

# Fostering Sustainable Rural Tourism: Mitigating Co2 Emissions Through Technology and Eco-friendly Travel Practices

---

**Andrić, Berislav; Ristanović, Vladimir; Goncalves, Rodrigo Franco**

*Source / Izvornik:* **Četvrta konferencija o slavonskom modelu zbrinjavanja komunalnog otpada - SLAMKO 2023., 2023, 177 - 185**

**Conference paper / Rad u zborniku**

*Publication status / Verzija rada:* **Published version / Objavljena verzija rada (izdavačev PDF)**

*Permanent link / Trajna poveznica:* <https://urn.nsk.hr/urn:nbn:hr:277:049353>

*Rights / Prava:* [In copyright](#) / [Zaštićeno autorskim pravom.](#)

*Download date / Datum preuzimanja:* **2024-10-18**



*Repository / Repozitorij:*

[FTRR Repository - Repository of Faculty Tourism and Rural Development Požega](#)



Panon – Institut za strateške studije - Osijek  
Fakultet elektrotehnike, računarstva i informacijskih tehnologija - Osijek  
Fakultet turizma i ruralnog razvoja u Požegi  
Građevinski i arhitektonski fakultet – Osijek  
Strojarski fakultet u Slavonskom Brodu  
Veleučilište “Lavoslav Ružička” u Vukovaru  
Veleučilište u Virovitici

**Četvrta konferencija o slavonskom modelu  
zbrinjavanja komunalnog otpada - SLAMKO 2023.  
Zbornik radova**

***Fourth Conference on the Slavonian Model of Municipal  
Waste Disposal - SLAMKO 2022  
Conference Proceedings***

Kaptol, 2023.

Izdavači / *Publishers*

Panon – Institut za strateške studije, Osijek / *Panon Think tank for strategic studies, Osijek*  
<https://www.panon.eu>

Alberta - Osijek/ *Alberta publishing Osijek*  
<http://www.alberta-naklada.com/>

Partner konferencije / *Conference partner*

Općina Kaptol  
<https://www.o-jankovci.hr/>

Datum i mjesto održavanja konferencije / *Venue and date of the conference*

21.11. 2023. – Vijećnica Općine Kaptol

Organizacijski odbor / *Organizing Board*

(Prema abecednom redu prezimena / *List in alphabetical order*)

mr. sc. Franjo Ambroš, Panon Osijek - predsjednik  
Ivan Belaj, mag. iur. - Veleučilište Vukovar  
prof. dr. sc. Zlatko Lacković - Panon Osijek  
mr. sc. Tatjana Mijušković-Svetinović , GRAFOS  
dr. sc. Antun Marinac - FTRR Požega  
Mile Pavičić, ing. – Općina Kaptol

Uredništvo Zbornika / *Editorial Bord*

(Prema abecednom redu prezimena / *List in alphabetical order*)

doc. dr. sc. Berislav Andrić - FTRR Požega  
izv. prof. dr .sc. Josip Cumin - SF Sveučilište S.Brod  
prof. dr .sc. Hrvoje Glavaš – FERIT, glavni urednik  
izv. prof. dr. sc. Silva Lozančić – GRAFOS Osijek

IT podrška

Ružica Kljajić, mag. ing. el. – FERIT

Službeni jezici konferencije: hrvatski i engleski.

*The official languages of the conference - Croatian and English*

Grafička oprema / *Design and layout*

Alberta naklada - Osijek

Tisak / *Printed by*

Infos\_promotion d.o.o. Osijek

ISSN 2706 - 4131

Kontakt / *Contact e-mail:*

[panon.institut@gmail.com](mailto:panon.institut@gmail.com)

- - - - -

Zbornik radova sadrži radove koji su prošli dvije neovisne recenzije. Organizator konferencije nije ulazio u načine (jezike) izražavanja te oni predstavljaju stavove i stil autora.

*Each paper in the conference proceedings was reviewed by independent reviewers. The content of the conference proceedings does not reflect the official opinion of the conference organizers. Res-ponsibility for the information and views expressed in the papers lies entirely with the respective author(s).*

**Programski odbor / Programme Committee**

(Prema abecednom redu prezimena / List in alphabetical order)

dr. sc. Ivan Ambroš, Centar kompetencija - Vinkovci  
doc. dr. sc. Sanja Gongeta, Veleučilište Vukovar  
prof. dr. sc. Mirko Karakašić, SF Sveučilište – Sl. Brod  
prof. dr. sc. Hrvoje Krstić, GRAFOS, Osijek  
doc. dr. sc. Krešimir Lacković - predsjednik  
prof. dr. sc. Tomislav Matić, FERIT, Osijek  
doc. dr. sc. Katarina Štavlić, FTRR Požega

**Znanstveni odbor / Scientific Committee**

(Prema abecednom redu prezimena / List in alphabetical order)

dr. sc. Dragan Dokić – Općina Erdut - Dalj  
dr. sc. Milan Ivanović - Panon Osijek - predsjednik  
izv. prof. dr. sc. Tomislav Keser – FERIT Osijek  
prof. dr.sc. Borislav Miličević - FTRR Požega  
doc. dr. sc. Željko Sudarić - Veleučilište Vukovar  
doc. dr. sc. Dejan Tubić - Veleučilište Virovitica



*Sudionici konferencije SLAMKO u Kaptolu (21.11.2023.)*

# S a d r Ź a j

Predgovor	9
<b>PRIKUPLJANJE I RECIKLIRANJE KOMUNALNOG OTPADA</b>	
1. Zbrinjavanje komunalnog otpada na području Slavonije u 2022. godini Milan Ivanović	13
2. Zbrinjavanje komunalnog otpada na području općine Kaptol Mile Pavičić	23
3. Mogući modeli smanjivanja količine komunalnog otpada na kućnom pragu - primjer Općine Erdut Dragan Dokić, Vera Popović, Vesna Gantner	35
4. Održivo gospodarenje komunalnim otpadom čimbenik razvoja Općine Antunovac Zvonimir Filipović, Marko Eljuga, Željko Jurkić	43
5. Komunalni otpad, europski standardi i lokalna samouprava; stanje na izlazu iz brdskih visoko posjećenih izletišta Đorđe Balić	53
6. Svjetski i europski trendovi zbrinjavanja, recikliranja i ponovne uporabe GFRP (polimeri ojačani staklenim vlaknima) Aleksandar Jurić, Krešimir Pavelić	59
7. Lokalno zbrinjavanje otpada - od sigurnosne mjere do organske poljoprivrede i negativne emisije stakleničkih plinova Darko Mrkonjić	67
8. Zeleno poduzetništvo u funkciji održivog gospodarenja otpadom Katarina Štavlić	75
9. Od strategije do operativnih politika gospodarenja komunalnim otpadom Siniša Bilić, Zvonimir Filipović, Ivica Opačak	83
10. Uređaji za sprečavanje nastanka bio otpada Robert Sedlar	89
11. Primjena CSC mobilnog spremnika Danijel Koprivanac, Enes Ciriković, Borna Đurđević	101
12. Robotizacija zbrinjavanja komunalnog otpada Andrej Bošnjak, Petra Pejić	109
13. Zbrinjavanje komunalnog otpada i umjetna inteligencija Zlatko Lacković	115
14. Uloga blockchaina u digitalizaciji odlagališta otpada Miljenko Švarcmajer, Mirko Köhler, Ivica Lukić	117
15. Pregled konstrukcijskih rješenja crpnih stanica za odvodnju fekalnih voda Mirko Karakašić	127
16. Primjena senzora za kontrolu kvalitete zraka na odlagalištima otpada Kristian Đokić	139

17. Primjena infracrvene termografije u nadzoru odlagališta otpada Hrvoje Glavaš, Mirko Karakašić, Eleonora Desnica, Tomislav Barić	149
18. Važnost protupožarne prevencije kod odlaganja i prerade komunalnog otpada Boris Banjan	159
<b>RURALNI RAZVOJ I TURIZAM U EKOLOŠKIM OKVIRIMA</b>	
19. Razvoj ruralnog turizma na području Općine Kaptol Antun Marinac	169
20. Poticanje održivog seoskog turizma: smanjenje emisija CO <sub>2</sub> tehnologijom i praksama ekoloških putovanja Berislav Andrić, Vladimir Ristanović, Rodrigo Franco Gonçalves	177
21. Ekološki održivi turizam u Slavoniji Tomislav Korov	185
22. Povezanost broja turista i količine otpada po županijama u Republici Hrvatskoj Mijana Radman Funarić, Patricija Velečki, Katarina Štavlčić	193

## C o n t e n t s

Foreword	9
<b>COLLECTION AND RECYCLING OF MUNICIPAL WASTE</b>	
1. Municipal Waste Disposal in Slavonia in 2022 Milan Ivanović	13
2. Disposal of municipal waste in the area of Kaptol municipality Mile Pavičić	23
3. Possible Models for Reducing the Quantity of Municipal Waste at the Doorstep - Example of the Erdut municipality Dragan Dokić, Vera Popović, Vesna Gantner	35
4. Sustainable Municipal Waste Management a Factor in the Development of the Antunovac Municipality Zvonimir Filipović, Marko Eljuga, Željko Jurkić	43
5. Municipal Waste, European Standards, Local Government, Situation at the Exit from Highly Visited Mountain Resorts Đorđe Balić	53
6. World and European Trends of Disposal, Recycling and Reuse of GFRP (Glass Fiber Reinforced Polymers) Aleksandar Jurić, Krešimir Pavelić	59
7. Local Waste Disposal - from Safety Measures to Organic Agriculture and Negative Greenhouse Gas Emissions Darko Mrkonjić	67
8. Green Entrepreneurship in the Function of Waste Management Katarina Štavlić	75
9. From Strategy to Operational Policies of Municipal Waste Management Siniša Bilić Zvonimir Filipović Ivica Opačak	83
10. Devices for Preventing the Generation of Bio-Waste Robert Sedlar	89
11. Application of the CSC Container Danijel Koprivanac, Enes Ciriković, Borna Đurđević	101
12. Robotization of Municipal Waste Disposal Andrej Bošnjak, Petra Pejić	109
13. Artificial Intelligence in Waste Disposal Processes Zlatko Lacković	115
14. The Role of Blockchain in the Digitization of Landfills Miljenko Švarcmajer, Mirko Köhler, Ivica Lukić	117
15. Overview of Design Solutions of Pumping Stations for Sewage Drainage Mirko Karakašić	127

16. Comparison of Three Machine Learning Algorithms for Air Pollution Source Classification Using Two Sensors	139
---	-----

Kristian Đokić

17. Application of Infrared Thermography in the Monitoring of Waste Landfill	149
--	-----

Hrvoje Glavaš, Mirko Karakašić, Eleonora Desnica, Tomislav Barić

18. Fire Protection of Plants for Recycling Plastic	159
---	-----

Boris Banjan

## **RURAL DEVELOPMENT AND TOURISM IN ECOLOGICAL FRAMEWORKS**

19. Development of Rural Tourism in Kaptol Municipality	169
---	-----

Antun Marinac

20. Fostering Sustainable Rural Tourism: Mitigating CO <sub>2</sub> Emissions Through Technology and Eco-Friendly Travel Practices	177
--	-----

Berislav Andrić, Vladimir Ristanović, Rodrigo Franco Gonçalves

21. Environmentally Sustainable Tourism In Slavonia: The Key Role of Municipal Waste Disposal	185
---	-----

Tomislav Korov

22. Analysis of the relationship between the number of tourists and the amount of waste by county in the Republic of Croatia	193
--	-----

Mirjana Radman Funarić, Patricija Velečki, Katarina Štavlić



# FOSTERING SUSTAINABLE RURAL TOURISM: MITIGATING CO<sub>2</sub> EMISSIONS THROUGH TECHNOLOGY AND ECO-FRIENDLY TRAVEL PRACTICES

Pregledni rad

**Berislav Andrić,<sup>1\*</sup> Vladimir Ristanović,<sup>2</sup> Rodrigo Franco Gonçalves<sup>3</sup>**

<sup>1</sup>Sveučilište Josipa Jurja Strossmayera u Osijeku, Fakultet turizma i ruralnog razvoja, Požega

<sup>2</sup>Institut za europske studije, Square Nikole Pašića 11, 11000 Belgrade, Serbia

<sup>3</sup>Graduation Program in Production Engineering, Universidade Paulista, São Paulo, Brazil

## Abstract

This research explores the link between rural tourism and sustainable development, with a focus on reducing CO<sub>2</sub> emissions through eco-friendly travel practices. It evaluates rural tourism practices and eco-friendly initiatives in 10 EU countries, emphasizing the significance of low-carbon transportation, renewable energy, and smart travel technologies in CO<sub>2</sub> reduction. The findings reveal variations in emissions and the effectiveness of eco-friendly practices. The study calls for location-specific strategies, eco-friendly practices adoption, and technological integration. It also suggests future research areas, highlighting the importance of sustainability in rural tourism.

**Key words:** low-carbon transportation, rural tourism, travel practices,

## Poticanje održivog seoskog turizma: smanjenje emisija CO<sub>2</sub> tehnologijom i ekološkim putničkim praksama

### Sažetak

Ovo istraživanje istražuje vezu između ruralnog turizma i održivog razvoja, s fokusom na smanjenje emisija CO<sub>2</sub> putem ekološki prihvatljivih praksi putovanja. Ocjenjuje prakse ruralnog turizma i ekološke inicijative u 10 zemalja EU-a, naglašavajući značaj prijevoza s niskim udjelom ugljika, obnovljivih izvora energije i pametnih tehnologija putovanja u smanjenju CO<sub>2</sub>. Nalazi otkrivaju varijacije u emisijama i učinkovitosti ekološki prihvatljivih praksi. Studija poziva na strategije specifične za lokaciju, usvajanje ekološki prihvatljivih praksi i tehnološku integraciju. Također predlaže buduća područja istraživanja, naglašavajući važnost održivosti u ruralnom turizmu.

**Ključne riječi:** niskougljični prijevoz, putničke prakse, ruralni turizam

---

\* E-pošta: bandrlic@ftrr.hr

## 1. INTRODUCTION

Rural tourism, a burgeoning sector of the global tourism industry, has emerged as a powerful catalyst for sustainable development. This introduction sets the stage for our research, shedding light on the intricate relationship between rural tourism and sustainable development, with a specific focus on curbing carbon dioxide (CO<sub>2</sub>) emissions through eco-friendly travel practices. Rural tourism, fundamentally, entails the experience of tourism activities in rural areas, where travelers engage with local communities and immerse themselves in the natural and cultural assets of the countryside. This form of tourism represents a dynamic bridge between urban and rural spaces, fostering rural economic growth and societal well-being. Sustainable development, on the other hand, refers to the pursuit of economic progress, social equity, and environmental preservation in a balanced and harmonious manner. Rural tourism plays a pivotal role in this context by promoting the sustainable utilization of rural resources, elevating the quality of life for rural inhabitants, and safeguarding the natural environment.

In recent years, concerns about climate change and its repercussions have become increasingly urgent. CO<sub>2</sub> emissions from various sectors, including tourism, significantly contribute to this global challenge. Rural tourism is not exempt from these concerns, as travelers' transportation, energy consumption, and activities can leave a considerable carbon footprint. Recognizing the significance of this issue, our research places a distinct emphasis on the need to address CO<sub>2</sub> emissions within the realm of rural tourism. It is imperative that we explore eco-friendly travel practices that minimize the environmental impact of rural tourism, ensuring that the benefits of this sector do not come at the expense of our planet.

The primary objectives of this research are threefold. First, we aim to comprehensively assess the current state of rural tourism in the context of sustainable development. This involves evaluating the economic, social, and environmental impacts of rural tourism initiatives. Second, we seek to identify and analyze the existing eco-friendly travel practices and policies that are implemented within rural tourism destinations. By doing so, we hope to gain a deeper understanding of the measures taken to reduce CO<sub>2</sub> emissions in rural tourism. Lastly, we intend to provide a set of recommendations for stakeholders, including governments, local communities, and tourists, to further enhance the sustainability of rural tourism and reduce its carbon footprint.

In alignment with these objectives, we formulate the following hypotheses:

- Rural tourism, when managed sustainably, can foster economic growth and social well-being in rural areas while preserving the environment.
- The promotion and adoption of eco-friendly travel practices can lead to a reduction in CO<sub>2</sub> emissions associated with rural tourism activities.

As we progress through this research, we will delve into these hypotheses, exploring the interplay between rural tourism, sustainability, and CO<sub>2</sub> emissions, ultimately seeking to contribute to a more environmentally conscious and sustainable future for rural tourism.

## 2. THEORETICAL BACKGROUND OF SUSTAINABLE TOURISM

Rural tourism can be defined as a subset of tourism that occurs in non-urban areas, characterized by a close interaction between tourists and rural communities, the appreciation of local culture and natural resources, and the creation of economic opportunities for rural inhabitants [1]. Sustainable development is a holistic and multidisciplinary concept that aims to meet the needs of the present without compromising the ability of future generations to meet their own needs [2]. The relationship between rural tourism and sustainable development lies in rural tourism potential to contribute to economic, social, and environmental dimensions of sustainability.

The relationship between tourism and sustainability is multifaceted according to Figure 1.



Figure 1. Sustainable tourism factors [19]

On one hand, tourism can stimulate economic growth, generate employment, and promote cultural exchange, aligning with the economic dimension of sustainability. On the other hand, tourism can strain local resources, disrupt ecosystems, and exacerbate climate change, posing challenges to environmental sustainability. The social dimension of sustainability comes into play by examining the impacts of tourism on local communities, their cultural heritage, and their quality of life [3].

Several models and frameworks have been developed to analyze the sustainability of tourism, such as the triple bottom line framework, which evaluates economic, social, and environmental impacts. Additionally, the tourism area life cycle model explains the development stages of tourist destinations and their environmental and sociocultural consequences [4]. Eco-friendly travel principles encompass a wide range of practices and strategies aimed at reducing the negative environmental impacts of tourism. Key principles include responsible tourism behavior, minimizing waste and resource consumption, using renewable energy sources, and supporting local economies. Ecotourism, a subset of eco-friendly travel, emphasizes the conservation of natural environments and the empowerment of local communities.

To address CO<sub>2</sub> emissions in the context of travel, various strategies are employed, including modal shifts toward more sustainable transportation options (e.g., public transport, cycling, and walking), energy-efficient accommodations, and carbon offset programs. The carbon footprint of travel is a critical factor in evaluating the environmental sustainability of tourism [5]. By comprehending these theoretical concepts, we establish the foundation for our research to investigate the intricate interplay between rural tourism, sustainable development, and eco-friendly travel in the context of CO<sub>2</sub> emissions reduction, according to sustainable goals from Figure 2.



# SUSTAINABLE DEVELOPMENT GOALS



Figure 2. Sustainable development goals [19]

### 3. COMPARING RURAL TOURISM PRACTICES AND ECO-FRIENDLY TRAVEL IN THE EU

Rural tourism practices and eco-friendly travel vary widely across the European Union, showcasing the diversity and innovative approaches within the region. This chapter delves into rural tourism initiatives in 10 EU countries, highlighting best practices through case studies and successful eco-friendly travel models, while also examining EU policies and regulations promoting sustainable tourism.

- Spain: Spain has excelled in agritourism, epitomized by the "Catalan Rural Tourism" initiative in Catalonia. It allows tourists to partake in farming activities, fostering economic growth and a direct connection with rural communities [6].
- Romania: Romania's focus is on preserving cultural heritage, notably in the Maramureş region. The "Maramureş – Living Museum" project showcases historic villages and traditional craft-making experiences, revitalizing local culture and communities [7].
- France: France offers diverse rural tourism experiences, such as vineyard tours, cheese making, and historical village visits. Initiatives in regions like Provence-Alpes-Côte d'Azur emphasize cultural preservation and economic development [13].
- Greece: Greece combines historical tourism with nature conservation, as seen in the Peloponnese region. Eco-tourism and agritourism ventures enhance sustainable development, offering unique experiences to travelers [14].
- Portugal: Portugal's Alentejo region emphasizes nature-based rural tourism, with activities like birdwatching and hiking. Sustainable initiatives encourage visitors to explore the countryside responsibly [15].
- The Netherlands: Zeeland in the Netherlands showcases eco-friendly transportation options like bike-sharing programs and walking tours. These practices reduce carbon emissions while providing low-impact experiences [8].
- Sweden: Sweden's "Eco-labeled" accommodation certification system and "Nature's Best" eco-tourism label promote responsible outdoor activities and energy-efficient accommodations, reducing CO2 emissions [9].

- Austria: Austria's Alpine region emphasizes eco-friendly transportation for tourists, including electric buses and hybrid trains. Sustainable infrastructure contributes to CO2 emission reduction [16].
- Croatia: Croatia's Dalmatian coast promotes sustainable practices like hiking and cycling. Protected areas, such as Plitvice Lakes National Park, prioritize eco-friendly tourism [17].
- Slovenia: Slovenia is known for its eco-friendly and green tourism approach, focusing on responsible exploration of its natural beauty. It encourages tourists to reduce their ecological footprint [18].

In conclusion, the 10 EU countries exemplify the vast range of rural tourism and eco-friendly travel practices, from agritourism in Spain to cultural heritage preservation in Romania. Eco-friendly travel approaches are showcased in the Netherlands and Sweden. These efforts are bolstered by EU policies like ETIS, EU Ecolabel, and carbon pricing mechanisms, ensuring the sustainable development of tourism in the region.

#### 4. ECO-FRIENDLY TRAVEL AND CO<sub>2</sub> EMISSION REDUCTION IN RURAL TOURISM

Rural tourism, characterized by its natural landscapes and community-based experiences, holds great potential for eco-friendly travel and CO<sub>2</sub> emission reduction. In this chapter, we explore the strategies and challenges associated with fostering sustainability in rural tourism while minimizing carbon emissions. The synergy between eco-friendly travel and rural tourism is examined, emphasizing the importance of achieving a harmonious balance., according to next figure.

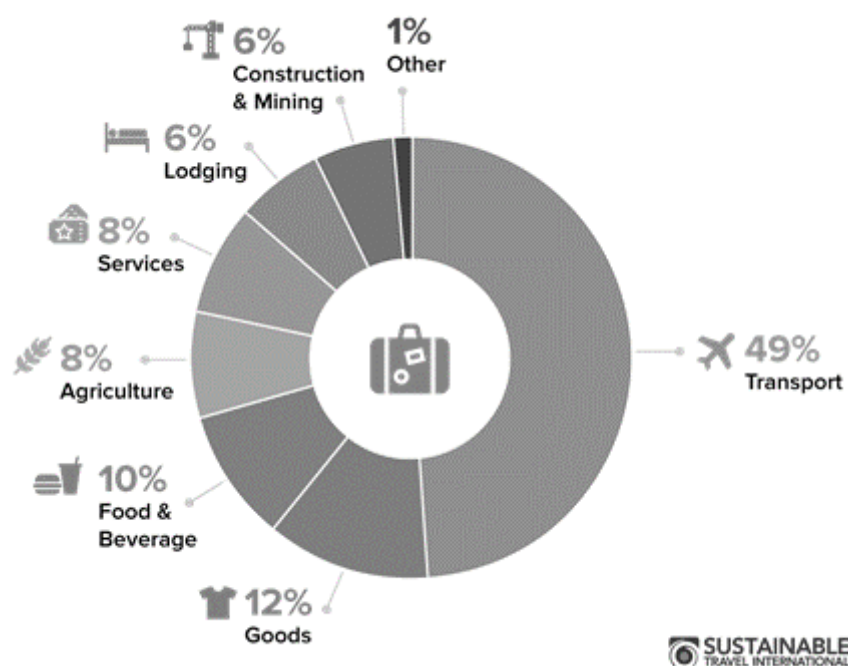


Figure 3. Carbon footprint of tourism [20]

Eco-friendly travel, a subset of sustainable tourism, seeks to minimize the negative impacts of tourism while maximizing the benefits for local communities and the environment. Rural tourism, with its emphasis on natural and cultural assets, lends itself to eco-friendly practices. CO<sub>2</sub> emissions in rural tourism primarily arise from transportation, energy consumption, and resource use in remote areas. To mitigate these emissions, rural tourism destinations must address these challenges with tailored solutions [21]. Promoting eco-friendly travel in rural tourism involves implementing strategies that reduce CO<sub>2</sub> emissions. These strategies include:

- Encouraging low-carbon transportation modes such as electric vehicles and bicycles

- Embracing renewable energy sources for accommodations and facilities
- Implementing sustainable building practices that reduce energy consumption .

This research focused on the impact of eco-friendly and smart travel practices on reducing CO2 emissions in rural tourism settings across the European Union. The key findings of study highlight the following:

- Variation in CO2 Emissions- We found significant variations in CO2 emissions in rural tourism settings across EU countries, emphasizing the role of location-specific factors.
- Eco-friendly travel practices, such as efficient public transportation, bike-sharing programs, and renewable energy sources, were effective in reducing carbon emissions. These practices led to a substantial reduction in CO2 emissions, indicating their significance in mitigating the environmental footprint of rural tourism.
- The integration of smart travel technologies, such as mobile apps for transportation information and route optimization, positively correlated with reduced CO2 emissions. Countries with a higher percentage of smart travel technology users experienced greater reductions in carbon emissions, underscoring the potential of technology in enhancing sustainable travel practices.

## 5. CONCLUSION

Rural tourism destinations should develop location-specific strategies to address CO2 emissions. Understanding the factors that contribute to variations in emissions is crucial for targeted and effective sustainability initiatives. The adoption of eco-friendly travel practices, including sustainable transportation and responsible tourism behavior, is essential for reducing the environmental impact of rural tourism. Policymakers, businesses, and tourists should prioritize and support these practices. Also, the integration of smart travel technologies can enhance sustainable travel practices and contribute to reduced CO2 emissions. Destinations should invest in technology infrastructure to support these initiatives.

While this study provides valuable insights, there are several areas for future research in this field:

- Long-Term Impact: Investigate the long-term impact of eco-friendly and smart travel practices on CO2 emissions in rural tourism settings. Longitudinal studies can provide a better understanding of the sustainability of these practices.
- Behavioral Studies: Explore the behavior and preferences of tourists in relation to eco-friendly and smart travel practices. Understanding tourist motivations and decision-making can inform the development of targeted strategies.
- Policy Evaluation: Assess the effectiveness of government policies and regulations in promoting eco-friendly and smart travel practices in rural tourism. This research can provide guidance for policy improvements.
- Technological Advancements: Investigate emerging technologies and innovations that can further enhance eco-friendly and smart travel practices in rural tourism. Stay updated with technological advancements that can contribute to sustainability.

In conclusion, this research underscores the importance of eco-friendly and smart travel practices in reducing CO2 emissions in rural tourism settings. The findings have practical implications for sustainable rural tourism development, emphasizing the need for tailored strategies. The research contributes to the field by providing data-driven insights and suggestions for future research areas that can advance sustainability in rural tourism.

## References

- [1] Sharpley, R., & Vass, A. (2006). Tourism, farming and diversification: An attitudinal study. *Tourism Management*, 27(5), 1040-1052.
- [2] Brundtland, G. H. (1987). *Our Common Future: Report of the World Commission on Environment and Development*. United Nations.
- [3] Gössling, S. (2002). Global environmental consequences of tourism. *Global Environmental Change*, 12(4), 283-302.
- [4] Butler, R. W. (1980). The concept of a tourist area cycle of evolution: Implications for management of resources. *The Canadian Geographer*, 24(1), 5-12.
- [5] Gössling, S., Scott, D., & Hall, C. M. (2020). Tourism and water: Interactions, impacts, and challenges. *Annual Review of Environment and Resources*, 45, 21-47.
- [6] Catalan Rural Tourism Glossary
- [7] Maramureş – Living Museum. Retrieved from [Reference 7 URL].
- [8] Zijlstra, J. S., Dijst, M., & de Vos, H. (2008). Lifestyle and travel behavior: Exploring the potential for sustainable mobility in the Netherlands. *Environmental Science & Policy*, 11(6), 497-511.
- [9] European Commission. (2020). Nature-based tourism
- [10] European Commission. (2020). European Tourism Indicator System (ETIS)
- [11] European Commission. (2020). EU Ecolabel
- [12] Swedish Environmental Protection Agency.portal (2020). Flight tax in Sweden.
- [13] Atout France. (2021). Tourism in Provence-Alpes-Côte d'Azur.
- [14] Greek National Tourism Organization. (2020). Greece – Nature Tourism.
- [15] Visit Portugal. (2021). Alentejo – Sustainability
- [16] Austrian Federal Economic Chamber. (2021). Austria – Sustainable Tourism.
- [17] Croatian National Tourist Board. (2021). Dalmatia – Croatia's Sustainable Tourism Destination.
- [18] Slovenian Tourist Board. (2021). Green Scheme of Slovenian Tourism.
- [19] CBI Ministry of foreign affairs portal (2023)
- [20] Sustainable travel portal (2023)
- [21] Gössling, S., Scott, D., & Hall, C. M. (2019). *Tourism and water: Interactions and impacts*. Channel View Publications.