D.3.1.2 MAP OF EXCELLENCE AT CROSS-BORDER LEVEL

InnovaMare project

Blue technology - Developing innovative technologies for sustainability of Adriatic Sea

WP3 - Enhancement of framework conditions by development of innovation ecosystem

Project References

Call for proposal 2019 Strategic – InnovaMare
Project number: 10248782
Work package: WP3 Enhancement of framework conditions by development of innovation ecosystem
Activity title: A1 Mapping of relevant stakeholders in underwater robotics and sensors
Deliverable title: D3.1.2. Map of excellence at cross-border level
Expected date: M7
Deliverable description: As a main document to understand what stakeholders are offering in technology, services and people as well as what are their main needs for partner search, RDI projects development, internationalization and financing. the map consists of relevant stakeholders from quadruple helix approach, services, best practices, projects regarding monitoring, surveillance sector, robotics, and sensors as technology. All partners will work on development of map of excellence.
Partner responsible for the deliverable: University of Trieste
Dissemination level: CO - Confidential
Status: Final
Version: V1
Date: 26th January 2021

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1. AIM- MAP OF EXCELLENCE AT THE CROSS-BORDER LEVEL

The aim of the InnovaMare project is to enhance the framework conditions on cross-border level by jointly developing and implementing strategical and operational level capacities that consist of mix of policy instruments and innovation players as a frame for development of innovative technologies for sustainability of the Adriatic Sea. In this project, the overall aim of WP3 had been to research and analyse policy instruments in overall framework conditions as well as **key innovation players** on cross border level and thru policy dialogues define best mix of policy instruments together with innovation players for development of innovation ecosystem in underwater robotics and sensors and in this way enhance framework conditions for innovation.

The first objective had been to research and analyse all relevant stakeholders together with their capacities (human, technological, projects, equipment), in order to create a map of excellence. For this aim the first activity had aimed at identification and mapping of the main stakeholders – based on the quadruple helix approach – which can be included into the underwater robotics and sensors sector. Further, each identified stakeholder will be described based on specific organizational and technological capacities and previous experience in the field, with particular attention concerning marine and maritime robotics and sensors activities. Stakeholders will be considered both taking into account the geographical areas of the projects.

2. THEORETICAL FRAMEWORK

Quadruple Helix model of innovation (Carayannis & Campbell 2009) is the main theoretical framework used for activity WP3.1. This model has added a fourth helix to the original "Triple Helix" model of innovation (Etzkowitz and Leydesdorff 2000) which refers to interactions among

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academia/universities, industry, and state/government that can shape the innovation ecosystem. Instead, Quadruple Helix has added the fourth dimension of "society/public" to the original model. Cooperation and collaboration among the various actors are at the core of this model.

In order to use this framework, it is important to gain an understanding of relevant terminology that is at the core of data collection.

- **Stakeholders:** the aim of this activity had been to map the relevant stakeholders. They are defined as companies, private and public institutions, policy makers, service providers (i.e. KIBS), citizens and NGOs, support bodies, clusters and associations, etc. which have scientific, public, business-related interests in the sector of **underwater robotics and sensors and sea pollution activities**
- **Snowballing:** a sampling technique that allows to reach new contacts based of the information and data provided by previous contacts

3. METHODOLOGY USED AND DIFFERENT PHASES

The data gathering needed for the mapping of the stakeholders has been based on the snowball sampling technique (Goodman, 1961). For this aim, the data collection had been divided into two phases. In the first phase University of Trieste – PP2 (UNITS) also supported by Regional Union of the Chambers of Commerce of Veneto Region - PP1 (UCV) had asked the project partners to conducts a desk research in order to provide the contact information of their relevant public and private stakeholders (suppliers, clients, research partners, policy makers, etc.) in the sectors of underwater robotics and sensors by inserting such data in the Monday platform.

The information to be gathered was categorized as following:

General information on the organization: scientific research, private sector and public sector

Key projects: research projects and projects involving the society;

Key individuals: key persons working in the sector

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Key platforms: list of the platforms such as crowdsourcing; crowdfunding; open innovation platforms, online community that has been used for co-development

Key resources: these resources were categorized in 5 sections:

- *infrastructures* (R&D labs; testing labs; Fablabs; etc.)
- *technologies* (laser cutter; 3D metal printer; lidar technologies; etc.)
- *intellectual property rights* (patents; trademarks, etc.)
- *know-how*
- *equipment*

Key partners: other relevant organizations that are active in the sector of underwater robotics and sensors (following the snow-ball methodology) as they have come up during the interview

At the end of this phase information regarding a total number of 147 organizations were collected with the overall situation as following:

Table 1- Desk research collected data: organization by type

		Croatia	Italy	Total
Scientific research	N	22	21	43
	%	51%	49%	29%
Private sector	N	33	25	58
	%	57%	43%	39%
Public sector	N	28	18	46
	%	61%	39%	31%

The percentage for countries refer to the distribution of the variable between the countries. The percentage for the total refers to the distribution of the variable across the organizations types.

In the second step, University of Trieste and Croatian Chamber of Economy had indicated to each partner the name of the stakeholders they should collect relevant data (conducting interviews) to complete the data gathering in the Monday platform and the names and contacts of further relevant

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stakeholders to be added into the Monday platform. The aim of this activity had been to gather more in depth data through in depth interviews. This phase has also contributed to the snowball method employed in this activity.

By the end of the data collection phase (15th of January, 2021) information regarding 169 stakeholders was collected and this number is almost equally distributed with 85 organizations from Croatia and 84 from Italy. Of these organization 37 had been interviewed including 11 in Croatia and 26 in Italy. However, the **snowball method** applied in this activity would require an **update** of the situation every 6 months until the activity makes sense.

Table 2- Number of organizations by country

		Desk Research	Snowball method	Total
Croatia	N	83	2	85
	%	98%	2%	50%
Italy	N	64	20	84
	%	76%	24%	50%

The percentage for countries refer to the distribution of the variable between the countries. The percentage for the total refers to the distribution of the variable across the organizations.

The snow ball method helped with the adding of a total of 22 new organizations as in comparison with those found in the desk research. In particular, we can see that the snowball method helped with finding new organizations in Italy by 24%.

Having used the snow ball method also had contributed with finding relevant projects, individuals and platforms. Table 3 illustrates the overall situation at the end of the data collection.

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Table 3- Collected data in different phases

		Desk Research	Snowball method	Total
Organizations	N	147	22	169
	%	87%	13%	-
Projects	N	17	32	49
	%	35%	65%	-
Individuals	N	23	28	51
	%	45%	55%	-
Platforms	N	2	2	4
	%	50%	50%	-

The main contribution of the snowball method had been with finding relevant projects as 65% of the data was collected through interviews. The same can be said with detecting the individuals active in this sector. As illustrated, half of the individuals were identified in the second phase

While the snow ball method opened up the window for more data collection. This has meant that while our data analysis is based on the data collected by 15th of January, 2021 an interview with the new organizations or individuals from the snowball method can help with expansion of the platform. Therefore, this report should be updated every 6 months until the activity is needed.

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4. RESULTS FROM THE DATA COLLECTION

4.1. Characteristics of the organizations:

The desk research had been devoted to gathering data on the organizations active in the field of sector of underwater robotics and sensors. The gathered data had been related to their type (public sector, private sector and research centres). In addition to the descriptive data, private firms were particularly asked to identify their position in the value chain, blue economy sectors, Marine Strategy Framework Directive's 11 descriptors and their NACE code. In the following section the descriptive data will be presented.

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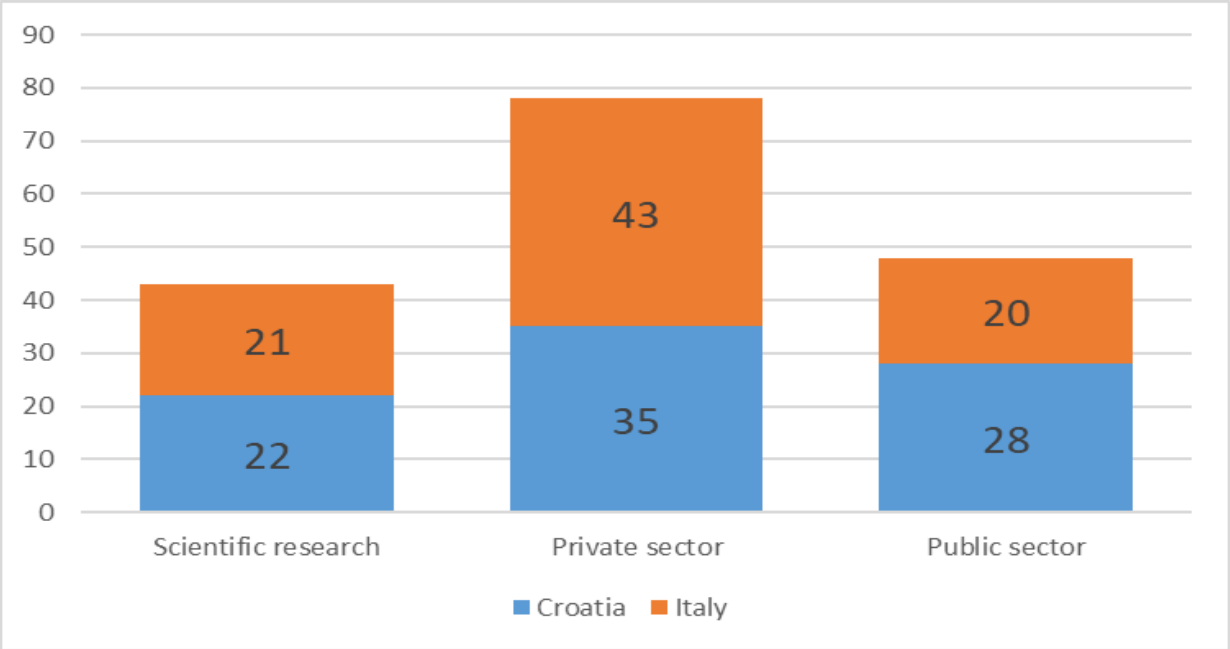
A. Organizations by type and country (total 169)



		Croatia	Italy	Total
Scientific research	N	22	21	43
	%	51%	49%	25%
Private sector	N	35	43	78
	%	45%	55%	47%
Public sector	N	28	20	48
	%	58%	42%	28%

The percentage for countries refer to the distribution of the variable between the countries. The percentage for the total refers to the distribution of the variable across the type of organizations.

Our data sample is dominated by the private sector (47% of the overall data). While scientific research sector and public sector are rather evenly distributed. With public sector playing a significant role in Croatia (58%) as in comparison to Italy (42%).

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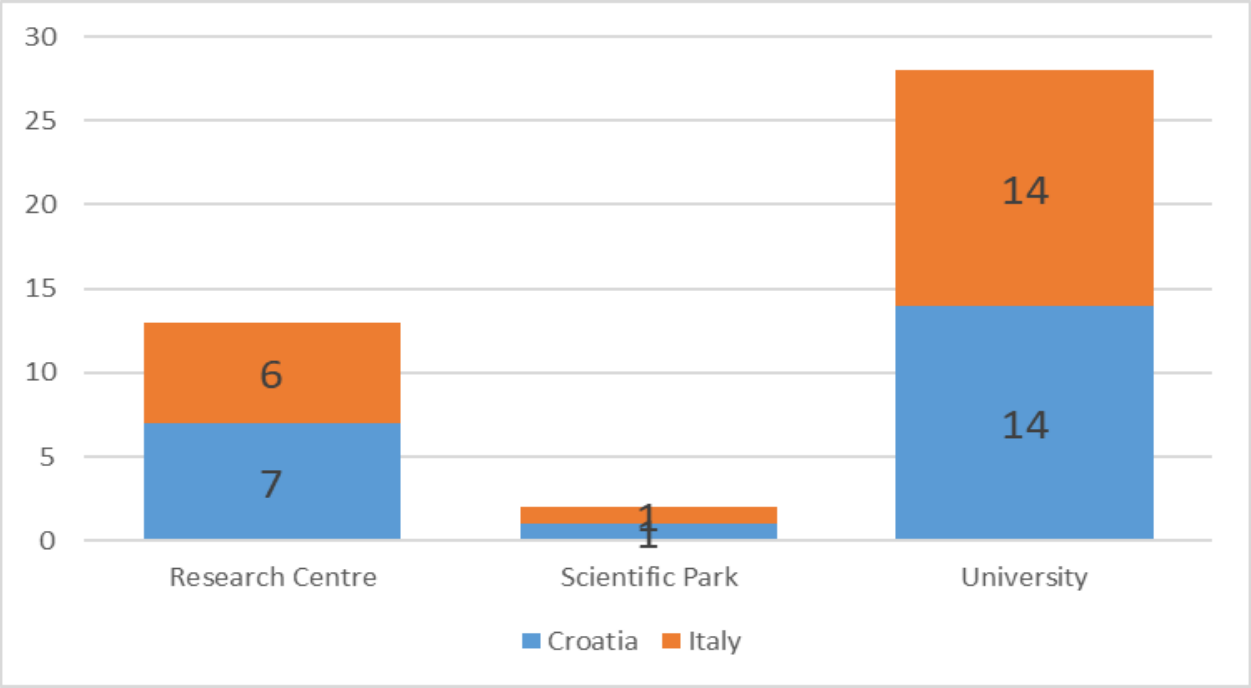
B. Scientific sector by type and country (total 43)



		Croatia	Italy	Total
Research Centre	N	7	6	13
	%	54%	46%	30%
Scientific Park	N	1	1	2
	%	50%	50%	5%
University	N	14	14	28
	%	50%	50%	65%

The percentage for countries refer to the distribution of the variable between the countries. The percentage for the total refers to the distribution of the variable across the type of organizations.

The results show that in the scientific sector, universities (65%) are the main active actor both for Croatia and also Italy. However scientific parks do not play a crucial role in both countries with only one organization from each.

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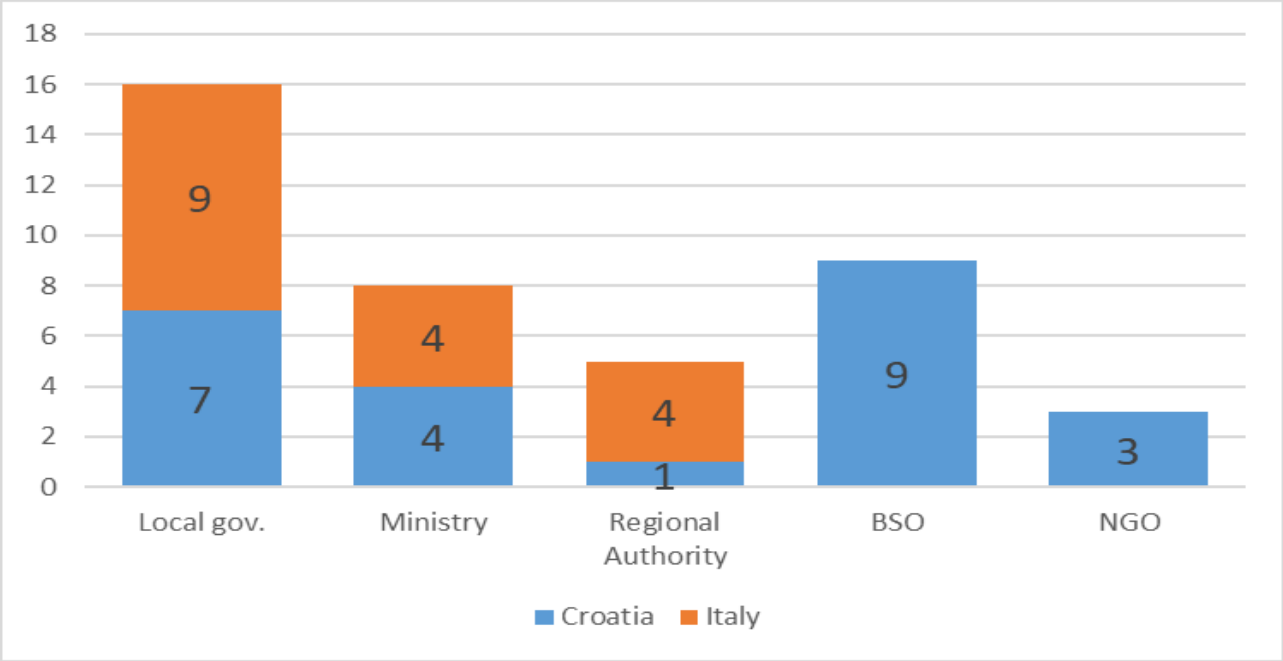
C. Public sector by type and country (total: 48)



		Croatia	Italy	Total
Local Government.	N	7	9	16
	%	44%	56%	33%
Ministry	N	4	4	8
	%	50%	50%	17%
Regional Authority	N	1	4	5
	%	20%	80%	10%
BSO	N	9	0	9
	%	100%	0%	19%
NGO	N	3	0	3
	%	100%	0%	6%
Missing	N	4	3	7
	%	7%	9%	15%

The percentage for countries refer to the distribution of the variable between the countries. The percentage for the total refers to the distribution of the variable across the type of organizations.

In the public sector, the local government is the main actor active (33%). However, we can observe the role of NGOs and also BSO in Croatia.

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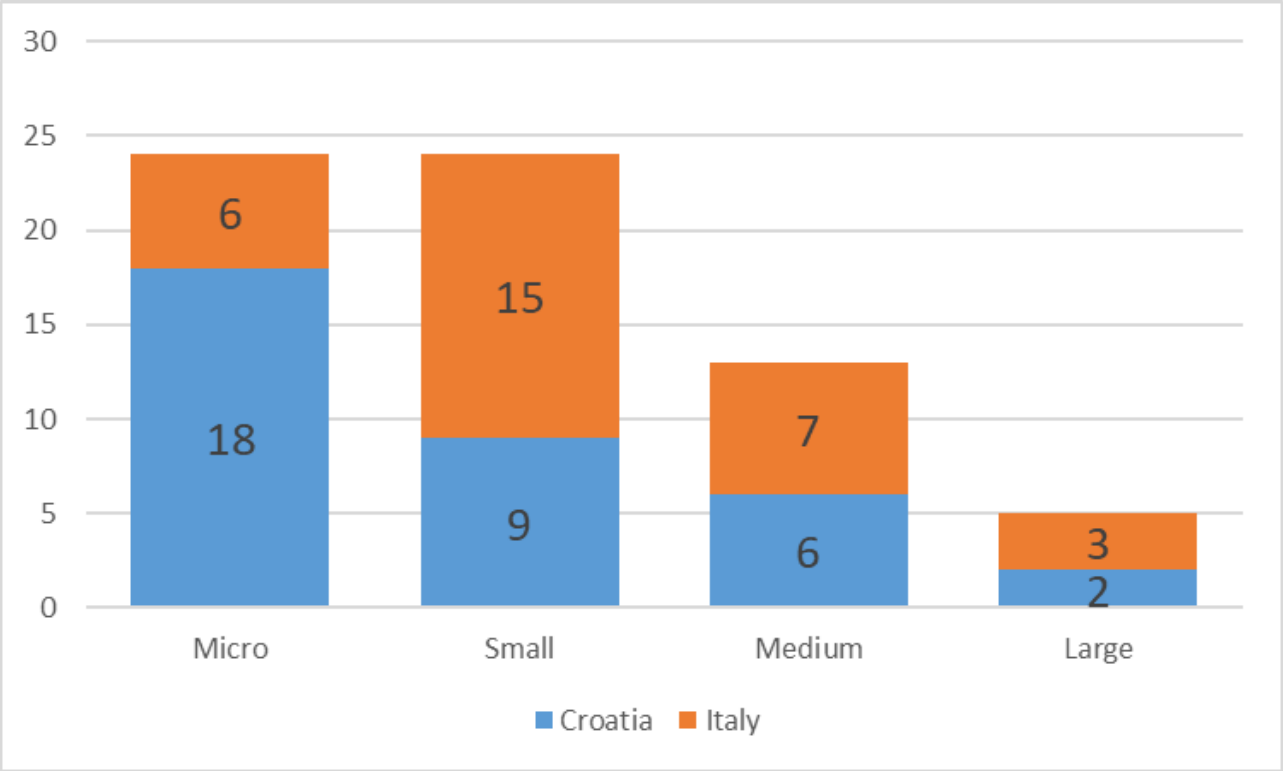
D. Private sector by size and country (total 78)



		Croatia	Italy	Total
Micro	N	18	6	24
	%	75%	25%	31%
Small	N	9	15	24
	%	38%	63%	31%
Medium	N	6	7	13
	%	46%	54%	17%
Large	N	2	3	5
	%	40%	60%	6%
Missing	N	0	12	12
	%	0%	100%	15%

The percentage for countries refer to the distribution of the variable between the countries. The percentage for the total refers to the distribution of the variable across the size of organizations.

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When it comes to the size of firms, micro and small firms (62% overall) are the main firms active in the sector. We do not see a clear distinction among the countries in terms of the size of the firms present in our sample.

E. Private sector by blue economy and country (total: 36 answers)

		Croatia	Italy	Total
PA4 Service activities incidental to water transportation	N	15	1	16
	%	94%	6%	44%
OG3 Support activities for petroleum and natural gas extraction	N	1	6	7
	%	14%	86%	19%
SR1 Building of ships and floating structures	N	5	2	7
	%	71%	29%	19%
ES6 Environmental protection	N	1	3	4
	%	25%	75%	11%
ES4 Defence and Security	N	2	1	3
	%	67%	33%	8%
ES7 Ecosystem services	N	1	2	3
	%	33%	67%	8%
ES9 Multiuse platforms	N	2	1	3
	%	67%	33%	8%
LR2 Aquaculture	N	3	0	3
	%	100%	0%	8%
SR2 Building of pleasure and sporting boats	N	3	0	3
	%	100%	0%	8%
PA3 Construction of water projects	N	2	0	2
	%	100%	0%	6%
SR3 Repair and maintenance of ships and boats	N	1	1	2
	%	50%	50%	6%
Others*	N	2	3	5
	%	40%	60%	14%

The percentage for countries refer to the distribution of the variable between the countries. The percentage of the total is calculated based on the number of firms that have answered to the question.

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**Others: CT5 Transport; ES0 Research and education; LR3 Processing and preserving of fish; MT1 Sea and coastal passenger water transport; MT5 Renting and leasing of water transport equipment.*

Of the total of 78 firms in our private sector sample, 36 had answered to this questions (24 firms from Croatia and 12 firms from Italy). However, as some had stated more than one answer, the number of answers are higher than the total number of firms.

According to the blue economy sector categorization, "PA4 Service activities incidental to water transportation" is an important sector for Croatia (15 firms) followed by "SR1 Building of ships and floating structures" (5 firms). However, for the Italian firms we can see the importance of "OG3 Support activities for petroleum and natural gas extraction" (6 firms).

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F. Private sector by value chain position and country (total: 33 answers)

		Croatia	Italy	Total
VCC1 - Components manufacturing - SW Components	N	8	2	10
	%	80%	20%	30%
VCP4 - Production - Peripheral services and logistics	N	7	1	8
	%	88%	13%	24%
VCC2 - Components manufacturing - HW Components	N	7	0	7
	%	100%	0%	21%
VCS1 - Sales - ROV/AUV operators & Survey Firms	N	3	3	6
	%	50%	50%	18%
VCC3 - Components manufacturing - ROV/AUV Components & Tooling	N	3	1	4
	%	75%	25%	12%
VCP3 - Production - Integrated systems manufacturing	N	3	1	4
	%	75%	25%	12%
VCC3 - Customers or Buyers - Offshore Energy & Installations	N	2	0	2
	%	100%	0%	6%
VCD2 - Distribution - After Sales Customer Support & Technical Training	N	2	0	2
	%	100%	0%	6%
VCS2 - Sale - Marine environment and depollution	N	0	2	2
	%	0%	100%	6%
Others*	N	2	4	6
	%	33%	67%	18%

The percentage for countries refer to the distribution of the variable between the countries. The percentage of the total is calculated based on the number of firms that have answered to the question.

** Others: D08 Contaminants; MT2 Sea and coastal freight water transport; MT5 Renting and leasing of water transport equipment; OG3 Support activities for petroleum and natural gas extraction; VCC4 - Customers or Buyers - Fisheries and Aquaculture; VCD1 - Distribution - Marketing & Distribution.*

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Of the total of 78 firms in our private sector sample, 33 had answered to this questions (23 firms from Croatia and 10 firms from Italy). However, as some had stated more than one answer, the number of answers are higher than the total number of firms.

When it comes to the value chain position the Croatian firms are mainly positioned in: CC1 - Components manufacturing - SW Components (8 firms); “VCP4 - Production - Peripheral services and logistics” (7 firms) and “VCC2 - Components manufacturing - HW Components” (7 firms). While the Italian firms are positioned in: “VCS1 - Sales - ROV/AUV operators & Survey Firms” (3 firms).

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G. Private sector by NACE and country (total: 42 answers)

		Croatia	Italy	Total
71.1 Architectural and engineering activities and related technical consultancy	N	9	3	12
	%	75%	25%	29%
62.0 Computer programming, consultancy and related activities	N	4	2	6
	%	67%	33%	14%
27.9 Manufacture of other electrical equipment	N	3		3
	%	100%	0%	7%
71.2 Technical testing and analysis	N	1	1	2
	%	50%	50%	5%
26.5 Manufacture of instruments and appliances for measuring, testing and navigation; watches and clocks	N	1	1	2
	%	50%	50%	5%
Others*	N	10	8	18
	%	56%	44%	43%

The percentage for countries refer to the distribution of the variable between the countries. The percentage of the total is calculated based on the number of firms that have answered to the question.

**Others: 3.2. Aquaculture; 9.1 Support activities for petroleum and natural gas extraction; 25.1 Manufacture of structural metal products; 26.1 Manufacture of electronic components and boards 28.9 Manufacture of other special-purpose machinery; 30.1 Building of ships and boats; 33.1 Repair of fabricated metal products, machinery and equipment; 33.2 Installation of industrial machinery and equipment; 38.1 Waste collection; 39.0 Remediation activities and other waste management services; 41.2 Construction of residential and non-residential buildings; 43.9 Other specialised construction activities; 46.1 Wholesale on a fee or contract basis; 46.9 Non-specialised wholesale trade; 50.0 Water transport; 61.9 Other telecommunications activities; 72.1 Research and experimental development on natural sciences and engineering; 74.9 Other professional, scientific and technical activities n.e.c..*

Of the total of 78 firms in our private sector sample, 42 had answered to this questions (28 firms from Croatia and 14 firms from Italy). However, as some had stated more than one answer, the number of answers are higher than the total number of firms.

The NACE codes show that the Croatian firms are active in: "71.1 Architectural and engineering activities and related technical consultancy" (9 firms). However, both for Italian and Croatian firms we can see that they are active in a wide variety of sectors when it comes to the NACE classification.

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H. Key Activities.

Only firms that were interviewed have answered to this questions. The key activities were stated as following:

- Geophysics; Habitat mapping; Water quality; Bathymetry; Autonomous Surface Vehicles (ASVs) (Autonomous underwater vehicles (AUVs) is more adapt for underwater);
- Service management and execution for the prevention, control and restraint of water pollution;
- Studies made for the assessment of the environmental impact coming from maritime activities or industrial sites along coastal areas or open sea;
- SDampling and monitoring of waters;
- Management and fulfilment of the pollution;
- Designing building and preparation of maritime crafts used for the prevention of pollution in the cleaning up of maritime and inland waters;
- Underwater robotic systems development and production;
- Underwater sensors development and production- ultrasonic and eddy current sensors remote control software for underwater robotic systems;
- Underwater non-destructive testing and inspection services (ultrasonic, eddy-current, visual);
- Underwater repair systems;
- Radar sensors research;
- Development, and production – electronics, phase array antennas, embedded software and signal processing software;
- Monitoring of fish fauna in transitional environments or in shallow waters;
- Monitoring of general biotic or abiotic parameters in coastal marine environments and transitional waters;
- Management of harmful and allochthonous wildlife, both freshwater and transitional marine waters, terrestrial including poultry (avicolo);
- Problem management and resource management related to fishing areas (both traditional fishing in the lagoon area and small-scale coastal fishing);
- Service and research project development (i.e., They have just closed a European project MARGNET of which they were partners. They worked on the assessment and removal of the presence of marine plastic waste in the upper Adriatic area).

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- Scientific research in the field of underwater sensors. - Production of software for IoT and development of advanced methods for cooperative control of a fleet of AMVs and of their support vessel;
- Production of software and hardware components to be implemented in underwater robots and sensors;
- Advanced users of underwater robots for naval and offshore infrastructure inspection (e.g. structural integrity) and underwater robotics system integrators Engineering procurement and construction contractors operating in the energy segment and specialized offshore Multidisciplinary structural engineering Naval engineering (e.g. ferry boats, anchor handling vessels, harbour platforms) Super yachts construction and sales

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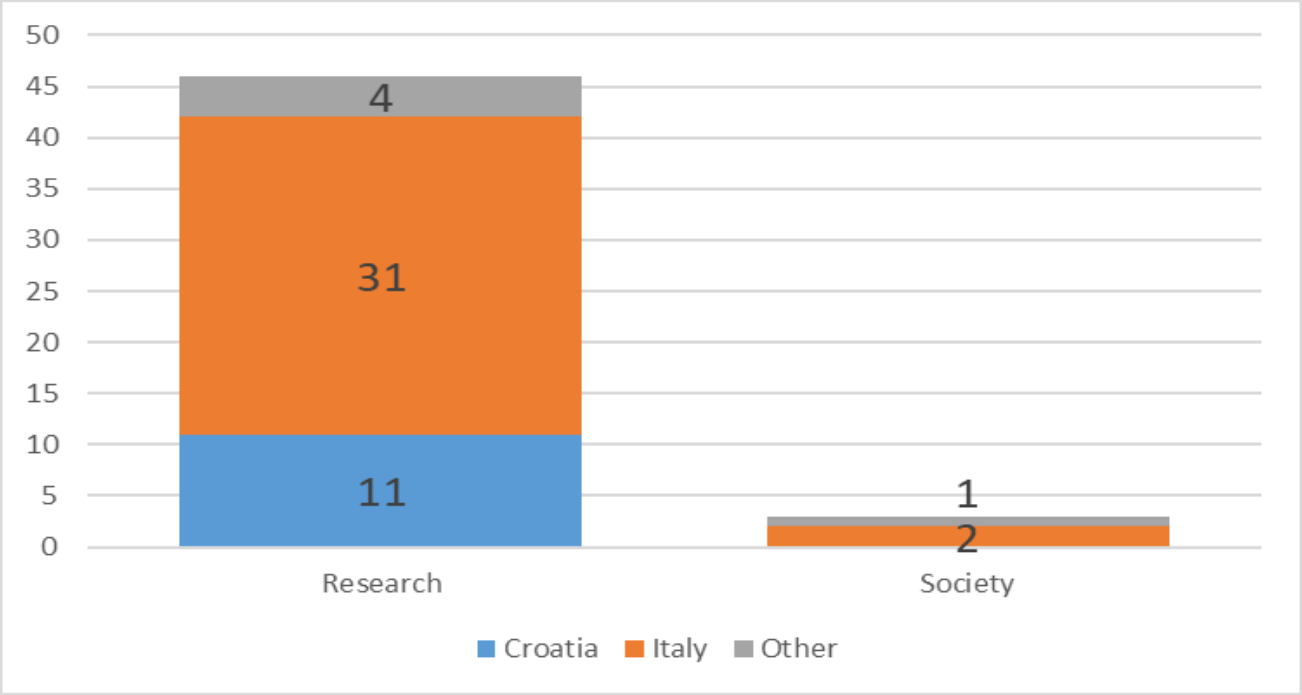
4.2. Projects:

Identification of the main projects (in the past 5 years) related to the sector, had been a main part of the data collection but during the desk research and also followed up by interviews. The projects had included both “research” projects or projects that involves the society (NGOs, citizens, students…).

In the following analysis, projects are analysed by the country of lead partner.

I. Projects by type and country of Lead Partner (LP)



		Croatia	Italy	Other*	Total
Research	N	11	31	4	46
	%	24%	67%	9%	94%
Society	N	0	2	1	3
	%	0%	67%	33%	6%

The percentage for countries refer to the distribution of the variable between the countries. The percentage of the total is calculated based on the total number of projects.

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Other countries as the lead partner included: Belgium, Netherland, Portugal, UK

Identified projects had been mainly research projects (94%). In this regard Italians have been involved in 31 projects (67%) as the lead partner.

The gathered data also show that the main lead partners had been: University of Zagreb (5 projects); CNR – ISMAR (4projects); Proambiente S.c.r.l. (3 projects); G-NOUS (2 projects) and University of Bologna (2 projects)

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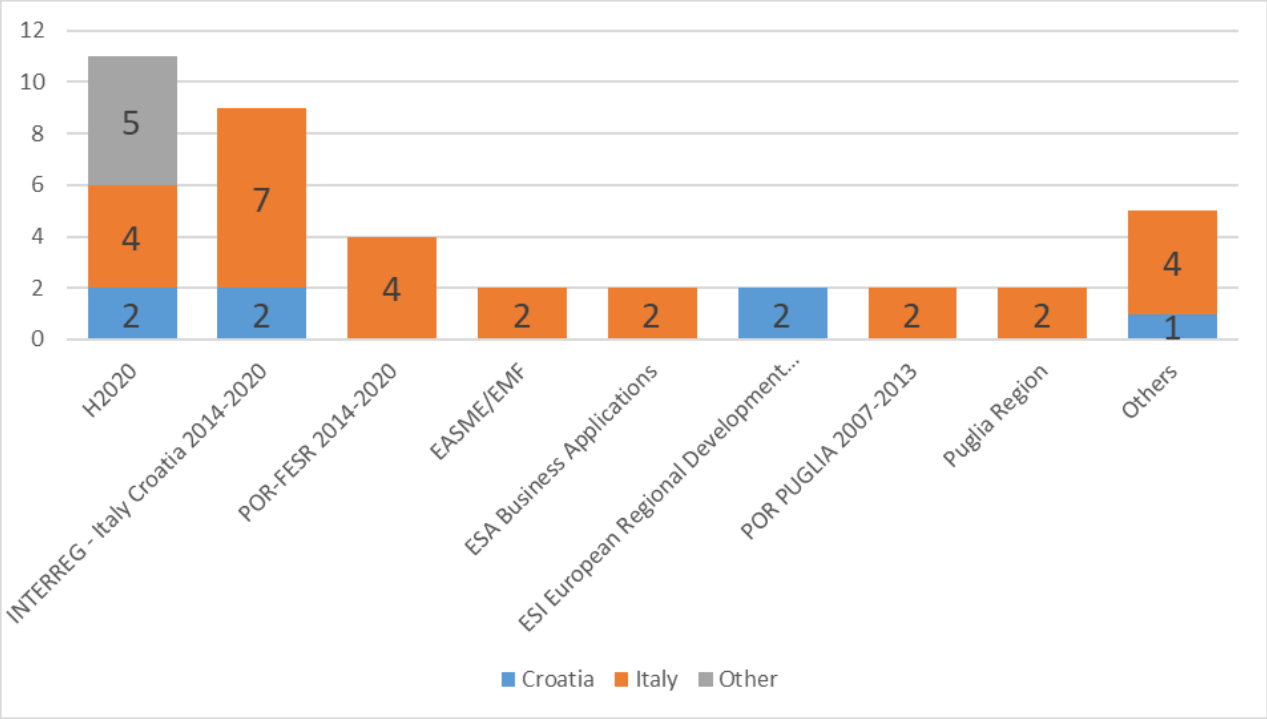
J. Funding programme and country of LP (total projects: 49)



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		Croatia	Italy	Other	Total
H2020	N	2	4	5	11
	%	18%	36%	45%	22%
INTERREG - Italy Croatia 2014-2020	N	2	7	0	9
	%	22%	78%	0%	18%
POR-FESR 2014-2020	N	0	4	0	4
	%	0%	100%	0%	8%
EASME/EMF	N	0	2	0	2
	%	0%	100%	0%	4%
ESA Business Applications	N	0	2	0	2
	%	0%	100%	0%	4%
ESI European Regional Development Fund	N	2	0	0	2
	%	100%	0%	0%	4%
POR PUGLIA 2007-2013	N	0	2	0	2
	%	0%	100%	0%	4%
Puglia Region	N	0	2	0	2
	%	0%	100%	0%	4%
Others*	N	1	4	0	5
	%	20%	80%	0%	10%
Missing	N	4	6	0	10
	%	40%	60%	0%	20%

The percentage for countries refer to the distribution of the variable between the countries. The percentage for the total refers to the distribution of the variable across the funding programme.

**Others: Adrion; Regional Technological Clusters 2014; Private source; IPA II; PON PNR 2015-2020 – BLUE GROWTH*

The main funding programmes for the projects had been the H2020 followed by INTERREG - Italy Croatia. However, for the Italian projects we can also see the role of local funds

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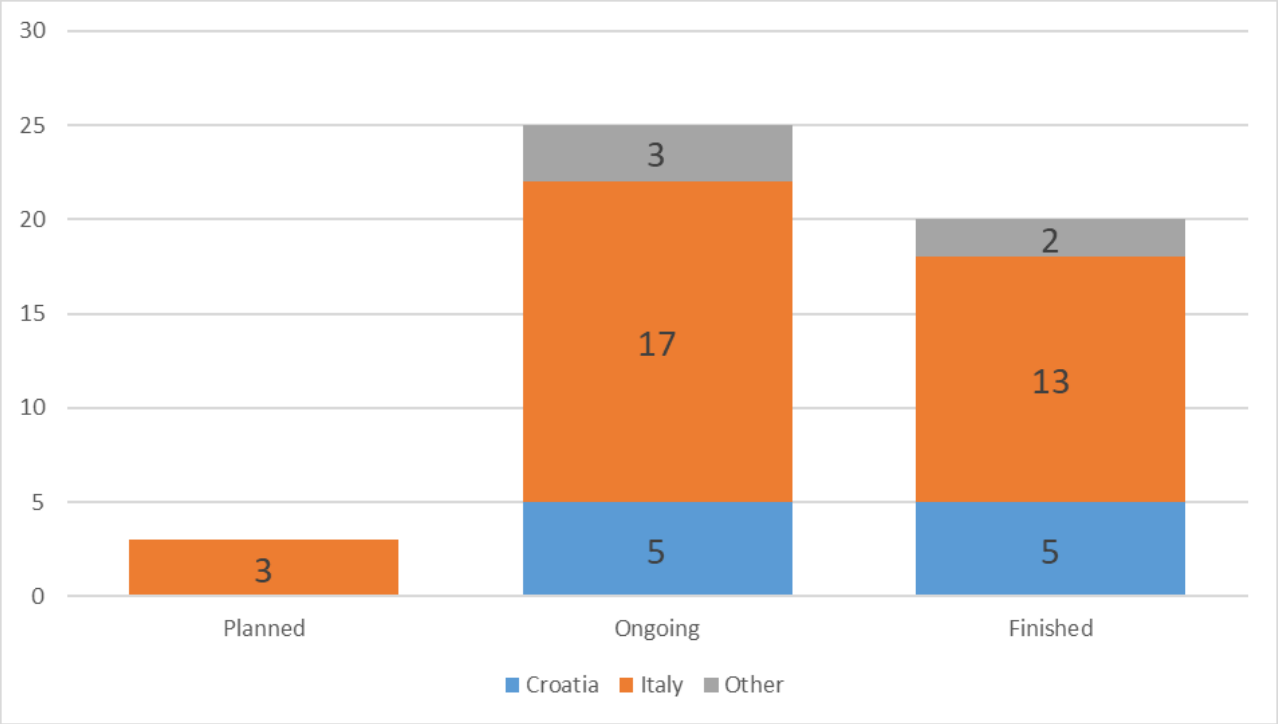
K. Status of the project by LP country



		Croatia	Italy	Other	Total
Planned	N	0	3	0	3
	%	0%	100%	0	6%
Ongoing	N	5	17	3	25
	%	20%	68%	12%	51%
Finished	N	5	13	2	20
	%	25%	65%	10%	41%
Missing	N	1	0	0	1
	%	100%	0%	0%	2%

The percentage for countries refer to the distribution of the variable between the countries. The percentage for the total refers to the distribution of the variable across the status of the projects.

The projects in our data are mainly ongoing projects although we can also see 3 relevant projects planned for the future.

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L. Projects by blue economy sector and LP country (total answers:30)

		Croatia	Italy	Others	Total
ES0 Research and education	N		2	1	3
	%	0%	67%	33%	10%
ES6 Enviromental protection	N	2	17	1	20
	%	10%	85%	5%	67%
LR2 Aquaculture	N	2	4		6
	%	33%	67%	0%	20%
Others	N		2		2
	%	0%	100%	0%	7%

The percentage for countries refer to the distribution of the variable between the countries. The percentage of the total is calculated based on the number of firms that have answered to the question.

**Others: ES7 Ecosystem services; ES9 Multiuse platforms*

Of the total of 49 projects in our private sector sample, 30 had answered to this questions (4 projects from Croatia and 24 projects from Italy; 2 from others). However, as some had stated more than one answer, the number of answers are higher than the total number of firms.

Projects are mainly related to the “ES6 Enviromental protection” when it comes to the blue economy sector (67%).

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M. Marine Strategy Framework Directive's 11 descriptors (22 answers in total)

		Croatia	Italy	Others	Total
D01 Biodiversity	N	2	1		3
	%	67%	33%	0%	14%
D07 Hydrographical Conditions	N		8	1	9
	%	0%	89%	11%	41%
D10 Marine Litter	N		7	1	8
	%	0%	88%	13%	36%
Others	N	1	2		3
	%	33%	67%	0%	14%

The percentage for countries refer to the distribution of the variable between the countries. The percentage of the total is calculated based on the number of firms that have answered to the question.

**D02 Non-indigenous Species; D03 Commercial Fish and shellfish; D06 Sea-floor Integrity.*

Of the total of 49 projects in our private sector sample, 22 had answered to this questions (3 projects from Croatia and 17 projects from Italy; 2 from others). However, as some had stated more than one answer, the number of answers are higher than the total number of firms.

The MSFD categorization shows that Projects are mainly related to the "D07 Hydrographical Conditions" (41%) followed by D10 Marine Litter (36%).

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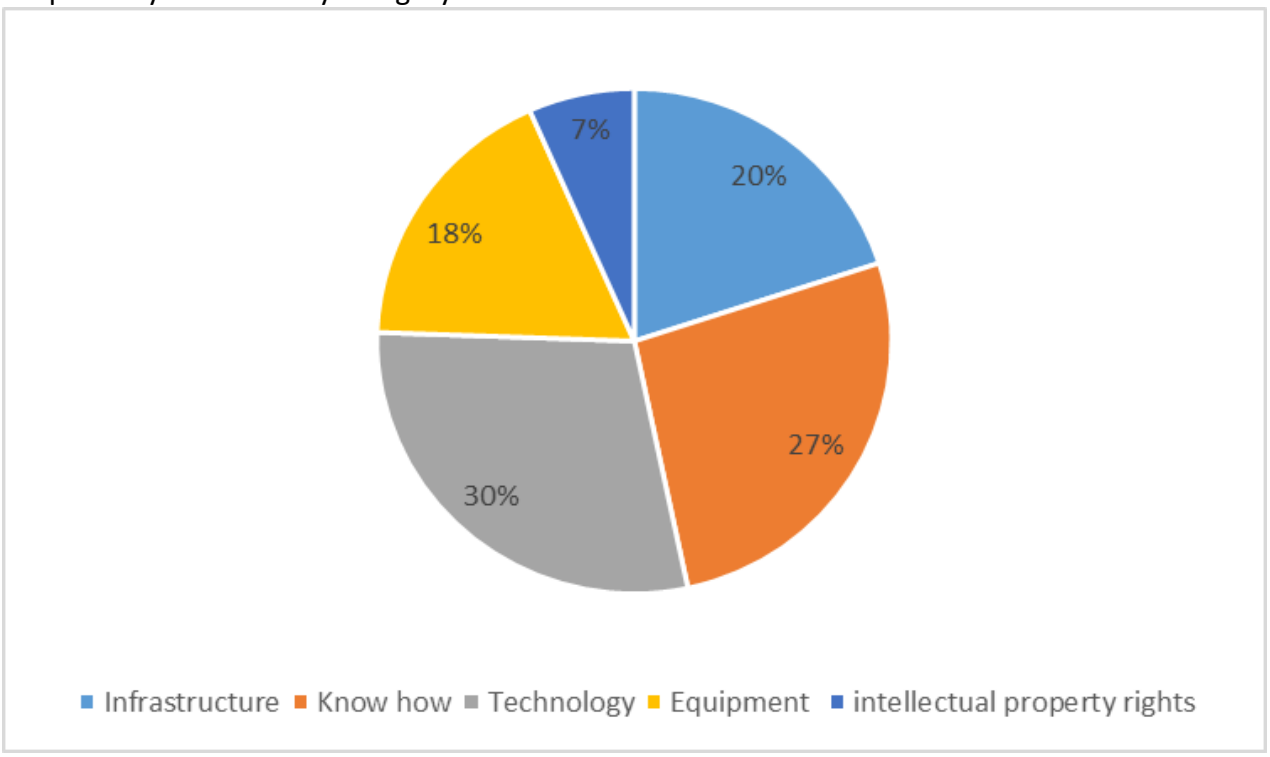
4.3. Key resources

Organizations were asked to indicate their main key resources refer to the resources that the company/institution would like to communicate to potential business and research partners. They had been categorized as following:

- infrastructures (R&D labs; testing labs; Fablabs; etc.)
- technologies (laser cutter; 3D metal printer; lidar technologies; etc.)
- intellectual property rights (patents; trademarks, etc.)
- equipment
- know-how (if none)

N. Key resources by category

Graph1- key resources by category



			Examples
Infrastructure	N	9	Vehicles for monitor and studying the marine ecosystem; R&D lab
	%	20%	
Know-how	N	12	Structural calculations; analysing satellite data; the "commercial" side of developing products
	%	27%	

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Technology	N	13	Hardware and software; 3D Print; Submarine technology
	%	30%	
Equipment	N	8	Underwater equipment; equipment for diving activities
	%	18%	
Intellectual property rights	N	2	Patents in the sector
	%	7%	

As only Italian firms have stated the key resources in their organization, the graph does not show a distinction among the countries.

The main category is related to the having a key technology followed by a know-how. However, organizations in our sample does not show to be in position of an important Intellectual property rights with only two firms stating such.

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4.4. Key individuals

Information related to key persons working in the sector of underwater robotics and sensors had also been collected both in the desk research phase and also during the interviews.
In total 51 individuals including 4 (8%) from Croatia and 47 (92%) from Italy had been identified.

O. Key individuals by specialization (total answers: 48)

Role			Examples of Expertise
University Professor	N	15	Expert in Integrated 3D design; Expert in fuel cell propulsion; Expert in electric systems
	%	29%	
Expert	N	14	GIS and drones; Marine geologist; submarine ships building; IT and Security Service; environmental sciences
	%	27%	
Director/Manager	N	9	R&D Technical Manager
	%	18%	
Researcher	N	5	Physics; Geologist
	%	10%	
Technician	N	2	Environmental monitoring
	%	4%	
Founder	N	2	-
	%	4%	
Vice Director	N	1	-
	%	2%	
Missing	N	3	-
	%	6%	

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P. Key individuals by ERC sector (total answers: 21)

ERC Sector		Total
LS8 Ecology, Evolution and Environmental Biology	N	4
	%	19%
PE10_8 Oceanography (physical, chemical, biological, geological)	N	4
	%	19%
PE8_3 Civil engineering, architecture, maritime/hydraulic engineering, geotechnics, waste treatment	N	4
	%	19%
PE7_10 Robotics	N	3
	%	14%
SH2 Institutions, Values, Environment and Space	N	2
	%	10%
Others	N	8
	%	38%

Others: PE10 Earth System Science; PE6 Computer Science and Informatics; PE7_1 Control engineering; PE7_2 Electrical engineering: power components and/or systems; PE7_3 Simulation engineering and modelling; PE7_7 Signal processing; SH1 Individuals, Markets and Organisations; SH4 The Human Mind and Its Complexity.

Of the total of 51 individuals in our private sector sample, 21 had answered to this questions (only Italians). However, as some had stated more than one answer, the number of answers are higher than the total number of firms.

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4.5. Key platforms:

The platforms for co-development related to the sector of underwater robotics and sensors were identified as following:

Platform name	Web Address	Info +
crodrones.network.	https://crodrones.network/	Croatian network/platform of drone operators, services and related services.
Plavo Oko / Blue Eye	http://plavo.oko.hr/	Blue eye is an application designed to systematically record data on marine organisms and sea pollution with the aim of increasing knowledge of the sea and its effective protection
Italian Institute of Robotics and Intelligent Machines	https://i-rim.it/en/	I-RIM is an institute created to offer a national organizational reference for its members and stakeholders, and to interact with public institutions on the topics of Robotics and Intelligent Machines.
euRobotics	https://www.eu-robotics.net/eurobotics/index.html	euRobotics aisbl (Association Internationale Sans But Lucratif) is a Brussels based international non-profit association for all stakeholders in European robotics. It was founded in September 2012 with the aim to strengthen Europe's competitiveness and to ensure industrial leadership of manufacturers, providers and end-users of robotics technology-based systems and services

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Annex 1:
Organizations in the platform by 15th of January

Scientific Research (SCR)

CNR
University of Rijeka, Faculty of Maritime Studies
Laboratory for Underwater Systems and Technologies (LABUST)
LARIAT-Laboratory for Intelligent Autonomous Systems
University of Zagreb, Faculty of Agriculture
Innovation Centre Nikola Tesla
Laboratory for Robotics and Intelligent Control Systems - LARICS
Institute of Oceanography and Fisheries
Croatian Academy of Engineering
Center for Underwater Systems and Technologies (CUST - CEPOST)
University of Split, Department of Professional Studies
University of Dubrovnik, Department of Applied Ecology
Center for Artificial Intelligence and Cybersecurity (AIRI), University of Rijeka
University of Dubrovnik, Institute for Marine and Coastal Research
Laboratory for autonomous systems and mobile robotics (LAMOR), Faculty of Electrical Engineering and Computing, University of Zagreb
Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture, Split - Department of Mechanical Engineering and Naval Architecture
Laboratory for Automation and Robotics, Faculty of Mechanical Engineering and Naval Architecture, Zagreb
University of Rijeka Faculty of Engineering - Department of Automation and Electronics
Natural history museum in Rijeka
University of Bologna DEPARTMENT Civil, Chemical, Environmental, and Materials Engineering - DICAM
University of Bologna Marine Biology and Fisheries Laboratory of Fano
University Ca' Foscari of Venezia- Dipartimento di Scienze ambientali, Informatica e Statistica
Iuav University of Venice
University of Zadar
Politecnico bari DICATECh - Dipartimento di Ingegneria Civile, Ambientale, del Territorio, Edile e di Chimica
CMCC - Fondazione Centro Euro-Mediterraneo sui Cambiamenti Climatici
Department of Innovation Engineering
DISTEBA - Unisalento
ISME
University of Padua - Department of Information Engineering

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University Ca' Foscari of Venezia - Department of Humanities
Area Science Park
University of Trieste - Department of Engineering and Architecture
Istituto Nazionale di Oceanografia e Geofisica Sperimentale - OGS
The Abdus Salam International Centre for Theoretical Physics
University of Zagreb - Study programme for energy efficiency and renewable energy in Šibenik
Università Politecnica delle Marche - Dipartimento di Ingegneria dell'informazione
University of Zadar
University of Padua - Department of Biology
University of Padua - Department of Comparative Biomedicine and Food Science
University of Zagreb, Faculty of Geodesy
Istituto Zooprofilattico Sperimentale delle Venezie

Private Sector (PRS)

Vectrino
Communication Technology srl
PROAMBIENTE S.c.r.l. (consorzio)
H2O-Robotics
Saipem
Brodosplit
Statim d.o.o.
Cromaris
Redaelli Tecna SPA
TRIPMARE SPA
Crismani ecologia srl
Neptun-Sub
H2O Robotics
Skyproxima
Rana Diving SPA
Subsea fenix srl
Bourbon offshore DNT s.r.l
Seastema SPA
INETEC - Institut za nuklearnu tehnologiju d.o.o.
CNT Technologies Srls
Reicom- Insis engineering solutions Srl
Saipem Croatia

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Aeda d.o.o.
Dalmont d.o.o.
De Naval d.o.o.
Framos Technologies d.o.o.
GDi d.o.o.
Geolux d.o.o.
HAVYARD DESIGN & ENGINEERING RIJEKA d. o. o.
IEL d.o.o.
Inelteh d.o.o.
INTECO ROBOTICS
KvarnerCAD d.o.o.
Mali Mol d.o.o.
MARIS NAVAL d.o.o.
Orqa d.o.o.
Tema d.o.o.
Matuna d.o.o.
Tipteh Zagreb d.o.o.
EniProgetti SpA
SOCOTEC Italia
Diamec
Microlaben
Shoreline soc. Coop.
Laguna Project snc
ANTHEUS srl
APPHIA srl
Servizi Tecnici S.r.l.
PLANETEK Italia Srl
MEDIS DIH
Terminale GNL Adriatico S.r.l.
CroNoMar d.o.o.
MARINETEK ADRIATIC d.o.o.
IVANAL d.o.o.
Jadranski ronilački servis d.o.o.
Impol - TLM, d.o.o.
Prehnit d.o.o.
Byte Lab grupa d.o.o.
ZADAR SUB d.o.o.
G-NOUS Srl

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MICOPERI S.p.A
Navalprogetti Srl
Aqua Engineering Srl
Orion S.p.A.
GoeCom Parma
GREEN SEA Soc. Coop
SELC Soc. Coop.
AGRI.TE.CO sc Ambiente Progetto Territorio
ELMAR s.r.l.
ROVCRAFT
Distretto Ittico di Rovigo e Chioggia
WIRELESS AND MORE
Subsea Fenix
CNT Technologies srl
CODEVINTEC

Public Sector (PBS)

Regional Development Agency Dubrovnik-Neretva County DUNEA
Hydrographic Institute of the Republic of Croatia - Split
Association Sunce
HRVATSKE VODE - legal entity for water management
Plovput
Clean Adriatic Sea Alliance
Šibensko - kninska county
Croatia Indepedent Software Exportes (CISEX)
Croatian AI Association
Croatian Association of Unmanned Systems (HUBS)
Croatian Employers Association - ICT Association
Dubrovnik Development Agency DURA d.o.o.
Entreprenurial incubator IZAZOV Pula
Croatian business angels network - CRANE
Primorsko - goranska county Regional Development Agency PRIGODA
Rijeka Development Agency
Šibensko kninska county Regional Development Agency

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Technology center Split
Technology Incubator Pula
Urban center/Incubator Šibenik
Zadar county Development Agency ZADRA NOVA
Dubrovnik Port Authority
Eastern Adriatic Port Authority- Trieste
Central Adriatic Port Authority- Ancona
North Adriatic Sea Port Authority- Venezia
ARPAV - Servizio Osservatorio Acque Marine e lagunari
ISPRA - Istituto Superiore per la Protezione e la Ricerca Ambientale
Istituto Idrografico della Marina Militare
Regione Marche P.F. Biodiversita e Rete ecologica regionale
ARPA Puglia
ARPA Molise
ARTA Abruzzo
Autorità Portuale del Mare Adriatico Meridionale
Port of Ravenna Authority - Autorità di Sistema Portuale del Mare Adriatico Centro Settentrionale
ARPA Emilia Romagna - The oceanographic structure DAPHNE
Development Innovation Center AluTech
Veneto Region
Forum of the Chambers of Commerce of the Adriatic_Ionian area
Friuli Venezia Giulia Region
Protezione Civile Regione Friuli Venezia Giulia
ARPA Friuli Venezia Giulia - Qualita' delle acque marine e di transizione
Polytechnic of Šibenik
Public institution "Nature Park Telašćica"
Kornati National Park
ŠIBENSKA PRIVATNA GIMNAZIJA & CENTAR IZVRSNOSTI SV: LOVRE
Public institution Nature of Šibenik – Knin County
ARPA Calabria
ARPA Liguria

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