

# Abstract

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## **Green Port Performance Index for Sustainable Ports in Egypt: a Fuzzy AHP Approach**

**Purpose:** As today's competitiveness is highly rising in the global maritime sector paralleled with an increased concern on the sustainability of operations and the environment, the purpose of this research is to propose a performance measurement system to evaluate and improve ports' green performance. The proposed system would support ports' authorities in assessing their green performance, defining the areas that would need improvement and ultimately allocating the necessary fund to develop and improve its green performance.

**Design/methodology/approach:** The literature is reviewed and a survey is conducted to identify the key green port performance indicators. This survey targeted subject matter experts (SMEs) and academics in the maritime sector in Egypt, the United Kingdom and Singapore. A fuzzy analytic hierarchy process (FAHP) questionnaire is then carried to determine the relative importance weight ( $W$ ) of the key ed indicators among three major container ports in Egypt namely Alexandria, East Port Said and Sokhna. The indicators would then be quantified and a performance rate ( $R$ ) would be assigned for each indicator based on a performance rating scale. Finally, a green port performance index would be designed using a weighted averaging aggregation method in order to aggregate the indicators' weighted rates ( $WR$ ) into a single index of overall performance from which a port can compare its performance with other competitive ports. **Originality/value:** Scholarly work has revealed some evidence suggesting the lack of research investigating green port indicators, and the absence of practical tools that can effectively support governments/authorities in sustaining ports' operations. Therefore, this paper would contribute in closing the gap in literature through the design of the green port performance index. **Research limitations/implications:** The research proposes a conceptual green port performance measurement system which provides an effective quantifiable tool to analyse, assess, and improve the green port performance through quantifying the green port performance indicators, and designing the green port performance index. **Practical implications:** The development of the green performance index would support port authorities in evaluating and improving their performance and consequently increasing their regional and global competitiveness in terms of regional and global sustainability.