

D3.1.1 Inventory of results and cross-project assessment

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1. Inventory of project results

The following three subchapters present the three clustered projects, their description, key outputs and results, and target groups:

1. Boosting INVESTments in INnovation of SMEs along the entire FISHerY and aquaculture value chain (INVESTINFISH)
2. Blue enhancement action for technology transfer (BEAT)
3. BLUE Knowledge Exchange Program and integration of education systems in the cross-border area (BLUEKEP)

1.1. Boosting INVESTments in INnovation of SMEs along the entire FISHerY and aquaculture value chain (INVESTINFISH) project

1.1.1. Project description

Fisheries & aquaculture - F&A sector is characterized by SMEs/micro-firms generally facing difficulties in accessing to innovation due to their dimension combined with high entry costs for R&D. SMEs have also scarce attitude to cooperate and there is substantial gap between R&D providers and SMEs due to lack of substantive understanding of industry needs and mutual dialogue. To meet challenges, it is necessary that F&A firms exploit their products potential, innovate value & quality of territorial F&A tradition by transforming the classic "do everything alone" into innovative multi-open partnership approach applied with tailored and innovation & demand-led support. Challenge is even intensified by impact of persistent financial & economic crisis, which requires structural & significant changes for F&A.

INVESTINFISH innovative multi-open partnership approach created critical mass to compete on world level and set steady linkage among PPs excellence systems for sustainable

cooperation. Co-learning dialogs with S3 policy makers accelerated development of innovation investment instruments and jointly steered beneficial market deployment in IT-HR regions, contributing to RIS targets. The importance of the technological transfer was indeed highlighted by the Smart Specialization Strategies developed in the programme area on national and regional level, all of them selecting as a priority for the upcoming period the Key Enabling Technologies (KETs). The use of KETs for the F&A sector included solutions aimed at increasing the environmental sustainability of the SMEs themselves. Most innovative part of INVESTINFISH concerned the capitalisation of frontrunner H2020 project's results related to novel EU label for INNOVATION Voucher scheme.

Innovative capacity and sustainable structures for research and innovation are linked to the interaction of framework factors enabling knowledge to be converted into new products, processes, behaviors and organizational forms, which in turn enhance economic development and growth. The improvement of innovation framework conditions - in terms of institutional cooperation, policy instruments and developing practical cross-linkages between enterprises, R&D institutions, higher education, the public sector and the citizens - is a major challenge for the most part of the area. This challenge is even intensified by the impact of the persistent financial and economic crisis on the blue sector, which requires structural and significant changes of the whole production chain. The economic crisis has in fact reinforced the need to develop new organization processes and knowledge-based competitiveness, encouraging clusters among innovation players and the creation of innovative business and social models. In particular, there is a need for integrated management in the field of fishery, especially concerning innovative mechanisms for sustainable growth and protection of Adriatic ecosystem.

To increase the competitiveness and economic performance of aquaculture and fishery sector, it is vital to stimulate and to provide support for investment in innovation. INVESTINFISH approach, towards driving innovation in F&A sector, started from the lack of systematization of information, identified as prior on both countries, regarding the F&A in terms of mapping poles of excellence able to trigger innovation in the 5 Regions concerned, funding schemes, innovation requirements from SMEs and best advanced solutions. To this goal, an entire WP3 was specifically devoted to providing an exhaustive diagnosis of the innovation background, needs, solutions for fishery & aquaculture. The WP4 was structured to offer tailored innovation services to selected groups of enterprises of F&A; bringing science

and innovation from the drawing table to the marketplace is one of the main leverages to support for emerging-sector start-ups and incentivizing innovation in SMEs as key to job creation and the sustainable use of seas and other water mirrors.

In INVESTINFISH, the cross-border cooperation was itself the key-brick of the innovation management services in technology transfer characterized by an "open innovation" approach. Indeed, the rise of increasingly technology concepts capable of modernizing F&A (such as new IT devices, automation, last-generation sensors & nanomaterial, as proposed by the market or deriving by EU-funded research & ITHR laboratories) requires the creation of an appropriate open & collaborative environment, as the key-matter of competitiveness is the rapid transposition of KET of R&D results in new end-users components and new applications for companies operating in fishery and aquaculture sector.

Therefore, it is evident that joint knowledge sourcing services can be more and more efficient for the final beneficiaries by aggregating the excellence nodes in one system and this can be reached through the cross-border cooperation within the most dynamic innovation poles inside and outside the Italy – Croatia cooperation area.

The INVESTINFISH overall objective was strengthening the competitiveness of F&A production system through the promotion of investment streams aimed at the acquisition of innovation services, instrumental in the development of innovative entrepreneurship programmes, intellectual property management, support for design, use and organizational upgrading. The use of emerging KETs for the sector included solutions aimed at increasing the environmental sustainability of the SMEs themselves. The implemented pilot actions boosted the creation of marketable innovative products and/or processes that will improve SMEs potential market positioning.

INVESTINFISH leaned over proposing financial instruments that are completely new for the F&A sector: Innovation vouchers and the combined use of ESIF and EFSI funds for the benefit of F&A SMEs. They have to encourage SMEs in implementing innovative solutions (also more sustainable ones) and helping to go ahead from the idea to market.

The project embedded the change from the current innovation management model, where F&A companies have a low posture to innovation & technology scouting is mainly "local

based”, to the open innovation environment. The matchmaking analysis to combine project advanced technologies with actual/real companies’ requirements and the effective application of the test over selected & target enterprises, regardless the origin of the R&D and KET-based technological concepts, increased economic interdependences among the INVESTINFISH pilot areas & encouraged more effective cross border value chains in fishery and aquaculture sector.

Knowledge transfer strategy & Regional Innovation's driven Action kept bridging and multiplying R&D activities in a collaborative environment and fostered business in synergetic sectors, consolidating and expanding the open innovation services to new companies & users.

1.1.2. Key project outputs and results

The INVESTINFISH project’s main objective was strengthening of competitiveness of F&A production system, through promotion of investment programs aimed at acquisition of innovation services. After having conducted an in-depth analysis of poles of excellence able to trigger innovation in 5 Regions concerned, funding schemes, innovation requirements from SMEs and best advanced solutions, INVESTINFISH implemented pilot actions providing several IT-HR F&A SMEs with a roadmap to innovation instruments & services, boosting creation of marketable innovative products and/or processes that improved the SMEs potential market positioning.

Expected benefits for enterprises were: accelerated time to market, increased linkages with innovators, increased F&A enterprises’ R&D expenditures in new & greener components/technologies/services, boosted HR-IT competitiveness, etc. INVESTINFISH also helped the F&A sector to substitute the value chain concept with value network, proposing a shift from traditional value chains towards more collaborative value networks.

The INVESTINFISH project demonstrated a concrete capacity to promote the Innovation in the blue economy of 5 Regions of the IT-HR cooperation area and abroad. In specific, the main results were:

- Increase of Innovation potential of F&A enterprises of IT-HR Regions, thanks to the application of new technologies and adoption of a new model of innovation management;
- Innovative solutions with particular focus on sustainability were adopted by the SMEs (tested by 48 enterprises of F&A in the IT-HR area);
- Improved mechanisms on access to financing for KETs implementation - Introduction and capacity building action of novel label for INNOVATION Voucher scheme in the regional innovation facilitators for transferring specific knowledge and competences on the financing streams for SMEs.

Project specific objective 1 title was: Cross-border network to capitalize R&D available innovative solutions within the F&A enterprises, to improve the capacity to adopt innovative solutions, through better coordination and integration of R&D existing networks of excellence and promote support services based on the methodological model of "open innovation", defined and based on SMEs specific needs. The use of KETs for the F&A sector included solutions aimed at increasing the environmental sustainability of the SMEs themselves. This was done by the involvement of Cross-border innovation network to enhance excellence, cross-sectoral cooperation, innovation level, R&D-firms know-how transfer to capitalize research in marketable results.

Project specific objective 2 title was: Promoting investments in technology transfer and innovation services among the F&A enterprises, in order to develop services to sustain investments in innovation, targeted to F&A enterprises (mainly SMEs) and for new entrepreneurship development, in order to deliver a concrete support in the evaluation of new solutions marketability and its potential market positioning, by delivering extensive services to help developing the business model and further create start-ups and spin-off.

Project specific objective 3 title was: Boosting innovative financing streams for F&A SMEs, in order to capitalize the frontrunner initiative "INNOVOUCHER" supported by the EC-DG Growth and financed by the H2020 programme: project, devoted to the implementation of the EU Labelling voucher scheme, which experience was transferred in the INVESTINFISH project. A capacity building action on it spread it to the innovation facilitators and also at IT-HR Programme level. A study was developed for the creation of a cross-border platform for the combined use of ESIF and EFSI funds.

Further growth of aquaculture sector, including the development of innovative techniques and growing on new species, can bring benefits to the regional economies of cooperation area and build synergies between business and research institutions. By improving interaction processes and framework conditions among key players of fishery aquaculture sector, the project also affected two other major challenges in those fields:

(1) increase quality of sea products and by-products by stimulating investments in marine biotechnology that can open up new opportunities for innovative foods areas, nutraceutical and pharmaceutical industries and of bio-economy in general.

(2) improve quality of sea water, by stimulating investments for more sustainable production and management processes of fishery and aquaculture sector, which can have a positive impact on sustainable management of coastal and marine areas.

The challenge was embraced by the INVESTINFISH partnership, composed by 6 Partners representing the interlocutors among industries (SMEs mainly), R&D players, policy makers, in particular at regional level, but not only, some of them having high positioning within EU platforms or having a privileged channel with some DGs at the EC.

8 F&A enterprises x 6 areas (2x Veneto, Marche, Apulia, Istria and Zadar) received technical support for applying open innovation solutions (of product, process or service). The service was intended as accompanying measures, targeted for the F&A enterprises of the value chain, aimed at improving their competitiveness and market exposure by applying the chosen solutions. The service included a technical feasibility analysis and an economic & environmental sustainability study to evaluate and measure the impacts of the pilots.

8 enterprises (mainly of small-micro size) from the Fisheries and Aquaculture value chain from 6 areas of Regions represented in INVESTINFISH were introduced to innovative services and/or technological products. These companies were selected through inviting a larger number of companies in each area to submit their application for the pilot test. The enterprises were informed about the INVESTINFISH possibility preliminary through the Cross-border Blue Innovation thematic Labs. The enterprises were selected according to some IT-HR cross-border criteria and applied for receiving technical support for the introduction of innovative solutions. The companies were invited to take part in an awareness meeting to prepare them to meet the requirements stated and to know in advance the opportunities

deriving from the participation in the testing phase, in terms of innovation (services and products-technologies).

A first phase was conducted in order to assess the specific needs of the enterprises for each of the 6 areas. This consisted in the investigation of current practices and systems used by the companies for innovation purposes and in the analysis of the tools adopted so far.

Face to face interviews and surveys were the source of information gathering about the companies' requirements and innovation background.

A second phase provided feedback on the innovation status of the companies to each of them. Data collected during the first activity was elaborated in order to create a first assessment and to provide the enterprises with useful recommendation for improvements.

During a third phase, companies were selected based on the needs that emerged in the analysis. A technological audit was carried out in order to define specific experts who then proceeded with transferring innovation through the realization of consultations.

The durability of INVESTINFISH outputs and results is linked to the results received from the evaluation of technical feasibility and economic & environmental sustainability of the pilot application of innovative solutions. They were used for the definition of monitoring indicators of some thematic KPI to evaluate and measure the impacts of the pilots. Another important aspect was related to the financing streams for F&A SMEs: the INVESTINFISH strategy, discussed with the ESIF Funds public Regional Authorities and also with the EC DGs, was proposed as approach to mitigate existing disparities between regions and as model for other industries.

The transferability played a decisive role in the project and was conceived to be stakeholders oriented. A series of activities were foreseen at regional, national, EU level & addressed to various stakeholders (industry, policy makers, innovation facilitators and HUBs, wide public). A capillary Communication action was structured to address to an audience of different stakeholders a customized information and oriented to the maximum level of dissemination of INVESTINFISH results.

The important aspect, to be transferred to other F&A enterprises of IT-HR territories, is related to the methodology for nurturing the Innovation in F&A sector through the cross -

fertilisation set up by the INVESTINFISH Partnership, in particular, the Roadmap to innovation instruments and services for F&A SMEs containing the pilots. This can be exploited in other Programme areas, but also at EU level.

1.1.3. Target groups

General public 150000

Citizens, despite not being the main target of the INVESTINFISH project, were informed about the project potential; in particular how INTERREG funds can contribute to the improvement of territorial enterprises. In specific, through public events, mass media communication, social networks, sectorial articles, PPS prepared ad hoc messages having a divulgative level of comprehension.

Local, regional and national public authorities 5

Regional councils of IT-HR Regions were directly addressed; in particular, their Department for ESIF funds regional managing authorities were directly implicated in the discussion on the future combination of ESIF and EFSI funds and also on the working tables (together with banks, chambers of commerce, private equity funds) studying novel mechanisms stimulating access to funds and investments by the F&A enterprises.

SMEs 75

Enterprises (mainly of small-micro size) of 6 Regions were involved in the first step selection. 48 of them received ad hoc innovation services by the PPs. Among the INVESTINFISH PPs there is a business support org that also acts as ichthyic cluster. Other PPs had as mission the support to F&A SMEs and a privileged link with regional institutions and R&D providers 35 start-up – spin off were implicated within the local-based open selection.

Universities, technology transfer institutions, research institutions 10

Scientific international community, including leaders of research projects financed by EU or National Government in the same thematic field.

Centers of excellence 10

Innovation poles and networks devoted to trigger innovation were reviewed and directly involved in the project as innovation providers.

1.2. Blue enhancement action for technology transfer (BEAT) project

1.2.1. Project description

Research and business relationships between IT and HR are characterized by some limits referring to creation of efficient synergies/network between clusters and SMEs, research centers/universities that are not able to exploit their potentials, both individually and in collaboration by creating an appropriate critical mass for improvement of innovation capabilities. Not practical cross linkages among SMEs, clusters, research centers, universities, chambers of commerce to support the creation and contamination of new organizational processes that could reinforce knowledge-based competitiveness of main actors in area encourage clustering among innovation actors and creation of innovative business and social models.

The main aim of the BEAT project was **to strengthen innovation processes of main economic actors and cooperation levels between SMEs, cluster and research centers/universities operating in IT and HR, as qualified segments of shipbuilding and maritime sectors and of “blue value chain”**. By capitalizing on the feasibility study implemented in the Blue Tech project, **BEAT consortium created a cross-border cluster in maritime and shipbuilding sectors including operators of other sectors operating in the same value chain, to help SMEs operating in this sectorial space (“blue value chain”) to improve their ability to organize and manage their innovation processes in more effective way.**

Specific objectives were: developing a transnational cluster in blue technologies in shipbuilding sector and sectors related to blue value chain; mapping/assessing conditions enabling the development of transnational cluster; networking to facilitate collaboration and knowledge; definition of appropriate transnational cluster governance model to support the sustainability on cluster; identification models ability to organize/manage their creative and innovative processes in a more effective way; revision of innovation strategies.

1.2.2. Key project outputs and results

The project contributed to increasing the effectiveness of innovation activities thanks to the creation of new networking opportunities, clustering procedures, implementation of training sessions and benchmarking of innovation capabilities of SMEs.

The partnership achieved the following outputs: involvement of 55 firms for the creation a cross-border cluster in shipbuilding and maritime sector; involvement of 13 research institutions participating in cross-border innovation initiatives, cross-border training activities on blue technologies, depth analysis to the selected SMEs for their innovation capabilities to improve their organizational and managerial routines to better manage their innovation processes.

2 open training sessions were organized on organizational and managerial routines that foster innovation, 1 business matchmaking to foster transnational market development, 4 visits to companies and TTOs/research centers in Italy and Croatia to present best practices related to innovation and enhance cross-border knowledge among firms involved in the blue value chain. BEAT project involved 55 SMEs that took part to opening training sessions, 13 research institutions and 22 local, regional/national authorities in charge of cluster initiatives.

Project solutions went in the direction of implementing integrated, interconnected, homogeneous networks for maritime technologies and shipbuilding sectors, overcoming obstacles at borders, to facilitate the identification of joint innovation path, promoting network/clustering between SMEs, universities/research centers, port authority related to Blue Growth. The project facilitated the creation of cross-border cluster in blue value chain characterized by wide sectorial variety of main actors (universities/research centers, chambers of commerce, port authority, cluster, manufacturing SMEs in iron/steel, mechanics industry etc.) coupled with high geographical dispersion of same actors.

At a micro level, the project supported the creation of innovation-related knowledge and its transfer to smaller firms that will use such knowledge to reinforce their competitive advantage in the area. At a macro level, the project enhanced the framework conditions for innovation, in terms of institutional cooperation, policy instruments and development of practical cross – linkages between enterprises, R&D institutions, higher education. Hence, the

project did not focus just on supporting the knowledge development and the improvement of the own innovation capacity of single firms, but it also tackled the following three challenges:

- to provide a transnational setting to facilitate the implementation of EUSAIR Action Plan in particular Pillar 1 – Topic 1;
- to exploit the opportunities derived by the Blue and Green Growth approaches related to the comparative advantages of the area;
- to promote clustering policy thanks to the capitalization of the activities and the results of the previous project Blue Tech that was rooted on Blue Growth as a competitive advantage for the Adriatic SMEs, through fostering innovative technology solutions and incentivizing networking activities for the development of common future initiatives.

The project created and reinforced a cooperation network among the PPs and the target groups, by stimulating technological innovation, improving the relationships along the value chain and developing specific pilot communities on selected maritime technologies topics. Further, it tackled the territorial challenges by supporting the competitive growth of regional business to facilitate the realization of product innovation/process, technology transfer, organizational development and management. It also improved the competencies of SMEs located in the area through their inclusion in an open innovation community that valorized their existing best practices and transferred new ones by the mean of focused training sessions.

Finally, the project tackled the territorial challenges by promoting the creation of networking/clustering between the SMEs belonging to the blue value chain at a transnational level, in order to increase the innovation and cooperation levels of the entire sector.

The project enhanced the competitiveness of the firms involved in the blue value chain through new innovation management solutions to adopt blue technologies in a cross-border cluster setting.

On the one hand, the project capitalized research on blue (green) technologies to outline technological innovation frontiers. Based on such inputs, the project created opportunities for knowledge transfer among firms – and other stakeholders - within the blue value chain embracing the different firms' specialization and positions within the value chain.

On the other hand, the project provided a new framework for economic development based on the blue growth related to cross-border cluster initiative.

Based on Italian and Croatian experience of clustering, the project reinforced clustering dynamics sustaining transnational collaboration and agreement to institutionalize business and innovation cooperation in the maritime sector. By allowing firms to self-assess their innovation capabilities and routines and by providing them with benchmarking feedback, the project enhanced the ability of firms to effectively manage their innovation processes.

Despite their geographical proximity, Italy and Croatia have still to explore and to exploit their collaboration potential, especially between research center/Universities and SMEs. There is still a lacking “business resource efficient culture” in the Program Area resulting from a poor involvement of the main stakeholders of the area and scarce interrelation among business, research and public sector.

In order to enhance the current situation of poor cross-border cooperation, the BEAT project identified the main competences that could be provided by each actor of the area and to start sharing the knowhow and best practices. Considering the unbalanced development and the low innovation performance of the area, the joint implementation of the project activities contributed to giving to the Regions and Member States a more informed perspective from which building and reformulating their smart specialization and cluster strategies. The creation of new and solid relationships among the actors involved contributed to strengthening the links between research and innovation in the cross-border Area.

Project results included:

- the development of cross border cluster in blue technologies in the shipbuilding sector across Croatia and Italy in order to support the competitiveness of firms specializing in maritime industry and related sectors (blue value chain) of the territories involved by the project.
- mapping of technological competences of firms belonging to blue sector. Mapping allowed the research team to measure the level of adoption of specific blue technologies; to measure organizational skills and capabilities for managing innovation processes, to identify main training needs firms with specific reference to organisation/management of innovation processes in SMEs; to identify different cluster models can apply in different/specific economic contexts; to identify through an in-depth analysis the strengths and the weakness of targeted

SMEs in relation to their innovation activities; to improve organizational and managerial processes of previous firms in order to allow them to better manage their innovation processes.

- organization of targeted events for knowledge related to innovation opportunities in the field of blue technologies, training on blue technologies involving firms, universities, cluster, chambers of commerce and local and regional authorities.

- development of an analysis of the level of the innovation capabilities of the target firms. Definition of specific in-depth analysis in order to detect the current level of innovation and technologies and proposed tools and strategies to improve their routines and practices for managing innovation related processes.

Experiences/results gained constitute the basis for an effective, practical cooperation among relevant stakeholders.

BEAT project used novel models to improve the ability of involved SMEs to organize and manage their creative and innovative processes. It provided the fodder for wide scale deployment, identified services opportunities for specific action plans to go beyond the project life thanks to the 1 memorandum of understanding for cluster development among firms and other stakeholders.

The transnational cluster continued after the closure of the project, and its durability will be ensured by direct involvement of existing cluster organizations (IT/HR) and associated institutions enabling international networking and further institutional collaborations. The project outputs will support measures for additional financing opportunities profitable investments for improvement, development innovation, research in blue economy sectors thanks at dialogue among different stakeholders.

Main outputs were disseminated and other organisations/regions/countries were informed about the BEAT's results by different means: participations at EU meetings related EUSAIR, participation in other projects. Development plans focused on joint technological R&D aligned between clusters in IT/HR and national level (i.e. Italian transport cluster) and were elaborated to further enhance sustainability and transferability of results. Development of innovation capabilities at a company level is by definition a long-term output that will be exploited well beyond the project duration.

1.2.3. Target groups

SMEs - 60

The BEAT project supported the target SMEs to improve their ability to organize and manage their innovation processes in more effective way. During the implementation of the project the partners in charge for the organization of specific training and events have involve SMEs belong to the sector of the Blue Economy for a mutual knowledge and sharing best practices.

Universities, technology transfer institutions, research institutions - 4

The BEAT project supported the creation of the dialogue with the Universities, technology transfer institutions and offices, research institutions, centres of R&D excellence of the partner countries in order to share the framework conditions of innovation.

NGOs, associations, innovation agencies, business incubators, cluster management bodies and networks – 5

Regarding NGOs, associations, innovation agencies, business sector, cluster management bodies and networks, education and training organization as well as social partner and labour – market institutions: the project opened the dialogue with the above-mentioned target groups in order to disseminate the project's outputs, guarantee a transfer of knowledge and awareness, with specific attention to the development of cross-border cluster.

Regional and local development agencies, chambers of commerce and other business support organisations – 30

The project involved the chambers of commerce the partner Countries involved in the project, in particular involved them in the target activities and the participation at the main relevant project events.

Local, regional and national public authorities – 8

To receive inputs and recommendations for the development of initiatives and actions for the Blue Economy, local, regional and national public authorities were involved. Moreover, the partnership opened a dialogue with the national and regional authorities of the two Countries by inviting them to the main project events.

1.3. BLUE Knowledge Exchange Program and integration of education systems in the cross-border area (BLUEKEP) project

1.3.1. Project description

In the Programme area, Blue Economy value chain (Nautical, shipbuilding, and maritime technologies) represents one of the main socio-economic assets and shows evident potentials for development. However, its potential is currently hampered by barriers related to the regulatory framework of mutual recognition of competences, diplomas and professional paths, and lack of both technical skills and innovation. As regards the lack of technical skills - which is one of the main reasons of lack of innovation – the Secondary Schools are still too much focused on the mere passive transfer of notions, and they are often not able to face the cultural and social challenges of a constantly changing world.

Skill shortages and mismatch in the Programme area are also highlighted by the European Parliament 's study “Labor market shortages in the European Union”. Therefore, the framework conditions for a competitive and innovative blue economy can be improved only through cooperation between innovation players in blue economy relevant sectors. Consequently, BLUE KEP aimed at enhancing the framework conditions for innovation in nautical and maritime sectors within the cooperation area, by strengthening integration of

education systems in the cross-border area through the harmonization of the technical education systems.

This goal was achieved through standardization of school curricula and methods for assessment and recognition of educational and professional knowledge of students. The project contributed to the creation of an integrated educational and professional framework in the Partnership area, leading to increased mobility of knowledge and workforce, and to increased exploitation of the economic potential of the area.

Project overall objective was to enhance the framework conditions for innovation in nautical/maritime sector within the cooperation area, by strengthening the integration of education systems through harmonization of the technical educational systems. This goal was achieved through standardization of school curricula and methods/tools for assessment and recognition of skills at both educational and professional level, building on good practices gained by former KEPASS project. The strategy was to create/strengthen connections among Italian and Croatian educational sectors and productive systems, starting from the technical school system addressed to nautical/maritime technologies. In that way, the project developed new educational and knowledge mobility schemes and professional skills, which contributed to a better exploitation of the innovation existing potential in CB area. The project was therefore fully in line with the Programme priority specific objective.

BLUE KEP innovative character derived from the choice of nautical and technical institutes as main recipients of the project, and student involvement in traineeships. The reason of this choice was that nautical and technical institutes should be considered as a catalyst for innovation and new ideas. Therefore, student mobility enhanced a virtuous cycle boosting “brains circulation”, contributing to the reinforcement of cross-border clusters in the blue economy area and promoting joint development of synergies between enterprises and education centres.

BLUE KEP capitalized on several KEPASS project achievements and outputs: working approach in terms of improvement of reciprocal knowledge and standardization of educational programs and school systems will be exploited and implemented in ship/maritime sectors. This created a long-lasting cross-border network among actors of the quadruple innovation helix in the Programme area and fostered the production of specialized workforce with common recognized skills, able to foster innovation and competitiveness.

The need to achieve innovation shall be fulfilled by ensuring the availability of high skilled resources able to meet SMEs demand in key blue economy sectors. For the above-mentioned reasons, the project aimed to develop an integrated cross border (CB) approach to upgrade and internationalize technical secondary schools and Maritime Technical Colleges that would benefit from knowledge exchange, mobility programs and upgrade of their education offer with additional “international modules”, and, most important, internships in Blue Economy value chain companies. Investing in better education systems fostered competitiveness and dynamism of the CB economy, and aligned skills targeted to the specific labor market need. This contributed to the achievement of the Europe 2020 Strategy’s first pillar (Smart Growth). Availability of qualified workers and an efficient integrated education system are pivotal elements to meet both knowledge and technical needs of maritime/ship companies and to improve their innovation performance.

The added value of the cross-border cooperation in this project stemmed from the promotion of joint implementation of actions focused on shared needs of the Programme area, especially in terms of skills shortages, youth unemployment, lack of innovation and weak competitiveness. Cross-border cooperation was an essential condition to ensure the achievement of project’s main objectives, particularly regarding settling the conditions for effective “brains circulation” across the Programme area and the related improvement of the Area’s innovation, competitiveness and economic performances. All project activities were conducted through a cooperative approach between partners who jointly developed working methods and implemented the planned activities at both local and transnational level. In particular, joint cooperation was essential to set the mutual recognition of professional skills criteria and to pave the way for a joint educational offer through the introduction of common modules in English in the partner schools’ teaching programmes. To this end, a joint discussion was opened to establish a mutual recognition framework for skills and teaching programmes and to approve shared methodological evaluation standards. Thus, all project objectives and methods were based on a cross border rationale, and the project itself could not be realized unless a cross-border cooperation approach was adopted. In other words, the added value of the project’s CB approach stemmed from the exchange of good practices among different education systems which were achieved through the strict cooperation among involved actors. The project enabled the creation of a CB learning and knowledge coordination system,

combining both bottom-up and top-down governance, and its outcomes were presented at national level to let adopt and implement project's good practices on a larger scale.

1.3.2. Key project outputs and results

BLUE KEP was expected to enhance framework conditions for innovation in relevant sectors of the blue economy of the cross-border area. Project results are the direct consequence of main outputs such as agreements among nautical/maritime schools, exchanges of students and teachers and shared education modules. Feasibility and achievement of results were ensured by a set of measures such as the selection of schools really aware on the project action plan, a risk management plan and the subscription of cooperation agreements among schools lasting after the project's end.

A feasibility study was exploited to standardize educational programs and to create a system for mutual recognition of student skills and credits. This aimed at creating integrated high-quality education system.

A school assessment grid was used as a starting point for creating BLUE KEP schools' accreditation criteria and tailoring its contents to the specific characteristics of ship/maritime schools. School selection lead to the signing of Cooperation Agreements between schools that paved the way for long lasting, continuous relations between them.

A student selection grid was exploited and tested and integrated by a section dedicated to the assessment of student school merits in fields related to the nautical sector.

The framework for mutual recognition of skills and competences was revisited, integrated, tested and implemented on the basis of the educational specificities of nautical and technical institutes in order to create future workforce with common recognized skills and credits. This improved companies' competitiveness and increased youth's chances to enter the labor market.

Shared international modules were created, tested and integrated in the involved schools' formal curricula during project implementation in order to pave the way for the standardization of the education programs.

The project produced cooperation agreements, teachers exchanges, 38 student mobility and 38 training programs that not only provided students with valuable educational and professional experience, but they also contributed to providing companies with future specialized labor force. One shared tool for student assessment was created to ensure mutual recognized student mobility evaluation. This contributed to create a better prepared workforce, helping to lower the skills shortages which are often complained by companies.

4 international modules were developed and integrated in school ordinary curricula, contributing to establish a standardized cross border education system. BLUE KEP based most of its methodological approach on the formerly implemented KEPASS project. The project kept the target-oriented approach to secure maximum involvement of stakeholders.

Both project objectives and methods were based on a CB rationale, and the project itself could not be realized without a cross-border cooperation approach. The added value of the project's cross border approach stems from the exchange of good practices among different education systems which were achieved through the strict cooperation among involved actors.

BLUE KEP main results are interlinked and can be summarized as follows:

- improved education system in nautical/ship sector through a standardization of technical secondary schools' curricula between Italian and Croatian educational systems and a better integration with productive sector,
- creation of an effective "region of knowledge" in the CB area, fostering the availability of trained professionals and the circulation of young people.

BLUE KEP kept the target-oriented approach by involving nautical and technical institutes, public decision makers and blue economy companies in order to secure maximum involvement of stakeholders. BLUE KEP adopted, improved and implemented the successful tools developed by KEPASS project and applied them in a more specific context, in order to persuade as many schools and companies involved in the blue economy sector as possible to

join the initiative. This resulted in increasing the student mobility average rate and strengthening and enlarging the cross-border cooperation framework among schools and companies.

The innovative character of the project was related to the choice of nautical and technical schools as main recipient of the project, and students' involvement in traineeships. The reason of this choice is that nautical and technical institutes should be considered as a catalyst for innovation and new ideas. Therefore, student mobility enhanced a virtuous cycle boosting "brains circulation", contributing to the reinforcement of cross-border clusters in the blue economy area and promoting joint development of synergies between enterprises and the education sector knowledge.

Moreover, student participation in traineeships at blue economy companies helped to bridge the skills gap and skills shortages - which are often complained by companies of the Programme area - and enhanced student's chances to find employment in the cross-border area thanks to the recognition of diplomas and concrete professional experience. Fostering cooperation at secondary school level and at blue economy companies' level, enabling knowledge to be converted into new products, processes, behaviors and organizational forms that in turn can enhance economic development and growth, were the most prominent results of the project.

Project specific objective 1 was to encourage standardization of technical schools' curricula & knowledge mobility to support innovation. BLUE KEP encouraged standardization of technical schools' curricula since it outlined, tested and implemented both standardized international education modules for technical education and shared schemes for mutual recognition of course credits in the targeted sector. Standardized education modules had a particular focus on innovation; they were the result of teachers exchange and cooperation agreements of the involved schools; they included training programmes of the apprenticeships in companies of the targeted sector.

Standardized modules and shared schemes for mutual recognition of course credits were necessary to make possible and facilitate the mobility of students between the countries, to strengthen the cooperation among Italian and Croatian educational systems and to pave the way for other IT-HR sectoral exchanges allowing knowledge mobility and supporting innovation and competitiveness of the nautical and ship sectors in the Programme area.

Project specific objective 2 was to increase availability of trained professionals in targeted sector with mutually recognized skills. BLUE KEP actions standardized technical schools' curricula among Italian and Croatian educational systems by taking into account and trying to better meet ship/maritime companies needs in the cross-border area in terms of professional skills (outputs: International modules; Shared schemes for mutual recognition of course credits). Moreover, Italian and Croatian companies were selected and involved in the definition of specific programmes of apprenticeship for students (output: Training Programmes). Students participating in the mobility carried out the apprenticeship in the selected companies of the hosting region, by developing qualitative professional skills and experiencing a different entrepreneurial environment (output: Students' mobility and tools for student assessment). In that way, BLUE KEP improved the professional skills in the maritime and ship sector and increased the availability of trained professionals in the targeted sector in the Programme area

Project specific objective 3 title was to improve CB cooperation among targeted blue economy systems, clusters & complementary specializations. BLUE KEP actions strengthened the cooperation between several Italian and Croatian players of the quadruple helix (policy level, education, companies and young) in the ship/maritime sector. Cooperation Agreements between Italian and Croatian technical schools, outlined international modules & shared schemes of recognition of credits thanks to the involvement of relevant public administrations (regions and Ministries) and training programmes of the apprenticeships in ship/maritime companies have proven the achievement of a durable cross border cooperation among targeted blue economy systems, clusters & complementary specializations.

The main durability and transferability outputs of the BLUE KEP project were teachers' exchanges, durable cooperation agreements among schools, training programmes among schools and companies, students' mobility, international modules and students' common assessment tool. Cooperation agreements among schools were assured by inserting their subscription in the selection criteria of schools.

Outputs durability was also ensured by involving education ministries, which validated project's results and by long-lasting, trust-based network among teachers, built by means of the project actions. Moreover, durability of exchanges was inserted in schools' cooperation

agreements. This system paves the way for similar cooperation projects funded by other national or EU funds.

Outputs transferability was ensured by the involvement of the Adriatic Ionian Euroregion which has an acknowledged experience in capitalization and dissemination of practices and policies aimed at the replicability and transferability of project's results, with particular focus in AIE. Moreover, outputs and results achieved in BLUE KEP were tailored for technical schools in maritime/ship sector, but can be easily fine-tuned for other educational fields such as tourism, hospitality and catering training schools.

20 SMEs training programmes signed with companies will enhance the availability of future professionals with skills tailored to companies' needs. International modules will contribute to standardize education quality standards and to create a high-quality education system. This context provided companies with better prepared workforce, helping to lower the skills shortages often complained by ship/maritime companies. Thus, companies directly received an important support by the project (both project outputs).

27 teachers + 38 students were involved in the exchanges. 43 teachers' exchanges have involved teachers in cross border training activities on the different education system; in addition to direct participation of teachers in the training, the output strengthened the cooperation among schools paving the way for other joint training activities. 7 cooperation agreements among 12 schools were the starting point for students' mobility and 38 students' mobility exchanges were the testing phase to encourage future and joint training initiatives across the programme area: both project outputs contributed to programmes outputs indicator. One tested tool for students' assessment ensured mutual recognized students' mobility evaluation, leading to an increase of participants in training activities.

20 SMEs Training programmes signed with 20 companies enhanced the availability of future professionals with skills tailored to companies' needs. This contributed to the output indicator. 4 international modules contributed to standardize education quality standards and to create a high-quality education system. This context will provide companies with better prepared workforce, helping to lower the skills shortages often complained by ship/maritime companies. Thus, companies directly receive an important support by both project outputs.

1.3.3. Target groups

General public 200

The project involved teachers and young people attending nautical or technical institutes. Young people were the target of the mobility programme, while teachers were involved to standardize the school curricula, to outline international module and to carry out the pilot activities.

Local, regional and national public authorities 4

Projects' results were transferred to the education departments of competent policy levels in order to make them aware of the project's achievements, to transfer, and further implement good practices at large scale at regional or national level by competent authorities.

SMEs 20

The project aimed at creating more efficient synergies between blue economy SMEs and nautical and technical institutes in order to ensure that SMEs fully exploit the potential offered by the transfer of technology. SMEs were involved in the project in the pilot activities (apprenticeships) and in the communication action.

2. Table that identifies the project outputs

The table below is attached as a separate .xls file.

	INVESTINFISH	BEAT	BLUE KEP
TECHNOLOGIES ADDRESSED	Key Enabling Technologies (KET); systematization of information; Exhaustive diagnosis of the innovation background, needs, solutions for fishery & aquaculture; Tailored innovation services; Matchmaking analysis to combine project advanced technologies with actual/real companies' requirements and the effective application of the test over selected & target enterprises; Roadmap to innovation instruments & services, boosting creation of marketable innovative products and/or processes that improved the SMEs potential market positioning	Stimulating technological innovation, improving the relationships along the value chain and developing specific pilot communities on selected maritime technologies topics; Supporting the competitive growth of regional business to facilitate the realization of product innovation/process, technology transfer, organizational development and management	Integration of education systems in the cross-border area through the harmonization of the technical education systems. A school assessment grid was used as a starting point for creating BLUE KEP schools' accreditation criteria and tailoring its contents to the specific characteristics of ship/maritime schools. School selection lead to the signing of Cooperation Agreements between schools that paved the way for long lasting, continuous relations between them. A student selection grid was exploited and tested and integrated by a section dedicated to the assessment of student school merits in fields related to the nautical sector. The framework for mutual recognition of skills and competences was revisited, integrated, tested and implemented on the basis of the educational specificities of nautical and technical institutes in order to create future workforce with common recognized skills and credits. This improved companies' competitiveness and increased youth's chances to enter the labor market.
TARGET GROUPS AND STAKEHOLDERS	1. General public; 2. Local regional and national public authorities; 3. SMEs; 4. Universities, technology transfer institutions, research institutions; 5. Centers of excellence	1. SMEs; 2. Universities, technology transfer institutions, research institutions; 3. NGOs, associations, innovation agencies, business incubators, cluster management bodies and networks; 4. Regional and local development agencies, chambers of commerce and other business support organisations; 5. Local, regional and national public authorities. Involvement of firms for the creation a cross-border cluster in shipbuilding and maritime sector; involvement of research institutions participating in cross-border innovation initiatives, cross-border training activities on blue technologies, depth analysis to the selected SMEs for their innovation capabilities to improve their organizational and managerial routines to better manage their innovation processes.	1. General public; 2. Local, regional and national public authorities; 3. SMEs. The choice of nautical and technical institutes were main recipients of the project, and student involvement in traineeships.
STRATEGIES/ METHODOLOGIES APPLIED	Strengthening of competitiveness of F&A production system, through promotion of investment programs aimed at acquisition of innovation services instrumental in the development of innovative entrepreneurship programmes, intellectual property management, support for design, use and organizational upgrading; Implemented pilot actions providing several IT-HR F&A SMEs with a roadmap to innovation instruments & services, boosting creation of marketable innovative products and/or processes that improved the SMEs potential market positioning; Involvement of Cross-border innovation network to enhance excellence, cross-sectoral cooperation, innovation level, R&D-firms know-how transfer to capitalize research in marketable results; Deliver a concrete support in the evaluation of new solutions marketability and its potential market positioning, by delivering extensive services to help developing the business model and further create start-ups and spin-off	Developing a transnational cluster in blue technologies in shipbuilding sector and sectors related to blue value chain; mapping/assessing conditions enabling the development of transnational cluster; networking to facilitate collaboration and knowledge; definition of appropriate transnational cluster governance model to support the sustainability on cluster; identification models ability to organize/manage their creative and innovative processes in a more effective way; revision of innovation strategies	Standardization of school curricula and methods for assessment and recognition of educational and professional knowledge of students; The creation of an integrated educational and professional framework in the Partnership area, leading to increased mobility of knowledge and workforce, and to increased exploitation of the economic potential of the area; The strategy was to create/strengthen connections among Italian and Croatian educational sectors and productive systems, starting from the technical school system addressed to nautical/maritime technologies
MODERNITY OF RESULTS	Creation of marketable innovative products and/or processes that will improve SMEs potential market positioning; Accelerated time to market, increased linkages with innovators, increased F&A enterprises' R&D expenditures in new & greener components/technologies/services, boosted HR-IT competitiveness, etc	Strengthening innovation processes of main economic actors and cooperation levels between SMEs, cluster and research centers/universities operating in IT and HR, as qualified segments of shipbuilding and maritime sectors and of "blue value chain" and creation of a cross-border cluster in maritime and shipbuilding sectors including operators of other sectors operating in the same value chain, to help SMEs operating in this sectorial space ("blue value chain") to improve their ability to organize and manage their innovation processes in more effective way. The project enhanced the competitiveness of the firms involved in the blue value chain through new innovation management solutions to adopt blue technologies in a cross-border cluster setting. In order to enhance the current situation of poor cross-border cooperation, the BEAT project identified the main competences that could be provided by each actor of the area and to start sharing the knowhow and best practices.	New educational and knowledge mobility schemes and professional skills, which contributed to a better exploitation of the innovation existing potential in CB area. The project developed an integrated cross border (CB) approach to upgrade and internationalize technical secondary schools and Maritime Technical Colleges that would benefit from knowledge exchange, mobility programs and upgrade of their education offer with additional "international modules", and, most important, internships in Blue Economy value chain companies. The added value of the cross-border cooperation in this project stemmed from the promotion of joint implementation of actions focused on shared needs of the Programme area, especially in terms of skills shortages, youth unemployment, lack of innovation and weak competitiveness. Project results are the direct consequence of main outputs such as agreements among nautical/maritime schools, exchanges of students and teachers and shared education modules.
FEASIBILITY EVALUATION	Increase of Innovation potential of F&A enterprises of IT-HR Regions, due to the application of new technologies and adoption of a new model of innovation management; Innovative solutions with particular focus on sustainability were adopted by the SMEs (tested by enterprises of F&A in the IT-HR area); Improved mechanisms on access to financing for KET implementation - introduction and capacity building action of novel label for INNOVATION Voucher scheme in the regional innovation facilitators for transferring specific knowledge and competences on the financing streams for SMEs	Project solutions went in the direction of implementing integrated, interconnected, homogeneous networks for maritime technologies and shipbuilding sectors, overcoming obstacles at borders, to facilitate the identification of joint innovation path, promoting network/clustering between SMEs, universities/research centers, port authority related to Blue Growth. The project facilitated the creation of cross-border cluster in blue value chain characterized by wide sectorial variety of main actors (universities/research centers, chambers of commerce, port authority, cluster, manufacturing SMEs in iron/steel, mechanics industry etc.) coupled with high geographical dispersion of same actors. Project results included: the development of cross border cluster in blue technologies in the shipbuilding sector across Croatia and Italy, mapping of technological competences of firms belonging to blue sector, organization of targets events for knowledge related to innovation opportunities in the field of blue technologies, and development of an analysis of the level of the innovation capabilities of the target firms.	Feasibility and achievement of results were ensured by a set of measures such as the selection of schools really aware on the project action plan, a risk management plan and the subscription of cooperation agreements among schools lasting after the project's end. A feasibility study was exploited to standardize educational programs and to create a system for mutual recognition of student skills and credits. This aimed at creating integrated high-quality education system. Student mobility enhanced a virtuous cycle boosting "brains circulation", contributing to the reinforcement of cross-border clusters in the blue economy area and promoting joint development of synergies between enterprises and the education centres. The project enabled the creation of a CB learning and knowledge coordination systems, combining both bottom-up and top-down governance, and its outcomes were presented at national level to implement project's good practices on a larger scale.