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Maritime, Ocean Sector and Ecosystem Sustainability: Fostering Blue Growth in Atlantic Industries

Blue Growth Pathway for Aquaculture

Contents

Contributing Authors
Zacharoula Kyriazi and Agnès Marhadour, CIIMAR

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For further information please contact Dr. Zacharoula Kyriazi (zkyriazi@ciimar.up.pt) or see www.mosesproject.eu

Series Editor
Dr Wesley Flannery, Queen's University, Belfast (w.flannery@qub.ac.uk).

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Executive Summary

Globally, aquaculture production is rising rapidly and is being driven by increasing demand for global food security and economic growth. This growth however must be in line with sustainable development standards, a task that both governments and businesses must undertake. This is interlinked with other challenges that also need to be addressed. The most crucial challenges are linked to governance especially in relation to managing conflicts over the use of space and natural resources as well as the need to strengthen management regimes that often focus more on promoting economic growth rather than environmental and societal goals.

There is also the need to manage impacts stemming from global challenges such as climate change that pose threats to sustainable aquaculture development. As part of the MOSES project, how sustainable Blue Growth in aquaculture may be further enhanced through the application of a Transition Management approach was examined using the case study of Portugal's Centro region aquaculture sector. If and how aquaculture's sustainable Blue Growth has been achieved so far is also assessed. Using the Transition Management framework, the potential of Blue Growth is identified by comparing drivers and barriers likely to impact the growth profile of aquaculture and assessing how the sector could respond to sustainably realise its potential.

The study concludes by outlining sustainable Blue Growth pathways that can address governance and economic barriers including through the simplification of licencing processes; facilitating access to space and water; and reinforcing sectoral competitiveness.

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Introduction

The blue economy currently provides around 5.4 million jobs in Europe and generates a gross added value of almost €500 billion a year[1]. Aquaculture is cited as one of the most promising areas offering a high potential for the creation of sustainable jobs and growth. In this context, how sustainable Blue Growth in the aquaculture sector can be achieved over the long-term is examined. A case study approach involving Portugal's Centro Region Aquaculture sector is employed to assess the level of sustainable Blue Growth achievement so far by collecting information from scientific and policy publications, statistical datasets and key actors. Existing and new sustainability assessment indicators are also tested.

The overall outcome is that existing aquaculture practices in the Centro region are already moving towards a promising sustainable Blue Growth profile. However, for the purposes of this study, an additional step was undertaken to address the complexities and uncertainties in how sustainable blue growth in aquaculture can be managed over the longer-term. To facilitate this, a Transition Management approach was used to help to identify policy, governance, administrative, economic, societal, environmental, and scientific/technological drivers and barriers to sustainable blue growth goals. From this analysis, key recommendations to develop a pathway towards sustainable Blue Growth in aquaculture have been developed.

€500 billion

Gross added value generated by blue economy in Europe

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Aquaculture and the Atlantic Action Plan

Aquaculture is one of the Blue Growth sectors and one of the traditional Atlantic industries promoted by the Atlantic Action Plan (AAP). It has received special attention under AAP Priority 1 "Promotion of entrepreneurship and innovation"[2] that sets the objective of enhancement of competitiveness and innovation capacities by improving skills in the sector, reforming the Common Fisheries Policy and revitalizing the EU's aquaculture industry.

Regarding AAP priority 2 "Protect, secure and enhance the marine and coastal environment" aquaculture can play an important role by providing healthy and sustainable fish and seafood production while marine environmental protection is a requirement for aquaculture development in national strategies.

Finally, for AAP priority 4 "Create a socially inclusive and sustainable model of regional development" aquaculture is particularly relevant[3] largely because of its impact on employment and potential for collaborative research and development and the delivery of technological improvements and innovation, at the regional level[4].

Protect, secure and enhance marine and coastal environment

Aquaculture production is rising rapidly and is being driven by increasing demand for global food security and economic growth

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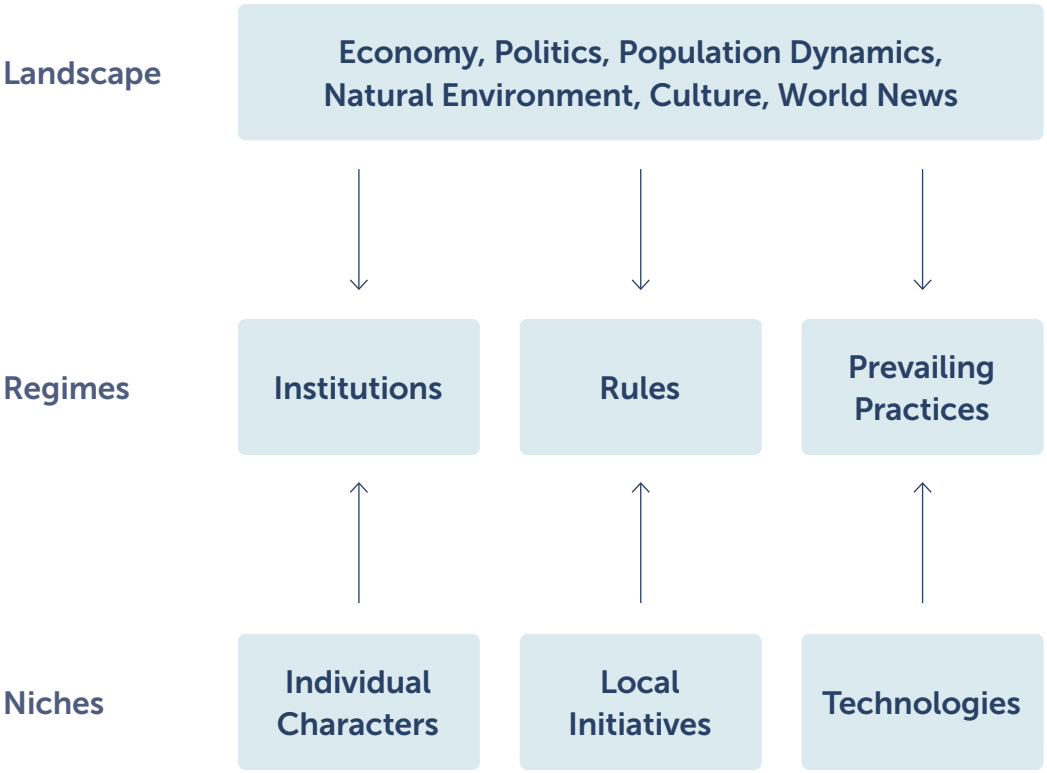
Transition Management

Transition management is a governance approach that aims to facilitate and accelerate sustainable transitions. Transition management focuses on coordinating a wide range of actors with the aim of achieving long-term sustainability. It seeks to coordinate these actors through the creation of a shared understanding of a problem and the development of a long-term vision and sustainable pathways through which the problem can be addressed. Sustainable transitions require actors to develop an understanding of the interconnections between the current management regime and the change pressures exerted on it (See figure below).

The management regime is the amalgamation of the dominant practices, rules, institutions, and norms that structure activity within a particular policy area. Change pressures can be characterized as landscape pressures and niche practices. Landscape pressures operate at the macro level and include issues such as economic, political, environmental, and demographic dynamics. These dynamics put pressure on the existing regime to change but cannot be directly controlled by the regime. For example, population growth will place pressure on food and energy regimes to scale up production. Niche pressures are micro-level innovations that exert pressure for regime change from below. Niches can be the actions of individual actors, the development of alternative technologies and local management practices that do not conform to established practices and put pressure on the regime to adopt to accommodate them. For example, the development of alternative aquaculture technologies or the emergence of cultivation of new indigenous species can put pressure on the process of aquaculture licensing, managing and monitoring regimes. Landscape pressures and niches are, therefore, vital seeds for change and are crucial for path-breaking innovations.

The Multi-Level Concept in Transition Studies

Source: Adapted from Geels, 2002[5]



Transition management focuses on the development of sustainable pathways that can overcome barriers and maximize opportunities and can steer innovations to become established within reformed and more sustainable regimes. MOSES has adopted transition management as a broad analytical framework through which to understand existing marine management regimes and to stimulate thinking about how more sustainable regimes may be realized in the future.

A broad analytical framework through which to understand existing marine management regimes

Atlantic salmon, blue mussel and Pacific oyster are the three species that dominate production in the Atlantic Arc region

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Aquaculture Management Regime

The Atlantic Arc regions have been the focus of aquaculture activities for a considerable period. Atlantic salmon, blue mussel and Pacific oyster are the three species that dominate production in the Atlantic Arc region[6]. Shellfish farming is most intensive along the coast of France, Portugal and Spain (Bay of Biscay and Iberian Coast)[7] while Scotland is the largest producer of farmed Atlantic salmon in the EU.

EU Aquaculture production (in volume) has stagnated over the last decades, even if its value has increased. Considering the increasing demand of seafood products in the EU, it seems realistic to expect growth in EU aquaculture products. This growth would also help boost the processing sector that is currently dependent on global fish markets[8]. Various policies, sustainable development initiatives and strategies or funding mechanisms comprise a current management regime that creates opportunities for the aquaculture sector to contribute to sustainable Blue Growth at EU, Atlantic and National levels.

Some examples include:

- The revised Common Fisheries Policy (CFP) includes the conservation of marine biological resources and the management of fisheries impacting them in relation to market and financial measures, fresh water biological resources and aquaculture activities, as well as the processing and marketing of fishery and aquaculture products.
- The strategic guidelines for the sustainable development of EU aquaculture[9] that has been linked to other important strategic guidelines in Europe, like the MSFD, the Europe 2020 strategy or the Blue Growth strategy as well as the wider aquaculture sector.
- The European Maritime and Fisheries Fund (EMFF)[10] encourages, community-led local development and fisheries local action groups, marketing and processing related measures.
- The Blue SOS[11] launched by the European Investment bank in 2019 which has sought to improve the health of oceans, build stronger coastal environments, and boost blue economic activity, by supporting sus¬tainable ocean projects. This includes projects that help busi¬nesses produce seafood more sustainably and can include fisheries, aquaculture or the processing and preservation of seafood.

- The European Aquaculture Technology and Innovation Platform (EATiP)[12] is an international non-profit association dedicated to developing, supporting and promoting technology and innovation in aquaculture in Europe. The aim here is to establish a strong relationship between aquaculture and the consumer; assure a sustainable aquaculture industry; and consolidate the role of aquaculture in society.
- The European Green Deal is an ambitious growth strategy, which sets out a plan for an economy-wide transition, which will enable Europe to achieve climate neutrality by the year 2050[13].
- The Atlantic Ocean Research Alliance (AORA) is an Atlantic Ocean Cooperation that is aiming to provide direct support to multiple sectors of the Blue Economy such as Aquaculture through the "Ocean of Food program."
- The increase in the variety of eco-labelling options (GAA, ASC etc.) and production standards for various types of production systems. This can be viewed as a response by the sector to consumer and NGO pressures that were identified above as drivers of change.

In Portugal, the Strategic Plan for the Portuguese Aquaculture (2014-2020) aims to "increase and diversify the supply of products of national aquaculture, based on the principles of sustainability, quality and food safety, to meet consumer needs" and encourages a transition to a low carbon economy, which is also a priority of EMFF.[14] In the law decree no 40/2017, a new consent process has been defined for the installation and operation of mariculture establishments whilst in the Marine Situation Plan (PSOEM, 2019), new potential and specific areas have been identified for open ocean aquaculture production. A strategy for aquaculture in brackish waters and coastal lagoons has also been developed.

Despite these enabling factors, challenges still exist that may hinder a universal management approach for the aquaculture sector as a whole. A significant challenge is that aquaculture represents a diverse sector that brings together multiple actors who are responsible for the entire supply and management systems of quality fish and shellfish production. Other challenges include ensuring aquatic animal welfare, sustainable feed production, product quality, consumer safety and health and integration with the environment[15], which also includes adaptation to climate change[16]. In the Atlantic Area, the diversity of products that are produced in aquaculture across the countries varies due to the physical and climatic conditions of their waters. For instance, northern countries on the Atlantic (Ireland and the UK) have a strong focus on (Atlantic) salmon production, whereas shellfish farming is primarily found in France, Spain and Portugal[17]. There are also different administrative restrictions, based on the location and operations of aquaculture units and the requirements in place for environmental impact monitoring. Also, both finfish and shellfish aquaculture are affected by the uneven application of regulation across countries, which in turn impacts competitiveness. Furthermore, there is criticism of the uneven development of national policies for aquaculture that could promote the development of this sector and address inter-sectoral issues. For instance, while Spain and

Portugal have been prioritizing strategies that can identify key constraints and frame the development in terms of the wider CFP and public funding opportunities, there has been considerably less progress on these issues in the UK[18].

At the national level and specifically in Portugal, the economic performance of the sector[19] suggests that aquaculture in Portugal is less profitable than in other areas of the Atlantic Arc and that additional investment could increase the stability and competitiveness of the sector. The Portuguese Aquaculture[20] identifies several potential constraints which include the extensive and small-scale nature of much of the sector and the need to be able to address competition from intensive aquaculture of other countries. Product quality and the need to add a price premium to Portuguese aquaculture products has been identified as an issue that needs to be addressed in the national policy.

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MOSES Portugal's Centro Region Aquaculture Case Study

The aquaculture sector's growth potential and its contribution to local as well as national Blue Growth has been examined in Centro Region of Portugal using the MOSES framework. By collecting information from scientific and policy publications, statistical datasets and input from key actors, the aim here was to: a) identify what approaches (if any) are being used by the sector for sustainable Blue Growth assessment; b) use existing quantitative and qualitative sustainability assessment (SA) indicators (suggested by FAO and the EU) and identify new indicators using experts' and stakeholders' perception analysis respectively; c) assess drivers and barriers that impact sustainable Blue Growth; and d) suggest a pathway to overcome these barriers. Similarly, to the previous examination of management regimes and their impacts at the MOSES case study level, the overall conclusion is that there is a positive trend for the development and expansion of the aquaculture sector towards realising a sustainable Blue Growth profile. This is evidenced by the national and local strategies as well as other initiatives and efforts by companies, either existing or emerging, that have sustainability inherent already in their planning stages.

Based on input from key actors the most important drivers towards realising sustainable aquaculture are economic, administrative, governance and scientific/technical improvements. The economic drivers include: 1) a high demand for fish products by the Portuguese; 2) the existence of EU and national or local funding mechanisms (current funding mechanism MAR2020 requires more flexible application criteria); 3) better quality of local vs imported products which can justify higher prices and branding; 4) growing local and foreign demand for delicatessen products such as organic seaweed, organic clams and locally produced oysters and corvine; 5) the cost for licensing and using public land/sea sites is not very high; and 6) increased spending for research on feeding and the impacts of introducing new species. Administrative drivers relate largely to improvements in licensing processes, especially in terms of requirements and duration, although for some actors this process is still time consuming and difficult to navigate. Governance drivers include the management of conflict with other users in spatial plans that allow some types of aquaculture in protected areas or provide official negotiation processes. Finally, scientific knowledge and advanced research in areas like biotechnology are also important drivers for sustainable aquaculture in the Centro Region.

However, a number of obstacles have been identified that restrict the sustainable development of the sector and moving forward these need to be addressed. The most pressing obstacles relate to governance and economic barriers. Governance obstacles emerge when there is more than one aquaculture spatial planning framework and a lack of conflict management between aquaculture and other uses. There is also a lack of enthusiasm for collaboration and communication between the same or different categories of key actors (researchers, companies or others operating in the supply chain) as well as a distinct lack of promotion for aquaculture products to consumers. Economic obstacles include: 1) cheap imported aquaculture products that compete with local production; 2) unproportioned allocation of funding; 3) lack of investment in marketing of aquaculture products; 4) difficulties for new actors to enter the sector; and 5) the emergence of illegal activities from producers to address uncertainties around production. Nevertheless, the majority of the key aquaculture sector actors involved in the case study remain positive towards achieving sustainable Blue Growth and highly optimistic in realising this goal in the future.

Key aquaculture sector actors involved in the case study remain positive towards achieving sustainable Blue Growth

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Pathway for Sustainable Development of Aquaculture

Based on the balance between drivers and barriers identified previously there is potential for the aquaculture sector in the Centro Region to deliver the priorities of both the AAP, the EU and Portugal and to ensure a faster transition towards sustainable Blue Growth. For Portugal, these priorities are grouped in three axes[21], and each one outlines specific goals and corresponding actions and/or projects to implement:

- Simplify the administrative processes to reduce the deadlines and administrative steps needed for licensing. This priority has to some extent already been addressed through the renewed licensing process but according to some investors and producers they would benefit from further gains in efficiencies.
- Facilitate better spatial planning to identify areas with higher potential for aquaculture and reduced environmental impact. This priority has been addressed by the publication of various aquaculture plans and the Marine Situation Plan (2019) that include suggested sites for further (marine) aquaculture development.
- Reinforce the competitiveness of the aquaculture sector and promote equal conditions for the EU operators, to increase, diversify and add value to national aquaculture production. This priority has been addressed by initiatives that aim to increase and diversify the production and supply of new products; encourage greater investment in production methods that can ensure higher food safety standards, and; promote additional research and planning for offshore aquaculture.

There are features of the EU Member States in the Atlantic Arc area that can be observed that will influence the balance between drivers and barriers for aquaculture blue growth across the region as identified above. From a transition management perspective, it is apparent that:

- There are differences within the aquaculture sector and hence its management regime, that are mainly connected to the diversity of the production systems as well as the type of products, varying environmental conditions and consumption patterns among regions and countries. These differences combine to hinder a more uniform management regime across the Atlantic Arc or even the EU. Despite these differences, the current management regime corresponds well to the change pressures set by both the landscape pressures and the niche practices through a strong institutional framework and strategic planning practices already in place.

- The landscape pressures result mainly from the increasing demand for fish and seafood as well as the need for sustainable food production; the need to address overexploitation of the marine resources; and the need to address adaptation to climate change.
- In parallel, at a niche level, key-actors such as research institutions, investors, producers, government agencies, consultants and clusters have strongly interlinked interests in the blue economy and aquaculture within it. These actors make an important contribution to aquaculture to ensure a good balance between economic, environmental, societal and governance objectives as well as realising sustainable blue growth. To advance these objectives, stronger and more effective collaboration is required between these key actors working across the sector at the local, national, and regional level. It will also be important to improve the effectiveness of aquaculture associations, which in turn will help support investors and producers.

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