Estimation of the impact of Blue Economy at the regional level in Poland

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MAIN research goal: Estimation of the contribution of Blue Economy to the economic growth of the NUTS2 regions in Poland

RESEARCH STEPS / PROCEDURE
1. Estimation of the size of the Polish Blue Economy using local data (enterprises’ data reported nationally) (see: Figures 1 and 2).
2. Extension of existing Input-Output national table by adding 16 marine sectors.
3. Computing direct effects, indirect effects, and induced effects for the Polish economy.
5. Applying Leontief Input-Output modelling framework to study the spatial spill-overs of the Blue Economy (see: Figures 3, 4, 5).

KEY FINDINGS:
1. The use of microdata resulted in estimations of the Polish Blue Economy ca. 11% higher than in international EC reports.
2. The share of the total effect of the Blue Economy in the Polish GDP exceeded 5%.
3. Big absolute values of the total effect (above 1 billion EUR) not only in marine regions.
4. The share of total effect in regional GDP exceeded 1% in majority of Polish regions.
5. Even in some economically weaker regions e.g. Podlaskie and Lubuskie this share > 2%.
6. 50% of indirect and direct effects produced by tourism industry, fish processing, shipyard sector, maritime transport and logistics.
7. 38% (on average) of induced effects generated in food products, real estate services, energy and heating, and retail trade services (non-maritime sectors).

Fig. 1. GVA of Polish Blue Economy estimated using local data approach and EC methodology (% of GDP)
Fig. 2. Blue Economy sectors generating the largest GVA in Poland in 2015 (EUR million)
Fig. 3. Direct effects of the Blue Economy in Polish regions (2015)
Fig. 4. Indirect and induced effects of the Blue Economy in Polish regions (2015)
Fig. 5. Total effects of Blue Economy as % of GDP in Polish NUTS2 regions in 2015
ENVIRONMENTAL IMPACT STUDY OF OFFSHORE WIND ENERGY PROJECTS IN BRAZIL: A participatory approach

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Context
In the past three years, the interest in the development of offshore wind farms (OWF) on the Brazilian Coast has been growing significantly, covering an area of ~ 48 thousand Km² with a estimative of more than 11.5 thousand towers.


Public Participation
Beside the lack of social participation during the regulatory framework discussion, Brazil does not have a spatial planning and participatory process for the selection of areas for offshore energy purposes. From the environmental licensing process perspective, there is a public consultation that happens only at its final stage, often resulting in tension between the community and the developers, delaying the progress, increasing costs, and generating less favourable results for both parties.

Handling the Social License to Operate (SLO)
A participatory approach methodology to be integrated into the licensing process of offshore project was developed aiming to address and integrate a previous social participation with the offshore wind impact assessment. Based on the Engagement strategy for the Macaronesian Maritime Spatial Planning Project (Vergílio et al, 2019) and having as a guide the Terms of Reference of Brazilian Institute of Environment and Renewable Natural Resources (IBAMA) for OWF, the proposal methodology is composed by the following key steps:

1. Stakeholders Mapping and assessment
2. Define Social Participation Level
3. Identify the impacts and risks perceived by local communities
4. Map potential use conflicts of the marine space
5. Facilitate tailored workshops to assess the impacts and propose mitigation measures
6. Integrate the recommendations from social participation into the EIA

Table: Proposed engagement strategy for environmental impact study of offshore wind farm projects in Brazil

<table>
<thead>
<tr>
<th>Target Audience</th>
<th>General community of the project region.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method</td>
<td>Communicate general information about the project to promote awareness.</td>
</tr>
<tr>
<td>Stakeholder consultation</td>
<td>Opinion interview</td>
</tr>
<tr>
<td>Stakeholder consultation</td>
<td>All (general public and key stakeholders)</td>
</tr>
<tr>
<td>Objective</td>
<td>Collect information on the opinion and perception of the community in relation to the project, also considering their perceptions in relation to the potential impacts (positive and/or negative).</td>
</tr>
<tr>
<td>Address IBAMA's</td>
<td>ToR</td>
</tr>
<tr>
<td>Source</td>
<td>IBAMA (2022).</td>
</tr>
</tbody>
</table>

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Developing MSP objectives for SUAPE Port Area

Marinez Eymael Garcia Scherer¹, Camila Pegorelli², Sereno Diederichsen¹, Tiago Borges Ribeiro Gandra³
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Contextualization

Ports are important players in the coastal landscape due to their role in the economic development of a region. Ports ends up significantly altering the social, environmental and economic dynamics of the region, configuring in a complex system of multiple interactions.

Methodology

This process was based on the methodology developed and applied in the Macaronesia Maritime Space Planning Project (CAÑA VARONA et al., 2019). It includes essential aspects such as policy review and stakeholder consultation. Figure 2 shows the process followed to reach the objectives.

Results

Table 1: List of documents

<table>
<thead>
<tr>
<th>Document</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1. Analytic Plan | 1. Contextualization and Regulatorios
| 2. Stakeholder Consultation | 2. Literature review
| 3. Social and Environmental Conflicts | 3. Interviews and workshops
| 4. Urban and Coastal Governance | 4. Ocean literacy

Table 2: Challenges and opportunities

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Opportunity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited economic potential</td>
<td>Increased economic opportunities</td>
</tr>
<tr>
<td>Lack of public awareness</td>
<td>Enhanced public understanding</td>
</tr>
<tr>
<td>Conflicts with other users</td>
<td>Improved conflict resolution</td>
</tr>
</tbody>
</table>

Table 3: Identifying objectives

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic</td>
<td>Increase economic benefits</td>
</tr>
<tr>
<td>Social</td>
<td>Enhance social equity</td>
</tr>
<tr>
<td>Environmental</td>
<td>Protect biodiversity</td>
</tr>
</tbody>
</table>

Figure 2. Scheme of the methodology followed for the development of the proposal of objectives for the Marine Spatial Planning in the CIPS.

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Aiming to minimize conflicts between activities as well as identify opportunities for the area, the Suape Industrial and Port Complex (CIPS) - an important player for the region of Pernambuco State, Brazil - developed a study based on the Marine Spatial Planning concepts. This study focused on the selection of the objectives that will guide the future MSP process and had two scales of analysis Figure 1.

With cooperation of:
Analysis of Spatial Compatibility between Consolidated and Emerging Activities in the Exclusive Economic Zone of Southern Brazil

Júlio César Medeiros¹, Carlos Vinicius da Cruz Weiss¹, Marinez Eymael Garcia Scherer¹
¹Federal University of Santa Catarina (UFSC)

The growing expansion of the exploitation of ocean resources points to the need for integrated approaches in management and strategic planning in order to minimize conflicts and optimize the use of space. Thus, the present work sought to analyze the compatibility between consolidated and emerging activities and uses in the Exclusive Economic Zone of Southern Brazil (ZEESB).

A Spatial Compatibility Index (SCI) was developed to analyze potential spatial synergies and conflicts. Potential zones for exploration of wind energy, wave energy, aquaculture and mining were overlapped with existing activities and uses in the ZEESB. The identified overlaps served as the basis for the application of a virtual questionnaire, where a group of experts indicated the degree of compatibility between the identified intersections. The responses obtained were applied in the method of hierarchical analysis (Analytic Hierarchy Process - AHP) to generate the normalized ICE.

Renewable energy sector showed high compatibility between the combination of wind and wave energy exploitation. The mining sector also had a high compatibility rate with shipping activity. On the other hand, aquaculture showed low compatibility in relation to the other activities considered, mainly with mining. Considering that offshore areas are being increasingly explored for the development of marine economies focused on renewable energies, mining and aquaculture studies like this can help in the sustainable planning of the marine environment and optimize the multi-use of the ocean.

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Introduction

In the literature, marine organisms including Ascidians are known for their richness in molecules of interest that can be used in many fields. However, the ascidiological fauna of the southwestern coast of Madagascar is according to the literature almost completely unknown. The present study, carried out from January to March 2020, allowed the identification of Ascidians in the Bay of Sarodrano, one village fishing in the southwestern coast of Madagascar.

Methods

The chemical study made was fixed on the feasibility study of lipid production from Ascidians. For this, the Folch method, specific for the extraction of marine lipids, was adopted. It is based on the principle of the difference of polarity in a mixture of two solvents, one polar (Chloroform) and the other apolar (methanol), in a volume ratio 2:1.

Results

The samples of Ascidians collected during our two dives, are distributed on four genus of which: Phallusia, Polycarpa, Sigillina and Didemnum. These samples of Ascidians constituted the raw materials of the chemical part of this study realized in the VALOREMAR laboratory at the IH.SM, University of Toliara.

Thus, with the 127g samples of Ascidians collected, all species included, 1.04g of crude extract corresponding total lipids were obtained, that is an extraction yield of 0.82%.

Conclusion

Ascidians are part of marine animals very studied in the field of marine biotechnologies thanks to the growing interest of their metabolites in particular in pharmacology and food. They are found in all the seas of the world and they are often studied for the active substances which are present in them. The Ascidians produce lipids having important roles. They are exploited in developed countries thanks to their metabolites of which the lipids have different ways of valorisation. The valorization of the lipids of Ascidians is important as much in the treatment of the diseases as in the food complements. Moreover, lipids are universally distributed in the environment, in extremely variable proportions.
MSP monitoring alignment with blue economy in Madeira archipelago

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Introduction

Portugal has taken a very active role in the development of the EU Marine Spatial Planning Directive 2014/89/EU as well as the EU Maritime Strategy for the Atlantic area. The Madeira Archipelago (Portugal), is composed by a group of small islands (Madeira, Porto Santo, Salvagens, and Desertas Islands), characterized by traditional services as fishing and tourism, which accounts for more than 76,8% of the “Sea” regional GVA, making clear the need to align realistically the policy and strategic aspirations to a sustainable development.

Approved in 2019 the maritime spatial plan (PSOEM) is the maritime planning instrument that will enable the Administration to issue Titles of Private Use of the National Maritime Space, called TUPEM, ensuring transparency and legal security and promoting compatibility between competing uses or activities.

Within MSP-OR project, OR’s will develop a guide to the improve MSP monitoring and evaluation process, focused on the identification of a set of relevant indicators, transversal to the various activities and Directives, integrating all aspects of sustainability: environmental, economic and social pillars.

MSFD Commission Decision 2010/477/EU outlined the criteria and methodological standards for the good environmental status (GES) of national marine strategies, on which MSs could determine GES, while subdividing the 11 descriptors into 29 criteria and 56 associated indicators. Madeira, part of the Macaronesia sub-region, is committed to meet the goal of ecosystem-based management maintaining its ecosystem in a healthy, productive and resilient condition so that it can provide goods and services wanted and needed, conciliating MSFD, MSP and Blue economy.

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The Blue Economy Strategy of Madeira presents itself as a document that intends to strengthen the economic potential presented by the ocean, promoting economic and social growth, but simultaneously ensuring the long-term capacity of ecosystems to support the maritime sectors, remaining resilient and healthy.
Innovation in Tourism for Sustainable Blue Economic Development

Srijon Paul¹, Md. Eleyeas Chowdhury¹, Jewel Das¹
¹Institute of Marine Sciences, University of Chittagong, Bangladesh

Introduction
One of the most significant tourist attractions in Bangladesh is Saint Martin’s Island (SMI), the only coral-bearing offshore island. Moreover, it is considered to be the richest biodiversity hotspot in terms of marine biotic resources in Bangladesh. Tourism plays a significant role in this island. During the tourist season (November-March), approximately 6000 people visit this island each day. It seems the tourist visit and their activities are beyond carrying capacity. Recently, the island was declared a marine protected area (MPA). It is urgently necessary to devise a sustainable plan for protecting the island and ensuring that the local economy and livelihoods are sustained.

Goal and Objectives
It aims to develop an integrated tourism plan for Saint Martin’s Island (SMI) that considers economy, environment, and society. Specific objectives are as follows:
- To protect and restore the island’s biodiversity
- To enhance the local livelihood engaging with the tourism
- To ensure sustainable development of the blue economy

Approaches
- For managing sustainable tourism appropriately, a committee will be formed including all stakeholders related to this island management.
- By developing a digital app (software that must be mobile-friendly, such as Android or iOS), the central tourism authority will develop an integrated tourism plan. (Figure 1)
- Model app would be called SMart (Saint Martin’s artificial). The app will contain all information about the island (like a manual) and keep track of the tourists’ movements.
- By using the SMart app, tourists can easily book, hire a tour guide before entering the island, pay, seek help and follow guidelines.
- The proposed tourism concept incorporating Marine/Maritime Spatial Planning (MSP) and other discoveries will feature modern, traditional, and eco-friendly facilities. (Figure 2)

Expected outcome
A rich database will be collected through the apps which helps in studying tourists’ behavior, record keeping trades and businesses, management dos and don’ts for way forward planning. Furthermore, a tourist friendly app facilitates a tourist’s planning, budgeting and getting information. (Figure 3)

Conclusion
Innovation is indispensable for better management of eco-friendly tourism that address sustainability in the pursuit of economy, environment, and society.

Reference
From co-location to co-management of fisheries and offshore wind: current practices and knowledge to support marine spatial planning

Prince Owusu Bonsu¹, Vanessa Stelzenmueller¹, Jonas Letschert¹, Jennifer Rehrenr¹, Dr. Katherine Yates², Dr. Thomas Kerkhove³, Dr. Marcel Rozemeijer⁴, Dr. Jon Christian Svendsen⁵, Dr. Torsten Schulze¹, Dr. Jorg Berkenhagen¹
¹Thuenen Institute for Sea Fisheries; ²Salford University; ³Royal Belgian Institute of Natural Sciences; ⁴Wageningen University; ⁵Technical University of Denmark

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THE WHY
Fast pace growth of Off shore Wind Farms (OWF) in the North Sea

THE IDEA
A co-management strategy that allocates ocean space, infrastructure and co-governance for multiple uses in the same space and/or time

Establishing a baseline:
An understanding of the current science * implementation of OWF & Fisheries co-location

Suitability Analysis and Mapping
Suitability criteria for co-location based on key enablers

RESULTS
National co-location regulation & examples

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<thead>
<tr>
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<th>Operation Details</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
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<td>Static gears Bottom trawling over export cables</td>
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<td>United Kingdom (50m)</td>
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Key Barriers & Recommendations
- Financial costs
- Safety and Navigation
- Participation & consultation
- Compensations
- Consultation & Information sharing
- Technical Innovation
- Research, Monitoring & Assessment
- Finance & Investment

Challenges facing co-location:
- Unclear interpretation of co-location
- Sectorial alienation and imbalance
- Co-location Benefits vs Negative Impacts
- Differences in:
  - Governance approaches
  - Ecological & sectorial characteristics

THE HOW
THE IDEA
Co-location

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THE WHY
Fisheries displacement

THE IDEA
Co-location

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  - Governance approaches
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Local MSP approach towards sustainable development of Malaga Bay (SW-Mediterranean)

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Introduction
One of the main objectives of sustainable fishing development is the sustainable biological, economic and environmental exploitation of living resources (CFP, 2013). Breeding areas of target species are of special importance.

Essential Fish Habitat (EFH)
High abundances of Hake <15cm can be observed in the unprotected Bay of Malaga (Fig. 1a). The swept per recovery time index (SPR) of bottom habitat shows that trawling frequency in the Bay of Malaga has to be reduced 60 times in order allow benthic habitat to recover. In order to protect the Hake nursery area, Malaga Bay has been proposed as an Essential Fishing Habitat (GFCM, 2019) (Fig 1b).

Future uses
Aquaculture suitable declared areas, by the government, is one of the most important conflict with extractive fishery in the future (figure 3b).

MSP Proposal
The reduction of extractive fishery in the EFH protects the nursery area, while fishery benefit fishing on the spill-over outside of the EFH. Coastal aquaculture of herbivory species replacing fishmeal by alga (García-Márquez et al., 2022) cultivated on nutrient rich waste water could reduce eutrophication of the Bay of Malaga.

References:

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Acknowledgements: Muñoz, M. acknowledges the support by "Plan Propio Universidad de Málaga."