Review session on pilot action final report

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D.5.3.2

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1. Introduction

1.1. Deliverable description

The deliverable 5.3.2 "Review session on pilot action final report" aims to summarise all activities implemented, problems encountered and, most of all, the results achieved by the Pilot Actions (PA) that have been carried out by the involved Partners of FRAMESPORT Project. The description is taken from the final reports drafted by the Partner responsible for the PA development. In the introductive section of this deliverable, some generalities are resumed from the consolidated documentation in order to introduce the classification of the PAs, according to which following sections are structured. In particular, the following aspects are reported for each PA:

- Aim of pilot action
- Main outcomes

1.2. Clustering of the pilot actions

The aim of the pilot actions is to test technical solutions and experimental initiatives to identify innovative paths to solve existing problems and to drive small ports towards a sustainable growth. Partners involved in the project are responsible for one or more pilot actions that fall into specific macro-themes. As described in the deliverable 5.1.1 "Pilot action development methodology" the 25 PAs are grouped as follows (Figure 1-1) by their macro-theme, and, in the ICT case, by their sub-topic:

- ICT application and service development (ICT)
    - o Promotion of ports' resources and territory
    - o Monitoring of seaside and landside port areas
    - o Management of port operations and services
    - o Harbour and navigation safety
- Spatial planning and management (P&M)
- Business oriented aspects
- Training and knowledge aspects (T&K)
- Environment and energy aspects (E&E).
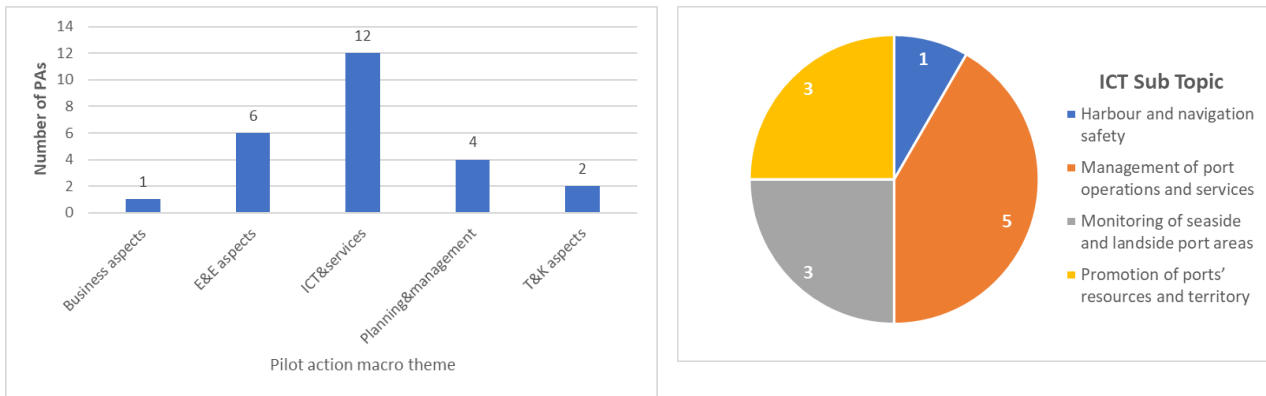
Figure 1.2-1 Macro-themes of the Pilot Actions and ICT sub-topics

2. Contributions from Project Partners

2.1. ICT application and service development

2.1.1. Harbour and navigational safety

PA 3.3 – Development of a meteo-oceanographic forecasting system for sea shipping activities - PP3 ASSET, PP13 CMCC

The aim of the pilot action "3.3 - Harbour and navigational safety: development of a meteo-oceanographic forecasting system for sea shipping activities" is to improve safety conditions of harbours and navigation. It acts on the macro theme "ICT applications and services development". The purpose is to develop a meteo-oceanographic forecasting system based on atmospheric forecasts and hydrodynamic forecasts and VISIR ship routing for sea shipping activities.

The modelling activities of the meteo-oceanographic forecasting for the pilot ports are finalized and the model is running operatively, as reported for port of Otranto, Trani and Vieste in Figure 1, Figure2 and Figure 3 respectively. For all cases the main variables provided by the systems are currents, salinity, temperature and waves. The models are available at https://otranto.cmcc.it/ for the port of Otranto and at https://soap.oceanity.eu/ for the ports of Vieste and Trani.

The ship routing system is based on a python software called VISIR (https://www.cmcc.it/models/visir). It is a numerical model for computing optimal maritime tracks, based on a graph-search method and uses dynamic meteo-oceanographic fields for computing optimal maritime tracks. The vessel's sea-keeping and emissions are based on mathematical models that take into account ocean currents, surface gravity waves and wind. The forecasts are used to

identify the tracks that minimise distance, navigation time and CO2 emissions. The service is available at https://www.frame-visir.eu/. Two examples of the information provided are presented in Figure 4 (sailboat) and Figure 5 (motorboat).

2.1.2. Management of port operations and services

LP 2 – Set of ICT tools (DSS) about the quality of service within the Programme Area to support competitiveness and sustainability of small ports - LP CORILA

The FRAMESPORT DSS – called STEADFAST (System fosTEring sustAinable Development oF Adriatic Small porTs) - serves as a decision support system specifically tailored to the needs of the FRAMESPORT project. By providing essential data, analysis, and a user-friendly interface, this comprehensive toolbox acts as a powerful resource to enhance decision-making processes and guide strategic actions.

The project has achieved significant results that have contributed to the success of the developed Decision Support System (DSS). Below are six key outcomes with a significant impact within the context of the FRAMESPORT project:

- Development of a comprehensive and intuitive DSS: The project has led to the creation of a DSS that provides valuable recommendations and information primarily for users (luxury, adventurous, and family travellers) as well as for expert users. This has allowed both user groups to benefit from a sophisticated and user-friendly system.
- Intuitive user interface: Special attention has been given to designing an intuitive user interface for the DSS. This has greatly improved the overall user experience, enabling easy navigation among the various system functionalities and ensuring optimal usability.
- Testing and validation: Comprehensive testing and validation procedures have been conducted to ensure the reliability and accuracy of the DSS. Through these processes, bugs, issues, and inconsistencies have been identified and resolved, enhancing the system's stability and usability.
- Pilot actions: The DSS was implemented in the specific Adriatic basin to evaluate the effectiveness of the system in real scenarios. Relevant data has been collected and integrated into the DSS, enabling the simulation of potential scenarios and the assessment of the impacts of decisions made.
- Stakeholder involvement: Expert users, luxury travellers, adventurous travellers, and family travellers have been actively involved in the testing and development process of the DSS.

Their valuable feedback has contributed to improving the system, ensuring that it meets their specific needs and expectations.

These outcomes highlight the successful completion of a comprehensive and iterative process to develop and enhance the Decision Support System within the FRAMESPORT project.

PA 3.2 – Regional ports networking and their connections: Promotion of the territory, ICT app for boat berth booking services, marine connectivity (sailboat) - PP3 ASSET

The aim was to develop a mobile App that collects booking services and technical information for all port networks is improving cultural and touristic aspects of Apulian Region, making them accessible by maritime tourists; improving connections among ports and the internal parts of the region; creating an ICT application that collects booking services and technical information for all port networks; improving maritime connectivity, also regarding sailboat activities.

The webApp is called **FramesportPuglia**, available on https://www.framesportpuglia.eu/framesport/, is a free multilanguage Portal in which boaters and yachtsmen can easily find useful information related to navigation, boat berths and points of cultural and historical interest near the port areas where they dock, articulated in different sections. In the section dedicated to berths and mooring booking, all the information and contacts of Pilot ports and marinas are included. In the section dedicated to the Puglia promotion, historical and cultural information on the Pilot Areas are described; the promotional information is extracted from official portals and reports of institutional entities in the region that are responsible for tourism and promoting the territory, and therefore have a high degree of reliability.

Moreover, Framesport Puglia offers free services such as meteo-marine information and ship routing, aiming at facilitating the navigation. In particular, the meteo-marine information section provides weather information, while the ship routing represents a useful tool for a safer navigation, including different kind of information related to route with different types of boats (sailing, vessels, engine load, etc.) such as length, duration, speed, route, true wind direction, wind speed, etc.

The WebApp, which is published on Android Stores, is linked to the official project website framesport.eu.

PA 6.1 – Development of a prototype of a software application for the identification, booking and payment of available spots at Adriatic small ports. Testing phase at Port of Termoli - PP6 AAST

The Pilot action was aimed at introducing new digital tools and methodologies, for the benefit of both the personnel of the marina and its activities, and for guests of the marina, including yachtsmen.

The Pilot action was made through two complementary integrated interventions defined in the supplier's project proposal:

- the development of an application software (app)
- improvement of port/marina digital network.

The app has been published on the Android and Apple stores. The back-end is on-line and accessible to registered and approved users belonging to a marina.

The pilot action carried out by the AAST Termoli falls under the macro theme of ICT applications and services development, with a focus on the subtopic of management of port operations and services. The realization and implementation of an APP and the acquisition and use of thematic equipment s such as the WIFI network ant the Tourism Port of Termoli, demonstrated a strong commitment to improving the available technologies for port management and services necessary for more efficient management of small ports and for the acquisition of more clients who can afterwards visit the in-land territories.

PA 7.1 – Improvement of the available technologies for port management - PP7 LUUN

The aim of the pilot action by the Port Authority of Umag-Novigrad was to improve the available technologies for the port management and to enhance the services necessary for more efficient management of small ports. The objective was to create a Port Management Program Platform that provides supervision of vessels in ports managed by the Port Authority of Umag-Novigrad, and consists of several connected modules - applications, with the possibility of upgrading to new modules-functionalities together with their data exchange with other systems. The new services were designed to improve the communication with the port guards, make the service more accessible and comfortable for customers, and facilitate the work of the port authority.

The pilot action carried out by the Port Authority Umag-Novigrad falls under the macro theme of ICT applications and services development, with a focus on the subtopic of management of port operations and services. The implementation of a Port Management Program Platform and the acquisition and use of thematic equipment such as a video surveillance system, port management (berth availability, business processes) and an electric-powered vessel demonstrate a strong commitment to improving the available technologies for port management and services necessary for more efficient management of small ports.

The Port Authority Umag-Novigrad's pilot action provides a strong foundation for the enhancement of a framework for the sustainable development of small ports, and the integration of innovative technologies and software solutions to improve the efficiency and accessibility of port services.

PA 8.1 – Improvement of the small ports monitoring system (mooring management, billing system, analysis of customer habits) - PP8 PGZ

The aim of the pilot action led by Primorje-Gorski Kotar County in the FRAMESPORT project was to enhance the monitoring and management of small ports through the implementation of innovative smart systems and technologies. The pilot action aimed to address several challenges and improve the existing systems in small ports, including the monitoring of vessel conditions and movements, integration of information solutions, real-time display of berth status, and overall port security. By introducing modern information and communication technologies, the pilot action aimed to create a unified overview of data related to port operations, berth status, vessel movements, and financial information of berth users. The goal was to provide port authorities with comprehensive and real-time administrative data that would support decision-making processes and facilitate efficient management of the ports.

Furthermore, the pilot action sought to increase security within the ports by implementing surveillance cameras with machine learning capabilities. These cameras were intended to detect and distinguish between occupied and unoccupied berths, ensuring accurate and up-to-date information on the availability of berths.

Overall, the aim of the pilot action was to establish an advanced smart monitoring system in small ports, enabling port authorities to effectively manage vessel traffic, optimize resource allocation, and enhance the overall operational efficiency of the ports.

2.1.3. Monitoring of seaside and landside port areas

PA 2.2 – Development of monitoring system for port operations and public events in the canal port's area - PP2 ITL

The area of Canal Port of Rimini is affected by problems related to social decline and perceived low security by citizens, which makes it necessary to monitor the area with the general objective of counteracting the phenomena of improper use of the public spaces.

During the preparatory phase, thanks to the stakeholder engagement, this general objective was translated into a series of specific objectives with the aim of defining in detail the corrective actions and selecting the most appropriate tools to carry out an effective site monitoring action:

The specific objectives are summarised as follows:

- Increase site security,
- Limit social decline phenomena and poor hygiene of the site,
- Improve surveillance at public events,
- Respect for the rules.

These led to the opportunity to analyse and design a monitoring system to be managed by the subjects who are responsible for the surveillance and maintenance of public order in the area (Port Authority and Municipal Police), but which indirectly benefits the entire sector linked to the activities of the Port (fishing, logistics, urban hygiene, recreational activities).

The Pilot Action achieved the objective of improving the safety in the area by extending and upgrading (with three cameras) the existing video surveillance system which is connected to all security organisations: port authority, local police, local army command that can access real time and stored videos streams and timely react in case of emergency.

The key elements of the Pilot Action allowing to set a path toward the overall FRAMESPORT strategy are:

- Key dialogues with stakeholders assessing phenomenon needs in the Canal Port and supporting the definition of sound and concrete requirements;
- A thorough analysis of the context and of the available best practices and technology able to deal with the defined problems.

PA 5.3 – Creation of Innovation Lab to promote development and planning of small ports along the Adriatic coasts: ICT Platform for monitoring and supervision of freights/passenger - PP5 ARAP

The purpose of the Pilot Actions carried out in Abruzzo Region was to engage and coordinate citizens, artists, students, governmental agencies, businesses and community organizations of the Region to enhance public awareness, to intercept and to valorise different competences and experiences, to stimulate measures and actions aimed at recovering small port efficiency and

attractiveness. An Innovation Lab was set and composed by four sessions: a) energy efficiency and pollution reduction; b) valorization of "port space"; c) ICT solutions d) training/informative paths.

Regarding the ICT solution, ARAP realized "Landscape ANPR (Automatic Number Plate Recognition)", an ICT platform which allows the port's management to automatically detect in real time the plates in transit in the two gates vehicles of the Port (entry and exit), with a high degree of accuracy, both day and night and even in adverse weather conditions, thus obtaining unambiguous information for the vehicular flow control (license plate, date and time).

PA 10.1 – Feasibility Studies on alternative moorings for ship and on the use of electric ro-ro passenger ships - PP10 LUS

The main purpose of the Feasibility Study of alternative ways of mooring ships in the port of Šibenik is to create strategic documentation that will be an integral part of the comprehensive project of sustainable development of the port infrastructure and superstructure in the port area under the administration of the Port of Šibenik Authority. The increased intensity of cruise ship arrivals and the limited mooring capacity on the available operating shores in the passenger part of the Šibenik port require the Port of Šibenik Authority, which manages the port area, to establish alternative mooring methods that would enable faster and safer mooring and provide additional port capacity to accommodate a larger number of cruisers. In addition, the limited sea passage to the city of Šibenik through the channel of Sv. Ante on the maximum length of ships of 230 meters directly affects the impossibility of accepting larger cruise ships that today already sail on the Croatian side of the Adriatic towards or from Dubrovnik.

Based on the analysis, the basic guidelines with which a better ship mooring system can be achieved and models for improving the existing mooring capacities of the passenger part of the Šibenik port were determined.
The existing mooring system can be upgraded with a new automatic mooring system and better light marking of operational shores, while the total mooring capacity can be increased by placing mooring buoys in the area of the Martinska anchorage and implementing a mobile floating jetty that will allow passengers to disembark from large cruise ships at a location outside the Šibenik Bay.
This will significantly increase the total passenger traffic of the port of Šibenik, but also contribute economically to the economic growth of the City of Šibenik and Šibenik-Knin County.

2.1.4. Promotion of ports' resources and territory

PA 1.2 – Promotion of the territory linked to Nautical clubs through development of extended reality application - PP1 MMON

The aim of the pilot action was to facilitate the users of sailing and nautical centers through the development of tourism attractiveness and promotion in the territory of the Gulf of Panzano through an AR Augmented Reality system. The challenge that the pilot action addressed concerns the inclusion of sailing and nautical centres in the circuit of tourist activities in the area, in order to create a web portal for the promotion of cultural and natural elements to integrate the services and opportunities of the territory of Monfalcone.

The report analyses the structure and implementation of Pilot Action 2 of the Municipality of Monfalcone, within the macro-theme of "ICT application and service development".

The PA produced the realization of a digital tool called Monfalcone experience, developed as a website and app for discovering points of interest in the Monfalcone area but replicable in any other area. The small ports and sailing centers of the coastal area of Monfalcone are very developed but do not have internal connections to the tourist/cultural and natural attractions of the area.

The intention has been to create an ICT Tools that develops a series of routes that connect the coastal area and small sailing centers to the main cultural and natural elements.

Key element is the intention to create a connection and support network that, through a series of integrated interventions to provide the development of a tool which will be useful for promotion and knowledge of the area thank to:

- Creation of a series of "paths/experience" in AR that will include all the sailing and nautical centers and the entire tourist/cultural area of the city;
- Creation and activation of a web space, which gives access to a real video guide of the territory to allow users to be able to access the paths inserted precisely in a special website through mobile devices.

PA 2.3 – Realization of initiatives for the promotion of the canal port activities, especially during the low touristic season - PP2 ITL

The Pilot Action 2.3 "*Realization of initiatives for the promotion of the canal port activities*", implemented by PP2 – ITL Foundation, was aimed at promoting the Canal Port of Rimini through

the organization and implementation of a dedicated exhibition event to showcase the diversified range of activities and operators that are based within the Port's area, in order to better strengthen their attractiveness and display their value, thus also increasing the presence of people who are not directly involved in the Port's operation even beyond the high-peak summer season.

For this reason, the event has taken take place specifically in this period, in order to contribute to the promotion of the Port – and of the whole territory of Rimini – even in this season when the flow of tourist is notably lower. In addition, the promotional event was also aimed at the local population, who often see the Port in a detached way and does not realize its full potential.

To achieve such aim, a close engagement of stakeholders and Port's operators has been implemented, both during the planning and implementing phases of the pilot action, in order to ensure a tight connection with the territory and its needs.

The promotional event "Ti porto al Porto", aimed at enhancing the value and knowledge of the Canal Port of Rimini among citizens and tourists, was organized by the Rimini Nautical Club and took place on the 09th and 10th of April within the area adjacent to the Port's grounds.

PA 5.2 – Creation of Innovation Lab to promote development and planning of small ports along the Adriatic coasts: Port attractiveness - PP5 ARAP

The purpose of the Pilot Actions carried out in Abruzzo Region was to engage and coordinate citizens, artists, students, governmental agencies, businesses and community organizations of the Region to enhance public awareness, to intercept and to valorise different competences and experiences, to stimulate measures and actions aimed at recovering small port efficiency and attractiveness. An Innovation Lab was set and composed by four sessions: a) energy efficiency and pollution reduction; b) valorization of "port space"; c) ICT solutions d) training/informative paths.

Regarding the valorization of "port space", Arap Abruzzo, in cooperation with local relevant stakeholders, organized a series of local events, to promote "ports spaces" and to valorize their attractiveness.

- First Event was in Vasto on July 2021: Arap organized a valorization event to present the territory's attractiveness, including a guided tour on the boat along the Trabocchi coast.
- Second event was in Pescara. Arap took part in a public event, which also had resonance in the online press. The event was included in a larger exhibition related to the environment, and it was the opportunity to present the project to different local stakeholders. Because it

was an outdoor event, it attracted also the attention of tourists and local citizenship. On the occasion of the 36th edition of Goletta Verde 2022, the historic Legambiente summer campaign in defense of Italian waters and coasts, Arap organized an aperitif on a boat. In this way Arap took the opportunity to promote the value of the small ports of the Abruzzo Adriatic coast.

- Third event was in Pescara. Arap took part in the 9th edition of SOTTOCOSTA - MIDDLE ADRIATIC BOAT SHOW which took place from 29 April to 1 May 2023 at the "Marina di Pescara" tourist port. The event represents one of the most important boat shows in the Middle Adriatic, thus becoming one of the 8 territorial nautical events connected to the Genoa boat show. During the 3 days of the event there were exhibition spaces and a rich program of events, in which ARAP as a Framesport partner participated to disseminate the project.

2.1.5. ICT application and service development - comments

All 13 pilot actions under the ICT macro-theme were successfully completed, achieving significant outcomes, despite the problems encountered due to the COVID-19 pandemic and often difficult tendering procedures, mainly related to the provision of equipment and external technical expertise.

Strong synergies have been developed between the actions, the most significant being the joint development of the methodological approach to the main concept of the 'digital port' and the sharing of data, collected through the widespread involvement of local stakeholders in the different pilot sites.

Concerning data collection and stakeholder involvement, this is the main lesson learned for all pilot actions: the early and proactive engagement of stakeholders is a critical factor in ensuring a smooth and effective development for small ports, which must be based on robust, consistent and comprehensive databases of the whole system.

Integration between ports and their surrounding territories is another key factor that emerged from the pilot actions: the resulting IT applications and promotion initiatives leveraged on this aspect, enhancing port performance while improving services for tourism development.

Environment and energy aspects

LP 1 – Development of an Ecolabel criteria proposal for small ports to be submitted to the EU Ecolabelling Board (EUEB) - LP CORILA

The objective of this pilot project was to draft an Ecolabel proposal for small ports. In this way, it is possible to deliver guidelines for a sustainable development of this sector. In particular, the activities are related to involving the relevant stakeholder (i.e., the small ports), creating the quantitative study to define the main environmental impacts and mitigation strategies, and preparing the needed documentation to send to the draft proposal to the Joint Research Center (JRC).

The new Ecolabel service group aims to create a more consistent, sustainable and united network of small ports. In fact, their environmental performances, infrastructures and management practices can be aligned and improved, and their development and growth can be favoured. The Ecolabel can therefore become a concrete scheme that can support small ports in becoming more sustainable and can make them the driver of the socio-economic development of the whole Europe. To achieve these objectives an LCA study has been performed and a list of criteria has been created.

PA 3.1 – Implementation of Port sustainability best-practices - PP3 ASSET

The aim of the pilot action is to improve ports conditions by touristic point of view. For this, ASSET realized a best practices (plastic free kit) and information campaign in three Apulian ports (Vieste, Trani, Otranto). On one hand, the objective was to reduce CO_2 emissions and waste from port operations and boaters. On the other hand, ASSET tried to collect existing services addressed to boat tourists. The pilot project included the supply of a branded plastic free kit with Project logo. ASSET decided to focus its Pilot action 3.1 into these 3 ports. Through these Pilots, ASSET's purpose was to raise the awareness of the target groups about the importance of responsible behaviours in environmental terms, by implementing an action that involves the addressees immediately, directly and without any mediation. The vision followed in the Pilot is to materialise the principle of environmental sustainability into something tangible, namely into several everyday objects of common use, linked to life at sea and sailing, capable of conveying the message in a simple and immediate way to personnel of small ports and recreational boaters.
In view of this objective, ASSET designed, produced, and distributed a "plastic-free kit" (nr. 400 in total) each composed by:

- nr. 1 thermal bottle;
- nr. 1 bamboo cutlery set;
- nr. 1 palm leaf plate;
- nr. 1 t-shirt (in bio-cotton);

- nr. 1 backpack in eco-friendly material.

The main outcomes of the pilot action "**3.1 - Implementation of port sustainability best-practices**" were:

- Creation and distribution of 400 plastic-free kit;
- Organization of 2 events in the port areas;
- More than 500 stakeholders involved.

PA 4.1 and 4.2 – Sustainable and local mobility interventions (ex. electric bus and bike services) - PP4 SVEM

The aim was related to investigate smart mobility solutions to improve the connections of the small Ports with other inland destinations, in order to improve the tourist vocation of the ports and at the same time develop sustainable transport modality to reduce energy consumption and environmental impact.

The Pilot actions 4.1 for Vallugola port (Gabicce Mare) and 4.2 for Numana port pursued the same theme "Sustainable and local mobility interventions" and have been designed in parallel considering the following common aspects:

- the touristic vocation of the ports;
- the territorial context: both ports are located in natural protected areas;
- needs to develop transport connections with inland and/or other destinations.

Considering the specific context and needs of local territories, it was implemented for the summer season:

- an E-Bus Service of Vallugola port: execution of the EBUS service from 22nd of July to 7th of September 2021.
  - During the 45-day period of E-bus testing, 3738 users were registered; it means an average of 83 passengers per day, about 10 for each trip from Vallugola to Gabicce Mare.
  - The questionnaire to evaluate the Ebus service has been compiled by 31 passengers. It emerged that most of the respondents are local tourists instead of boat owners, coming from local hospitality structures.
  - The E-bus service was highly appreciated: 40% of the respondents did not recognize the needs of any change, while 30% suggested adding trips in the evening.

- It highlighted the willingness of 60% of respondents to pay for a similar service in the future.
- an E-Bike Service of Numana port execution of the EBike service from 3th of August 2021 to 3th of October 2021.
  - The monitoring of the E-bike system covered both quantitative and qualitative aspects, through:
    - data gathered from the online booking service and the kilometres travelled by the GPS of the vehicles.
    - a sample questionnaire filled in by the users
  - In total, 49 E-EBIKES rents have been realised, with an average distance of 23 km, with peaks of 50 km.

PA 5.1 – Creation of Innovation Lab to promote development and planning of small ports along the Adriatic coasts: environmental impact - PP5 ARAP

The purpose of the Pilot Actions carried out in Abruzzo Region was to engage and coordinate citizens, artists, students, governmental agencies, businesses and community organizations of the Region to enhance public awareness, to intercept and to valorise different competences and experiences, to stimulate measures and actions aimed at recovering small port efficiency and attractiveness. An Innovation Lab was set and composed by four sessions: a) energy efficiency and pollution reduction; b) valorization of "port space"; c) ICT solutions d) training/informative paths.

Regarding the action focused on energy efficiency and pollution reduction, an environmental sustainability study of the Port of Vasto has been carried out. The study analyses the state of art (Air quality management - Energy saving and climate change - Noise management -Waste management - Water - Other environmental priorities - Analysis of the various environmental aspects related to the use of new energy sources in the port system, focusing on the use of hydrogen as an energy resource) and above all identifies tools, methodologies and indications to improve the current situation.

PA 10.2 – Testing IT system for the forecast of possible geographical dispersion of the pollutants in case of accident - PP10 LUS

The pilot action focused on the forecasts of possible geographical spread of pollution. The pilot installed buoys with sensors and an IT tool to predict the possible geographical spread of pollution, allowing the Port of Šibenik Authority to predict the geographical spread of pollution and respond

properly in case of pollution. The goal of the pilot was to ensure timely and adequate response solutions to preserve the sensitive Adriatic Sea and protect the entire Adriatic coast area.

The tender for the pilot was realized in December 2022, and the contract was signed on December 22, 2022. Two drones and two buoys with sensors were acquired. In May 2023, the buoys were completely installed, but, as the location permits were still missing, could not be situated in the sea. Finally, in June 2023, the buoys were installed in the sea, on the planned location in order to give the information from the optimal sea location.

The two types of drones (air and underwater) were tested in May 2023. The air drone can produce precise photos in a length of few hundred meters, which is significant in order to detect possible dangerous vehicle and to document it from the air side. The underwater drone was also tested in May 2023, and is significant in order to create precise photos in very high resolution, which is important for detecting the pollutants on the seabed and to react promptly.

Two buoys with sensors for pollutants detection were tested in June 2023. Two types of simulations were held in order to show the speed of the pollutants movement through the channel. During the simulations, the analysis involved two different types of pollutants, meteo data (wind direction and strength) and time. The simulation of the oil spill was carried out using various parameters, including the location, amount, duration of the spill, type of substance and other data. After that, winds and currents, or oceanographic and hydrometeorological data collected in real time from various sensor systems, were included in the simulation. The analysis showed that the pollutants can move very fast all overall the Šibenik channel and can cause significant damage, if there is no prompt reaction to prevent pollution.

2.1.6. Environment and energy aspects – comments

The same problems due to COVID-19 and tendering procedures faced by the ICT pilot actions slowed down the implementation of the most operational actions of this cluster, i.e. those concerning the validation in real scenarios of electric mobility services (4.1 and 4.2), the pollutant dispersion forecasting system (10.2) and awareness-raising best practices (3.1). However, all 6 pilot actions under the Energy and Environment macro-theme were finally successfully completed. They addressed the major topic of sustainability by focusing on different but complementary aspects, all of which were integrated within a general approach to the environmental performance of small ports in terms of assessment methods and criteria (LP1, 5.1).

2.2. Spatial planning and management

PA 2.1 – Development of Master Plan for the development of a regional-level port system in Emilia-Romagna region - Project proposal for the renewal of Rimini canal Port - PP2 ITL

The aim of the Pilot Action 1 was to analyse the urban planning, technical, environmental, socio-economic and cultural framework of the Canal Port of Rimini and the subsequent drafting of a project proposal for the redevelopment and the enhancement of services and infrastructure.

During the implementation of the pilot action, stakeholders of interest are involved for the definition of objectives, progress, and results of the activities, in order to achieve a concerted and participated project.

The main objectives of the project can be summarised in the following points:

- Restoring hydraulic safety conditions;
- Connect the already redeveloped areas at the waterfront;
- Qualify existing facilities and services;
- Implement the connection between the Port and the XXV Aprile Park, as well as between the two banks of the canal.

In particular, the project proposal focuses on the following points:

- Identification of the elevation level of the docks;
- Study of the accesses to the quays;
- Study of the public spaces to be integrated to increase the attractiveness of the area;
- Study of soft mobility routes;
- Study of the technological systems to be applied to the project.

PA 4.3 – Strategic document for the development of tourist ports in Marche Region - PP4 SVEM

The PA 4.3 "Strategic document for the development of tourist ports in Marche Region" aimed to support the updating of planning and management of tourist ports in Marche region, according to the regional tourism policy. Indeed, the PA addressed the Macro Theme Spatial planning and management.

Through pilot action 4.3, SVEM intended to carry out an analysis and a study aimed at understanding the system of tourist ports of the Marche and analyzing their needs in terms of growth and sustainability and in supporting the regional tourism policies.

The main objectives were:
- To update and further analyze the regional touristic ports/marinas system and to examine the requirements in terms of growth and sustainability;
- To provide awareness on useful aspects for planning and managing purposes on regional touristic ports;
- To define guidelines for the development and enhancement of touristic ports as part of the regional policy on tourism.

The main outcomes of the pilot action "Strategic Guidelines for the Development of Touristic Ports in the Marche Region" are summarized in 3 topics:

1. updates of the current planning frame "under unchanged strategic scenario";
2. strategic Guidelines;
3. supporting tools for the operational implementation of some proposed actions.

PA 9.1 – Development of Master Plan for the development of a county-level port system in Zadar County - PP9 ZLUZ

The aim of Pilot Action was to classify the county level port system and create necessary development steps for Zadar County ports, of which the final result is Master Plan.

Thanks to the pilot actions, for the first time different levels of ports have been classified in a meaningful and systematic way. Necessary steps and guidelines for the development of the port system were defined in order to improve the infrastructure, commercialization of the port space, customer services, the available information for users and encourage cross-border cooperation/service.

County Port Authority of Zadar has the largest number of ports (111) under its jurisdiction. While these ports are of great local and county significance, most are underdeveloped and their commercial potential has not yet been adequately exploited. Development of these ports is of utmost importance for touristic and economic system, depending on the cross - border exchange.

The Master Plan has been preceded by smaller scale surveys and researches whose final purpose led to its creation. This was a more operational than a strategic plan and most of the measures focused on the development of infrastructure, environmental and user-friendly improvements.

The pilot action is in line with the main goal of the task of developing a strategic framework that deals with the further development and planning of small ports along the Adriatic coast. The goals for the guidelines on strategic management and development of small ports in cooperation between Italy and Croatia were achieved, while adhering to the legislative framework.

The pilot project is under the category of spatial planning and management for long-term regional plans, and thus the Master Plan includes relevant county ports for CPA Zadar, which are of exceptional importance for economic, touristic and ecological systems.

PA 14.1 – Development of Master Plan for the development of a county-level port system in Ličko-Senjska County - PP14 LUSE

The aim of the activities envisaged for this pilot action consists of extensive research activities encompassing a lot of smaller-scale surveys and research whose final purpose led to the creation of the Master Plan for the development of a county-level port system in Ličko – Senjska County, or to be more specific the ports managed by the Port of Senj Authority.

Researchers planned to develop an overview of the existing state in all of the smaller ports under the Port of Senj Authority governance and according to the results, the Master Plan was created encompassing all of the shortcomings and all of the improvement potentials for the ports. Port of Senj as the biggest port containing the largest number of entities and stakeholders will benefit from thorough research regarding all the possibilities that could benefit the region. Stakeholders were involved in several levels of the process to assure that the most transparent scenario was represented in the Master Plan.

2.2.1. Spatial planning and management – comments

The 4 pilot actions under this macro-theme were successfully completed, providing valuable planning documentation focused on different spatial scales and areas, but developed following a complementary and fully coherent methodological approach. The final plans can now serve as a starting point for local actors responsible for the development of ports and surrounding areas, as well as guidelines for other contexts.

The main challenge for the implementation of these actions was the engagement of stakeholders playing different managing and institutional roles in the strategic development of the areas: the pilot actions succeeded in achieving the goal of a shared planning process based on synergies.

2.3. Training and knowledge aspects

PA 1.1 – Develop / refine professional skills for refitters and shipwrights for the classic and historical boat sector - PP1 MMON

Regarding the macro-theme T&C PP1 Municipality of Monfalcone realized a first Pilot Action called: "Develop/ refine professional skills for refitters and shipwrights for classical boat sector".

The goal was to develop interest, especially among the younger generations, towards the skills and knowledge of the shipwrights, in order to continue in the future this important tradition and develop it thanks to new technologies.

The specific objectives of the pilot action have been to:
- Implement technological knowledge for the strengthening of sailing and nautical centers;
- Develop professional skills in the field of refitters and shipwrights;
- Promote awareness and attractiveness of the professions related to the sector.

The actions have been realized through the creation of a digital platform for:
- Promotion of a training course for knowledge of ancient sea crafts;
- Creation of a database of classical and historical boats open to everyone, in order to create a network in the field of sea professions.

The target reached during the training course exceeded expectations, as more than 300 people from Italy and abroad participated (data were collected through questionnaires). The promotion of the course during pre-course events and meetings helped to broaden the target audience.

PA 5.4 – Creation of Innovation Lab to promote development and planning of small ports along the Adriatic coasts: training and learning events

The purpose of the Pilot Actions carried out in Abruzzo Region was to engage and coordinate citizens, artists, students, governmental agencies, businesses and community organizations of the Region to enhance public awareness, to intercept and to valorise different competences and experiences, to stimulate measures and actions aimed at recovering small port efficiency and attractiveness. An Innovation Lab was set and composed by four sessions: a) energy efficiency and pollution reduction; b) valorization of "port space"; c) ICT solutions d) training/informative paths

Regarding the session focused on training/informative paths, Training meetings with the students were concluded on June 2022. A monthly meeting was held for six months.

Target: Students of the High School of the "R. Mattioli - S. D'Acquisto "of San Salvo. Purpose: Discover the ancient crafts and places of traditional fishing and maritime trade for develop sustainable and historically based models for new proposals for fishing and activities for the use of marine resources.

Intermediate goals can be summaries in the learning of:

- the ancient economic and social history of the reference territory through documents and finds;
- the transformations of the coastal landscape of the reference area through documents, direct observations and archaeological remains;
- the most representative sea trades;
- the potential of sustainable and innovative tourism (ancient paths, vegetable gardens and overflow).

2.3.1. Training and knowledge aspects – comments

The 2 pilot actions under this macro-theme were successfully completed, providing high-quality knowledge resources and achieving significant results in terms of participants in the training initiatives carried out.

They successfully validated non-conventional learning models, transferring skills to a new generation of environmentally aware professionals in the maritime sector, and conveying the message of how strategic it can be for sustainable economic development to merge traditional knowledge and innovation.

2.4. Business oriented aspects

PA 12.1 – Development of small port prototype. Identification of opportunities to be taken in order to develop a single port and convey outcomes to stakeholders for the future development and investment plans - PP12 LOGO

The aim of the pilot was to educate the port authorities on the possibilities of upgrading ports at infrastructure level, super-structure, user services and / or port management organization.

Nautical services - small ports are seen as driver for improvement of maritime transport and sustainable development in the Adriatic area. Small ports can and should better use their potential

at all levels, thus they can become generators of local and regional development. They are of utmost importance for tourism and economic prosperity at islands. Aim of the project pilot works best as its cross-border dimension is emphasized as the small ports are differently developed on the Croatian and Italian side of the Adriatic. They vary in size, purpose, level of development, equipment, technological advancement, customer service, etc. They have in common that they have a lot of room for progress and that they are underutilizing their potential. They are of paramount importance for the life of the areas in which they are located, for the development of tourism and for the overall economic activities in the areas and need to be improved.

The final goal was to provide a comprehensive document containing the best practices from ports and similar infrastructural areas worldwide.

2.4.1. Business oriented aspects – comments

The pilot action under this macro-theme, fully completed, developed strong synergies with all the other actions in the project, as it encompassed all possible strategic areas of intervention for the sustainable development of small ports, recognised as drivers of economic growth.

The collection of best practices carried out is therefore a cross-cutting outcome of the piloting experience of FRAMESPORT.