



Empower Academia for Knowledge Transfer for Value Creation in the Atlantic Area

National Bootcamp: Portugal

Partner: SPI

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- a) profile relevant Blue economy sectors at national level, enabling benchmarking and future comparisons;

Blue economy covers a wide range of interlinked established and emerging sectors. It includes all economic activities related to oceans, seas and coasts. During the bootcamp, the stakeholders have identified several sectors which can be considered current strong Blue economy sectors for Portugal, compared to other European countries:

- Aquaculture

Farming finfish, shellfish and aquatic plants is one of the world's fastest growing food sectors. Examples of environmentally sustainable aquaculture include integrated multi-trophic aquaculture, seaweed aquaculture, shellfish aquaculture, and well-planned fish rearing based on an ecosystem approach.

- Coastal and Maritime Tourism

As part of EU's Blue Growth strategy, the coastal and maritime tourism sector has been identified as an area with special potential to foster a smart, sustainable and inclusive Europe.

- Maritime Transport, Ports and related services, shipping and shipbuilding

Globally, shipping provides the principal mode of transport for the supply of raw materials, consumer goods, essential foodstuffs, and energy. It is thus a prime facilitator of global trade and contributor to economic growth and employment, both at sea and ashore.

b) Identify needs, market opportunities and trends

Besides the Blue Economy sectors where Portugal performs well and should keep investing, maintaining their strong position, the bootcamp participants also discussed several sectors which can represent opportunities, either by being considered a need or a current trend.

- Marine Biotechnology and Bioprospecting

Marine life has adapted to thrive in the extreme ambient conditions found in the sea. Marine biological prospecting includes the discovery from the ocean environment of novel genes and biological compounds that can lead to commercial development of pharmaceuticals, enzymes, cosmetics, and other products.

- Renewable Marine Energy

Renewable Marine Energy is a realistic medium- to long-term energy option for many Small Island Developing States (SIDS). Sustainable marine energy can play a vital role in social and economic development, as well as in climate adaptation and mitigation.

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- Desalination

Desalination is a process that takes away mineral components from saline water. Securing adequate quantities of clean and safe water to meet the needs of a growing population is one of the greatest challenges and obstacle to development.

- Waste disposal management

Wastewater, nutrients, and marine litter are the main sources of pollution in marine and coastal areas. Excess nutrients originate from fertilizers, fossil fuel burning, and wastewater from humans, livestock, aquaculture, and industry, leading to air, water, soil, and marine pollution.

- c) Profile main barriers of communication and relationship between the Triple Helix players in order to determine the most suitable subjects and materials that should be provided to Academia researchers, so that they will be capacitated to mitigate such barriers and foster cooperation

In order to fulfil this objective, during the national bootcamp, the participants were asked several questions such as main key factors for success and failure of cooperation between Triple Helix players, mainly through project execution. The questions and respective answers can be found below:

Key aspects that enable a successful collaborative project between Academia and Industry

- Identification of synergies between Academia and Industry. Properly define the relationship and roles of each type of entity (Academia brings innovation and Industry applies innovative solutions to the market);
- Regular networking to build trust - especially data confidentiality, workshop networking, regular meeting
- Specific trainings for researchers, student-oriented educational programs to collaborate with industry and creation of entrepreneurial mindset;
- Promote technology transfer departments at universities and link these Technology Transfer (TT) offices with trade associations;
- Understand each other's objectives and goals – seek for a win-win relationship (Speaking of all points of collaboration beforehand - who belongs to what, who pays for what, who does what, etc);
- Organizational culture and people culture - namely soft skills - being able to understand the assumptions of each side and their interests, which are the drivers, ability to understand the other;
- Projects and work/tasks that motivate the researcher in collaborating with industry and dedicating relevant time (Set up an agile process to regulate the relationship - co-creation process);
- Platforms that identify and aggregate representatives from each sector who may wish to collaborate
- Realise that there is not always a match between what the Academia has researched and what the Industry needs. It is important to know how to adapt your research to meet what is needed;
- Understand the deadlines and speed that the Industry needs and be a target focus, not get lost with issues that are not necessary for collaboration;
- The management of Intellectual Property (IP) over time is different in Academia and Industry (Establishing trust regarding IP).

Key aspects that caused unsuccessful collaborations between Academia and Industry

- Opposite to the successful factors, the lack of common objectives negatively contributes to the collaborations (different objectives, and therefore trust, needs to be established);
- Misidentification of what is intended and what are the constraints of each party;
- The idea in Portugal that, since it is research carried out at the Academia, which is mainly funded by public funds, this transfer should be made without cost to the Industry;
- The mismatch between state-of-the-art enterprise level and state-of-the-art academic level - there are often solutions in Academia for certain business problems that companies are not aware of;
- The speed at which the Academia work and what business needs/expects in terms of administrative procedures;
- Expectations adjustment - what can we get out of the collaboration.

Professional and personal skills necessary for the successful establishment of Knowledge Transfer collaborations between Academia, Industry and Government

- Practical, dynamic, proactive people;
- Ability to build consensus and have an engaging/cooperative approach;
- Communication skills – between the Triple Helix – common language;
- Science communication skills - Ability to be concise, clear in message, fit in message to target
- Sectors and different entities should be well aware of the needs of others;
- Researchers able to develop policy briefs – provide training;
- Each party should be able to better understand their counterpart - more business-oriented academy; and more research-oriented industry;
- Academy should learn to look at their research and see the big picture=practical application;
- Understand how to value your IP without being naive but also obsessed and paranoid;
- Know the market your technology is in - ability to anticipate problems and needs;
- Industry is usually more receptive to collaboration with Academia than vice-versa.

Is Academia well prepared and equipped to establish collaborations with Industry and government

- The common opinion was that the Academia is somewhat prepared to collaborate with the Industry, however there is still a long way to go and many opportunities to improve;
- Specific departments in both Academia and Industry should be implemented, in order to bridge the existing gap;

- Industry could also start developing in-house R&D (more often);
- Involve more the Academia and Industry in the market process and encourage spin-offs;
- Aim at bridging departments within the Academia;
- People: Somewhat prepared - the training of students and researchers should be strengthened; must be focused on applied research in open innovation, translating Industry language into what they learn in Academia;
- Procedures: Not prepared – even though TT professionals help facilitate the relationship between Academia and Industry, it is not easy to approach the industry showcasing technology as the industry does not know which collaboration to establish;
- National and institutional university procedures are too time consuming, the culture of organisations and people themselves are excessively formal;
- Researchers with a more international profile are usually more open to working and collaborating successfully with industries;
- This can depend a lot on the profile of the individuals and their professional experience.

Is Industry prepared to work with Academia

- The comments and opinions follow a similar path as the preparation of Academia for collaborations (item above);
- Small industries want to work with Academia, but are unwilling to accept the Academy deadlines or available funding/lack of resources and often want the Academy to take the risk;
- In terms of qualified people, the Industry also needs to be more aware of IP and how it should be valued and protected, and how collaboration can benefit both entities;
- Academia has an obligation to generate and transfer knowledge so it cannot be overly dependent on publication timings and business confidentiality;
- This can depend a lot on the profile of the individuals and their professional experience.

- d) Best practices on R&D, tech transfer and innovation promotion initiatives (financial and policy) in order to get information on concrete tech transfer activities we should look at when preparing our learning materials and the acceleration methodology.

Taking advantage from the vast experience from our stakeholders in the bootcamp, various questions related with best practices in R&D, TT and innovation incentives were asked. Below are the inputs gathered during the different group sessions:

Main barriers for Knowledge Transfer

- Collaborative culture is low;
- Decision and definition of what type of collaboration to establish – contract research, licensing, spin-off;
- Lack of proactivity and ecosystem knowledge to know where to look;
- Lack of efforts to disseminate research findings;
- Ignorance/lack of knowledge of the work other parties are doing;
- Lack of commitment or dialogue towards problem solving;
- Missing actors who can take research to a level where Industry can adapt research – eg. spin-offs;
- Mismatch between what Industry needs and what Academia does;
- Lack of funding and human resources mechanisms to enable Academia to develop the data package it needs to make technology attractive to Industry and private investment;
- Lack of mechanisms to maintain IP records made by the Academy and which are necessary to maintain until industry interest;
- Ignorance of IP and its management, as well as legal procedures, both by Industry and administration when setting up financing mechanisms;
- Lack of career incentives for researchers to collaborate with industry - based on numerical indicators rather than marketable products and solutions;
- Difficulty in obtaining market information and market opportunities;

Main enablers for Knowledge Transfer

- Creation of evaluation departments of the technology;
- Existence of facilitators, events and mobilizing projects;
- Tendency of entrepreneurship mindset taking place in Academia;
- Willingness to create synergies between Academia and Industry – specific and tailor-made mapping is needed;
- Innovation and investment policies that ultimately lead to Industry collaborating with Academia;
- Professionalisation of TT professionals to foster collaborations;

- Focused platforms for direct connections;
- Funding from the government/Europe for concrete objectives in technology transfer;

Main services provided by Technology Transfer Institutes

- Tailor-made trainings: one part of the grant to make a business model, dedicated to the exploitation plan – a role of the TT professionals do help in this exploitation;
- Acceleration and training programs for an idea;
- Liaison role in order to foster the relationship between researchers and Industry;
- Matchmaking between researcher and Academia;
- Supporting researchers to know how to protect and disseminate IP;
- Support in the protection and management of IP and liaison with different stakeholders;
- Knowledge of financing policies and financing methodologies;
- Market Feedback;
- Trading Strategies;
- Business development;
- Interpretation of what happens in KT, through practical cases - Information technology conveyed by spin-offs;

- e) Identify innovation policies and R&D&I capacity to support development, as well as current constraints for innovation, including key areas requiring funding intervention, so that the consortium can provide information and suggestions to improve such policies at national level.

One of the aims of the project is to positively influence policy making, through the understanding of the current innovation policies, their pain points and how they be improved. Below is the feedback received from our bootcamp participants on this matter:

What is lacking in the current innovation policies

- More and adequate funding for networks;
- Simplification of financing processes and funding for riskier projects;
- Voucher funding for start-ups to use scale-up, for example market acceptance vouchers;
- Allocation of innovation funds to all regions in Portugal – strategy seems to be confusing and untargeted – both regionally and nationally;
- Ocean illiteracy from the policy makers

Is innovation management addressed by policymakers on a regional and national level

- Yes, both at regional and national level. However, this seems to be more at political level, which later at operational level, it is clear that technicians are not adequately aware;
- Similar as above, innovation funds to all regions in Portugal indicate a disorganised strategy;

Main pain points of current national strategy for research development and innovation

- The process of obtaining funding is very time consuming - investing in projects – two phase process;
- Projects for companies: lag until it is approved and the funds are made available;
- Innovation strategy is very personal - the respondent has had his area reflected in the RIS, but there is no RIS that has been built in a totally impartial manner and taking into account the greater good of the region and the country;
- Listening to the community in not being properly done;
- Continuous funding for fundamental investment in inadequate;
- Funding should be provided for research merit and not region wise;
- Lack of overall vision and integration.

SWOT ANALYSIS

A SWOT analysis is an assessing tool that allows to understand the Strengths and Weaknesses of an organisation or a specific sector as well as identify both the Opportunities and the Threats. Using the SWOT framework can help uncover opportunities to exploit and by understanding the weaknesses it is possible to manage and eliminate threats. Additionally, strengths and weaknesses are often internal to an organization or sector, while opportunities and threats generally relate to external factors. For this reason, the SWOT analysis is sometimes called Internal-External Analysis. For the purpose of this activity the SWOT analysis will identify needs and trends in Blue Economy in the Atlantic area based on insights from the triple helix players (Academia, Industry and Government).

Strengths (of the national TH stakeholders' ecosystem)

- Aquaculture
- Coastal and Maritime Tourism

The above sectors perform well with regards of the relationship between the TH players. In that sense, these sectors can be used as reference points and to extract best practices and processes for the other Blue Economy sectors.

Weaknesses (of the national TH stakeholders' ecosystem)

- Wave energy

It is in an emerging state - prototype installation is in a beginning stage. The current point of this technology is showing it survives friction and extreme conditions (such as currents, corrosion, etc). However, there is a huge cost of actually introducing the prototypes in water (the only way to properly test it). These prototypes are the full scale machines, which, if anything goes wrong, it gets ruined and investment made is lost. Cooperation between the TH players is essential in order to move ahead and de-risk. Currently, this has been an important barrier.

Opportunities (of the national TH stakeholders' ecosystem)

- Marine Biotechnology and Bioprospecting
- Renewable Marine Energy and Offshore Wind Technology
- Maritime Transport, Ports and related services, shipping and shipbuilding
- Desalination
- Waste disposal management
- Environmental and coastal protection

All these sectors are considered opportunities for the Portuguese economy, specially when the promotion of the collaboration between the TH players, can represent better results. Portugal has a lot of sea and has research capacity. Cooperation is an important for a bigger success of these sectors

Threats (of the national TH stakeholders' ecosystem)

- Logistics and transportation

The opportunities and threats from the Blue Economy sectors depend not only on the sea but also on other areas that may enhance or hinder an opportunity. In this particular case, land logistics and transportation can influence the reliability and growth of others sectors on the sea. As much as the aim is to increase the competitiveness of the Blue Economy, we have to look interactively with other areas that can make us more competitive.

GENERAL CONCLUSIONS

The Portuguese Blue Economy employs around 180,900 people and generates almost €4.1 billion in GVA. It is dominated by coastal tourism, which contributed 74% to the total Blue Economy jobs and 66% to profits in 2017. The Living resources sector (which includes fish hatcheries & aquaculture, commercial fishing , seafood markets and seafood processing) is also an important contributor, providing 20% of Blue Economy jobs and 19% of GVA in 2017 (DG Maritime Affairs and Fisheries and the JRC, 2019).

Blue Economy GVA decreased over the period 2009-2012 and sharply increased hitting its highest level for the reporting period in 2017. The share of Blue Economy GVA to national GDP also saw a significant increase of 30% for that same period; while national GDP in Portugal increased by 11% (DG Maritime Affairs and Fisheries and the JRC, 2019).

One of the issues that arose from the bootcamp is the lack of clarity in the strategy. The strategy, which exists, seems to be unfocused and uncertain, without a clear operationalisation. There are target and deadlines, but not much more than that.

In terms of the stakeholders (and the people in particular), they have the proper mindset, trust and capabilities to establish networks and engage with different organisations. Overall, it seems that Academia needs to better understand how to work and interact with the Industry and the Government, mainly regarding timings and deadlines, but also in the protection and management of IP. In terms of policies, they need to better meet the market needs and become more targeted. As a final note, de-risking the investment from the Industry on new research and technology, will also contribute to foster the cooperation.