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Design Development of Floating Performance Structure for Coastal Areas in the Maltese Islands

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Abstract : Background: Islands in the Mediterranean region offer opportunities for various industries to take advantage of the facilitation and use of versatile floating structures in coastal areas. In the context of dense land use, marine structures can contribute to ensure both terrestrial and marine resource sustainability. Objective: The aim of this paper is to present and critically discuss an array of issues that characterize the design process of a floating structure for coastal areas and to present the challenges and opportunities of providing such multifunctional and versatile structures around the Maltese coastline. Research Design: A three-tier research design commenced with a systematic literature review. Semi-structured interviews with stakeholders including a naval architect, a marine engineer and civil designers were conducted. A second stage preceded a focus group with stakeholders in design and construction of marine lightweight structures. The three tier research design ensured triangulation of issues. All phases of the study were governed by research ethics. Findings: Findings were grouped into three main themes: excellence, impact and implementation. These included design considerations, applications and potential impacts on local industry. Literature for the design and construction of marine structures in the Maltese Islands presented multiple gaps in the application of marine structures for local industries. Weather conditions, depth of sea bed and wave actions presented limitations on the design capabilities of the structure. Conclusion: Water structures offer great potential and conclusions demonstrate the applicability of such designs for Maltese waters. There is still no such provision within Maltese coastal areas for multi-purpose use. The introduction of such facilities presents a range of benefits for visiting tourists and locals thereby offering wide range of services to tourism and marine industry. Costs for construction and adverse weather conditions were amongst the main limitations that shaped design capacities of the water structures.

Keywords : coastal areas, lightweight, marine structure, multi purpose, versatile, floating device
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