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Article

Organizational and Economic Mechanisms of Increasing the Efficiency of Using Agroturism Resources in the Conditions of Digital Technologies (on the Example of Andijan Region)

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Abstract: This in the article digital The organizational and economic mechanisms for increasing the efficiency of using agrotourism resources in the regions in the context of the introduction of the economy and digital technologies were scientifically and practically studied on the example of Andijan region. During the research, the digitization of agrotourism facilities, the creation of geoinformation systems (GIS) and Smart-Agrotourism platforms, the introduction of public-private partnership (PPP) models were considered. to grow and agrotourism clusters digital to the ecosystem integration to do according to offers working Andijan of the province districts according to agrotourism potential and digital preparation level econometric modeling and many factorial regression analysis methods through evaluated . Research results according to territorial agrotourism efficiency to increase A model of a complex organizational and economic mechanism and forecasts for future economic development are presented.

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Key words: digital agrotourism , GIS-geoportal, Smart Agrotourism, organizational and economic mechanism , agrotourism cluster , public-private partnership , Andijan region , econometric model.

1. Introduction

The rapid development of the digital economy in the world and tourism to the industry innovative of technologies active enter arrival traditional service show areas fundamentally is changing . UN World tourism According to the World Health Organization (UNWTO), According to , global tourism in the market digital platforms and online booking systems user tourists share of 78 percent increased and agrotourism in the direction of digital to services the demand every year on average 16-18 percent growing [1]. Digital technologies are enabling the effective management of agritourism resources , services quality increase , regional the brand promote to do and village in places economic stability of providing important to the driver is spinning .

Uzbekistan In the Republic digital Special attention is being paid to the transformation and rapid development of the tourism sector. Uzbekistan Republic The President's " Digital Uzbekistan – 2030" strategy confirmation and him/her effective done increase measures "about" Decree and " For 2022–2026 New Uzbekistan progress strategy" of the regions tourism from the potential complete and reasonable use , agrotourism and the development of ecotourism and the widespread introduction of digital technologies in the sector have been identified as a priority task [2].

Andijan province of our republic population the most dense located and village farm high at the level specialized from the regions The region has a rich natural and climatic

and agrotourism resources there is to be despite them digital technologies using promote to do and the level of integration into a single digital ecosystem is insufficient [3]. Agrotourism of subjects (farmer farms , agro - recreation integrated digital to geoportals offline , online service show and monitoring systems absence agrotourism from resources use efficiency Therefore , improving organizational and economic mechanisms for increasing the efficiency of using agrotourism resources in the context of digital technologies is of urgent scientific and practical importance.

The economic and digital mechanisms of organizing the digital economy and agritourism activities have been studied in various aspects by international and local scholars. International in practice R. Sharpley and D.Vass defines agritourism village farm subjects their income diversification to do tool as founded if [4], M.Sznajder and L. Przezbórska agrotourism resources in management modern information and communication the role of information and communication technologies (ICT) separately who pointed out [5].

International researcher IVShkurkin et al. (2018) developed mechanisms for optimal distribution of tourist flows through digitization of agritourism in rural areas and GIS-geospatial modeling [6]. Uzbek from scientists A.Sh.Alimov, M.T.Alimova and NTTuhlievs scientific in their work territorial tourism market develop and agrotourism subjects state by support issues surrounding analysis those who did [7].

However, in densely populated oasis areas (for example, in Andijan region), managing agrotourism resources through digital technologies (Smart Agrotourism, GIS-geoportals), and digitally integrating agrotourism clusters are essential. platforms at the base formation and their economic efficiency assessment according to complex research enough done not increased .

2. Materials and Methods

The research process used a systematic and structural approach, comparative analysis, econometric modeling (OLS), GIS-geospatial assessment, and expert assessment methods. Agrotourism resources in Andijan region use to the effectiveness and digital platforms current to be completed related many A factorial regression model was constructed :[8]

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + e$$

Here : Y –

Agrotourism of subjects general annual revenue / income (billion soum);

X_1 – Digital platforms and to geoportals attached agrotourism subjects number (unit);

X_2 – Digital technologies and Smart infrastructure included investments volume (billion) soums);

X_3 – Digital Marketing and online advertisement expenses (billion) soums);

X_4 – Digital to skills has was agrotourism employees number (person);

β_0, β_1, β_2, β_3, β_4 – Coefficients of model parameters ; ε – Random error

Axbart and information base as Uzbekistan Republic National statistics agency and Andijan region Tourism and cultural inheritance Statistical Office of the Republic of Kazakhstan for 2018–2025 from the data was used [9].

3. Result and Discussion

Table 1. Andijan in the region as of 2025 more than 7200 farmer and farmer farms there is of which 320 agrotourism services show to the potential However, only 14.5 percent (46) of these entities have their own maps on modern digital platforms (Google Maps, Yandex Maps, booking geoportals). services placed .

Table 1. Andijan province districts according to agrotourism and digitization indicators (based on 2025 data [10])

District / City Name	Agritourism Entities (count)	Connected to Digital Platform (%)	Annual Tourists (thousand people)	Annual Revenue (bln UZS)
Khonobod City	45	35.5%	120.5	18.4
Khojaobod Dist.	38	21.0%	85.2	12.1
Oltinkol Dist.	40	17.5%	78.4	10.2
Asaka Dist.	35	14.2%	65.1	9.0
Marhamat Dist.	32	12.5%	62.0	8.5
Other Districts	130	6.1%	140.0	18.8

From the data in Table 1 It seems that digitization level high was Khanabad city and Khojaabad in the district from agrotourism removable annual income and the flow of tourists is significantly higher than in other districts. This dependency more precisely assessment for econometric modeling was held .[11]

Econometric model and evaluation results

Andijan The region's dynamic development in 2018–2025 row information according to The estimated regression model is as follows: the result gave :

$Y = 1.84 + 0.38\ X_1 + 0.52\ X_2 + 0.29\ X_3 + 0.11\ X_4$

$R^2 = 0.912$ | F-statistic = 54.8 ($p < 0.001$) | DW-stat = 1.94

Model's determination coefficient ($R^2 = 0.912$) under study consequential factor (agritourism 91.2 percent of the change in income to the model included digital factors on account of right to come proves . Analysis to the results according to :

Figure 2. Agrotourism of subjects digital to platforms connection (X_1) to 10 units if it increases , annual revenue 3.8 billion in soums increases ;

Digital to infrastructure included investments (X_2) 1 billion in soums If it increases , the income will be 0.52 billion in soums increases .[12]

Figure 2. Digital Agritourism Organizational-Economic Mechanism Model



Discussion

Received econometric and statistic results this shows that Andijan in the province agrotourism develop for traditional from approaches give up "Smart Agrotourism " Cluster model current to grow The results obtained are consistent with those of R.Sharpley and By IVShkurkins previously pushed ideas complete confirms , that is digital integration and agrotourism geo- information resources base create services efficiency on average 25-30 percent increases [13].

Organized in the region Smart Agrotourism Cluster to the composition farmer and farmer Farms , Digital technologies ministry territorial department , higher education institutions and private tourism companies [14] This is a self- contained in turn , agrotourism reduce the seasonality of services and year during permanent tourists flow provision opportunity gives [15].

4. Conclusion

The digital The study demonstrates that the efficient use of agrotourism resources can become an important component of sustainable economic development and rural diversification in Andijan Region. The region possesses a combination of agricultural, natural, cultural, historical, gastronomic, and recreational resources that creates favorable conditions for the formation of diversified agrotourism products. At the same time, the economic potential of these resources depends not only on their availability but also on the effectiveness of their organization, commercialization, promotion, infrastructure development, and integration with modern digital technologies.

The analysis confirms that the traditional approach to agrotourism development, based primarily on the use of natural and agricultural attractions, is no longer sufficient under conditions of increasing digitalization. Digital technologies create opportunities to transform individual agricultural and rural attractions into integrated tourism products. Digital platforms, online booking systems, electronic payment services, geographic information systems, social media marketing, virtual tours, artificial intelligence, and big data analytics can improve the accessibility and competitiveness of agrotourism destinations while reducing information asymmetry between service providers and tourists.

For Andijan Region, the integration of agriculture and tourism is particularly significant because the region has substantial agricultural activity and a large rural population. Recent regional development initiatives emphasize both tourism infrastructure and the creation of new tourism routes and products. Official data also indicate significant tourist flows to the region, demonstrating the existing demand base for further diversification of tourism services.

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