

BLUE GROWTH AND RELATED SMART GROWTH IN THE ADRIATIC-IONIAN MACROREGION

POLICY PAPER

The present policy paper sets forward a list of objectives and actions for promoting Blue Growth and related Smart Growth in the Adriatic-Ionian Macroregion, based on the final policy and technical results of the Thematic Cluster (TC) 1 “*Blue Growth and related Smart Growth*” projects-NEORION (Cluster coordinator), ARIEL, BIOECO RDI, BLUE BOOST, FUTURE 4.0, OIS-AIR, PoWER, SEADRION, and SHIPMENTT¹. Specific policy recommendations for the three (3) priorities areas of the EUSAIR Pillar 1 are developed, namely Blue Technologies, Fisheries and Aquaculture, and Maritime and Marine Governance and Services. The paper aims to collect and analyze the final results of all involved projects in order to create a policy report with scientific recommendations for influencing the policy debate in the topic of Blue Growth and related Smart Growth in the Macroregion.

BLUE GROWTH AND RELATED SMART GROWTH IN THE CONTEXT OF EUSAIR

The “**Blue Growth**” as one of the four thematic pillars of EUSAIR², aims at boosting innovative marine and maritime growth by promoting jobs and business opportunities in Blue economy. **The specific objectives of the pillar are**³:

- To promote research, innovation and business opportunities in Blue economy sectors, by facilitating the brain circulation between research and business communities and increasing their networking and clustering activity
- To adapt to sustainable seafood production and consumption, by developing common standards and approaches for strengthening these two sectors and providing a level playing field in the macro-region
- To improve sea basin governance, by enhancing administrative and institutional capacities in the area of maritime governance and services.

To achieve the aforementioned objectives, Pillar 1 focus on three topics:

Topic 1: Blue technologies

Topic 2: Fisheries and Aquaculture, and

¹More on the projects: <https://www.adrioninterreg.eu/index.php/2020/03/04/adrion-thematic-cluster-on-blue-growth-and-related-smart-growth/>

²Pillar 1: Blue Growth

Pillar 2: Connecting the Region

Pillar 3: Environmental Quality

Pillar 4: Sustainable Tourism

³ European Commission (2020), EUSAIR Action Plan-02.04.2020-SWD (2020) 57 Final. <https://www.adriatic-ionician.eu/wp-content/uploads/2020/04/EUSAIR-SWD-2020.pdf>

Topic 3: Maritime and marine governance and services

The Pillar 1 also strongly supports the Europe 2020 Strategy for Blue, Smart, Sustainable, and Inclusive growth. More specifically for Blue and Smart growth: **Smart Growth:** strengthened Blue technologies, as well as improvements in the sector of fisheries and aquaculture could contribute to Smart Growth in the region. Actions in this area will have to build on the Smart Specialization Strategies being developed at regional and national levels. Particular focus is on developing human capital, promoting entrepreneurship, networks of excellence, cooperation between research and public and private sectors, as well as users, to develop innovative products and services and technology transfer. **Blue Growth:** in addition to the standards objectives of Europe 2020, the actions carried out under this Pillar will contribute to growth mainly in the field of Blue technologies but also with regard to strengthening the aquaculture sector.

MAIN FINDINGS

In this section the final results of all involved projects are grouped, in order to be transformed in policy, according to the three (3) priorities areas of the EUSAIR Pillar 1 as follows:

Topic 1: Blue technologies

- Adriatic-Ionian shipyards and maritime equipment manufacturers are key for the green deal, for macro-region's Blue economy and green sea mobility. In this context, the improvement of cooperation between green shipbuilding stakeholders is considered essential, as well as the adoption of green shipbuilding technologies (e.g. LNG fuel for propulsion, Advanced Propeller System, Sulphur Scrubber System, Fuel and Solar Cell Propulsion, etc.) in current macro-regional shipping industry.
- The analysis of the shipbuilding and maritime sector in the macro-region brought out non-homogeneous situations as for the economic structure, the attitude towards innovation and enterprise demography. The three (3) key elements analyzed are the paths to move on to support Industry 4.0 revolution: improvement of productivity, development of professional skills and improvement of sustainability. The six (6) most disruptive technologies to realize the industry 4.0 revolution in the shipyard sector are: the Additive manufacturing, the Advanced Manufacturing Solutions, Big Data and Analytics, Augmented Reality, Cloud technologies and Cyber Security. The application of these technologies may support the shipbuilding sector to create new and efficient processes, to make a more efficient use of energy and fuel, to coordinate communication and information management, to improve ships safety, to improve trade and transport, and to share knowledge and experience.
- SMEs are not familiar with Intellectual Property Rights (IPR) and innovation management as well as with different tools (and how to access them), which may help them improve their business strategies. SMEs appreciate the opportunity to receive necessary information about IPR, but majority are not willing to deal with it in adequate manner. Also, it is characteristic that most of them are not aware of EU or national funding opportunities and requirements to apply for funds.

- Development of local and regional bioeconomy strategy dealing with aquaculture is essential. To date no comprehensive and specific blue biotechnology policy exists in Europe, neither in macro-region countries. The countries support blue biotechnology R&D under a wider strategic framework, either within an overarching science and technology strategy, as part of more general biotechnology research plan, or as a combination of both.
- Following the EU Green Deal initiative, and in order to achieve the decarbonisation of Europe's industry, heat pumps will play a key part in making Europe climate-neutral in the future, even though seawater heat pumps (SWHP) technology is still not widely used except in the hotel sector or public buildings on the coast or some islands in the macro-region. The inclusion of seawater heat pumps in ROPs, national funding programmes and Research and Innovation Strategies for Smart Specialisation-RIS3 or inclusion in Green Public Procurement is essential.
 - Data collection should be deepened and widened. Although the demand for statistical information on fisheries has undergone a significant increase in recent years, following the growing attention paid to management aspects and the number of national, EU and international subjects, for whatever reason interested in the sector, the data collected on the SSF (Small-scale fishing) and AQ (Aquaculture), including information on biological indices, catch trends and socio-economic indicators, is still fragmented, outdated and incomplete.
 - SSF operators are often not aggregated, not well represented and informed with the consequent marginalization in decision-making process. This affects their access to innovation and funding opportunities to innovate their business. On the other hand, QA operators generally demonstrate a good aptitude for technological and organizational innovation. However, there are still a number of producers who do not recognize the benefits of associations/clustering initiatives. The main challenge is to systematize their engagement in cooperation and clustering initiatives so as to further unlock their innovation potential.
 - The EU policy framework supports the achievement of EAF (Ecosystem based Approach to Fisheries) and EAA (Ecosystem based Approach to Aquaculture) objectives mainly through the Common Fisheries Policy, however it cannot act as a stand-alone policy and a comprehensive strategy is required. The ecosystem models are important tools to set the EAF and EAA in terms of dynamics, the status quo and scenarios and, in this context, the main common challenge is the definition of more place-based operational objectives and implementation process.
 - Capitalization and better valorization of practical knowledge. Further effort is necessary to make knowledge suitable and/or available for economic and/or societal use and translate that knowledge into competitive products, services, processes and entrepreneurial activity.

- Designing and implementing innovation in the fisheries sector require the development and enhancement of capacity building measures. Unfortunately, capacity buildings in general are rare, occur occasionally, and are rarely narrowly focused. They are mainly organized as one-off ongoing projects activities or related to current hot topics (usually national harmonization with EU regulations or similar). Fisheries and aquaculture research and policy framework evolve rapidly while knowledge transfer into governance is sometimes out of the step.
- Despite the relevance of SSF for the socio-economic growth of coastal communities, from several surveys on fishermen several difficulties emerged in accessing to market: Competition from low-priced imported products, lack or poor infrastructure and logistics (from dedicated areas for small-scale fisheries to transportation and refrigeration), lack or scarce knowledge of the market and marketing tools as of promotion difficulties, and lack or scarce use of Information and Communications Technology (ICT). In addition, SSF is characterized by micro-enterprises, often not aggregated into associations and/or cooperative. The landscape of the aquaculture sector is diversified and includes traditional artisanal and family businesses, medium-scale fish companies and multinational mariculture companies. This heterogeneous approach to AQ involves an ineffective development policy which results in a lack of efficiency in the production activity.
- Establishing models of Best practices in fish waste management through knowledge transfer and development and promotion of economically efficient Fish Waste Management Plans (FWMP) from wild catch, mariculture, aquaculture and processing in order to reduce the environmental impact which waste and by-products leave behind.
- The ports under study (i.e.: Bari, Brčko, Durres, Igoumenitsa, Ravenna and Rijeka):
 - a) Refers to themselves as lagging in terms of new technologies for energy saving applications on a technical level
 - b) Highlight a need for better operations' management and organization, possibly leading to a reduction of energy consumption as part of their operating expenses
 - c) Appear to focus mainly on areas seemingly producing more effective results in a shorter time frame
 - d) Appear to disregard needs and gaps that are strongly linked to central (government) administration or financial institutions-which provide them a degree of inflexibility and dependence-with actual results produced on a longer time frame
 - e) Detected a need to efficiently implement renewable energy applications for which a great potential exist
 - f) Seem to have an imminent need to exploit spaces and rationalize the logistics procedures, which could also have positive energy saving results (e.g. use spaces for RES production), and
 - g) Showed concern over energy data management. Ports identify the need to collect more data and apply ICT in order to design and implement energy efficiency measures.

- Enhancement of the strategic competencies/skills of blue MSMEs, that are needed to increase the value of their own products/services or address new markets, by cross-sectoral and cross-boundary fertilizations as well as by the close collaboration with research and innovation agents, taking into account regional Smart Specialization Strategies.
- Preparation of a favorable environment for the establishment of transnational clusters on promising blue economy's sectors through the adoption of open source, knowledge sharing and community based approaches.
- Increased awareness and understanding among the business community about the competitive advantage of the Blue Growth and its potential market opportunities.
- Valorization of the circular economy concept and practices as an innovation development tool for Blue Growth.
- Improvement of research collaboration among R&D players (Universities, innovative SMEs) in the ADRION area focused on the thematic priority areas identified in the Pilot Micro regional S3 analysis (i.e.: Agro-Bioeconomy – Healthy and functional food (Blue) with emphasis on seafood, Energy and environment, Transport and mobility, Tourism and culture, and Health and medicine).

Cross-Sectoral

Cross-Pillar

TOOLS

A tool established by the **NEORION** project to reinforce the traditional shipbuilding sector through coordinated efforts that will facilitate the exploration of innovative technologies and technology transfer between new complementary markets such as new materials and specialized vessels. NEORION aims at establishing a transnational Cluster in the Adriatic-Ionian on Green Shipbuilding that will accelerate both the cooperation of key actors and innovation industry.

Adriatic-Ionian
Green Shipbuilding
Cluster

Smart Learning
Model

A Smart Learning Model was developed by the **FUTURE 4.0** project to deal with companies of the maritime sector. The model is an intelligent and integrated learning space that is open to end users and is based on practical, specialized learning theory, and modern education methods that consists of devices, e-tools, e-learning, traditional as well blended learning techniques, media, teaching resources, teachers' communities, and learners' communities

SHIPMENTT project aims at establishing an innovation ecosystem focused on the green sea mobility sector (referred partially as green

Tools In The
IP/Access 2 Finance
Space

shipping in EUSAIR) across the ADRION area. The project a) design/ improve tools in the IP/access2finance space, b) implement them in a pilot environment (e.g. 1:1 support and an online showroom), c) extract conclusions about the effectiveness of their use in the region’s socio-economic and cultural context, and d) formulate a strategy for the long-term development of innovation conditions in the region.

Blue Innovation Voucher Scheme

An Innovation Voucher Scheme was developed by **BLUE_BOOST** project, providing €350.000 to 35 small-scale projects under the Blue Innovation Voucher Scheme, thus funding the implementation of innovation projects developed by companies. BLUE_BOOST also is actively engaged to endorse a Transnational Innovation Networking Strategy and Joint Action Plan for the long-term capitalization of project findings for maritime clusters in the involved 7 Adriatic-Ionian regions and beyond.

The **SEADRION** project launched a transnational seawater heat pump network to support sustainable development in the ADRION region, a science technology cooperation between research institutions and enterprises to enhance the innovation capacity of the heat pump sector and a common strategy to enhance the use of the seawater heat pump based heating and cooling.

Transnational Seawater Heat Pump Network

Regional & International Strategies

Regional and international strategies supporting regions in increasing bioeconomy RDI level and cluster maturity were developed by **BIOECO-R.D.I** project. Thanks to the full implementation of those outputs, it is possible to integrate in a unique and consistent process, regions living different steps in the process of creation of regional bio-economy. This process guarantees to the enterprises of the ADRION area to operate in a more advanced and integrated market, and to regional and national policy makers the needed support to develop effective policies based on circular economy approach.

One of the main goals of the **ARIEL** project is to test innovative technological and non-technological solutions to address day-by-day needs of small-scale fisheries and aquaculture operators in Italy, Croatia, Montenegro and Greece. To this, small-scale fisheries and aquaculture operators, institutions and research worked together from 2019 to 2020 to implement these pilot actions.

Pilot Actions for SSF & AQ

Innovation Hubs Network

PoWER project aims to support the evolution of ports into Innovation Hubs, able to act as new transmission belts between regions, and to exploit their untapped entrepreneurial potential. One of the main outputs of the project is the establishment of PoWER Innovation Hubs Network (IHN) as well as the IHN joint Strategy for the evolution of ports into innovation hubs, supported by an ICT Platform devoted to its implementation.

Under the **OIS-AIR** Proof of Concept Call, 10 innovative projects developed jointly by research institutes and SMEs in the field of Transport & Mobility, Energy & Environment, Agro-Bioeconomy, were selected to be funded with 18.500 EUR vouchers. Opened in April 2019, the PoC Call pushed research based innovation in SMEs, supporting early stage technologies and patents (TRL 3-5) developed in universities and research institutes to be transformed into commercial applications through the co-development of prototypes/testing with established SMEs.

OIS-AIR Innovation Voucher Scheme

KEY POLICY RECOMMENDATIONS

Green Shipbuilding

- Adoption of International Maritime Organization (IMO) rules in the macro-region, in order to reduce the impact from the marine industry into the environment by regulating exhaust emissions, anti-fouling, ballast water, etc. The shipping industry has to create and apply innovative measures in order to comply with these new regulations.
- Invest in green shipbuilding innovation in order to keep up with the international trend for both environment and economy.

Business Development and Intellectual Property (IP) Issues

- Improving coordination with national institutions in charge for creating a business enabling environment.
- Adoption of adequate legislation and creation of strategic framework for business development
- Creation of functional networks at national and ADRION level of policy makers and implementation stakeholders.
- Introduction of entrepreneurship and IP related topics in formal education programmes to increase awareness from early age.
- Assistance to SMEs in developing IP Strategy prior to taking any action related to IP issues.
- Boosting promotion of successful stories to motivate SMEs to deal with IPRs

Innovation

- Paving the ground for know-how transferring within and towards the business community by enhancing a regional and transnational innovation environment.

- Supporting innovation within Blue Economy and Blue Growth sectors through the set-up of targeted investment and funding programmes, valorizing regional Smart Specialization Strategies as well as the concept and previous experience of circular economy.
- Valorizing Innovation Vouchers as a very business friendly tool, suitable for implementing small scale innovative projects, in order to develop innovation potential and capacities of blue MSMEs, which are mainly very small and unexperienced in running R&D projects.
- Scaling up innovation processes at transnational level by enforcing multistakeholders' networks

Marine Renewable Energy/ Seawater Heat Pumps

- Inclusion of seawater heat pumps in ROPs, national funding programmes and RIS3 or inclusion in Green Public Procurement.
- Capacity building activities to address market needs for qualified professionals.
- Counteract both overregulation and the lack of specific policies in the field.
- Increase awareness and knowledge on existing regulatory frameworks impacting the development.
- Design and installation of pilot projects to develop and test new solutions.
- Development of special materials with the aim of increasing system efficiency and reducing problems in the operation of the system
- Introduction of multi-source energy systems, especially the photovoltaic/thermal cogeneration in order to utilize the same area both for producing electricity and heat.
- Promotion and diffusion of technology to targeted end-users (medium to large consumers, preferably hotel complexes and public administration buildings).

Blue Bio-economy/ Fishery and Aquaculture Waste Management

- Promote the active participation of entrepreneurs in bio-economy application.
- Enforce the connecting forces linking basic and applied research with knowledge transfer and consulting, towards entrepreneurial applications, for bio-economy and aquaculture.
- Support fishery cooperatives, fish processing industry, aquaculture industry with structured knowledge transfer on management of waste deriving from their activities.
- Promote novel technological applications of fishery and aquaculture waste management.

Small-Scale Fisheries and Aquaculture

- Improve data collection for small-scale fisheries and aquaculture at regional and transnational level to enable a better understanding of sectors dynamics for current interventions and future programming.
- Support innovation brokering facilitating a bottom-up process and providing common tools for networking and partnering.
- Paving the ground for co-management by involving small-scale fisheries and aquaculture representatives in shaping the Actions Plans for the next programming period.

- Supporting the setting-up of a training programme for periodical upgrading and building capacity of small-scale fisheries and aquaculture on EU policy context, ecosystem based approach to fisheries, advanced tools and models for planning and management.

Ports

- Supply of energy to ships during the docking phase in the port
- Efficient distribution of LNG
- Energy data collection and analysis
- Microclimate improvement
- Facilitation to virtuous behavior
- Spaces and/or logistics rationalizations
- Methods and solutions for an effective distribution of a compressed air and refrigerant fluid to make production processes more efficient
- Methods for the complete renovation of existing HVAC system
- Roofs to produce energy from the bound or dated buildings
- Efficient lighting/equipment management
- Lowering peak power and Excessive reactive electricity
- Implementing RES production
- Zero energy mobility for tourists

Industry 4.0

- In order to support companies and workers to face successfully the changes in the nature of work induced by the technological development and the digitalization of production linked to Industry 4.0, it is needed to update constantly education and training. The continuous analysis of new roles, new jobs and new skills produced by Industry 4.0 transformations brings out the need to equip companies and the workforce with the right skills to be prepared for the production and the jobs of the future and for a constantly changing industrial environment.
- The change towards Industry 4.0 is not merely a matter of investments: it is a cultural change that needs a strategy. The experience advices to start with small projects and reduced investments to explore the scalability of Industry 4.0 technologies.
- It is important to frame investments within a specific strategy, avoiding isolated implementations of one new technology. This allows the definition of a technological roadmap, the formulation of a whole strategy for digitization and the identification of key factors to improve competitiveness.
- The challenge of sharing knowledge is pivotal: it is fundamental to adopt a collaboration perspective with other companies, suppliers and customers to integrate digital technologies into the supply chain. It is also important to collaborate with universities (also at international level) for cooperation on research and development.

Pilot Macro Regional S3 Analysis

- Promote the alignment of research activities with the most promising thematic priority areas and related challenges.
- Facilitate the transnational collaboration among R&D players working on the same topics (e.g.: use of transnational innovation voucher proved to be a successful tool).
- Update the Pilot Macro Regional S3 Analysis constantly in order to get a fresh overview on the research and innovation opportunity and trajectories of the area.

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