

Incorporating climate change in the management and planning of tourism destinations: behavioural change and decarbonisation strategies

Aitziber Pousa-Unanue ^{1*}

¹ School of Business and Economics, Nebrija University, Spain, E-mail: apousa@nebrija.es

* Corresponding author

Supervisors:

Aurkene Alzua-Sorzabal

Francisco Femenia-Serra

Institution awarding the Ph. D. Degree: Nebrija University, Spain

Date of defence: 28th of November 2025

Citation: Pousa-Unanue, A. (2026). Incorporating climate change in the management and planning of tourism destinations: behavioural change and decarbonisation strategies. *European Journal of Tourism Research* 44, 4417. <https://doi.org/10.54055/ejtr.v44i.4923>

Publication history:

Received: 16/02/2026; *Revised:* 24/06/2026; *Accepted:* 25/06/2026; *Published online:* 01/10/2026;

Volume date: 01/11/2026

Coordinating editors: Marcello Atzeni and Katarzyna Barbara Minor



© 2026 The Author(s)

This work is licensed under the Creative Commons Attribution 4.0 International (CC BY 4.0). To view a copy of this license, visit <https://creativecommons.org/licenses/by/4.0/>

Goal and objectives of the dissertation

Goal

In response to the growing urgency of climate action and tourism decarbonisation (Becken, 2017; Osorio et al., 2023; Sun et al., 2024), this dissertation aims to accelerate the ecological transition of destinations through an integrated analysis of two complementary climate change mitigation levers: (i) policy-based management instruments and (ii) visitor behavioural change. From a territorial perspective, this thesis highlights the strategic role of Destination Management Organisations (DMOs) in coordinating climate action through knowledge-driven, data-informed management frameworks (Höpken et al., 2011) and smart governance models (Ivars-Baidal et al., 2022), aligning digital innovation with sustainability goals.

Objectives

The general objective is articulated into three specific objectives (SOs), each corresponding to a research phase:

SO1 – Climate policy assessment: To evaluate the progress and effectiveness of Spain’s public policies on environmental sustainability and tourism decarbonisation.

SO2 – Strategic planning and tools for climate action: To develop analytical tools and frameworks enabling DMOs to integrate carbon-footprint assessment into tourism planning and strengthen evidence-based climate action.

SO3 – Visitor behaviour and pro-environmental transformation: To examine tourists’ awareness, motivations, and willingness to adopt pro-environmental behaviour (PEB) practices to inform strategies that promote more sustainable behaviour.

Methodology

The research comprises three complementary phases. First, the implementation of Low Emission Zones (LEZs) in 48 municipalities in Spain has been analysed, assessing their contribution to tourism sustainability and destination decarbonisation through fsQCA, spatial analysis, and a case study of Madrid. Second, a methodology to quantify tourism carbon footprints at the local level (i.e., carbon emission coefficients) is developed, using primary visitor behaviour data from Donostia/San Sebastián and internationally recognised emission factors. Finally, strategies to promote tourism decarbonisation by analysing primary tourist behaviour across urban, coastal, and rural destinations have been examined through structural equation modelling, regression, and ANOVA techniques (Figure 1).

In sum, this dissertation applies a mixed methods approach (mostly quantitative techniques) in a clearly structured sequence across the research phases. This pragmatic approach is used because, although the investigations share a common thematic focus, their findings have progressively guided the direction of each subsequent phase.

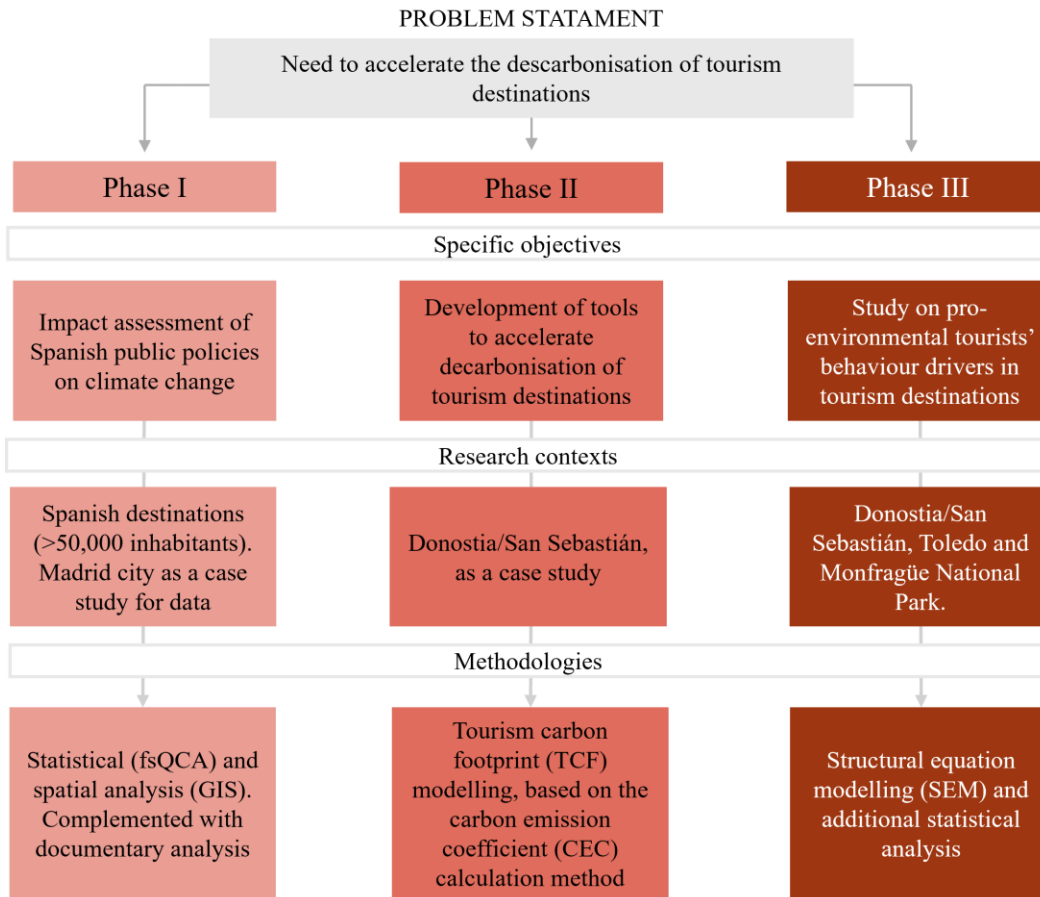


Figure 1. *Research phases, objectives and applied methodologies.*

Results

The first research paper revealed a clear relationship between municipal population distribution, the spatial layout of the LEZs, and the tourism variables analysed (e.g., locations accommodations clusters). Thus, this paper finds that, while LEZs aim to improve air quality and reduce emissions, they also influence urban tourism by intensifying touristification in central and historic areas, thereby contributing to the evaluation of Spain's environmental policy and its impacts on tourism decarbonisation and climate mitigation (Pousa-Unanue et al., 2025a).

The second study produced spatial representations of travellers' decision chains and estimated trip-level CO₂ emissions using the carbon emission coefficient method. This led into identifying the impacts of major visitor segments based on accommodation, transport, and activities (Pousa-Unanue et al., 2025b).

The last study integrates PEB theory with tourist decision-making models into a framework combining internal and external factors (e.g., perceived control and environmental knowledge) and shows that jointly analysing these determinants improves prediction of tourists' PEB, therefore validating the RNC PEB model (Pousa-Unanue et al., 2025c).

Theoretical conclusions

From a broad theoretical standpoint, this research strengthens the understanding that environmental and social dimensions of tourism development as inherently interlinked dimensions, thereby supporting the adoption of the strong sustainability concept, consistent with ecological limits, for guiding future sustainable tourism research.

More specifically, based on the empirical findings, this research expands the knowledge around tourists' PEB, contributing to both psychological (i.e., visitors' decision-making processes) and behavioural (i.e., time and human geography) theoretical frameworks. This is mainly due to the theoretical contributions made by these research papers with regard to the integration of rational and normative perspectives in enhancing understanding of visitors' specific decisions, as well as concerning the composition and variations in the tourism carbon footprint at the destination level.

Practical Applications of the Dissertation

This dissertation underscores the need for integrated governance frameworks that harmonise tourism development objectives with broader urban-planning priorities. It offers DMOs practical, scalable tools for assessing carbon footprints and conducting spatial analyses of emissions across tourism-intensive areas.

This research also recommends the adoption of tailored communication strategies designed to promote sustainable practices among diverse visitor segments, thereby enhancing the effectiveness of behaviour-change initiatives.

Content of the dissertation

Abstract of Chapter 1

The opening chapter establishes the dissertation's significance, outlines tourism's current ecological-transition context, and presents the research design and objectives. It also introduces the overarching conceptual framework underpinning the three studies and details the methodological considerations guiding each phase.

Abstract of Chapter 2

The second chapter presents the outcome of the first research stage of the dissertation. This paper assessed the advancement and impact of Spain's public policies on environmental sustainability and tourism decarbonisation by analysing the tourism-related implications of 48 existing LEZs in the country. The findings demonstrate that although LEZs reduce emissions and improve air quality, they may also intensify touristification in central urban areas (Pousa-Unanue et al., 2025a).

Abstract of Chapter 3

The third chapter of the dissertation presents the findings from the second phase of the research, in which analytical instruments and conceptual models have been developed to enable DMOs to incorporate carbon-footprint evaluation into tourism planning and to reinforce climate action grounded in robust evidence. The methodological framework developed in this study links spatial tourism consumption patterns with environmental impacts, offering a detailed breakdown of emissions by visitor segment (Pousa-Unanue et al., 2025b).

Abstract of Chapter 4

The fourth chapter includes the research comprising the last stage of the thesis. The presented paper analysed tourists' awareness, motivations, and willingness to engage in PEB to guide strategies that

foster more sustainable conduct. By validating the Rational, Normative and Contextual Tourists' Pro-Environmental Behaviour (RNC-PEB) model, the study advances understanding of behavioural drivers across visitor segments (Pousa-Unanue et al., 2025c).

Abstract of Chapter 5

The final chapter synthesises the principal conclusions of the research and underscores their theoretical and practical implications. It also delineates the study's limitations and identifies future research avenues emerging from the findings.

Overall, the dissertation contributes to bridging climate policy, destination governance, and tourist behaviour by offering integrated analytical tools and empirically validated frameworks that support measurable progress toward tourism decarbonisation.

References

- Becken, S. (2017). Evidence of a low-carbon tourism paradigm? *Journal of Sustainable Tourism*, 25(6), 832-850. <https://doi.org/10.1080/09669582.2016.1251446>
- Creswell, J. W. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.
- Höpken, W., Fuchs, M., Keil, D., & Lexhagen, M. (2011). The knowledge destination—a customer information-based destination management information system. In *Information and Communication Technologies in Tourism 2011: Proceedings of ENTER 2011* (pp. 417-429). Springer. https://doi.org/10.1007/978-3-7091-0503-0_34
- Ivars-Baidal, J. A., Celdrán-Bernabeu, M. A., Femenia-Serra, F., Perles-Ribes, J. F., & Giner-Sánchez, D. (2021). Measuring the progress of smart destinations: The use of indicators as a management tool. *Journal of Destination Marketing & Management*, 19, 100531. <https://doi.org/10.1016/j.jdmm.2020.100531>
- Osorio, P., Cadarso, M. Á., Tobarra, M. Á., & García-Alaminos, Á. (2023). Carbon footprint of tourism in Spain: Covid-19 impact and a look forward to recovery. *Structural Change and Economic Dynamics*, 65, 303-318. <https://doi.org/10.1016/j.strueco.2023.03.003>
- Pousa-Unanue, A., Femenia-Serra, F., & Alzua-Sorzabal, A. (2025a). Examining low-emission zones in urban destinations: climate change action or further touristification?. *Boletín de la Asociación de Geógrafos Españoles*, (104). <https://doi.org/10.21138/bage.3642>
- Pousa-Unanue, A., Alzua-Sorzabal, A., Álvarez-Fernández, R., Delgado-Jiménez, A., & Femenia-Serra, F. (2025b). Calculating the Carbon Footprint of Urban Tourism Destinations: A Methodological Approach Based on Tourists' Spatiotemporal Behaviour. *Land*, 14(3), 534. <https://doi.org/10.3390/land14030534>
- Pousa-Unanue, A., Alzua-Sorzabal, A. & Femenia-Serra, F. (2025c). Advancing Pro-Environmental Behaviour Models: Introducing the Rational, Normative and Contextual Tourists' Pro-Environmental Behaviour (RNC-PEB) Framework. *Consumer Behavior in Tourism and Hospitality*, 20(3), 477-495. <https://doi.org/10.1108/CBTH-11-2024-0363>
- Sun, Y. Y., Faturay, F., Lenzen, M., Gössling, S., & Higham, J. (2024). Drivers of global tourism carbon emissions. *Nature Communications*, 15(1), 1-10. <https://doi.org/10.1038/s41467-024-54582-7>