WP4 – Deliverable 4.3.4
Innovation services preliminary feedback from companies
STEP 2

Deliverable Number D.4.3.4

Project Acronym	INVESTINFISH
Project ID Number	10042901
Project Title	Boosting INVESTments in INnovation of SMEs along the entire FISHery and aquaculture value chain
Priority Axis	1 – Blue innovation
Specific objective	1.1 – Enhance the framework conditions for innovation in the relevant sectors of the blue economy within the cooperation area
Work Package Number	4
Work Package Title	Testing innovative solutions and assessing effectiveness
Activity Number	4.3
Activity Title	Providing SMEs with a roadmap to innovation instruments and services
Partner in charge	LP – T2i
Contribution by	
Partners involved	LP – T2i
Status	Final
Distribution	Private

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INVESTINFISH PROJECT

INVESTINFISH - "Boosting INVESTments in INnovation of SMEs along the entire FISHery and aquaculture value chain" is a project funded by the Italy – Croatia CBC Programme under the Priority Axis 1 "Blue Innovation", Specific Objective 1.1 (S.O.1.1) "Enhance the framework conditions for innovation in the relevant sectors of the blue economy within the cooperation area".

INVESTINFISH sees the cooperation of n. 6 Partners from 5 Different Regions: T2I (LP – Italy – Veneto), Sviluppo Marche (PP1 – Italy – Marche), D.A.Re. Puglia (PP2 – Italy – Puglia), Punto Confindustria (PP3 – Italy – Veneto), Istrian Development Agency (PP4 – Croatia – Istria), Zadar County Rural Development Agency (PP5 – Croatia – Zadar).

INVESTINFISH main objective is strengthening of competitiveness of F&A production system through promotion of investment programs aimed at acquisition of innovation services. INVESTINFISH implements pilot actions providing some IT-HR F&A SMEs with a roadmap to innovation instruments & services, boosting creation of marketable innovative products and/or processes that will improve the SMEs potential market positioning.

Expected benefits for enterprises are: accelerate time to market, increase linkages with innovators, increase F&A enterprises R&D expenditures in new & greener components/technologies/services, to boost HR-IT competitiveness. INVESTINFISH intends also to offer to 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.

Pilot cases were the heart of the INVESTINFISH project: 48 companies (8 for each region engaged by the project) were selected to act as a testbed to evaluate the feasibility and the impact of possible innovation.

The innovation to analyse was suggested by each company, ensuring that they fully reflect real-world company needs.

APPROACH

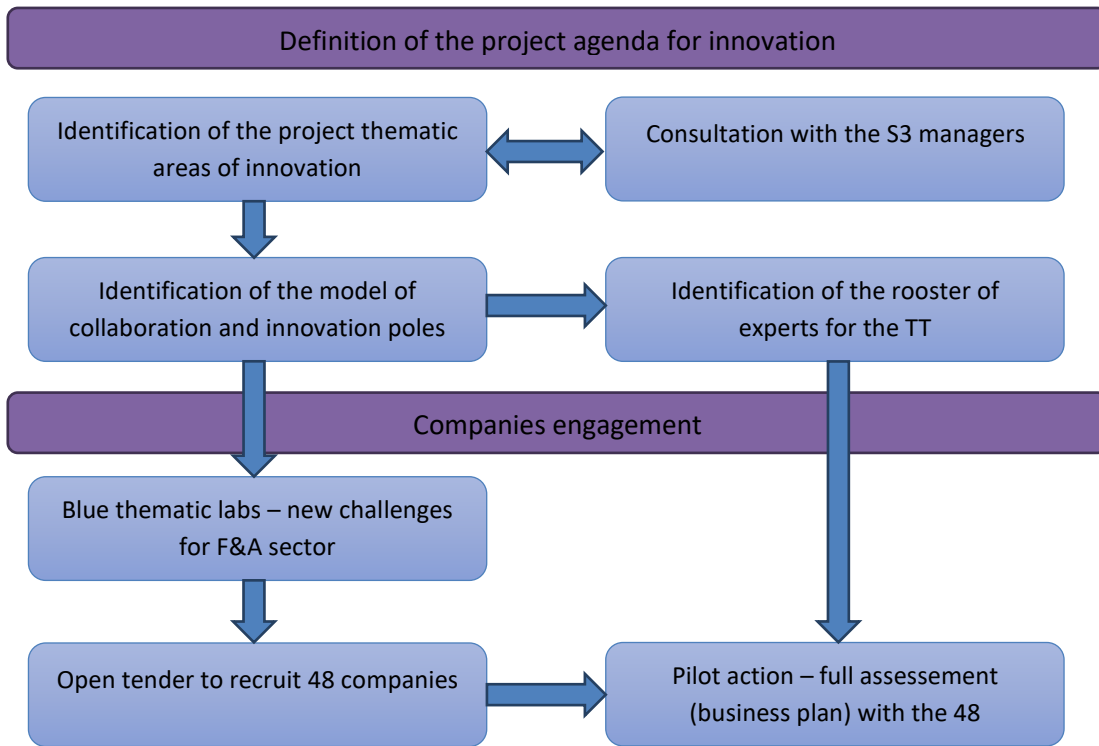The following figures summarise the approach to the pilots.

Figure 1 - Approach of pilot cases

OUTCOME OF PILOT CASES

The pilots gave very interesting feedbacks about needs and requirements in the F&A sector.

In the following, we refer as "innovation projects" as the actions that were hypothesised and analysed in the feasibility/impact/risk analysis that were conducted in each of the 48 pilots.

The areas of the innovation projects address different processes within the F&A supply chain, from fishing/farming (57%) to transformation (27%), logistics (2%), and commercialization (14%).
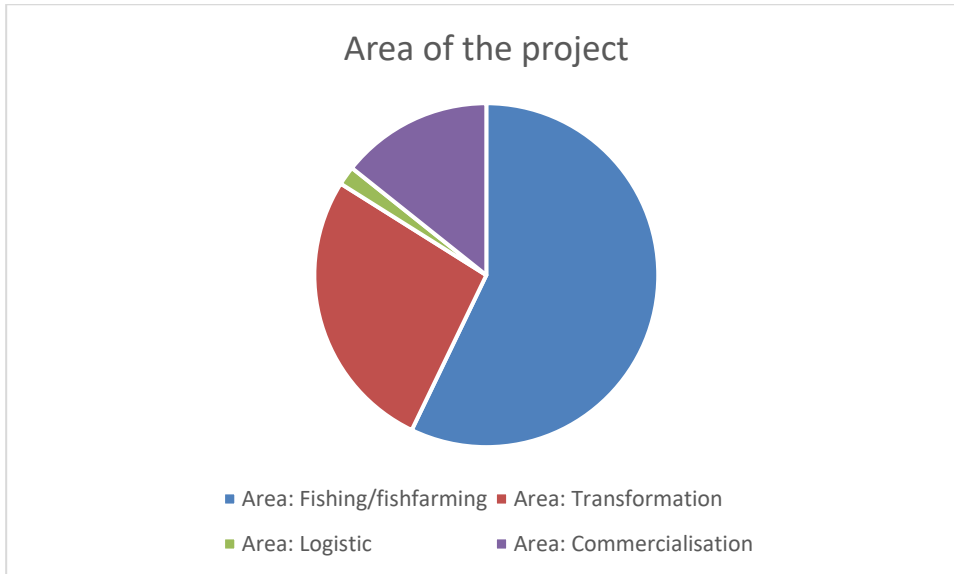

Figure 2 - Area of the innovation projects

The benefits expected by the innovation projects can be organised in four categories: cost reduction (48%), accesso to new markets (69%), sustainability (69%), increasing added value (38%). Note: more than one benefit could be associated to an innovation project.
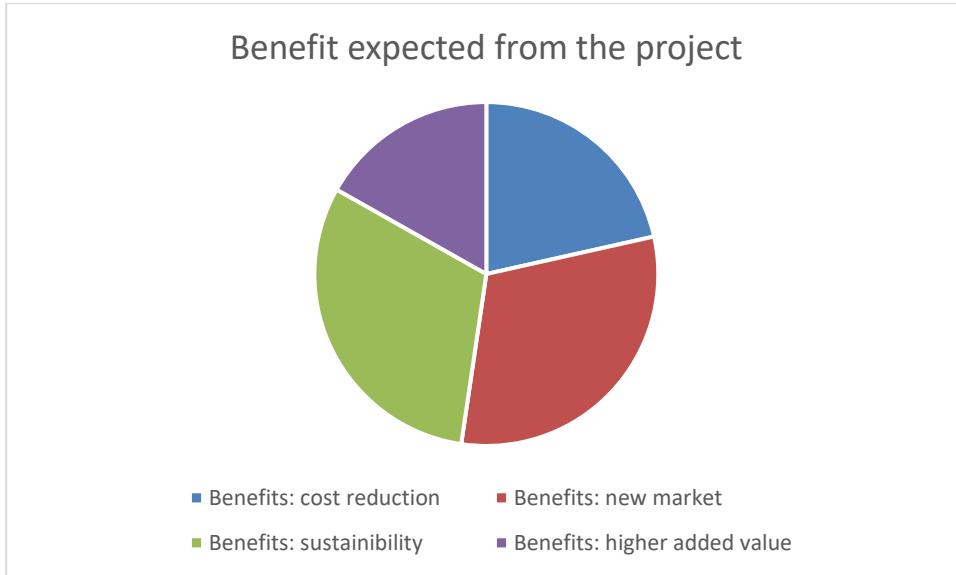
Figure 3 - Benefit expected from the innovation projects

Most innovation projects focused on a high Technology Readiness Level. This aspect will be discussed in detail in the Recommendation section of this document.
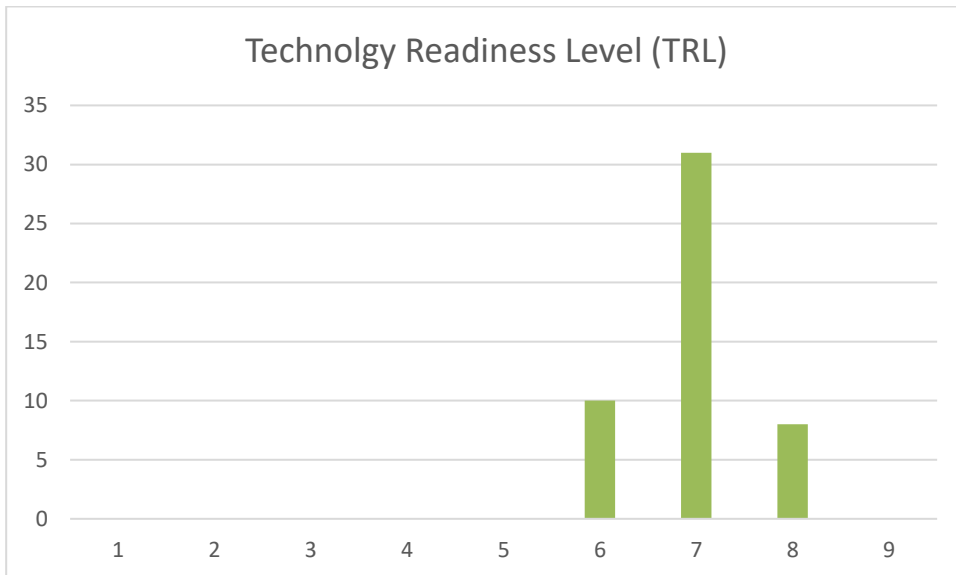

Figure 4 - Technology Readiness level of the innovation projects

Comparison Italy-Croatia

While there are differences in the subdivision of the innovation project areas of the pilots and of the benefits expected, there is no contradiction between the results on the Italian and the Croatian side, therefore we can conclude that the general trends are common among all the Italy-Croatia Programme area.
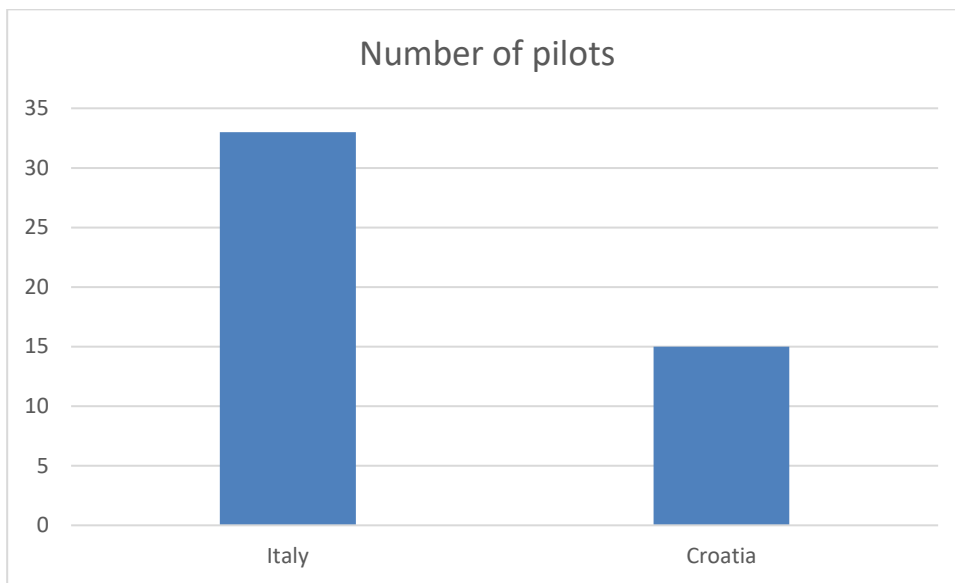

Figure 5 - Number of pilots in Italy and Croatia

Projects Area - Croatia

- Area: Fishing/fishfarming
- Area: Transformation
- Area: Logistic
- Area: Commercialisation
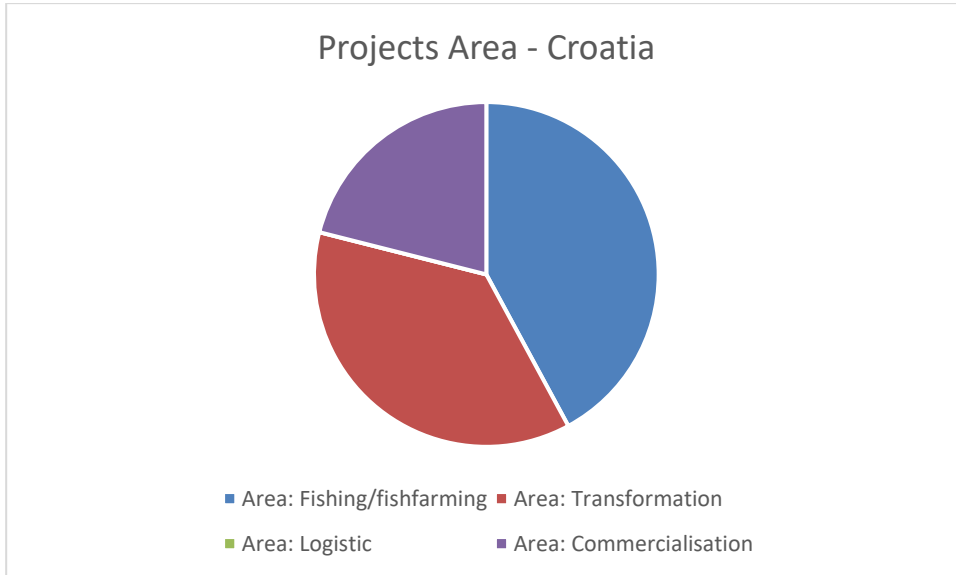
Figure 6 - Area of the innovation projects in Croatia

Projects Area - Italy

- Area: Fishing/fishfarming
- Area: Transformation
- Area: Logistic
- Area: Commercialisation
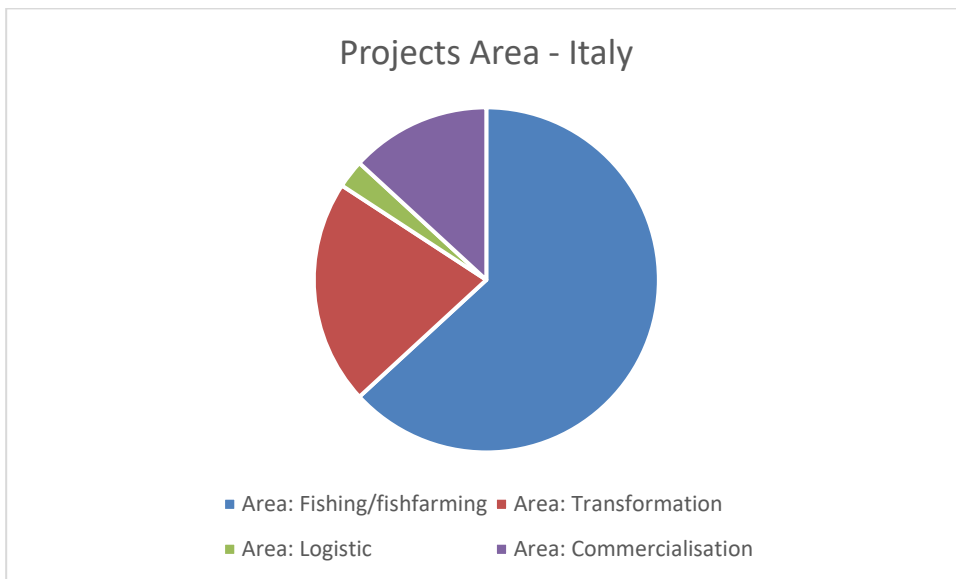
Figure 7 Area of the innovation projects in Italy

Expected Benefits - Croatia

- Benefits: cost reduction
- Benefits: new market
- Benefits: sustainibility
- Benefits: higher added value
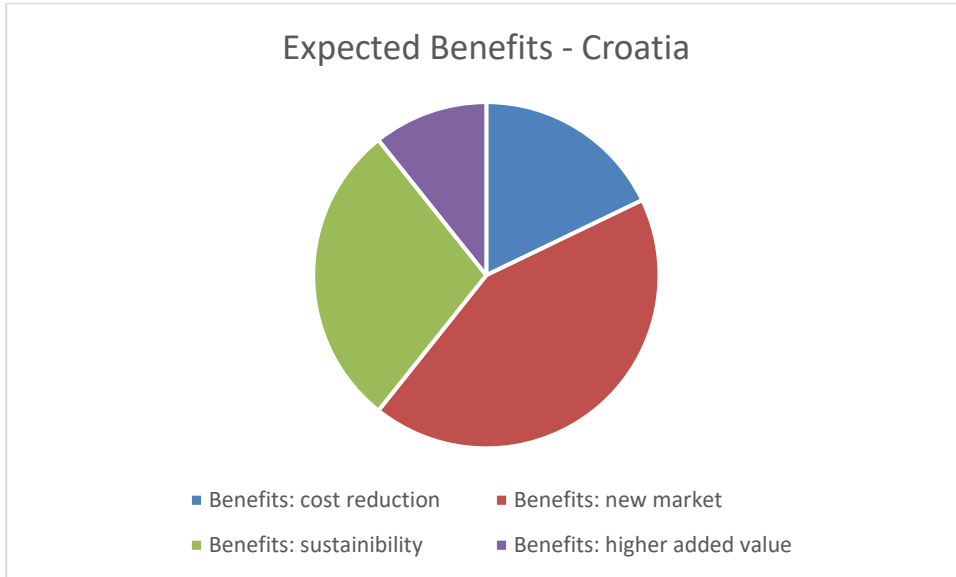
Figure 8 - Expected benefit from the innovation projects in Croatia

Expected Benefits - Italy

- Benefits: cost reduction
- Benefits: new market
- Benefits: sustainibility
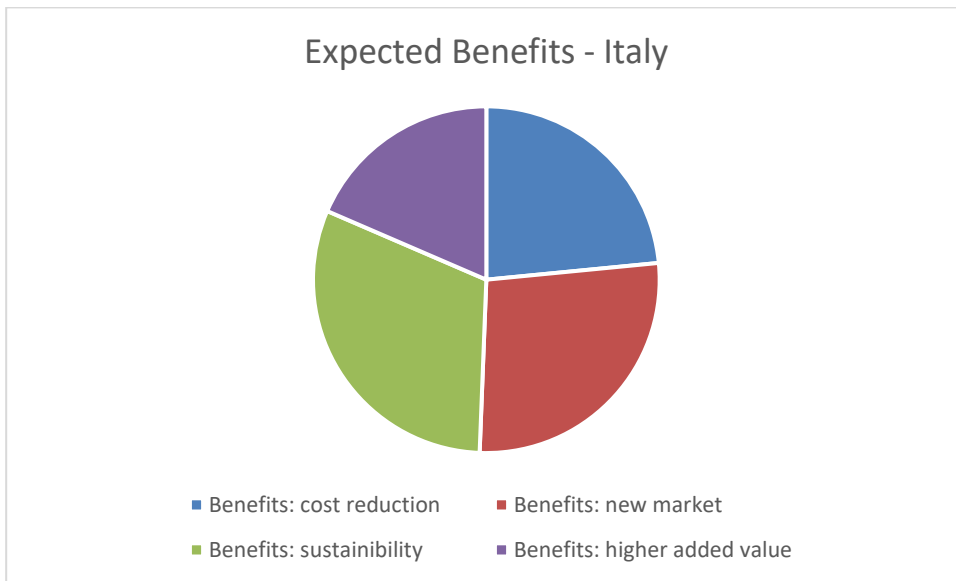- Benefits: higher added value

Figure 9 - Expected benefit from the innovation projects in Italy

Case analysis by project's area

Analysing the innovation projects by project area provides further interesting elements. While we can expect that a high percentage (47%) of project focused on commercialisation aim at new markets, it is relevant that most innovation projects focused on the transformation phase aim also at entering new markets (38%), secondly at sustainability (25%) and only 22% on increasing the added value. This shows that most companies are looking at innovation "to do more of the same" rather than to "do something new".
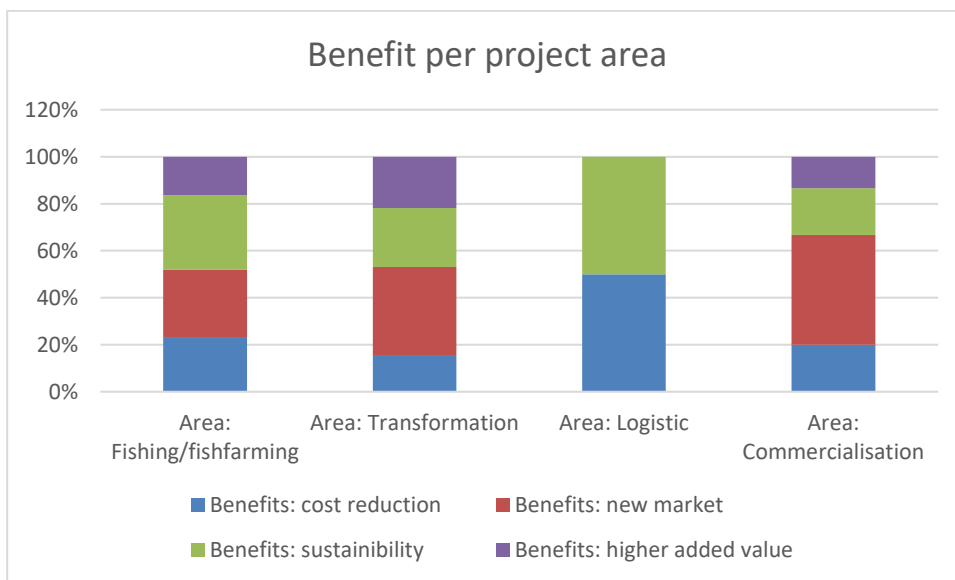

Figure 10 - Benefit expected divided per innovation project area

The breakdown of the TRL per innovation project area provides some insight. In the commercialisation area there is a greater focus on adopting solutions that are new for the company but already existing in the state of the art. This was even more evident in the logistic area, but in this case, we should be aware that the data can be biased as only few cases belonged to it.
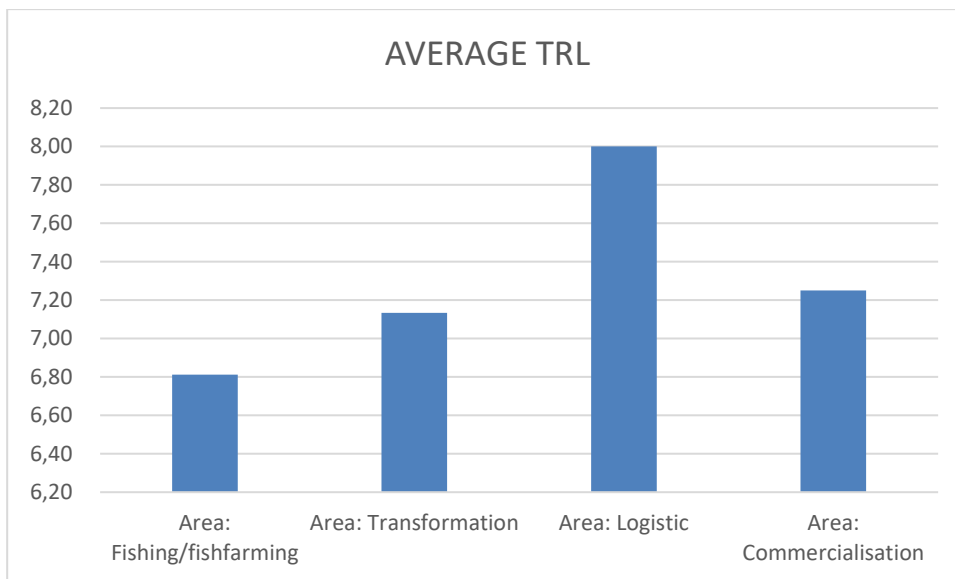
Figure 11 - TRL per innovation project area

The time estimated for implementation varies depending on the area of the innovation projects. There is a strong correlation with the average TRL of the innovation project, as it is reasonable since innovation with low TRL need more time to be implemented. However, it is important to notice that one should not take for granted that companies are aware of this correlation, therefore the fact that the results demonstrate awareness on this topic is an important outcome.

Another factor is that companies that focus on fishing and fish-farming must respect the constraints dictated by seasonality (that can be caused both by fish lifecycle, and by festivities that create a strong demand). Companies need to avoid the risk of being caught halfway in the implementation of innovation. Therefore, they may prefer to postpone implementation to next season to have all the time needed to implement it.
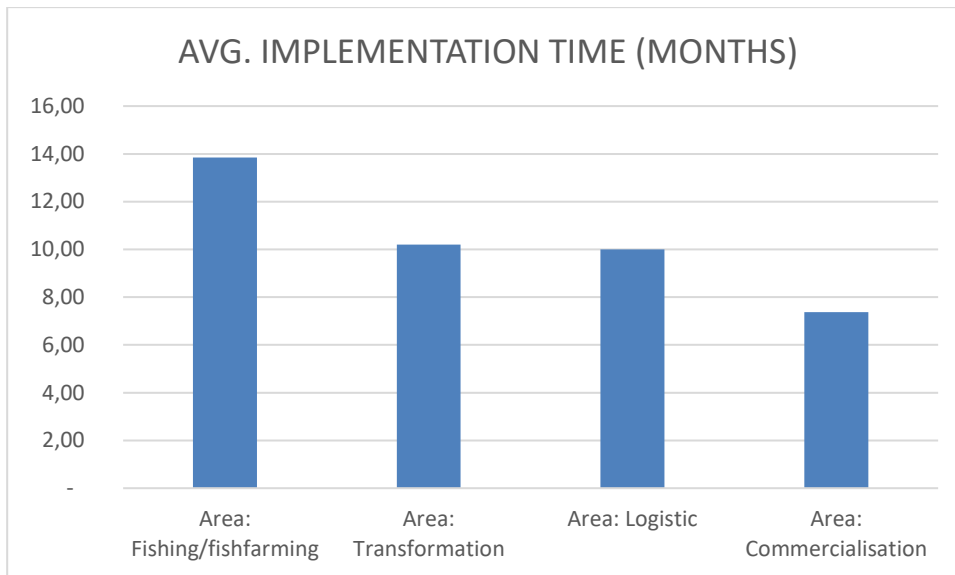
Figure 12 - Average Implementation time per innovation project area

The value of the innovation project varies vastly from one project to another (there were no constraints from INVESTINFISH side on the "size" of the projects to be analysed), ranging from few hundred euros to several millions. The largest projects, on average, are in the fishing and transformation area, while the commercialisation appears to require much smaller investments.

It is worth noticing however that very low projects' value may be a symptom of an inability of the companies to correctly approach the planning and estimation processes: in particular, they appear to consider only external costs, without taking into account the internal personnel effort. This bias is quite common in smaller companies, as they are often unaware of how much effort they actually dedicate to R&D, and in general they are not used to breakdown how the personnel time is employed.

AVG. INV.VALUE
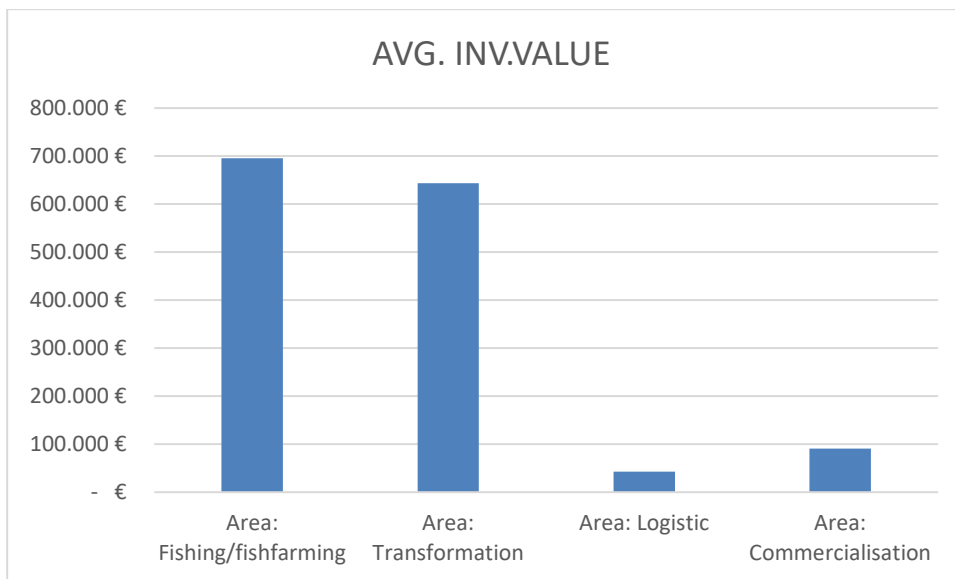
Figure 13 - Average Investment Value per innovation project area

Case analysis for benefits expected

We conducted the same analysis grouping the projects based on the benefit expected. It should be noted that more than one benefit could be associated to one project.

Looking at the average TRL, we have the highest when access to new market is expected: in this case, the project usually focuses on existing technologies (or at least existing on different markets), that the company wants to implement to reach the market more efficiently.

Oppositely, the lower average TRL is associated to the search for higher added value. This is quite positive, as it shows that companies look for custom solutions to increase their activity's added value, instead of looking for "easy, standardised solutions" (that likely would not be effective).
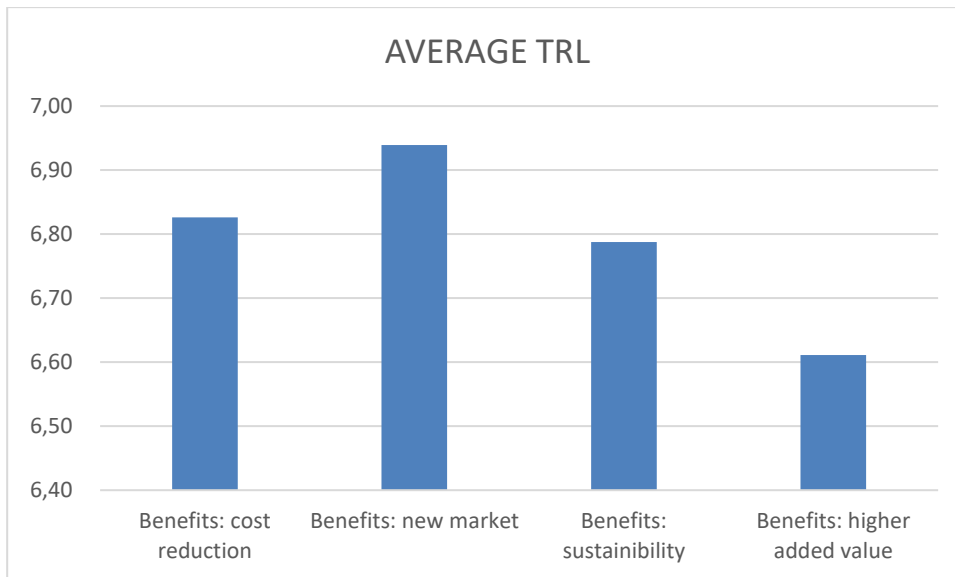
AVERAGE TRL

Figure 14 - Average TRL per benefit expected

Innovation projects focused on higher added value have a shorter average implementation time than other categories. This may appear contrary to expectations (given the lower TRL), but the explanation is also that this category of innovation projects focuses on immaterial elements, that can be implemented quicker than actions that impact on material processes.

AVG. IMPLEMENTATION TIME (MONTHS)
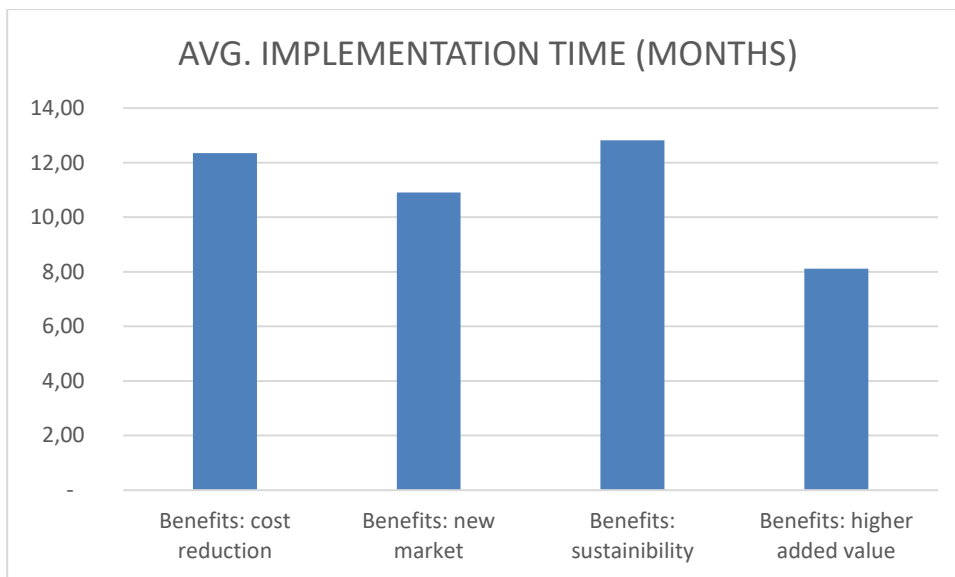
Figure 15 - Average implementation time per benefit expected

The average investment value of the innovation projects is related to the need of material investments, that is lower for accessing new markets (as the focus is usually digital tools) and increasing added value (that usually impacts mainly on business models, but since the TRL is lower, an higher investment is in proportion required).
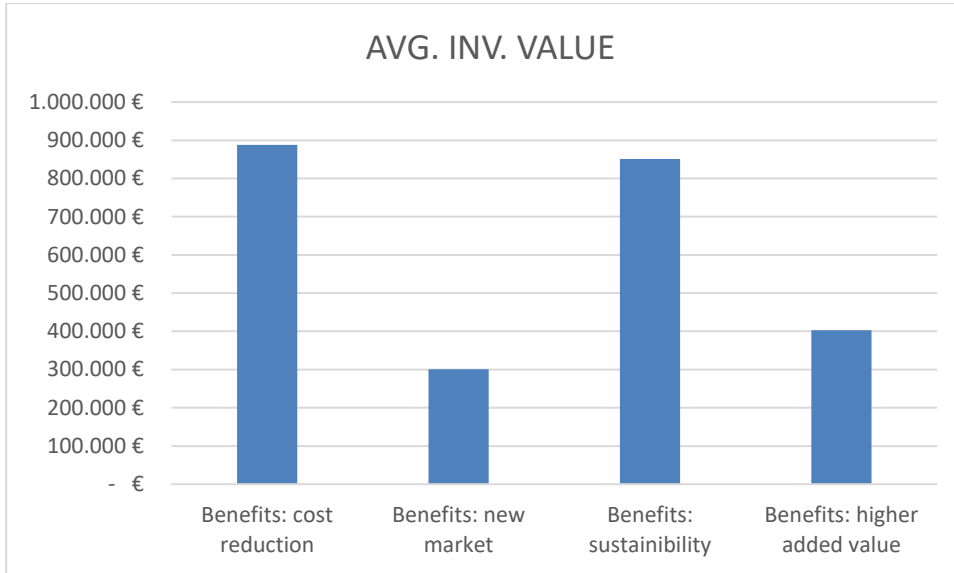
Figure 16 - Average investment value per benefit expected

Strengths

Figure 17 - Innovation projects strengths - keywords

Looking at the strengths of the innovation projects, they can be traced back to specific key elements (that should be considered by policymakers):

- **Increased sustainability**: reduce environmental impact, reduce energy consumption implement circular processes.
- **Develop the product value:** better promote the product, valorise local typicality, improve the product quality, increase the perceived value by the customer.

Weaknesses

Figure 18 - Innovation projects weaknesses - keywords

The main innovation projects' weaknesses are related to the **operator's skill and competences**. Adopting new processes and innovative technologies requires different skills by operators, and this may be challenging in the fishing and aquaculture sector.

Further weaknesses are related to environmental factors outside the company's control: projects rely on the implementation of general policies, including support to valorise typicality and support local market demand.

Opportunities

Figure 19 - Innovation projects opportunities - keywords

Opportunities are mostly related to the improvement expected in general for technology, environment, and product perception.

Figure 20 - Innovation projects threats - keywords

Threats are related mostly to uncertainty about future of technology, environment (climate change), and difficulties to estimate precisely the actual impact of innovation.

PATHS TO BENEFITS

The pilot actions allow to create a roadmap that links the desired benefit with the possible actions needed to reach it. Most innovation projects have a (greater or smaller) focus on the re-use of by-products and the reduction of wastes. Indeed, companies currently have to pay to discard wastes, and therefore becoming able to sell it would have huge benefits for the company. This

Benefit	How to Reach it

Cost Reduction	➜ Change/update equipment
	    o Implement digital technologies
	    o Implement more efficient equipment
	➜ Reduce wastes
	    o Improve environmental conditions (reduces wastes)

	o Transform waste in secondary products
	➔ Optimise processes
	     o Analise processes and get rid of inefficiencies
	     o Optimise transport

New Markets	➔ Develop new products
	     o Focus on traceability and quality
	     o Diversify production
	     o Find uses for waste
	➔ Get in touch with new customers
	     o New commercial channels
	     o Digital technologies (website, social networks)

Sustainability	➔ Transform waste in secondary products
	     o New uses of current waste
	     o Better separation of waste to recover valuable parts
	➔ Implement a management system to monitor the environmental impact of activities
	     o Certifications
	     o Traceability
	➔ Reduce packaging's impact

Higher Added Value	➔ Increase value of by-products
	     o Better marketing for by-products
	     o Better processing of by-products
	➔ New/improved products
	     o Better match with consumers' desires
	     o Digital technologies to monitor quality

Figure 21 - Main benefits and how they were reached

POTENTIAL BIAS IN PILOTS

While we expect that the pilots' results are fully representative of the F&A enterprises needs and approaches in the IT-HR area, we are also aware that some external elements could have impacted on the outcome of the pilots.

- The risk-averse attitude may also have been increased by the situation created by the Covid-19 pandemic, which increased uncertainty and reduced the resources available to companies.

- Furthermore, it was found that larger companies showed limited interest in participating in the pilots. There were two explanations for this attitude:
    - Resistance to sharing information with respect to company interests/objectives with external parties.
    - Difficulty in identifying which internal party could act as an interface for the pilot (as competences relating to process, administrative, purchasing, etc. aspects are "scattered" among several parties).

KEY RESULTS

F&A companies appear to be interested in innovation projects/paths that have a high Technology Readiness Level (7+, i.e. that have passed the Demonstration phase of a system prototype in the operating environment). None of the companies in the pilot cases showed interest in solutions at a "low" maturity stage (TRL 3-6).

This trend is strongly linked with other factors emerged from the pilots:

- **High risk aversion** of fisheries companies, and in particular smaller ones.
- **Limited economic resources**, which makes it preferring investments at reduced risk and shorter return time.
- **Limited time available**, as many MSMEs are characterised by very intense periods of work that do not allow to focus on anything other than operational activity.
- **Limited forecasting skills**, i.e. many to companies, especially smaller ones, are not used to analytical analysis of investment projects.

Risk aversion of the F&A SMEs

F&A companies, and in particular smaller ones, are strongly risk averse. In an investment in innovation, risk relates to factors such as:

- **Actual effectiveness** of the new solution.
- Actual **Total Cost of Ownership** of the implemented solution.
- Actual **revenues** or **lower costs** generated by the solution.
- Effective investment **return time**.
- Possible positive/negative **externalities**.
- Uncertainty between (initially) **estimated values** of the various indicators and actual values.

Limited economic resources

Smaller enterprises have fewer resources (financial and otherwise). This pushes towards a preference for investments with:

- reduced risk
- shorter return time

Limited time available

In the case of F&A SMEs, time available deserves to be discussed specifically. Many enterprises in this sector are characterised by very intense periods of work that do not allow to focus on anything other than operational activity. Moreover, these periods are dictated by external factors (especially seasonality – both due to the aquaculture lifecycle and demand), which represent irremovable constraints for the enterprise: any changes to business processes must be completed and debugged before the peak period, failing which there is a risk of serious economic damage.

Limited analytic planning skills

The pilot cases showed that F&A SMEs have limited economic forecasting skills, i.e. most companies (especially smaller ones) are **unfamiliar to the analytical analysis of investment projects**: in many cases, there was some difficulty in estimating possible costs and revenues, and defining success indicators for the project.

Almost no company was able to carry out a scenario analysis, which should be a quite well-known and well-established approach to analysis of investments with elements of uncertainty. This creates an additional barrier towards innovations (and investment in general) that present a risk element.

Supply chain scope

It is clear from the pilot cases that many innovation actions desired by the MSMEs in the fisheries and aquaculture sector require the **involvement of other actors in the supply chain**.

For example, the increased attention to the environment is pushing some companies in the sector to be interested in bioplastic materials for use in packaging. The advantage of this material is that in theory this material is compostable, thus minimising its environmental impact. However, only a small part of

the existing composting plants can degrade compostable plastics, and this material therefore ends up in landfill or incineration. The lack of an ecosystem therefore prevents the effectiveness of innovation.

More generally, MSMEs (also because of their size) are often verticalized to a specific stage in the supply chain and carry out only part of the process in which they are involved. The effective adoption of innovation therefore also requires the involvement of other actors upstream or downstream in the supply chain.