

D.3.3.2 POLICY RECOMMENDATIONS PAPER

InnovaMare project

Blue technology - Developing innovative technologies for
sustainability of Adriatic Sea

WP: 3 – Enhancement of framework conditions by development
of innovation ecosystem

Project References

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TABLE OF CONTENTS

1. Objectives of InnovaMare Policy Recommendations Paper	2
2. Policy recommendations	
2.1. Implementing EU policies promoting sea protection and blue innovation	3
2.2. Developing Regional strategies in the field of blue economy	6
2.3. Key factors for the creation of a successful innovation ecosystem	8
3. Final remarks	11

ANNEX:

Template of Questionnaire developed for high-level experts involved in InnovaMare Roundtables

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1. Objectives of InnovaMare Policy Recommendations Paper

InnovaMare strategic project - Blue technology - Developing innovative technologies for sustainability of Adriatic Sea, coordinated by the Croatian Chamber of Economy, is co-financed by the European Union, ERDF (European Regional Development Fund), through Interreg VA Italy-Croatia Programme (2014-2020). Its aim is to enhance framework conditions at cross-border level by reinforcing capacities, both at strategical and operational level, to develop an innovation ecosystem promoting breakthrough technologies for the environmental sustainability of the Adriatic Sea, with a focus on underwater robotics and sensors. Expected outputs will contribute to the achievement of the objectives of the EU Strategy for the Adriatic and Ionian Region (EUSAIR), with particular reference to Pillar 1 “Blue Growth”, Topic 1 “Blue Technologies”.

In the framework of WP3 “Enhancement of framework conditions by development of innovation ecosystem” of InnovaMare project, the partnership has foreseen the preparation by the Regional Union of the Chamber of Commerce of Veneto Region (The Regional Union of the Chambers of Commerce of Veneto Region, PP1), of a Policy Recommendation Paper, presenting the results of the interactions promoted among stakeholders, and a summary of the main institutional, organizational, and innovation insights and peculiarities concerning the development of an innovation ecosystem related to marine and maritime technologies enabling policy makers to design policies to foster the creation of such a cross-national ecosystem.

InnovaMare project partner organized a set of activities directly aimed at involving key stakeholders and acquiring valuable insights from them to be capitalized in the activities, which will hopefully bring to the creation of a cross-border innovation ecosystem on underwater robotics and sensors, for the sustainability of the Adriatic Sea.

In particular, the following tasks have been successfully accomplished:

- Realization of interviews with Italian and Croatian key stakeholders;
- Organization of two Roundtables, one in Italy on 18-19/02/2021 (organized by the Regional Union of the Chambers of Commerce of Veneto Region) and one in Croatia on 27-28/04/2021 (organized by University of Rijeka with the support of the Croatian Chamber of Economy);
- Realization of a questionnaire for high-level experts involved in the Roundtables.

This report highlights the key achieved results (findings and strategic policy recommendations).

2. Policy recommendations

2.1. Implementing EU policies promoting sea protection and blue innovation

Healthy Ocean and Waters are undoubtedly a **public good**, since the preservation of all forms of life depends on a good ecological status of water bodies.

Anyway, according to EU State of Nature, “81% of habitats and 63% of species have a poor or bad conservation status in Europe.”

As stated in Mission Starfish 2030: Restore our Ocean and Waters (Report of the Mission Board Healthy Oceans, Seas, Coastal and Inland Waters) *“the entire water cycle is under pressure like never before. Decades of pollution and damaging uses have severely degraded the condition of aquatic ecosystems. Climate change and ocean acidification come as additional, cumulative pressures, while the capacity of the ocean to regulate the Earth’s climate is fundamentally threatened. **Restoring and protecting our ocean and waters is one of the urgent and defining tasks of our time**”*.

The European Union is well aware of the importance of this task and is investing important resources for the accomplishment of the paramount mission of improving the sustainability and biodiversity of our Seas. Measures put in place to tackle this challenge are twofold: on one side, policy strategies and instruments, to be implemented also by Member States (to define and create favourable framework conditions, as well as incentivize behavioural change), on the other side targeted funding for R&D, pilot projects and investments (for instance one of the missions of Horizon Europe Programme is “Healthy oceans, seas, coastal and inland waters”).

The **European Green Deal** comprises a set of policy initiatives by the European Commission, with the overall objective of making Europe climate neutral by 2050. It is a growth strategy which seeks to kick-off a green and inclusive transition of our economy, stimulating Europe’s technological leadership in clean products and technologies, and creating new qualified jobs, while protecting our natural capital and human wellbeing.

The **EU Biodiversity Strategy 2030** is a key programming document, inspired by the UN Sustainable Goals and a key tool for the development of the EU Green Deal. It defines 4 overall priorities:

1. **Protect Nature**, which comprises binding commitments for marine protected areas (MPAs):
 - legally protect 30% of the European Union’s Sea area
 - strictly protect at least 1/3 of the EU’s marine protected areas
 - effectively manage all protected areas, defining conservation objectives and measures, as well as monitoring them appropriately.

2. **Restore Nature**, with the EU Restoration Plan with commitments by 2030:

- legally binding restoration targets for marine ecosystems;
- a new action plan to conserve fisheries resources and protect marine ecosystems by 2021;
- bycatch of species threatened with extinction/in bad conservation status must be eliminated or reduced to a level that allows full recovery;
- fisheries-management measures must be established in all marine protected areas;
- measures to limit the use of fishing gear most harmful to biodiversity;
- connections to Zero pollution action plan, Farm to Fork Strategy, etc.

3. **Enable Transformative Change**

4. **EU For an Ambitious Global Agenda**

On the other hand, **Mission Starfish 2030 identifies 5 overarching objectives for 2030:**

1. filling the knowledge and emotional gaps;
2. regenerating marine and water ecosystems;
3. Zero Pollution;
4. decarbonising our ocean, seas and waters;
5. revamping governance.

In this strategic framework, **the role of blue economy and blue innovation is paramount**. Ambitious targets and objectives cannot be reached, unless the potential of innovation in this field is fully unleashed (underwater robotics and sensors, new technologies and robotic systems for marine applications, surface and underwater autonomous systems, underwater manipulator control and environmental sensors, bioinspired aquatic robots, underwater drones, satellite systems, etc.).

This can only be possible with a **strong cooperation among science, industry and authorities**. Policy-makers are key enablers of the innovation system and can also benefit from the deployment of blue innovations to solve public interest challenges, science explores pioneering research and validates new concepts and technological breakthroughs, companies have the expertise, organizational structure and commercial background to ensure the up-scale and market uptake of innovations.

Blue Economy gives a significant contribution to the Mediterranean GDP and there is a huge potential for translating European Green Deal Priorities into Blue Economy Sectors. The Blue Economy includes all those activities that are marine-based or marine-related. Marine-based activities comprise Marine living resources (capture fisheries and aquaculture), Marine minerals, Marine renewable energy, Desalination, Maritime transport and Coastal tourism. Marine-related

activities are linked for instance to Seafood processing, Biotechnology, Shipbuilding and repair, Port activities, technology and equipment, Digital services, etc.

As stated in the EU Blue Economy Report 2020, the Blue Economy is embedded in the overall EU economy, and the contribution of this strategic sector to the EU-28 economy in 2018 was 1.5 % in terms of GVA and 2.2 % in terms of employment.

Anyway, a **set of barriers** exists and needs to be appropriately tackled:

- inefficient or opaque planning (while planning at a sea-basin level and collaboration among neighbouring countries are essential elements)
- insufficient sharing of assets, which could be too expensive for individual countries / regions (sharing of key infrastructures is becoming more and more important)
- need to boost innovation in blue technologies (market failures have been identified in the low / slow take-up of new platforms and technological innovations, which instead should be encouraged to increase competitiveness)
- lack of sustainable and long-term observations, with adequate allocated resources
- need to bring together all public bodies responsible for ocean observation, as well as reinforce cooperation with academia and business sector, to ensure coherence at a sea-basin level and consolidate scientific and technological leadership.

To overcome such barriers, the following **recommendations** have emerged:

- to align EU, macro-regional, cross-border and national and regional strategies and efforts, speaking with one voice and sharing assets and resources
- to promote the creation of shared innovation ecosystems favouring cooperation among public authorities, science, businesses and civil society
- to boost innovation, improving technology transfer making it possible to translate promising research results into technically and economically viable marketable products and services
- commit stable and sufficient financial resources to make such ecosystems prosper and become financially sustainable in the medium-long term
- to promote an integrated governance approach among Blue Economy sectors, using innovation ecosystems, maritime clusters, SME development, with a quadruple-helix approach
- to raise awareness among civil society on the impacts and potentials of blue innovation, eco-friendly solutions, new blue biotechnologies, MRE, blue circular economy, etc.

2.2 Developing Regional strategies in the field of blue economy

The sea, as a resource relevant to the strategic development of the territory, plays a major role in the decisions of policy makers. The creation of a sustainable marine ecosystem is essential for the preservation of the good ecological status and biodiversity of the marine environment as well as for human health. In fact, **Italian and Croatian policy makers have a mature awareness of the significance of a marine and maritime innovation ecosystem** and of the countless efforts that need to be undertaken in order to sustain its development over time. Therefore, Italian and Croatian policy makers perceive the existence in their country of an innovation ecosystem linked to the blue economy and blue growth.

Supporting this perception are:

- the many projects related to the Blue economy and Blue growth that see the involvement of both Italy and Croatia;
- the effort directed to the creation of collaboration networks in the marine and maritime sector between the political world on one side and the scientific sector and the entrepreneurial fabric on the other side.

Aware of the benefits and advantages that can be derived from building an innovation ecosystem related to marine and maritime technology; policy makers express concern about the success of such an ecosystem. They identify a number of factors that will need to be considered and managed effectively and efficiently as factors that can affect and negatively impact the success and maintenance of a marine and maritime innovation ecosystem.

Among the **key factors that policy makers highlight**, there are:

- adequate knowledge/training;
- political commitment;
- threats (especially economic/financial) related to the pandemic crisis due to the spread of COVID19;
- the regulatory system;
- climate change.

On the **Italian side**, policy makers also believe that banks and financial institutions are not involved as stakeholders in the process of creating the marine and maritime innovation ecosystem, and that it is difficult to involve the third sector.

On the **Croatian side**, on the other hand, it is believed that there should be in the ecosystem of innovation of the marine and maritime sector a proper connection (mix) of policies; people and resources and that local decision makers should be involved in initiatives; in cooperation with the scientific community and in public-private partnerships.

Ultimately, aware of how innovation, technological development, sustainability, infrastructures are crucial and fundamental in order to create and maintain an innovative ecosystem, according to policy makers, at national and cross-border level, the **drivers** which could contribute to the development of this ecosystem related to the marine and maritime sector are:

- scientific and applied research;
- innovation and innovative technologies;
- adequate training/education;
- adequate investment policies;
- the implementation of development plans;
- the creation of environmental protection programs;
- adequate waste management plans;
- territorial plans for the sea;
- the connection of companies with institutional players;
- the involvement of civil society.

The list of drivers outlined above for an effective development of an innovation ecosystem focused on marine and maritime technologies can be grouped into three areas from the most general to the most specific:

- a) policy interventions (through plans and financial support);
- b) research activities (specialized, key knowledge) and technological development;
- c) presence of specific public plans related to sea management from multiple perspectives.

Within the InnovaMare project specific attention should be given to drivers c). A review and analysis of the presence, structures and characteristics of these plans could be particularly relevant to inform project activities related to the DIH platform (content, actors involved, services to be provided).

2.3. Key factors for the creation of a successful innovation ecosystem

All interactions with stakeholders in the framework of InnovaMare project have highlighted the strategic importance of **innovations ecosystems**, that are complex and dynamic environments bringing together different complementary actors pursuing technology development and innovation, with a view at increasing competitiveness, promoting growth and solving societal challenges.

Such ecosystems are based on a network of interactions facilitating flow and exchange of information, knowledge and talent in an organized system of co-creation of value.

In this context, a **Digital Innovation Hub (DIH)** is an innovation ecosystem acting as a support facility helping companies to become more competitive (by improving their business/production/market development processes, exploiting the potential of digital technologies), but also helping organizations, research centres and citizens. DIHs are based upon technology infrastructure and provide access to the latest knowledge, expertise and technology to support their customers with piloting, testing and experimenting with digital innovations

DIHs offer a **wide range of services in one place**, for instance:

- training, development of talents;
- networking and matchmaking opportunities;
- technology - offering prototyping, research & development, and/or manufacturing expertise to speed-up the development of a product / service, Demonstration and Testing facilities;
- incubations and Accelerator Services (support to start-ups and spin-offs, etc.);
- access to funding (also Venture capital, Business Angels, etc.);
- IPR consultancy;
- certification and Go-to-Market;
- helping innovators understand customer segments, regulations and value chains to design a good business development and market entry strategy;
- building awareness on digital technologies.

DIHs connect key stakeholders acting as **orchestrator** (public governance, education institutions, R&TD institutions, business incubators, competence centres, start-ups and spin-offs, SMEs, large companies, industrial associations, chambers of economy, investors).

Innovation ecosystems and DIHs are effective solutions to the following gap: **Europe is a world leader in science but underperforms in innovation. There is a lack of breakthrough and disruptive innovations that create new markets, as well as an insufficient entrepreneurship spirit of talents.**

Private companies are in fact faced with a “valley of death”, that means that the upscale of breakthrough innovative technologies is often accompanied with elevated economic risks and market failures. This justifies an **intervention from public authorities, pursuing a general interest.**

Such support for the development of effective and competitive innovation ecosystems is aimed at overcoming also the following **main critical issues**:

- existing skill gap;
- uptake of research results from the private sector, in particular SMEs, needing the improvement of technology transfer structures and services;
- low competitiveness of SMEs on international markets, since scientific-technological advances do not often turn rapidly enough into marketable products / services;
- lack of targeted support schemes and private investors (considering high risks involved);
- weak networking of key stakeholders (public sector, private companies, academia, civil society), which need to be linked and cooperate with a quadruple-helix approach.

The Italy-Croatia cross-border area has great untapped potential to be fully exploited for smart and sustainable growth through the creation of an innovation ecosystem focused on underwater robotics and sensors for the sustainability of the Adriatic Sea.

There are key research centres (some involved as partners in InnovaMare project) performing frontier research and studying new technology applications, as well companies (most of all SMEs and start-ups), with key expertise and know-how which could greatly benefit from a shared facility enabling opportunities for training, business support services, networking and funding opportunities.

There are also key development and innovation agencies, clusters and chambers of economy, which have a deep understanding of the needs of the private sector and can help facilitate connections and dedicated services.

The **main identified factors to be addressed to effectively launch the process of creating an effective innovation ecosystem** are:

- creating an appropriate **legal framework** (policy-makers on both side of the Adriatic are well aware of the existing potentials and of the great contribution of blue economy and blue innovation for growth and competitiveness, now it is time to engage them in a dialogue, started with InnovaMare Roundtables, to lay the foundations for the design of policy, legal and financial instruments to be implemented);

- setting up a **strong network of key stakeholders**, bringing together actors from public authorities, science, business sector and civil society, sharing a common Action Plan;
- undertaking a thorough **assessment of current and future need and technology foresights**, in order to possibly create targeted Roadmaps;
- **commit dedicated public funding**, mobilizing public investments for the start-up phase;
- engage and **attract private investors** (sponsors, funds, venture capital, business angels);
- develop **targeted training and education programmes**, as well as opportunities to develop talents and entrepreneurship spirit;
- count on key **R&D infrastructures and testing facilities** (“test before invest”);
- create **incubators and accelerators**, as well as targeted **business support services** (technological and market viability assessment, IPR, market entry strategy, exploitation strategy, business development strategy etc.);
- promote **cross-fertilization and collaboration among science, businesses, civil society and public authorities**;
- organization of **matchmaking opportunities, exchange programmes, challenges and awards, pitch events**, etc.
- stimulate **networking with other European innovation ecosystems**, clusters, innovation communities, competence centres, etc.
- **advocate for the design of dedicated new financial instruments** and for the **development of sector strategies and legislation**.

3. Final conclusions

The interactions with key stakeholders involved in InnovaMare project activities (interviews, roundtables, questionnaires) clearly show that **the cross-border area is ready and interested for the creation of an Innovation Ecosystem focused on underwater robotics and sensors for the sustainability of the Adriatic Sea.**

Policy-makers acknowledge the great contribution of blue economy to the GDP (which can be boosted thanks to the further development of blue innovation), as well as the need to appropriately address the societal challenge posed by the pollution of the Adriatic Sea (facing loss of biodiversity, presence of several typologies of pollutants, climate change, overfishing, not sustainable economic and tourism practices, etc.). They also share the obligation to implement the legally-binding priorities and targets defined by European strategies, contributing to a green and digital future.

Science and business are characterized by high scientific excellence, but need to improve their performance in innovation. Thanks to the best practices showcased in the framework of InnovaMare Roundtables, key stakeholders and project partners have increased their knowledge and understanding of the offer side existing in the Adriatic area, which needs to be linked with the demand side.

At present, the **most urgent policy recommendations** for InnovaMare consortium, with the aim of creating a cross-border DIH on underwater robotics and sensors, are summarized hereafter:

- **alignment of Italian and Croatian Blue economy policies** to EU priorities and to the Pillars of EUSAIR macroregional strategies, embedding blue growth also in the framework of smart specialization strategies;
- creation of a **strong and coordinated network of stakeholders**, comprising public authorities, academia / research centres, innovation and development agencies, chambers of economy, clusters, private companies, civil society and environmental associations;
- **design of a legal framework** establishing the guidelines, structure, process to be undertaken to create a cross-border innovation ecosystem on underwater robotics and sensors;
- **mobilization public investment** to effectively support the start-up phase;
- grant **access to funding** for companies and researchers (education, R&D, up-scale);
- **attract private investments and investors.**

ANNEX

Template of Questionnaire for high-level experts involved in InnovaMare Roundtables

**InnovaMare strategic project
(Interreg VA Italy-Croatia Programme
2014-20)**

Questionnaire for the speakers involved in the
Roundtables for policy makers on Blue economy
and blue technologies



Name of the high-level expert:

Name of the institution:

Location (City, Country):

<p>In your opinion, why do we need innovation in the Blue Economy sector?</p>	
<p>What are the main challenges perceived by your institution for the future further development of innovation in the EU blue economy sector?</p>	<p> <input type="checkbox"/> skill gap <input type="checkbox"/> uptake of research results from the private sector, in particular SMEs <input type="checkbox"/> low competitiveness of SMEs on international markets <input type="checkbox"/> lack of targeted support schemes <input type="checkbox"/> weak involvement of key stakeholders (public sector, private companies, academia, civil society) <input type="checkbox"/> lack of a targeted innovation ecosystem <input type="checkbox"/> need to develop joint roadmaps to develop commercial applications <input type="checkbox"/> need to mobilise industry partners to leverage private investments <input type="checkbox"/> other (please specify): </p>
<p>What are the programmes / actions that your institution undertakes to support innovation in the field of Blue Economy?</p>	
<p>In relation to your intervention, what is your suggested contribution to the public debate on the 2021-2027 Blue economy policy?</p>	

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1

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<p>In your opinion, what are the first steps to be undertaken for the creation of an Innovation ecosystem related to underwater robotics and sensors?</p>	
<p>What are the key factors ensuring the success of a cross-border Innovation Ecosystem?</p>	<ul style="list-style-type: none"> <input type="checkbox"/> prior creation of targeted policy instruments setting up favourable framework conditions and support schemes <input type="checkbox"/> involvement of stakeholders (public sector, private companies, academia, civil society) in the definition of a shared Action Plan <input type="checkbox"/> mobilization of public investments <input type="checkbox"/> mobilization of private investments <input type="checkbox"/> creation of education and training programmes to develop talent <input type="checkbox"/> creation of networking and matchmaking opportunities <input type="checkbox"/> availability of incubation and acceleration programmes <input type="checkbox"/> availability of dedicated funding programmes <input type="checkbox"/> availability of technological infrastructure for «test before invest» <input type="checkbox"/> strong links with EU thematic innovation communities <input type="checkbox"/> other (please specify):
<p>Could you please mention any best practice, at EU or MS level, related to the creation of framework conditions for innovation in the field of blue technologies?</p>	

THANK YOU VERY MUCH FOR YOUR TIME AND SUPPORT FROM InnovaMare TEAM!

European Regional Development Fund

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