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METHODOLOGY FOR QUANTIFYING GREENHOUSE GAS EMISSIONS IN THE DEVELOPMENT OF GREEN TOURISM

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Abstract
This article examines the methodology for quantifying greenhouse gas emissions in the development of green tourism, with an emphasis on sustainable practices that balance environmental protection, cultural preservation, and economic growth. The study analyzes Uzbekistan's rich natural landscapes, historical heritage, and biodiversity to identify key opportunities for green tourism, including ecotourism, agrotourism, and community tourism.

Keywords: Green tourism, green development, green tourism models, CO2, greenhouse gases, sustainable development.

Introduction. In the context of sharp climate change, global problems such as the increase in greenhouse gas emissions such as carbon dioxide, household waste, and excessive consumption of energy and water resources in Uzbekistan for 2019-2030 (Resolution No. PQ-4477) associated with the activities of the tourism industry, in addition to a number of industrial enterprises, require consistent scientific research in this area.
The “Strategy for the Transition to a Green Economy” in Uzbekistan for 2019-2030 (Resolution No. PQ-4477) creates a legal and scientific basis for the development of green tourism in the context of climate change. The strategy sets out tasks such as the efficient use of natural resources, the preservation of

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ecosystems, and adaptation to the consequences of climate change. For example, measures are being taken to combat desertification and improve the lives of local residents through the development of ecological tourism in the Aral Sea region. [1]

The implementation of the tasks set out in the Decree of the President of the Republic of Uzbekistan No. PF-158 dated September 11, 2023 "On the Strategy of Uzbekistan - 2030", the Resolution of the President of the Republic of Uzbekistan No. PQ-436 dated December 2, 2022 "On measures to increase the effectiveness of reforms aimed at the transition of the Republic of Uzbekistan to a "green" economy by 2030" and other regulatory legal acts will serve to increase the literacy of the population in the field of green tourism in Uzbekistan. [2]

Tourism is a sector with significant potential as a driver of growth in the global economy. The tourism economy accounts for 5% of global gross domestic product (GDP), while it also accounts for 8% of total employment. International tourism is the fourth largest global export (after fuels, chemicals and automotive products), with an industry value of US$1 trillion per year, accounting for 30% of world trade in services exports or 6% of total exports. Approximately four billion domestic tourists arrive each year, and an estimated 940 million international tourists are expected to arrive in 2022. Tourism is one of the top five exports in more than 150 countries and the number one export in more than 60 countries[3]. It is also the main source of foreign exchange for one-third of developing countries and one-half of least developed countries.

As the number of tourists who have the opportunity to travel increases, so does the environmental impact of tourism. [4].

In the initial stage of development of green tourism, many researchers have been using the scientific hypothesis of the ecological Kuznets curve (EKC) to study the negative impact of air transport and other means of transport related to tourism activities, which causes a sharp increase in the share of carbon dioxide CO2 greenhouse gas emissions, and excessive consumption of electricity in connection with the provision of hotel services, which also leads to a sharp increase in the share of carbon dioxide CO2 greenhouse gas emissions due to

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the burning of coal and natural gas by electricity generating enterprises, as well as excessive consumption of water resources in hotel activities.

Literature Review

In the economic literature, the methodology for determining the amount of greenhouse gas emissions in the development of green tourism has been interpreted differently by a number of economists and methods for reducing them have been proposed.

Professor S.R. Safayeva noted: 5% of the global CO2 emissions produced annually are due to transport, construction, catering, land development practices, etc. in the tourism sector. In turn, 2% of this figure is directly accounted for by the hotel business. According to the Paris Agreement, which is one of the main documents in ensuring environmental sustainability in the world, it is planned to reduce CO2 emissions by 50% by 2030, and by 100% by 2050. The hotel sector should also actively participate in the implementation of this large-scale goal [5].

Uzbek economists, such as B. Kuziboev and U. Matyakubov, have made a worthy contribution to the development of scientific, theoretical and practical issues related to the development of a methodology for determining the amount of greenhouse gas emissions in the development of green tourism. [6].

In recent decades, environmental problems and global warming, climate change, greenhouse gas emissions and pollution have become serious global issues, mainly due to excessive carbon emissions into the environment due to excessive energy and water consumption and misuse of natural resources. [7].

Research Methodology

The article uses the methods of analysis and synthesis, induction and deduction, monographic statement, logical and economic-statistical analysis, econometric modeling, comparison, grouping of statistical data, expert assessment, and scientific abstraction.

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Analysis and results

Tourism-related transport energy consumption is associated with transport modes such as buses, rail, cars, aircraft with different energy intensities and cruise ships.

According to the International Transport Forum forecasts for 2030, despite the expected improvements in fuel efficiency and the emergence of environmentally friendly transport modes, the increase in demand for passenger and freight transport will lead to an increase in CO2 emissions.

By 2030, total CO2 emissions from passenger and freight transport will increase by 21% compared to 2016, amounting to 8.772 million tons of CO2, which is 23% of all anthropogenic CO2 emissions.

Table 1. Global tourism spending, carbon footprint and carbon intensity, 2009–2023*

Indicators	Years			
	2009	**2013**	**2019**	**2023**
Tourism carbon footprint (Gt CO2-e)	3,7	4,4	5,2	2,2
Total global carbon footprint (Gt CO2-e)	50,9	55,5	59,1	54,5
Tourism's share of global greenhouse gases	7,3%	8,0%	8,8%	4,1%

* By Author's work based on research results

Table 1 shows that the global carbon footprint of the tourism industry increased from 3.7 Gt CO2-e to 4.3 Gt CO2-e between 2009 and 2013, with 2009 as the base year.

Two types of data are required to calculate greenhouse gas emissions: tourism activity data and emission factors.

We can calculate greenhouse gas emissions using the following general formula:

Greenhouse gases = Tourism activity data x Greenhouse gas emission factors (1) *

* By Author's work based on research results

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The unit of measurement for greenhouse gases is "tCO2e".

For example, CO2 emissions from jet fuel are 3.15 grams per gram of fuel, which equates to 115 grams of CO2 emissions per passenger from a Boeing 737-400. The airliner's speed is 780 km/h, which equates to 90 kg of CO2 per passenger per hour.

Relevant figures for a Boeing 747-400 (used for long-haul international flights):

Distance: 5556 km

Fuel used: 59.6 tonnes

Seats: 416

Seat occupancy: 80%

Average number of passengers: 333

Fuel consumption per passenger-km: 59.6 tonnes / (5556 km x 333) = 32.2 g / km. CO2 emissions: 101 g per passenger-km (multiplied by 3.15 g CO2 per g of fuel)

Airline speed: 910 km/h

CO2 emissions: 92 kg CO2 per passenger-hour.[3]

In the Resolution of February 7, 2025, "On the State Program for the Implementation of the "Uzbekistan - 2030" Strategy "In the Year of Environmental Protection and "Green Economy", the development of a plan of measures for the implementation of the "Green Tourism" program in the Republic of Uzbekistan, and the reduction of the "carbon footprint" in the economy through the widespread use of modern energy-saving technologies in economic sectors and the social sphere were identified as priority approaches to the country's development in the "Year of Environmental Protection and "Green Economy".

Table 3 CO2 calculation platforms *

T/r	Platform type	Platform source
1.	Greenview Hotel Footprint	www.hotelfootprints.org
2.	Carcamal Carbon Calculator	goodtourisminstitute.com
3.	ADEME`s	homeexchange.com
4.	Sustainable Development Goals (SDG) Action Platform	https://sdgs.un.org/partnerships

* By Author's work based on research results

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Conclusion

The results of the study on the development of a methodology for determining the amount of greenhouse gas emissions in the development of green tourism made it possible to formulate the following conclusions, develop scientific proposals and practical recommendations:

1. The scientific and methodological foundations of the development of green tourism are aimed at harmonizing environmental, economic and social aspects. Scientific research, the principles of sustainable development and the use of modern technologies play an important role in this process.
2. For countries such as Uzbekistan, which are significantly affected by climate change, this approach is of strategic importance not only for the development of tourism, but also for preserving the natural environment and ensuring economic stability.

References

1. Decree of the President of the Republic of Uzbekistan dated September 11, 2023 No. PF-158 "On the Strategy "Uzbekistan - 2030".
2. Resolution of the President of the Republic of Uzbekistan dated December 2, 2022 No. PQ-436 "On measures to increase the effectiveness of reforms aimed at the transition of the Republic of Uzbekistan to a "Green" economy by 2030".
3. http://cawater-info.net/green-growth/files/unep.pdf.
4. https://sustainabletravel.org/issues/carbon-footprint-tourism
5. S.R. Safayeva. ""Greening" Tourism. Why is it needed and how is it done?" Issue No. 93 of the "Yangi Uzbekiston" newspaper, May 15, 2024.
6. Kuziboev B., Saidmamatov O., Khodjaniyazov E., Marty P., Ibragimov J., Davron Ruzmetov D., Matyakubov U., Lyulina E., Ibadullaev D. CO2 Emissions, Remittances, Energy Intensity and Economic Development: The Evidence from Central Asia. Economies 12: 95. 2024.
7. N. Yu. Rasulova. Research models of green tourism development. American Journal of Interdisciplinary Research and Development. Volume 31, August 2024, Pages 70-74.