

Port Structures, Maritime Transport, and Tourism

Sérgio Lousada ^{1,2,3,4,5,*}  and Rui Alexandre Castanho ^{2,6,7,8} 

- ¹ Department of Civil Engineering and Geology (DECG), Faculty of Exact Sciences and Engineering (FCEE), University of Madeira (UMa), 9000-082 Funchal, Portugal
- ² CITUR—Madeira—Research Centre for Tourism Development and Innovation, 9000-082 Funchal, Portugal; acastanho@wsb.edu.pl
- ³ VALORIZA—Research Centre for Endogenous Resource Valorization, Polytechnic Institute of Portalegre (IPP), 9000-082 Portalegre, Portugal
- ⁴ Research Group on Environment and Spatial Planning (MAOT), University of Extremadura, 06071 Badajoz, Spain
- ⁵ RISCO—Civil Engineering Department, University of Aveiro, 3810-193 Aveiro, Portugal
- ⁶ Faculty of Applied Sciences, WSB University, 41-300 Dabrowa Górnicza, Poland
- ⁷ College of Business and Economics, University of Johannesburg, Auckland Park, P.O. Box 524, Johannesburg 2006, South Africa
- ⁸ CNPq Research Group Aquageo Ambiente Legal, University of Campinas (UNICAMP), Campinas 13083-970, Brazil
- * Correspondence: slousada@staff.uma.pt; Tel.: +351-963-611-712

1. Introduction to the Special Issue

The primary objective of this Special Issue of *Water* is to explore the interesting interplay that exists between port structures, maritime transport, and tourism. As a matter of fact, ports have played an important role throughout the centuries in connecting land and sea. Such a connection enhanced global trade, economic growth, and, ultimately, cultural exchange between different societies from around the globe. Furthermore, in recent times, the importance of ports has increased, as they now play a particularly important role when it comes to fostering sustainable tourism and coastal development [1–3].

Hence, this Special Issue's aim is to deeply explore the multifaceted aspects associated with port infrastructure, maritime transport, and the relationship that might be established between those topics and tourism. It gathers a range of scholarly articles and research papers that focus on multiple key aspects within this domain. In that sense, the contributing authors—experts in their respective fields of investigation—studied various topics and addressed both theoretical and practical aspects in order to provide a comprehensive understanding of the intersection between the aforementioned topics.

Some of the main themes explored throughout this Special Issue include:

1. **Port Infrastructure and Technological Advancements:** The studies presented in this section focus on the design, development, and modernization of port infrastructure. This encompasses the ports' management systems, implementation of technological solutions, and the importance that port structures have both from the maritime transport and the tourism perspectives [4,5].
2. **Maritime Transport and Sustainable Practices:** This section's focus is on studying the importance of sustainable practices in the maritime transport sector, mainly from an environmental point of view. Studies within this section of the Special Issue investigate various eco-friendly approaches that can be implemented in this field, such as the adoption of alternative fuels and the incorporation of renewable energy sources, aiming to foster the rise of more sustainable maritime transport options [6,7].
3. **Tourism and Port Cities:** Cities, where ports are located, have emerged as important tourist destinations. The articles in this section aim to study the different ways in which these cities are using their maritime heritage, culture, and local attractions to provide a sustainable and responsible tourist experience [8,9].



Citation: Lousada, S.; Castanho, R.A. Port Structures, Maritime Transport, and Tourism. *Water* **2023**, *15*, 3898. <https://doi.org/10.3390/w15223898>

Received: 2 November 2023

Accepted: 3 November 2023

Published: 8 November 2023



Copyright: © 2023 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

4. **Cruise Tourism:** Cruise tourism's importance to the global tourism industry significantly increased over the past few decades. Such a scenario results in this sector being one of the pillars of the global tourism industry currently. Hence, this section examines multiple aspects within the cruise tourism sphere, namely its economic impact, challenges, opportunities, and infrastructure requirements, with the objective of ensuring a balanced approach that enhances the well-being of both tourists and locals [10,11].
5. **Connectivity and Regional Development:** Efficient port and maritime transport systems are key to connect regions, promote international trade, and stimulate regional development. Thus, this segment assesses how ports can foster economic growth, namely by highlighting some success stories from different regions around the globe [12,13].

It is our belief that the insights presented here will contribute to the existing literature on the topic and, ultimately, will foster the development of future research in the field of port structures, maritime transport, and tourism. Understanding the connection that exists between these domains allows for the creation of a more sustainable, resilient, and inclusive maritime landscape while considering both the interests of locals and tourists.

We would like to express our gratitude to all the authors who contributed to the overall quality and rigor of this Special Issue. We hope that this collection will provide valuable information and tools for academics, industry professionals, policymakers, and all those that are interested in these topics.

This Special Issue is composed of five original papers, which are divided into two main categories: experimental and field survey studies. As such, each author's contribution provides different insights and research outputs that, when combined, contribute to a better understanding of the port structures, maritime transport, and tourism sectors.

2. Overview of the Contributions of this Special Issue

2.1. *Exploring Cruise Tourists' Preferences and Satisfaction: The Case of Taiwan [Contribution 1]*

In this study, the product attributes of cruise tours are distinguished into on-board activities, leisure space, cabin comfort, Michelin restaurant, and refund mechanism, and a multi-attribute utility model of cruise tours is constructed using the choice experiment (CE) method. Of the 575 questionnaires distributed, 439 were valid, with an effective recovery rate of 76.3%. The results revealed the following: (1) when cruisers travel, what they value the most is the quality of service on board, followed by the facilities on board; (2) passengers' preferences for comfortable pool space and more activities on board are negatively significant, indicating that they do not prefer to add these amenities and experiences to the cruise ship; (3) passengers are willing to pay extra to upgrade their interior cabin to one with a view and to experience the Michelin restaurant; and (4) influenced by the COVID-19 pandemic, cruisers are more willing to manage their own health. Moreover, the pandemic has not reduced their willingness to travel by cruise [contribution 1].

2.2. *Inland Navigation as an Opportunity to Increase the Cargo Capacity of the Tri-City Seaports [Contribution 2]*

The aim of the article is to analyze the transport accessibility of the Tri-City seaports as well as to verify the necessity of starting inland navigation. The proposal to develop inland navigation by creating new and developing existing waterways is supported by the idea of sustainable transport, which emphasizes how important it is to improve the efficiency of transport work and to minimize the harmful impact of transport on the environment. The purpose of this study is to determine the capability to increase the cargo capacity of the Port of Gdansk and the Port of Gdynia. The article presents the results of an operational analysis from the navigation and maneuvering simulator Navi-Trainer Professional 5000, demonstrating scenarios where a barge from Tri-City seaports reaches the planned dry port in Zajęczkowo Tczewskie. This concept is intended to present an option for relieving truck traffic in the Tri-City area [contribution 2].

2.3. The Role of the Andalusian Institute for Agrarian Reform (IARA) in Irrigation Expansion: The Case of the Chanza Irrigation Project (Huelva, Spain) [Contribution 3]

In the last two decades of the 20th century, irrigation in Andalusia experienced a historic expansion as a result of the transfer of political powers from the State to regional authorities and, thanks to its application in Andalusia, the passing, among other measures, of an agrarian reform bill, and the subsequent development of new irrigation infrastructures. Against this background, our objective was to determine the role of the body responsible for implementing agrarian reform, i.e., the Institute for Agrarian Reform (Instituto Andaluz de Reforma Agraria, IARA), by converting drylands into irrigation lands, with a special focus on one of the region's most vibrant agro-economically transformed areas: the irrigable area of the River Chanza (the west coast of the province of Huelva). To conduct this study, we have applied a history method and content analysis to technical, legal and agro-statistical documentation from the entire active period of the IARA (1984–2011). The results highlight the leading role played by the IARA in extending irrigation land in agrarian-reform priority areas, as well as in developing irrigation infrastructures in the areas that the State defined as strategic in Andalusia, such as the 17,200 hectares of irrigated land of the Chanza Irrigation Project. We conclude that the radical agro-productive transformation of the coast of Huelva in recent decades is mainly due to the availability of water for irrigation, which the IARA was primarily responsible for planning and executing [contribution 3].

2.4. Hydraulic Planning in Insular Urban Territories: The Case of Madeira Island—Ribeira Brava, Tabua [Contribution 4]

This study's primary goal was to conduct an analysis of the flood propensity of the Tabua (Ribeira Brava) drainage basin's main watercourse. In addition to that, this study also recommends two different methodologies in order to mitigate flood impacts, namely by dimensioning a detention basin and adjusting the riverbed roughness coefficient. Regarding the study on the flood propensity, it was necessary to resort to geomorphological data, which were obtained when characterizing the watershed; these data were crucial to determining the expected peak flow rate, according to the Gumbel distribution methodology and considering a 100-year return period, and to perform necessary tasks in the SIG ArcGIS 10.5 software. Lastly, the drainage capacity of this drainage basin's river mouth was also analyzed in order to conclude whether it would have the capacity to drain the total volume of rainwater if an extreme flood event were to happen. Indeed, the main results show that this watershed's river mouth does not have the necessary drainage capacity to cope with an extreme event for the return period that was considered. As a consequence, the two aforementioned mitigation measures were developed considering the Tabua (Ribeira Brava) drainage basin's specific features. The size of the detention basin was estimated through the Dutch method and the simplified triangular hydrograph method, while the adjustment of the roughness coefficient was found to be a valid solution to enhance the drainage capacity of this river mouth [contribution 4].

2.5. A Comparative Analysis of Seaports in Terms of the Development of Maritime Tourism in the Area of the Baltic Sea [Contribution 5]

This study examines maritime tourism in the Baltic Sea region. The first part presents basic information related to the maritime tourism market, along with the key aspects and effects that the maritime tourism market has on the regions where it takes place. The next part concerns the Baltic Sea. The location and characteristics of the Baltic Sea are briefly presented. Passenger shipping connections between Baltic ports are described. The last part is devoted to the analysis of statistical data in the Baltic Sea region, focusing on passenger exchange in selected ports and in the entire Baltic Sea over the years. Finally, the potential directions of the development of maritime tourism in the Baltic Sea are characterized [contribution 5].

3. Conclusions

The Guest Editors believe that the papers that compose this Special Issue will be of interest to researchers and industry professionals. In fact, practitioners might gain valuable insights from these articles, which can lead to the implementation of some of the findings in real-world scenarios. In addition to that, these papers are expected to significantly contribute to the existing literature on these topics, as well as to reveal future research directions. It is also this Special Issue's objective to stimulate future collaborations and knowledge exchange between researchers.

Lastly, the Guest Editors hope that this Special Issue turns out to be a valuable source of knowledge for the research community, inspiring further research in these domains and enabling advancements in these same fields. As such, the knowledge in these research articles is expected to inspire future research paths, fostering researchers to generate further knowledge and research opportunities.

Funding: This research received no external funding.

Acknowledgments: The authors of this paper, as well as this Special Issue's Guest Editors, would like to thank the journal editors, all authors who contributed by submitting papers, and the referees who revised and improved the five published papers.

Conflicts of Interest: The authors declare no conflict of interest.

List of Contributions:

1. Chang, M.-Y.; Wang, C.-H.; Chen, H.-S. Exploring Cruise Tourists' Preferences and Satisfaction: The Case of Taiwan. *Water* **2021**, *13*, 3183. <https://doi.org/10.3390/w13223183>.
2. Kaizer, A.; Winiarska, M.; Formela, K.; Neumann, T. Inland Navigation as an Opportunity to Increase the Cargo Capacity of the Tri-City Seaports. *Water* **2022**, *14*, 2482. <https://doi.org/10.3390/w14162482>.
3. Jurado Almonte, J.M.; Díaz Diego, J. The Role of the Andalusian Institute for Agrarian Reform (IARA) in Irrigation Expansion: The Case of the Chanza Irrigation Project (Huelva, Spain). *Water* **2022**, *14*, 2931. <https://doi.org/10.3390/w14182931>.
4. Lousada, S.; Alves, R.; Fernandes, M.; Gonçalves, L. Hydraulic Planning in Insular Urban Territories: The Case of Madeira Island—Ribeira Brava, Tabua. *Water* **2023**, *15*, 2609. <https://doi.org/10.3390/w15142609>.
5. Baran, K.; Neumann, T. A Comparative Analysis of Seaports in Terms of the Development of Maritime Tourism in the Area of the Baltic Sea. *Water* **2023**, *15*, 3721. <https://doi.org/10.3390/w15213721>.

References

1. Jo, B.W.; Jo, J.H.; Khan, R.M.A.; Kim, J.H.; Lee, Y.S. Development of a Cloud Computing-Based Pier Type Port Structure Stability Evaluation Platform Using Fiber Bragg Grating Sensors. *Sensors* **2018**, *18*, 1681. [[CrossRef](#)] [[PubMed](#)]
2. Li, W.; Hilmola, O.-P.; Panova, Y. Container Sea Ports and Dry Ports: Future CO₂ Emission Reduction Potential in China. *Sustainability* **2019**, *11*, 1515. [[CrossRef](#)]
3. Galiatsatou, P.; Makris, C.; Krestenitis, Y.; Prinos, P. Nonstationary Extreme Value Analysis of Nearshore Sea-State Parameters under the Effects of Climate Change: Application to the Greek Coastal Zone and Port Structures. *J. Mar. Sci. Eng.* **2021**, *9*, 817. [[CrossRef](#)]
4. Jofré-Briceño, C.; Muñoz-La Rivera, F.; Atencio, E.; Herrera, R.F. Implementation of Facility Management for Port Infrastructure through the Use of UAVs, Photogrammetry and BIM. *Sensors* **2021**, *21*, 6686. [[CrossRef](#)] [[PubMed](#)]
5. Özcebe, A.G.; Bozzoni, F.; Borzi, B. Seismic Vulnerability Assessment of Critical Port Infrastructure Components by Modelling the Soil-Wharf-Crane Interaction. *Infrastructures* **2022**, *7*, 102. [[CrossRef](#)]
6. Fratila, A.; Gavril, I.A.; Nita, S.C.; Hrebenciuc, A. The Importance of Maritime Transport for Economic Growth in the European Union: A Panel Data Analysis. *Sustainability* **2021**, *13*, 7961. [[CrossRef](#)]
7. Taneja, P.; van Rhede van der Kloot, G.; van Koningsveld, M. Sustainability Performance of Port Infrastructure—A Case Study of a Quay Wall. *Sustainability* **2021**, *13*, 11932. [[CrossRef](#)]
8. Lam-González, Y.E.; León, C.J.; de León, J. Competition in Maritime Tourism: Assessing the Effect of Previous Islands' Choice and Experience in Tourist Satisfaction. *Sustainability* **2019**, *11*, 6334. [[CrossRef](#)]
9. Martínez Vázquez, R.M.; Milán García, J.; De Pablo Valenciano, J. Analysis and Trends of Global Research on Nautical, Maritime and Marine Tourism. *J. Mar. Sci. Eng.* **2021**, *9*, 93. [[CrossRef](#)]

10. Radic, A.; Law, R.; Lück, M.; Kang, H.; Ariza-Montes, A.; Arjona-Fuentes, J.M.; Han, H. Apocalypse Now or Overreaction to Coronavirus: The Global Cruise Tourism Industry Crisis. *Sustainability* **2020**, *12*, 6968. [[CrossRef](#)]
11. Liu, Y.; Dong, E.; Li, S.; Jie, X. Cruise Tourism for Sustainability: An Exploration of Value Chain in Shenzhen Shekou Port. *Sustainability* **2020**, *12*, 3054. [[CrossRef](#)]
12. Kawasaki, T.; Tagawa, H.; Kavirathna, C.A. Vessel Deployment and De-Hubbing in Maritime Networks: A Case Study on Colombo Port and Its Feeder Market. *J. Mar. Sci. Eng.* **2022**, *10*, 304. [[CrossRef](#)]
13. Nikčević, J.; Škurić, M. A Contribution to the Sustainable Development of Maritime Transport in the Context of Blue Economy: The Case of Montenegro. *Sustainability* **2021**, *13*, 3079. [[CrossRef](#)]

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.