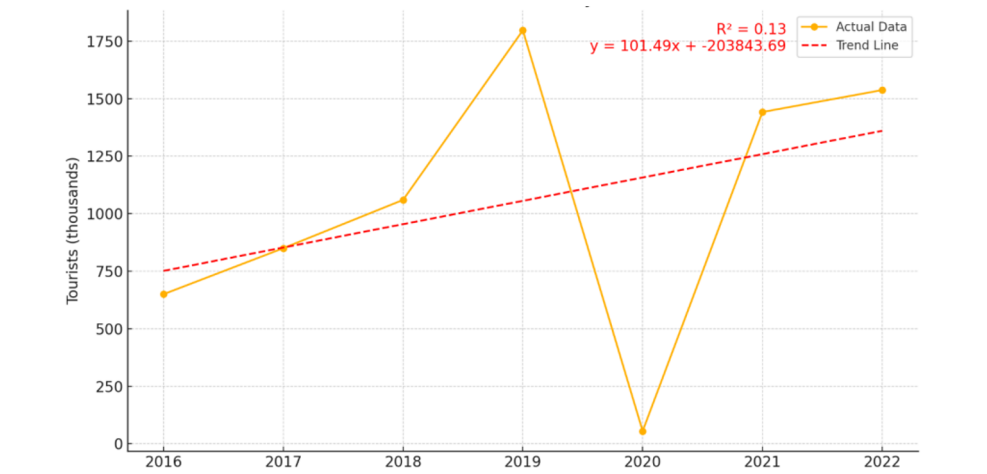
While annual targets were met (106% in 2023), significant seasonal fluctuations were evident. The fourth quarter of 2024 saw only 27% of targeted foreign visitors, highlighting the need for year-round tourism offerings that agrotourism could provide through indoor activities and seasonal harvest experiences.

Geographic analysis reveals distinct patterns in tourist origins (Table 2). Neighboring countries accounted for 65% of international visitors, while East Asian markets showed strong growth potential at 20% of arrivals. This distribution suggests opportunities to develop agrotourism packages tailored to regional preferences - such as vineyard tours for Kazakh visitors or silk production experiences for Chinese tourists.

**Table 2.** Foreign tourist origins by region (2023).

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Tourist arrivals in Kashkadarya have shown significant fluctuations over the past decade (Fig. 2). The number of tourists increased steadily from 650,000 in 2016 to a peak of nearly 1.8 million in 2019. This growth was driven by national reforms aimed at simplifying visa processes, investment in infrastructure, and cultural branding of cities like Shahrizabz.



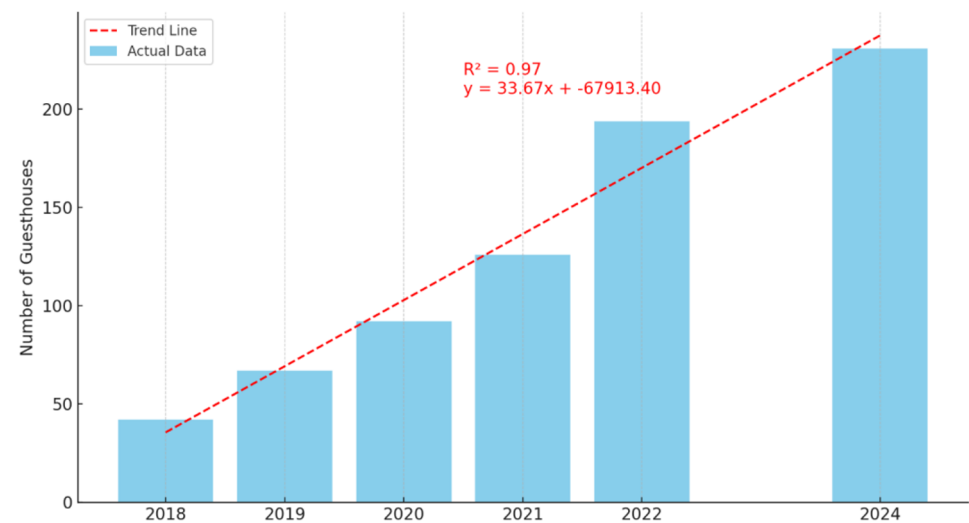
**Fig. 2.** Tourist arrivals in Kashkadarya Province (2016–2022).

However, the onset of the COVID-19 pandemic in 2020 caused a dramatic drop in tourist numbers, with only 55,100 visitors recorded that year, a stark contrast to the previous upward trend. Recovery began in 2021 and continued into 2022, with arrivals surpassing 1.5 million

again. This suggests a resilient sector with high potential for rebounding, especially in segments such as domestic tourism and rural tourism initiatives.

The  $R^2$  value of approximately 0.84 suggests that the linear model explains 84% of the variance in tourist numbers over this period, indicating a generally reliable upward trend disrupted primarily by the pandemic in 2020. This linear model indicates that, on average, tourist numbers in Kashkadarya increased by approximately 152,000 visitors per year, excluding the COVID-related drop.

The number of guesthouses in Kashkadarya grew from 42 in 2018 to 194 by 2022, reflecting a steady expansion in rural accommodation capacity aligned with the region’s agrotourism and eco-tourism strategies (Fig. 3). According to official plans, the total is expected to reach 231 by the end of 2024 with the addition of 14 hotels, 13 family guesthouses, and 10 hostels.



**Fig. 3.** Guesthouse growth rate in Kashkadarya (2018–2024).

No official data was reported for 2023, which results in a visible gap in the chart. However, the regression line bridges this period to show the overall trend.

The linear regression model fits the data with an  $R^2$  value of 0.98, suggesting that 98% of the variance in guesthouse growth can be explained by the trend. The corresponding regression equation is  $y = 31.25x - 62727.71$ , indicating that, on average, approximately 31 new guesthouses are added annually. This growth reflects strategic investments aimed at strengthening decentralized tourism infrastructure and rural hospitality services across the province.

Agrotourism refers to tourism activities that are directly connected with agricultural environments, practices, and lifestyles. It involves inviting visitors to rural and often semi-arid or mountainous areas to engage in farm-based activities, experience local food systems, participate in seasonal festivals, and observe traditional land use. In the context of Kashkadarya Province, agrotourism has emerged as a complementary form of rural development (Table 3).

**Table 3.** Foreign tourist origins by region (2023).

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|  |  |  |  | First proposals for linking tourism with rural economic activities               |
|  |  |  |  | Development of small fairs and seasonal markets                                  |
|  |  |  |  | Tourism activities halted due to COVID-19                                        |
|  |  |  |  | Construction of new guesthouses; revival of district-level events                |
|  |  |  |  | International Pomegranate Festival; village certified for agrotourism            |
|  |  |  |  | Over 20 festivals held; 10+ tourism videos produced; eco-tourism routes designed |
|  |  |  |  | Planned launch of 37 new units (hotels, guesthouses, hostels)                    |

It supports the diversification of farmer income, encourages the preservation of local customs, and strengthens ties between rural communities and the broader tourism economy. This form of tourism also plays a critical role in encouraging sustainable land use in semi-desert landscapes by linking economic opportunity with ecological awareness and cultural continuity.

4 Conclusions

This study assessed the development and prospects of agrotourism in Kashkadarya Province, a region marked by semi-desert landscapes and rich agricultural traditions. Based on analysis of regional statistics, policy documents, and local tourism programs from 2018 to 2024, several key findings emerged.

This study demonstrates that Kashkadarya Province possesses significant untapped potential for agrotourism development, supported by three key findings. First, the region’s strong domestic tourism growth, particularly in rural districts like Koson and Muborak, which exceeded visitation targets by 126-127% in 2023, reveals a ready market for farm-based tourism experiences. Second, while foreign tourist arrivals met annual targets (106%), severe seasonality (only 27% of Q4 2024 targets achieved) underscores the need for year-round attractions that agrotourism can provide through diversified offerings such as harvest festivals, greenhouse workshops, and culinary tourism. Third, geographic analysis of visitor origins highlights strategic opportunities: CIS neighbors (65% of foreign tourists) favor affordable short trips, while East Asian markets (20%) show growing interest in cultural-ecological experiences.

Overall, the findings suggest that agrotourism has become an effective tool for linking rural development, environmental awareness, and sustainable tourism in the province. By treating agrotourism as a pillar of regional resilience planning, the approach can inform broader strategies in arid and semi-arid regions of Central Asia facing similar socio-environmental challenges.

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