

Introduction

The Environmental Impact Assessment (EIA) directive [3] introduced a Europe-wide procedure to ensure that environmental consequences of proposed projects are identified and assessed before the consent is given. EIA is the process which examines (in a transparent way) the environmental consequences of a planned project, in advance, to inform decision making [9] and it also addresses alternatives which are important for better governance and sustainability [7]. An Environmental Statement (ES) documents the EIA process of the specific development and its main role has often been to avoid and mitigate, and at times to compensate for negative environmental impacts [12].

Objectives

- To compare quantitatively the mitigation measures for offshore wind farm developments.
- To assess qualitatively the current practices involved in preparing an ES.
- To identify opportunities to improve the quality of future ESs by adhering to the Institute of Environmental Management and Assessment's (IEMA) EIA quality mark criteria.

Methodology

A comparative analysis of three different ESs of offshore wind farm (OWF): Sheringham Shoal [13], Galloper [5], Inch Cape [6] in the UK was carried out taking into consideration IEMA's mitigation hierarchy [8] and mitigation measures according to project phase: construction, operation, decommissioning.

The quality of each ES was assessed by using both a simplified version of the Lee and Colley (1992) review package and IEMA's EIA quality mark criteria. The first one was chosen because it is specifically designed for the review of ES and the second one represents a voluntary commitment for improving EIA quality.

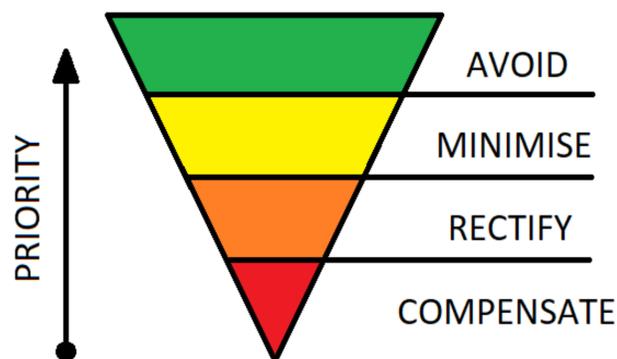


Figure 1. IEMA's mitigation hierarchy



Figure 2. IEMA's EIA quality mark

Results

Sheringham Shoal offshore wind farm was opened in 2012 (round 2), Galloper opened in 2018 (round 2) and Inch Cape (round 3) has already received the consent but the actual construction is yet to begin.

After analyzing the aforementioned ES reports, these findings were obtained:

1. Chronologically speaking, measures included in the 'Avoid' category are increasing.
2. There are no measures related to the 'Compensate' category.
3. Mitigation measures in 'Operation' and 'Decommissioning' phases are rising.

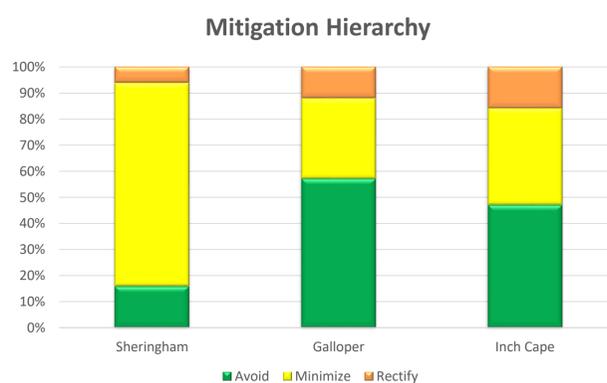


Figure 3. Mitigation hierarchy for OWF

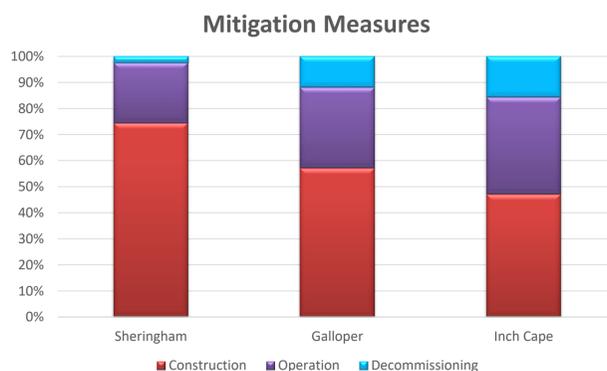


Figure 4. Mitigation measures for OWF

Discussion

As the ES is a mandatory requirement to get the development consent for every wind farm, it can be argued that EIA is increasing its influence on decision making throughout the process. However, regarding the prediction of the impact magnitude, it was found that the effects are not categorized into direct or indirect and permanent or temporary. Moreover, there is a lack of details regarding the factors influencing the impact significance and the issues raised by consultees are not properly addressed leading to reduced effectiveness of mitigation measures. Also, our findings point out to a possible improvement in current practices for developing ES as the time progresses and allocation rounds in the UK move forward. However, there are still weaknesses, especially related to impact prediction, decommissioning plans as well as residues and emissions.

The results obtained have similarities with previous studies undertaken. Lee and Colley (1992), for instance, had recommended the importance of more detailed information for the treatment of alternatives [10]. Poder and Lukki (2011) pointed out the need of detailed insight considering uncertainty and probability of predictions while Philip-Jones and Fischer (2013) observed the inadequacy in the quality of information and lack of public participation approaches [11].

If EIA quality mark would have been applied, the results would probably have differed in a substantial way including enhanced quality of ES and detailed mitigation measures along with their effectiveness and monitoring phase.

Conclusions

Current practices involved in the assessment of ES use outdated methodology. EIA quality mark is a voluntary practice applied to EIA related activities developed in the UK, and to organizations coordinating statutory EIA. Not only does it assess the final results of the EIA process but also the whole EIA project itself. All organizations interested in implementing EIA quality mark, need to meet strict minimum requirements, this way the best EIA practice is followed.

The review carried out using IEMA criteria and the Lee and Colley (1992) review package is limited and it does not offer advantages as the quality mark does and thus all the future ESs should follow this criterion.

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