

Managing Biodiversity in the Port Sector **Experiences from Three World Ports**

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Document Version Final published version

Publication date: 2023

License Unspecified

Citation for published version (APA): Acciaro, M. (2023). Managing Biodiversity in the Port Sector: Experiences from Three World Ports. Abstract from The Annual Conference of the International Association of Maritime Economists. IAME 2023, Long Beach, CA, United States.

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Download date: 04. Jul. 2025









IAME CONFERENCE 2023 New Realities in the Global Maritime Economy

September 5-8, 2023 Long Beach, California ECONOMISTS INTERNATIONAL ASSOCIATION OF MARITIME ECONOMISTS METRANS Transportation Consortium USC ICSULB

Managing Biodiversity in the Port Sector: Experiences from Three World Ports.

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Extended abstract presented at the International Association of Maritime Economists Annual Conference (IAME2023), Long Beach, CA, USA, 5-8 September 2023,

Extended abstract:

The biodiversity crisis is a global issue that refers to the accelerating loss of species and ecosystems worldwide. Human activities such as habitat destruction, climate change, pollution, and overexploitation of natural resources have caused unprecedented rates of biodiversity loss, with up to one million species at risk of extinction. This crisis is particularly urgent because biodiversity is essential for the functioning of ecosystems, which in turn provide critical services to human societies, such as clean air and water, food, and medicine.

Biodiversity plays a critical role in port and coastal areas (Madon et al. 2023). These ecosystems are often locally, regionally, or even nationally important and provide essential services such as supporting fisheries, protecting coastlines, and mitigating the effects of climate change. The presence of wetlands, dune fields, and other intertidal or marine ecosystems in and around ports helps to maintain water quality, filter pollutants, and provide habitat for a wide range of species (Borja and Perez, 2000). Moreover, they act as a buffer zone between industrial activities and the surrounding environment, reducing the impact of

pollution and other disturbances. Therefore, protecting biodiversity in port and coastal areas is essential for maintaining healthy and resilient ecosystems, which are essential for both human wellbeing and the sustainable development of coastal communities.

The importance of biodiversity in ports has been extensively studied (Ferrario et al., 2022). Several studies have focused on the role that ports play in influencing the biodiversity of their surrounding areas. Valdor et al. (2020) argue that the activities of ports, such as cargo handling and waste disposal, can result in spills into water bodies, which can alter seabed, increase organic loads, and turbidity. Such changes can negatively impact the flora and fauna of the region and disrupt the ecological balance. Moreover, the noise pollution caused by ports can also have a detrimental effect on marine life.

To mitigate the impact of ports on biodiversity, several port authorities have adopted measures to monitor and preserve the flora and fauna of the region. For example, the Port of Rotterdam has carried out several projects aimed at assessing the conditions of the fauna and flora in proximity to the port, including in the water. One of the main issues they monitor is salinity upstream of the river, which can be impacted by infrastructural development downstream in the port. Similarly, the Port of Brisbane has implemented measures to manage the impact of port operations on biodiversity in the surrounding areas. The port has established a Biodiversity Management Plan, which aims to protect and enhance the biodiversity of the area.

Moreover, port authorities are increasingly being entrusted with the preservation of the local biodiversity, in port areas, on land, at sea and in neighboring coastal areas. However no study so far as investigated wether the current practices and governance systems are adequate for the actual preservation of biodiversity in areas connected to ports. While some efforts have been made to promote sustainable port development and biodiversity conservation, more research is needed to better understand the relationship between ports and biodiversity, and to identify effective strategies for managing this relationship in a sustainable and socially responsible manner.

This paper investigates whether the current governance models used in ports are adequate for preservation of biodiversity and develops a framework for managing biodiversity in the port sector, building on the experiences of three world ports, Vancouver, Brisbane and Rotterdam. These three ports constitute three individual case studies of best practices, as all three ports have three different biodiversity management strategies.

Case study methodology has become an increasingly popular research approach in the field of port management studies, due to its ability to provide in-depth, detailed insights into complex phenomena. One of the key strengths of case study methodology is its ability to capture the complexity and diversity of port management issues. Moreover, case study methodology is well-suited to studying port management issues from a holistic, systems perspective. Ports are interconnected systems, with many different stakeholders, processes, and activities. The case studies are build on publicly available documents (biodiversity strategies, websites) and interviews with port representatives.

The paper provides a detailed analysis of the biodiversity strategies of the three ports and shows that biodiversity loss is an enormous challenge for ports. Lack of adequate consideration of biodiversity losses can rapidly damage the port brand and all ports recognise that managing biodiversity is becoming increasingly urgent in ports. Even in the case of best practices, it can be seen that the biodiversity preservation strategy is challenged by:

- fragmentation and constant change of targets
- more urgency as a result of climate change and other changes outside the port authority control
- financial and economic pressure on port management
- broadening of the responsibilities of port authorities without considering the development of adequate biodiversity governance tools
- more complex cooperation with local stakeholders and authorities

The paper's contribution to the policy discussion is significant as it offers a framework for managing biodiversity in the port sector, building on the experiences of three world ports. The case studies provide detailed insights into the biodiversity strategies of these ports and highlight the challenges and opportunities for managing biodiversity in the port sector. This information can be used to develop effective policies and strategies for managing biodiversity in ports worldwide.

Keywords: Biodiversity; ports; case study; externalities. JEL topic area code: Q57; R49.

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