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Inbound Tourism Transport and Carbon Emissions in Serbia: Insights into Sustainable Tourism Improvement

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Abstract:

Research Question: What are the implications of the carbon footprint generated by foreign tourist transport in Serbia for sustainable tourism planning? **Motivation:** Low-carbon tourism is an important way for the tourism industry to achieve the United Nations Sustainability Development Goals and the goals of carbon peaking and carbon neutrality. Previous research amply deals with the carbon footprint, but most research is focused on countries where tourism is developed. There are not many papers on the topic of carbon footprint in Serbia, so we considered this kind of research could be an important contribution. **Idea:** The idea is to analyze and quantify the carbon footprint caused by the transportation of foreign tourists in Serbia. The research is based on available data regarding the distribution and characteristics of foreign tourist arrivals in Serbia, with an analysis of regional differences between Belgrade, southeastern, northern, and west-central Serbia. **Data:** Using official tourism statistics, data on distances travelled, and recognized emission factors, this research quantifies the CO_2 emissions derived from air, road, and rail transport (1,213,835 tons of CO2 in total in 2023). The methodology includes spatial analysis of tourist arrivals that are spread across four different Serbian regions: Belgrade, Northern (Vojvodina) represented by Novi Sad, Central-Western represented by Zlatibor, and South-Eastern Serbia represented by Niš. The methodology considers short-haul destinations and long-haul destinations too. **Tools:** The descriptive statistics are use to present data, and also OpenStreetMap contributors and the GIS use to display the data on the map. **Findings:** In general, it is shown that air travel is the main contributor to emissions from intercontinental markets, particularly the USA and China. These destinations contribute significantly to most emissions: regional road travel also produces significant emissions for the tourists moving to different destinations after they enter the country. This shows that Belgrade is the centre for foreign tourists and hosts most emissions, while growing environmental pressure occurs in inland tourism centers such as Zlatibor and Niš. Importantly, this is in line with the promotion of low-carbon alternatives like rail to put tourists under lower pressure of emissions in their destination regions by optimizing tourist flows and enabling increasingly longer stays of tourists. **Contribution:** Hence, this research will give directions on the effective application of national tourism with environmental policy, also requesting integrated strategies linking the growth of tourism with Serbia's sustainability commitments and global climate goals. It sets a basis for further studies and planning adjustment toward a more sustainable, low-carbon tourism sector.

Keywords: carbon footprint, transportation, inbound tourism, Serbia

JEL Classification: L41, L83, Q51, Q56

1. Introduction

Tourism is a significant contributor to world economic development and the creation of employment (Anjali & Prita, 2018; Obersteiner et al., 2021). Foreign tourists, in particular, contribute to the economy through direct consumption of various tourism services. This consumption generates income, which is especially impactful in rural areas, where both domestic and international visitors help stimulate local economies (Tsutsumi et al., 2024). Through a configuration analysis, Chen et al. (2022) gain a better understanding of the relationship between transportation connectivity and the tourism economy. Transportation forms an

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important component of the tourism industry, while travel is an important part of the overall impression experienced by tourists. Key elements for competitiveness are transport connectivity and accessibility of the destination. These competitiveness factors, and progress in the transport sector, are essential factors for tourism growth (Sanchez-Rivero et al., 2024). Consumer behaviour is experiencing notable shifts, particularly in the selection of travel destinations that reflect individuals' environmental values (Vrontis et al., 2021). As a result, the tourism industry must adapt to these evolving preferences. Key areas of focus include sustainable transport and environmentally friendly accommodations, both of which play a significant role in shaping consumer demand (Baena & Cervino, 2024).

Along with the economic consideration, there is a need to look into how sensitive tourism is to climate change (Wang & Xi, 2023). Sustainable tourism has become the core of future tourism, playing a key role in developing policies and strategies to support the sustainability of tourism resources and communities (Goulding et al., 2014; Budeanu et al., 2016). Concerns about natural resources as the foundation of tourism have been driven by scientific research, academic discussions and considerations, industry analysis, etc. All of these have created a new concept of "sustainable tourism" that has emerged as a response to the concerns of all stakeholders whose business survival depends on tourism (Zhang & Chan, 2020; Agarwal et al., 2024).

Many authors have studied the relationship between tourism development and transport infrastructure, particularly emphasizing the important role of transport in creating and maintaining tourism services and attracting more visitors (Kartsan, 2022; Boto-Garcia & Perez 2023).

Long-term sustainability in tourism requires a careful balance between three interrelated dimensions: economic, socio-cultural and environmental sustainability. Achieving this balance is essential for the continued growth and competitiveness of the tourism industry. Central to this is an efficient and effective functioning of transport systems, as tourism is intrinsically dependent on mobility – there is no tourism without travel and transport. Furthermore, the industry benefits significantly when tourists opt for public transport, which not only supports sustainable practices but also contributes to reducing environmental impacts and improving the accessibility of the destination (Pellegrino, 2021).

In addition, tourism plays a key role in global carbon emissions (Sun et al., 2024). It is important to note that carbon footprint associated with tourism activities includes both direct carbon emissions such as using petrol for travel purposes as well as usage of petrol in the goods and services which are purchased by tourists (Popovic et al., 2025).

Low-carbon tourism is an important way for the tourism industry to arhieve the United Nations Sustainability Development Goals and the goals of carbon peakning and carbon neutrality (Cao et al., 2023). The carbon footprint associated with tourism reflects the quantity of greenhouse gas (GHG) emissions that are produced by travelers through their tourism activities (Vaske et al., 2015; Luo et al., 2018).

1.1 The primary aim of reseach

A large number of studies point to a constant global increase in domestic and foreign tourist trips (Vergori et al., 2025), highlighting the growing dominance in the tourism sector. The increase in tourist trips as the most important travel category was influenced by the popularization of private vehicles and low-cost airlines. Along with all this, we have the growing productivity of the labour force, the increase in disposable income and free time, as well as the strong influence of social networks (Bursa et al., 2022). Promoting environmentally friendly transport choices is key to strategies aimed at developing a sustainable transport system (Gao & Zhu, 2022). This topic has attracted increasing interest from both scholars and policymakers, who are exploring different strategies and policy frameworks to achieve this goal. However, limited attention has been paid to the mobility patterns of tourists at destinations - especially in terms of the time spent using environmentally friendly transport modes compared to private motor vehicles. Understanding and addressing this gap is essential to improve sustainable mobility practices in the tourism sector (Zamparini & Vergori, 2021). Providing satisfactory solutions when it comes to accessibility and mobility of transport should be one of the main priorities. Innovative and sustainable transport solutions can reduce the negative impact of transport on the environment and increase the competitiveness of the region (Szymanska et al., 2021). If we look at natural resources, Serbia is rich in diverse landforms, beautiful landscapes, water resources, good climate, soil and rich biodiversity. As tourism and natural resources are connected through various complex relationships (Milanovic Pesic et al., 2025), research related to ecological sustainability must be a priority in future research. Environmental protection policies in Serbia increasingly emphasize

sustainability and protection of natural resources and are integrated into the national tourism development strategy. Sustainable tourism is encouraged by involving environmental transport modes and reducing impacts of tourists' movements. Balancing the environment with the interests of tourism development supports Serbia's performance towards international climate goals and enhances competitiveness of its tourism industry. For this reason, it is important to conduct research that provides an overview of transport in all regions of Serbia, in addition to the main tourist centres. For better understanding of research, the total territory of Serbia is divided into four regions: Belgrade region, Northern Serbia (province of Vojvodina represented by Novi Sad), Central-Western Serbia represented by Zlatibor and South-Eastern Serbia represented by Niš. The Region of Kosovo and Metohija, according to UNSCR 1244/99 definition, is excluded from research due to missing data.

The main task of this research is to analyze tourist transport in Serbia, where the main regions will be singled out. Basically the aim is to show and analyze the following:

- Transportation assessment of inbound tourism in Serbia in 2023
- Carbon footprint created by the transport of foreign tourists in Serbia in 2023
- Carbon footprint impact of inbound tourism in Serbia in 2023 by countries

The work methodology itself, which will be presented in the next chapter, uses precisely the formulae on the basis of which railway, road and air transports are analyzed in more detail. The aim of the paper is focused on the carbon footprint caused by transportation, but this is only a part of the analysis of how certain entities in Serbian tourism can influence the sustainable transport of tourists in the tourist regions of Serbia with their decisions in the future.

2. Materials and Methods

2.1 Methodology and data collecting

This study assesses the carbon emissions concerning transport performed by foreign tourists travelling within Serbia. The approach combines activity-based data on tourist mobility with universally adopted emission factors that enable a precise assessment of the environmental significance of different transport modes. Estimates of emissions were calculated by travel distance and mode of transportation, using conventional conversion factors for carbon. The foregoing were taken from reputable international databases, which also included those provided by the UK Department for Environment, Food and Rural Affairs (DEFRA) and the French Environment and Energy Management Agency (ADEME). To download and structure the data, Greentripper's web-based platform was utilized, and a dedicated calculator for tourist green house gas (GHG) emissions in terms of CO_2 equivalent was accessed.

The emissions were calculated utilizing the following formula:

$$CO_2 \text{ Emissions} = \text{Distance Travelled} \times \text{Emission Factor} \quad (1)$$

For each form of transport, there were defined variables in the model:

Rail Transport

Long-distance rail emissions were calculated based on data for high-speed rail, specifically for the Belgrade–Novi Sad line. Input parameters were rail type, total distance travelled and the number of passengers per journey.

Road Transport

Calculations were for long-distance coach buses with an average of 50 passengers. Private car travel was not factored in because there were not sufficient primary data. Levels of emission taken into account were vehicle efficiency, fuel type, and average fuel usage per kilometer.

Air Transport

Air travel emissions were estimated for round-trip, economy-class travel by tourists coming to Serbia from foreign destinations. The model took into account flight distance and flight type (direct or indirect), as well as average emission coefficients that were modified for travel class.

Although Greentripper provided a user-friendly interface, the estimates were cross-validated with established conversion factors for the sake of scientific reliability. The activity-based and accommodation-related emissions were omitted since the research scope was limited to transport emissions.

2.2 Tourists

The introduction of travel bans during the COVID-19 pandemic caused drastic changes in tourism. The very policy of all countries has caused tourists to be diverted from foreign to domestic destinations, which has led to the flourishing of domestic tourism (Yepez & Leimgruber, 2024). However, when looking at Serbia, certain domestic destinations could not meet the high demands, which called into question the sustainability of certain resources at the destinations. The large number of vehicles used by tourists to reach their destination should be mentioned here. This is why the importance of the researched topic, which deals with the impact of transport on the destination itself, is important (Zhu et al., 2024).

In 2023, Serbia's tourism generated €2.56 billion directly and indirectly, an increase of 80% compared to before the pandemic. In 2024, 5.5% more visitors visited in comparison with the previous year (Statistical Office of the Republic of Serbia, 2025). While around the globe tourism comprised 9.1% of GDP in 2023, in Serbia the part of it was comparatively minute, of about 2%. According to the National Bank of Serbia (2025), foreign exchange income from tourism in the first ten months of 2024 were 2.1 billion €, which is 11% more than in the same period in 2023. Tourism revenue growth from January to September 2024, recorded nearly doubled revenue (99% growth) compared to the same period of 2019 (WTO, 2025). The trend of development will be continued in 2025, as projected revenues exceed €3 billion. As tourism expands, the sector offers remarkable opportunities for direct jobs (Milosevic et al., 2021).

2.3 Transportation

As Miljkovic and Nikolic (2025) assert, investments in transport infrastructure are very significant because of the economic development they generate. Improving transportation, reducing costs, and increasing accessibility are important elements in driving effects that have an impact on employment, production, and incomes. This indirectly has a major influence on the choice of means of transport, on which the environmental impact on the country's natural resources can also depend.

When travelling from any country other than those bordering Serbia, the distance is determined based on the mileage between the tourist origin country with the highest number of air connections and Belgrade Airport. However, when travelling from any country bordering Serbia, the distance is determined based on the mileage between the capital of the country, or city which brings the most tourist due to its vicinity (Timisoara instead Buchurest in Romania and Banja Luka instead of Sarajevo in Bosnia and Herzegovina) and the destination, i.e., the dominant receptive centres of every region in Serbia. A region with its touristic centres has different shares in tourism reception. The Belgrade region with Belgrade as the centre has a share of 55.8%; Northern region with Novi Sad as the centre has a share of 17%, Central-Western region with Zlatibor as the centre has share16% and South-Estern region with Niš as the center hosts 11.2% of all foreign tourists. By road, the distance is determined using road networks and is calculated using the Google Maps engine.

3. Results and Discussion

The evaluation of carbon emissions from inbound tourism for Serbia indicates that the mode of transport is by far the most important factor influencing total carbon footprint. Since the majority of foreign tourists arrive by air, airplane emissions rank much higher into the totals than road or rail emissions. This is very apparent when considering intercontinental markets like the USA and China but also several European countries where tourists choose low-cost airlines (Jimenez & Suau-Sanchez, 2020; Mabrian tecnologies, 2023). For instance, carbon emissions from long-haul destinations such as New York and Beijing are several times higher per capita than those generated by visitors arriving from neighbouring countries via bus transport (Table 1).

Table 1: Transportation assessment of inbound tourism in Serbia in 2023

Country	Dominant tourist generating centre	Dominant receptive centre of touristic regions			
		Belgrade	Novi Sad	Zlatibor	Niš
		Mean of transport; distance in km			
Turkey	Istanbul	plane; 810	train*; 75	bus*; 250	bus*; 240
Russia	Moscow	plane; 1700	train*; 75	bus*; 250	bus*; 240
Bosnia and Herzegovina	Banja Luka	bus; 330	bus; 310	bus; 360	bus; 560
Germany	Berlin	plane; 1000	train*; 75	bus*; 250	bus*; 240
Bulgaria	Sofia	bus; 390	bus; 490	bus; 420	bus; 160
Northern Macedonia	Skopje	bus; 430	bus; 530	bus; 460	bus; 200
Croatia	Zagreb	bus; 400	bus; 380	bus; 590	bus; 630
Romania	Timisoara	bus; 150	bus; 150	bus; 380	bus; 350
Montenegro	Podgorica	bus; 450	bus; 520	bus; 230	bus; 360
China	Beijing	plane; 7450	train*; 75	bus*; 250	bus*; 240
Slovenia	Ljubljana	bus; 530	bus; 515	bus; 740	bus; 770
Greece	Athens	plane; 1130	train*; 75	bus*; 250	bus*; 240
Poland	Warsaw	plane; 1200	train*; 75	bus*; 250	bus*; 240
Hungary	Budapest	bus; 380	bus; 300	bus; 570	bus; 620
Italy	Rome	plane; 1280	train*; 75	bus*; 250	bus*; 240
USA	New York	plane; 7250	train*; 75	bus*; 250	bus*; 240
Austria	Wien	plane; 570	train*; 75	bus*; 250	bus*; 240
France	Paris	plane; 1750	train*; 75	bus*; 250	bus*; 240
Switzerland	Bern	plane; 1270	train*; 75	bus*; 250	bus*; 240
Netherlands	Amsterdam	plane; 1700	train*; 75	bus*; 250	bus*; 240
UK	London	plane; 2070	train*; 75	bus*; 250	bus*; 240
Sweden	Stockholm	plane; 2300	train*; 75	bus*; 250	bus*; 240
Czech Republic	Prague	plane; 900	train*; 75	bus*; 250	bus*; 240
Ukraine	Kyiv	plane; 1480	train*; 75	bus*; 250	bus*; 240
Other European countries	Capitals	plane; 1600	train*; 75	bus*; 250	bus*; 240
All other countries	Capitals	plane; 7600	train*; 75	bus*; 250	bus*; 240

*Traveling from Belgrade.

Source: authors

Furthermore, this puts emphasis on how a tourist visiting different regions of Serbia contributes to the emission patterns that range from one region to another. The capital city and the first visited city serve as the point of inhalation for tourism emissions-discharging-the-belgrade, while some places like Zlatibor and Niš also show high discharges at low levels of tourist inflow, given the kilometers travellers need to move once they enter the country for these specific cities. These movements usually take place on roads, thus adding to the carbon emission tally. Such geographical differences even lend credence to the need for emission-conscious tourism development schemes as sustainable interregional transport and longer stays in regional centers would usually have offset the initial high emissions that would come from travel.

Table 2 is based on countries of origin as well as regions in 2023 for the total carbon footprint due to foreign tourist arrivals for Serbia. A longer-haul-to-distance ratio of tourists flying into the country gives greater emissions, giving emissions that by far exceed the emissions from many European inbound tourists numbers. Also, emissions vary according to travel methods and between other places of travel within Serbia, going especially beyond Belgrade. Of course, Belgrade comes up to total carbon emissions as the entry point, but other destinations such as Novi Sad, Zlatibor, and Niš are also getting a significant carbon load from land-based travel. Indications like these bring about targeted decarbonization when it comes to intermodal transport, electric buses, and other incentives for regional rail.

Table 2: Carbon footprint created by the transport of foreign tourists in Serbia in 2023

Country	Total Tourist	Belgrade tourists	CO2 Tons	Novi Sad tourists	CO2 Tons	Zlatibor tourists	CO2 Tons	Niš tourists	CO2 Tons	Total CF Tons
Turkey	201440	201440	100317	34120	68	32409	551	22476	360	101296
Russia	170884	170884	120986	28945	58	27493	467	19067	305	121816
Bosnia and Herz.	158824	88648	1950	26902	565	25553	613	17721	673	3802
Germany	123059	123059	74820	20844	42	19799	337	13730	220	75418
Bulgaria	110419	61631	1602	18703	617	17765	497	12320	136	2853
Northern Macedonia	109738	61251	1776	18588	669	17656	547	12244	171	3164
Croatia	108161	60370	1630	18321	476	17402	696	12068	519	3321
Romania	100055	55846	558	16948	169	16098	419	11164	268	1414
Montenegro	96019	53593	1608	16264	569	15448	247	10713	257	2681
China	92125	92125	207281	15604	31	14822	252	10279	164	207729
Slovenia	85051	47472	1709	14406	504	13684	684	9490	493	3391
Greece	70388	70388	34983	11922	24	11325	193	7854	126	35325
Poland	58458	58458	29287	9902	20	9405	160	6523	104	29572
Hungary	54383	30354	789	9212	184	8750	341	6068	255	1570
Italy	49609	49609	22225	8403	17	7981	136	5535	89	22466
USA	47909	47909	101040	8115	16	7708	131	5346	86	101273
Austria	45554	45554	12937	7716	15	7329	125	5083	81	13159
France	37238	37238	21859	6307	13	5991	102	4155	66	22040
Switzerland	34699	34699	14574	5877	12	5583	95	3872	62	14742
Netherlands	33418	33418	19349	5660	11	5377	91	3729	60	19511
UK	32786	32786	22885	5553	11	5275	90	3658	59	23044
Sweden	24779	24779	16478	4197	8	3987	68	2765	44	16598
Czech Republic	23203	23203	10395	3930	8	3733	63	2589	41	10508
Ukraine	21974	21974	9053	3722	7	3535	60	2452	39	9160
Other Eur. countr.	118941	118941	78858	20146	40	19136	325	13271	212	79436
All other countr.	125191	125191	287939	21205	42	20142	342	13968	223	288548
Total	**2,134,305**	1,770,820	1,196,889	361,513	4,199	343,384	7,633	238,138	5,114	**1,213,835**

Source: authors

Flights that are long-haul and short visits into Belgrade will account for massive carbon footprints attributed to such distant markets as China (207,729 tons), the USA (101,273 tons), and Russia (121,816 tons). On the other hand, adjacent countries like Bosnia and Herzegovina, Northern Macedonia, and Romania contribute alarming figures because of proximity and overland movement. Belgrade stands out as the only high-emission destination in most markets, thus proving a hub for tourism flows into Serbia. As highlighted in Figure 1, it also shows how emissions correlate with distance and travel mode - a more distant country tends to contribute significantly higher amounts, while fewer volumes of tourists could be affected by this.

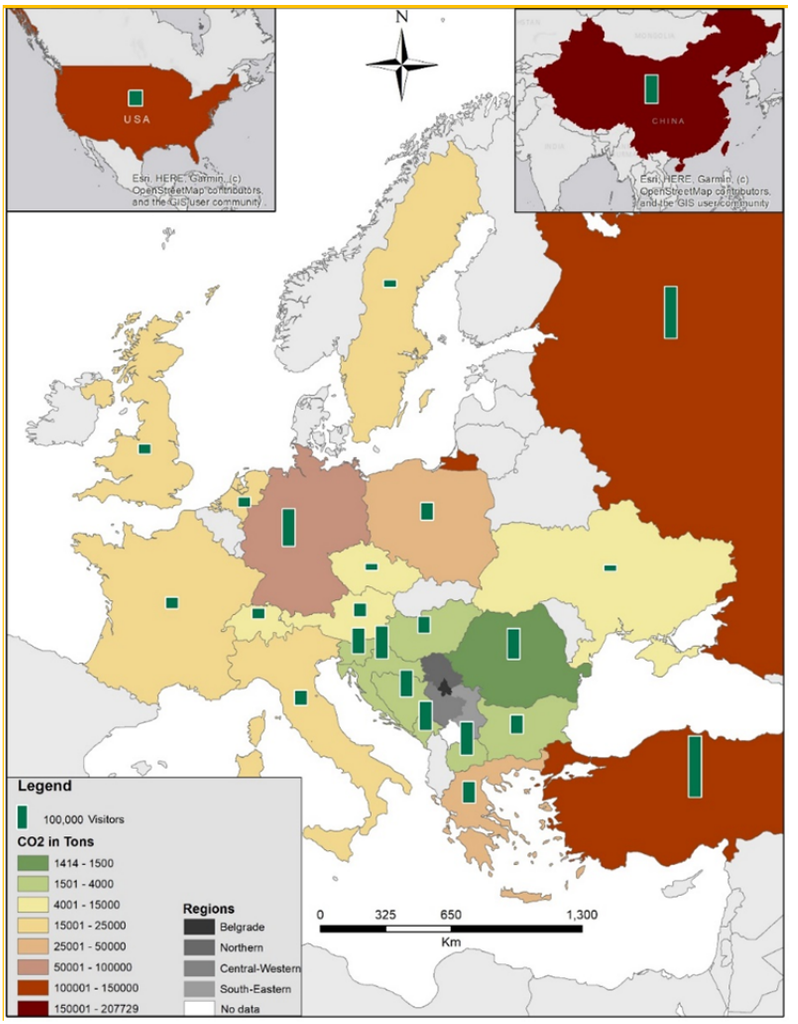

Figure 1: Carbon footprint impact of inbound tourism in Serbia in 2023 by countries
Source: Esri, HERE, Garmin, OpenStreetMap contributors and the GIS user

Such evidence brings forth the pressing need for and can easily support arguments for sustainable strategies to promote low emission source markets, reassessing tourist flows into regional hubs like Novi Sad, Zlatibor, and Niš, with extending eco-friendly transport options - especially rail from Central Europe. To develop Serbia's tourism goals within the overall climate framework, it is most imperative that such spatiate and emission information be collected for tourism planning.

The findings of this study provide significant insights into the dynamics of inbound tourism in Serbia, highlighting the critical interplay between economic factors, geographic proximity, and enviromental conditions.

For the purposes of this research, by the term tourist we also consider day trippers - visitors who visited a destination even though they did not spend the night there. This is because the aim of the paper is focused on the carbon footprint caused by transportation, and therefore the number of tourists in some of the regions may be higher than those registered. Visitors from different countries use different means of transport. This study covers the predominant form of transport from each country, taking into account available data and expert assessment based on knowledge of traveller habits. Although air travel is the most common option, visitors from the former Yugoslav countries and countries bordering Serbia prefer to travel by road, mainly by bus or their own car. Due to lack of more detailed data such as the number of tourists arriving by car, it was assumed that all visitors who arrived by road came by bus. This study also quantifies the impact of geographic distance on tourism. Excluding foreign tourists from neighboring countries, who travel mostly in private automobiles, the most frequent mode of travel for international tourists for arriving and departing from Serbia is air transport.This research offers valuable strategic insights for policymakers and stakeholders.

3.2 Limitations of the research

Previous research on carbon footprints in other countries reveals a substantial amount of work on this topic. Similar to Popovic et al. 2025, this analysis updates information for 2023 and provides greater detail with respect to the spatial variation in carbon emissions by region and across tourist origin. Unlike the earlier investigation, which offered a broad view of inbound tourism's environmental impact in Serbia, this study narrows that understanding by generating estimates of emissions from specific destinations (e.g., Belgrade, Novi Sad, Zlatibor, and Niš) and modes of transport, thus creating the basis for more focused policy recommendations on the low-carbon development of tourism. However, when focusing on Serbia, the limited data available, particularly regarding transportation, and the small number of studies on this subject, created certain limitations in our research. While this type of research has a significant positive impact on future studies, we must acknowledge its limitations when applied to different contexts.

A major challenge encountered during this research was the lack of data on passengers who arrived at the destination by car. The data presented in the paper specifically relates to air traffic arrivals and transportation by bus or train along the routes closest to the researched tourist areas. As mentioned in the introduction, previous works concerning air traffic served as guidelines in this respect. Consequently, this study included passengers who arrived in Serbia by plane from distant destinations, but due to limited data, we excluded those arriving by air from the region to Belgrade. Regarding waterway transport (via the Danube River) and the arrival of tourists through this route, the seasonal nature of these trips and the insufficient volume of traffic contributed to the decision not to include this aspect in the research. However, it is certainly an area planned for analysis in future studies.The reliability, accuracy and relevance of the new research would have been significantly improved if we had had access to more detailed data, especially regarding specific travel routes, energy consumption and individual modes of transport. It was decided not to include data that could not be verified in order to avoid creating confusion or undermining the credibility of the verified data presented in this paper. Overall, this research represents a significant step forward for future studies that will aim to focus on the limitations encountered, especially in collecting data related to modes of transport during tourist visits to Serbia.

Conclusion

This research provides a scientific basis for understanding the carbon footprint of tourist transport in Serbia, which addresses an existing gap in regional sustainability studies. It provides a better understanding of current tourist transportation and its impact on carbon emissions, despite certain limitations. In practical terms, it offers recommendations for the development of environment-friendly transport facilities and increasing low-carbon mobility within destination locations. All these are important contributions that are needed to direct policymakers and stakeholders toward sustainable tourism development at the cost of the natural environment of Serbia.Still, tourism as a sector somehow does contribute to environmental degradation, as it emits carbon in various ways. It is undeniable that almost every small town and village with unique natural or cultural attractions has a good chance for consolidating itself further as a sustainable tourism destination. However, when the community does not provide an extensive network of transport modes that are environmentally sustainable, tourists rely on their vehicles. This dependence can have negative impacts on the local environment and local populace, particularly when tourism activities are promoted and developed in their areas. What is particularly important in this research is the development of new ideas regarding smaller environments, transport networks, and their impact on air pollution. There are numerous attractions outside the main cities and tourist centres in Serbia, but transportation options are sadly limited. While income from tourism is considerable, sustainable development is invaluable to the long-term benefits it offers. Such types of destinations are mostly relevant to the concept of sustainable tourism, as they offer tourists what they want to gain from their vacation: clean air, water, healthy food, or less crowded environments. These factors are all directly connected to the theme of this paper.

This research is significant for several reasons, and several suggestions can be highlighted to improve research related to carbon footprints in Serbia:

1. Extension of carbon emissions research: This paper emphasizes carbon emissions related to transport, but this model can be expanded to include emissions from tourism activities, tourist accommodations, and general pollution from other catering service facilities in more detail. The research provides an analysis of the current state and impact of the carbon footprint in Serbia. With more accurate data, this study could serve as a basis for assessing and managing the environmental impact of tourism in Serbia, focusing on a low-carbon environment.

2. Development of environmentally friendly transport: The foundation for developing tourist centers in Serbia should be based on environmentally friendly transport. Although the transport analysis in this paper did not include car arrivals, this should be a priority in future research. Serbia faces the issue of many tourists arriving in transit, which is particularly evident

in tourist centers like Zlatibor. One of the problems of Zlatibor is over tourism, which attacks its environment because of the conveniences of its location. For this, the cities should adapt public transport systems, putting more emphasis on the fruitful result of the high-speed railway connecting Belgrade to Novi Sad. This environmentally sustainable and fast form of transport has allowed tourists to travel between Serbia's two largest cities with minimal environmental impact.

3. Connecting picturesque locations with eco-friendly transport: Given the focus of this paper is on transport in tourism, the potential for linking picturesque locations with eco-friendly transport should also be considered. This can include creating eco-stations or ecological parking areas in scenic spots along major tourist routes. Local agricultural products could be offered during breaks, enhancing the visitor experience. Additionally, establishing charging points for electric vehicles along these routes could promote low-carbon tourism. These measures would contribute to the development of the ecological industry and promote sustainable tourism practices.

4. Tourist destinations and seasonal impact: The destinations discussed in this paper have their own unique challenges related to tourist visits. There is no doubt that there are more tourists eager to discover places far beyond the cities in Serbia. However, many of these not-so-advanced places are not ready to take in so many visitors. Though the subject of carbon emissions may not be interesting to some states, research should be conducted for such places before they come to the harsh environmental conditions. More research papers have been made toward low-carbon consumption, while the number of visiting tourists in Serbia vis-a-vis the seasonal nature of certain tourist destinations must be considered. Low-carbon travel strategies and creation of a tourist brand through environmentally sustainable development can be crucial for preserving the authenticity and natural beauty of these regions.

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