Ploto

D8.2

Dissemination, Communication and Exploitation Strategy 1st version

Project name
Deployment and Assessment of Predictive modelling, environmentally sustainable and emerging digital technologies and tools for improving the resilience of IWW against Climate change and other extremes

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Table of contents

List of tables

List of figures

List of abbreviations and acronyms

Abbreviation	Meaning
DCES	Dissemination, Communication and Exploitation Strategy
IPR	Intelectual Property Right
KER	Key Exploitable Result
ROI	Return of Investment
TBD	To Be Defined
TRL	Technology Readiness Level
WP	Work Package

Executive Summary

The current document presents the PLOTO dissemination, communication and exploitation plans, which detail the activities to be conducted throughout the course of the project in order to achieve maximum visibility and enhance its impact within the research community. A strategy is created, which identifies the appropriate targets of the dissemination effort, as well as the communications channels and tools to be used, leading to the formulation of a complete dissemination and communication plan. Similarly, the opportunities for exploitation are explored, analyzing exploitable items and joint exploitation prospects to timely create a robust understanding of the project's output potential. In addition, a standardization and liaison plan is presented, which identifies bodies and communities related to the project's interests, further increasing its overall potential. The aforementioned plans are accompanied by monitoring mechanisms, which ensure the viability and tractability of the overall dissemination and exploitation plan.

1 Introduction

1.1 Purpose of the document

The purpose of deliverable D8.2 "Dissemination, Communication and Exploitation Strategy 1st version" is to present a complete communication, dissemination and exploitation strategy, considering the intended audience, stakeholders, dissemination channels, appropriate communication tools, exploitation opportunities, standardization bodies, etc.

This document is complementary to PLOTO deliverable D8.1 "Project Website, Corporate identity and general templates for dissemination material". D8.1 presents the corporate design developed for the project, including the logo and style guidelines for all project promotional materials, document templates and the project website. It describes the brand rationale and lays out graphic identity guidelines for the correct use of the logo, brand colours, and typography by the PLOTO consortium.

1.2 Intended audience

This is a public document. For the consortium partners, this document serves as a guide for the use of the available PLOTO's communications and dissemination tools, as well as related procedures to be respected. Also, it will be used to present a first study of PLOTO's potential regarding its commercial and marketing development. For interested stakeholders outside of the consortium, it helps to create an understanding of the project's dissemination, communication, and exploitation strategy.

1.3 Document structure

The rest of the document is structured as follows:

- Section 2 describes the communication plan of the project, in terms of objectives, visual identity, communication channels and tools, as well as communication Key Performance Indicators (KPIs).
- Section 3 presents the PLOTO dissemination plan, providing information on target audiences, dissemination activities, as well as dissemination Key Performance Indicators (KPIs).
- Section 4 describes the exploitation plan of the PLOTO project, providing a Key Exploitable Results analysis, the individual exploitation plans of the consortium partners, as well as describing the IPR Management, roadmap to market & business modelling methodology and preliminary findings from the initial market analysis and initial competition landscape analysis.
- Section 5 describes the PLOTO standardization and liaison plan.
- Section 6 provides some concluding remarks.

2 Communication plan

This Section describes the communication plan of the PLOTO project, in terms of objectives, visual identity, communication channels and tools, as well as communication Key Performance Indicators (KPIs).

2.1 Objectives

The main objectives of the PLOTO Dissemination, Communication & Exploitation strategy are to:

- Raise awareness among the stakeholders about the project itself, its objectives, activities and results, to support stakeholder engagement;
- Create understanding among the target groups of PLOTO and its results in a way that they can assess their usability and potential;
- Foster engagement of the stakeholders in the Project's activities and development;
- Facilitate the take-up of results during and after the end of the project;
- Define the strategies for the project execution and the communication & dissemination of its activities and results.

The proper and efficient communication and dissemination of the project's activities will be ensured by:

- Identifying the target audience to be addressed;
- Determining the key messages to be shared with the audience groups;
- Exploiting existing communication materials and channels and creating new ones as necessary;
- Providing ad-hoc tools for PLOTO partners to guarantee an impactful communication and dissemination.

2.2 Visual identity

The extended name of the project is **Deployment and Assessment of Predictive modelling, environmentally sustainable and emerging digital technologies and tools for improving the resilience of IWW against Climate change and other extremes**, **PLOTO**.

The guidelines for correctly representing the PLOTO brand cover all aspects of the project's graphic identity. They are described in the D8.1 and available in the Library section of the project website. They describe the rationale of the PLOTO brand, the logo, the logo elements, the logo options, the logo colours, information regarding the incorrect use of it and PLOTO typography.

As the project is co-funded by the European Union, communication and publication materials should clearly acknowledge receipt of EU funding through the display of the EU emblem and funding statement (translated into local languages, where appropriate). The EU funding statement (Figure 1) must remain distinct and separate and cannot be modified by adding other visual marks, brands or text.

Figure 1: EU funding statement (horizontal and vertical)

2.3 Communication channels and tools

In this Section, the PLOTO communication channels and tools are presented, namely the project website, social media, newsletter, scientific publications and marketing materials.

2.3.1 Website

The PLOTO project website address is www.ploto-project.eu.

The website is structured to display information about the project in a transparent and accessible manner and it comprises:

- Homepage
- Objectives
- Pilot sites
- Library
- News & Events
- Contact

A more detailed preview and explanation of the website is available in the deliverable D8.1, in the section “Electronic media”.

2.3.2 Social media

The project’s online presence is key to support the achievement of the communication and dissemination’s performance targets. To foster the online engagement, PLOTO will be available on Twitter, LinkedIn and YouTube. Social media will be used to strengthen the outreach of the project in a more general and immediate way. It will play an important role in raising the visibility of the project and engaging with a wider audience.

All partners are requested to:

- Follow the PLOTO Twitter, LinkedIn and YouTube accounts;
- Regularly check the social media accounts;
- Contribute with articles and/or news items when possible. Two approaches are suggested and equally valid**:**
    i) Having the project’s profiles share the news item;
    ii) Personally creating and posting the content and having the project’s profiles re-share it;
- Tag the accounts properly when posting PLOTO-related contents on your own social media accounts (corporate or personal);
- Engage on the social media channels by initiating discussions, re-sharing the post, reporting events and news items related to the project’s activities.

Twitter

The PLOTO Twitter account is called **@PlotoProject** (Figure 2). The account will be used to interact digitally with relevant stakeholders and disseminate the project's activities.

To increase the number of Twitter followers, tweets will be sent out, depending on the content available (2-5 tweets per week). Considering that, content will be published on the website and promoted via Twitter, partners are encouraged to retweet the website news on their corporate or personal accounts.

Using **#PLOTO** hashtag is mandatory and will be used to maximise exposure and outreach.

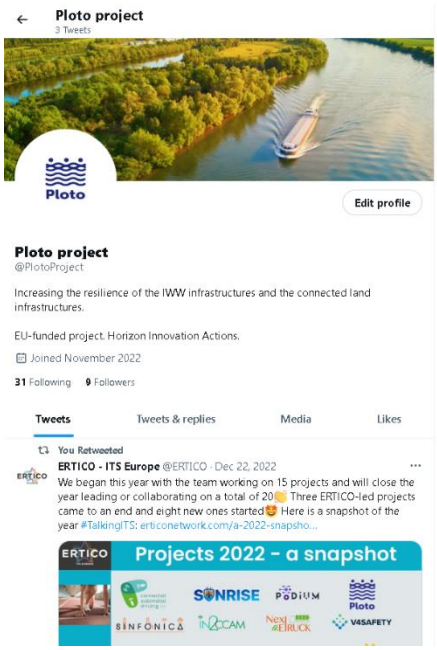

Figure 2: Twitter profile

LinkedIn

A project-specific LinkedIn company page called **PLOTO** (Figure 3) has been created (https://www.linkedin.com/company/plotoproject/?viewAsMember=true). All major project updates and announcements will be shared with the followers of this page.

When a news article is added on the website, it should also be shared immediately via the LinkedIn page to maximise the online visibility. The goal is to consolidate the social media presence in the project lifetime and get the most out of this important communication and engagement channel with the professional community.

To increase the number of LinkedIn followers, posts will populate the PLOTO page depending on the content available (1-2 posts per week).

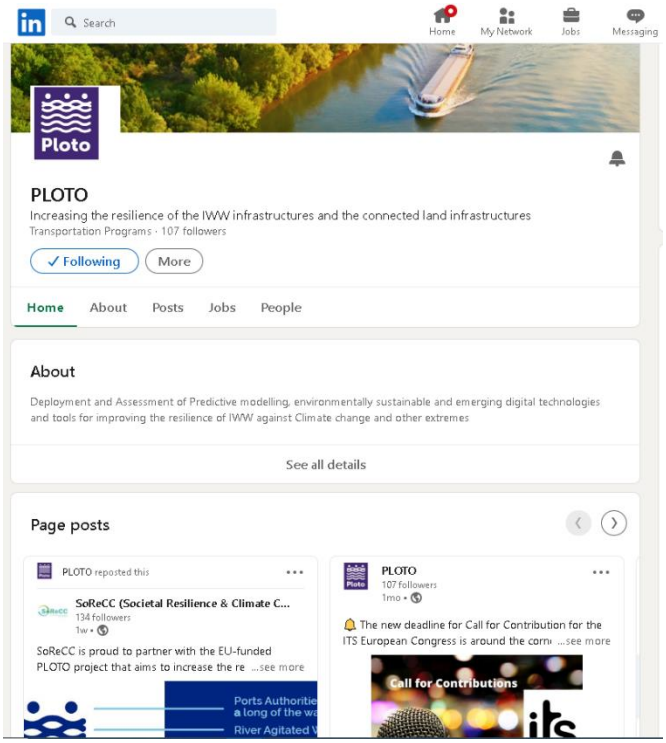

Figure 3: LinkedIn profile

YouTube

The PLOTO project has a dedicated YouTube channel called **Ploto project** (https://www.youtube.com/channel/UC4gr9srpS_LOKRSKH1CWJLA) that will collect and present all videos that will be created throughout the duration of the project (Figure 4).

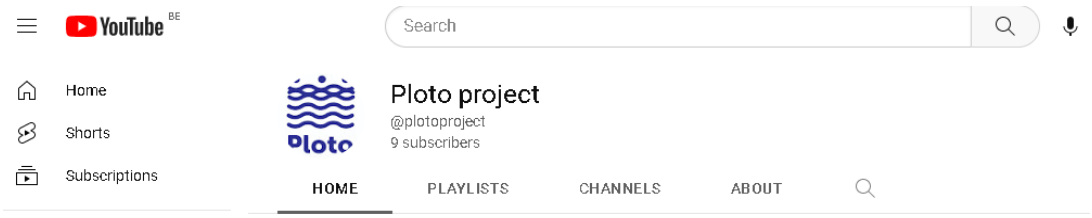

Figure 4: YouTube profile

2.3.3 Newsletter

A biannual newsletter will be sent to PLOTO partners and subscribers that are interested in staying informed on the project's proceedings and the related latest news. A banner in Figure 5 below has been implemented on the project's website homepage and contact page in order to allow interested partners and stakeholders to subscribed to the newsletter.

Figure 5: Newsletter banner

2.3.4 Scientific Publications

Dissemination in the scientific community will mainly include submission of publications in scientific journals in the field of climate, meteorology and atmospheric physics, hydrology, hydraulic engineering and water resources management.

2.3.5 Marketing materials

Marketing materials (not necessarily printed, and only on per-need basis) will be produced for the promotion of the project and used in external conferences, workshops and other events. Such materials include e.g., press releases, posters, flyers and/or business cards.

A roll- up banner (Figure 6) has been already developed and made available to partners on Sharepoint.

Figure 6: Roll-up banner

2.4 Communication Key Performance Indicators (KPIs)

The success of the communication actions will be evaluated throughout the project duration based on specific metrics, as outlined in Table 1. The table also shows the current values of the communication KPIs that have been achieved in the project so far. The KPI values are expected to be further improved as soon as the project enters a phase of producing mature results. The progress of the KPIs will be further monitored and reported in all future WP8 deliverables (D8.3 “Dissemination, Communication and Exploitation Strategy 2nd version” and D8.4 “Dissemination, Communication and Exploitation Strategy final version”).

Table 1: Communication KPIs

KPI	Description	Target	Status M6
Project identity	Logo, branding guidelines, templates	1	1

PLOTO general presentations	General presentations for key stakeholders (short and long version)	2	1
Banners	Roll-up banner to present in general terms the project and more in details the pilot sites	2	0
Posters	Poster to present the project	2	0
Brochures	A4 brochure and 3-fold flyer, developed at project's start, updated in M18	1	0
	Number of brochures distributed (per year)	200	0
Newsletter	Project newsletter issued by-annually (per year)	2	0
Videos	Promo videos presenting PLOTO solution and its components	2	0
	Number of views per video	1000	0
Website	Number of unique visitors (per year) Number of views	1000 250	202 204
News items	Articles online (per year)	≥ 12	0
Press releases	Press releases (per year)	1	0
Twitter	Number of followers (per year)	+100	9
LinkedIn	Number of followers (per year)	+200	112
YouTube	Number of subscribers (per year)	+100	9
TV spots	Spots in TV (M24-M36-M42)	3	0

3 Dissemination plan

This Section presents the PLOTO dissemination plan, providing information on target audiences, approval procedures, dissemination activities, as well as dissemination Key Performance Indicators (KPIs).

3.1 Target audiences

PLOTO communication, dissemination activities and tools will engage the following stakeholder groups:

- Regional/national water authorities;
- Ministries of transport;
- Freight companies;
- Passenger organisations and associations;
- Reinsurance companies;
- Shipping companies;
- Research and industry community members/institutions;
- Large industry and SMEs in the technology field of reference;
- Standardization organisations at European level.

Together with stakeholders and end users at various levels, the aim is to develop and demonstrate innovative concepts and solutions to make operations for passenger mobility, freight transport and logistics supply chains more resilient to large-scale shocks and disruptions.

3.2 Approval procedures, timing and reporting of dissemination activities

PLOTO consortium members wishing to participate in an event or carry out dissemination activities to (re)present the project must get prior approval of the Project Coordinator and Dissemination Manager.

Prior notice of any dissemination activity shall be given to the other Parties at least thirty (30) calendar days before the publication. Any objection to the planned publication shall be made, in accordance with the Grant Agreement, in writing to the Coordinator and to the Party or Parties proposing the dissemination within twenty (20) calendar days after receipt of the notice. If no objection is made within the time limit stated above, the publication is permitted.

All consortium members who carry out a dissemination activity (scientific paper, presentation at an external event, press release, article, video, or any printed material, e.g., poster, etc.) must enter it in the internal PLOTO Dissemination Activities record (Figure 7Figure 7). All required information in each column must be duly completed (type of activity, partners involved, description of the dissemination activity, website URL, etc.).

This file will be used as the basis for all reporting of Communication and Dissemination activities to the European Commission as required by the Grant Agreement.

These procedures are meant to:

- Ensure high-quality publications and presentations;

- Avoid overlap and possible disclosure of sensitive/confidential information;
- Monitor and record all dissemination activities in an efficient and timely manner.

		Journal publications, Technical & research papers, Conference proceedings, etc.							
No	Publication Title	Authors	Project Partners involved	Title of journal / magazine	Publisher	Publication date	Place of publication	Status	DOI/ available electronically at Archived
	(article title)	(authors name)	(organisation)	(title)	(publisher info)	(Publication date)		(Submitted / Published)	(Digital Object Identifier if applicable / website link if available)
1									
2									

Figure 7: Dissemination Activities Record

3.3 Dissemination activities and tools

3.3.1 Open access

A considerable volume of partners' work will focuse on producing material valuable in terms of effective dissemination of the project's contribution. PLOTO partners, in line with the COMMUNICATION, DISSEMINATION, OPEN SCIENCE AND VISIBILITY (— ARTICLE 17) of the PLOTO GA, will ensure open access to all peer-reviewed scientific publications relating to its results. As such results will be made freely available on Zenodo, an open access repository supported by the European Commission and OpenAIRE. The project has already established the ENCRYPT OpenAIRE profile, which can be accessed through the following link: https://explore.openaire.eu/search/project?projectId=corda____he::8526cb4c68e786ca6249c337dc30cf0e

Institutional repositories and other subject-based/thematic repositories, such as arXiv, and publicly available registries, such as Open Research Europe Platform, will be also considered to further promote dissemination of results.

3.3.2 Deliverables

PLOTO public deliverables will be uploaded to the project website for downloading by visitors and the wide audience. For the case of confidential/restricted deliverables, only a short summary (executive summary) will be uploaded. Public deliverables will be also shared with liaised projects. The indicative due dates for all PLOTO public deliverables are presented in Table 2 below.

Table 2: List of PLOTO public deliverables

Deliveble Number	Deliverable Title	WP number	Lead Beneficiary	Type	Dissemination level	Due date (in months)
D1.2	Data Management Plan	WP1	5 - DBC	R – Document, report	PU - Public	6

D1.3	Data Management Plan version 2	WP1	5 - DBC	R – Document, report	PU - Public	42
D2.1	Definition of the Requirements, Use Cases and System Specifications 1st version	WP2	12 – NTUA	R – Document, report	PU - Public	6
D2.2	Definition of the Requirements, Use Cases and System Specifications final version	WP2	12 – NTUA	R – Document, report	PU - Public	10
D3.2	Report on the dynamical downscaling of climate and atmospheric impacts 1st version	WP3	15 – FMI	R – Document, report	PU - Public	18
D3.3	Report on the dynamical downscaling of climate and atmospheric impacts final version	WP3	15 – FMI	R – Document, report	PU - Public	24
D3.4	Report on Dynamic Data Assimilation methodology and site-specific risk	WP3	18 - AUTH	R – Document, report	PU - Public	28

	parameters and stressor indicators					
D4.3	Multi-Hazard Vulnerability Modules for IWW and connected hinterland infrastructures 1st version	WP4	12 - NTUA	OTHER	PU - Public	18
D4.4	Multi-Hazard Vulnerability Modules for IWW and connected hinterland infrastructures final version	WP4	12 - NTUA	OTHER	PU - Public	24
D4.5	Impact Assessment Model and Overall Organisational Resilience	WP4	16 - SoReCC	R – Document, report	PU - Public	34
D5.1	Assessment along the IWW corridor and a surrounding disaster affected area, using multi-source remote sensing data	WP5	12 - NTUA	R – Document, report	PU - Public	24
D5.2	Dynamic link to hazard and resilience assessment	WP5	16 - SoReCC	R – Document, report	PU - Public	30
D6.3	Business Continuity	WP6	16 - SoReCC	R – Document, report	PU - Public	30

	Models, Adaptation Strategies Standard Response Procedures					
D7.1	The PLOTO Integrated System and Acceptance tests 1st version	WP7	1 - INTRA	DEM — Demonstrator, pilot, prototype	PU - Public	32
D7.2	The PLOTO Integrated System and Acceptance tests final version	WP7	1 - INTRA	DEM — Demonstrator, pilot, prototype	PU - Public	38
D7.3	Reports on pilot testing, assessment and recommendations, plus training report 1st version	WP7	1 - INTRA	R – Document, report	PU - Public	35
D7.4	Reports on pilot testing, assessment and recommendations, plus training report final version	WP7	1 - INTRA	R – Document, report	PU - Public	42
D8.1	Project Website, Corporate identity and general templates for dissemination material	WP8	19 - ERTC	DEC — Websites, patent filings, videos, etc	PU - Public	3
D8.2	Dissemination,	WP8	5 - DBC	R – Document, report	PU - Public	6

	Communication and Exploitation Strategy 1st version					
D8.3	Dissemination, Communication and Exploitation Strategy 2nd version	WP8	5 - DBC	R – Document, report	PU - Public	18
D8.4	Dissemination, Communication and Exploitation Strategy final version	WP8	5 - DBC	R – Document, report	PU - Public	42

3.3.3 Scientific publications

As PLOTO is an Innovation Action project its dissemination strategy targets a broad range of academic and domain-specific conferences and events. Project results are planned to be published via articles, mainly in specialized press, scientific journals, conferences and workshops. The high quality of the publications and the compliance with the IPR guidelines of the Project (as outlined in the Consortium Agreement) is ensured by the internal reviewing procedures. The tables that follow (Table 3 and Table 4) present a non-exhaustive list of journals and conferences that are relevant to the PLOTO research areas.

Table 3: Indicative list of scientific journals

Title	Acronym	Link	Relevant WP	Type
Science of the Total Environment	Sci. Total Environ.	https://www.sciencedirect.com/journal/science-of-the-total-environment	WP4, WP6	Hybrid
Structure and Infrastructure Engineering	Struct. Infrastruct. Eng.	https://www.tandfonline.com/journals/nsie20	WP4, WP6	Hybrid
Reliability Engineering & System Safety	Reliab. Eng. Syst.	https://www.sciencedirect.com/journal/reliability-engineering-and-system-safety	WP4, WP6	Hybrid
Building Research & Information	Build. Res. Inf.	https://www.tandfonline.com/journals/rbri20	WP4, WP6	Hybrid
Physics of Fluids	Phys. Fluids	https://aip.scitation.org/journal/phf	WP2, WP3	Hybrid

Meteorological Applications	Meteorol. Appl.	https://rmets.onlinelibrary.wiley.com/journal/14698080	WP2, WP3	Open access
Atmosphere	Atmosphere	https://www.mdpi.com/journal/atmosphere	WP2, WP3	Open access
Journal of Flood Risk Management	J. Flood Risk Manag.	https://onlinelibrary.wiley.com/journal/17533318x	WP4	Hybrid
Water Resources Management	Water Resour. Manag.	https://www.springer.com/journal/11269	WP4	Hybrid
Earthquake Engineering and Structural Dynamics	EESD	https://onlinelibrary.wiley.com/journal/10969845	WP4, WP6	Hybrid
Bulletin of Earthquake Engineering	BEE	https://www.springer.com/journal/10518/	WP4, WP6	Hybrid
International Journal of Disaster Risk Reduction	IJDRR	https://www.sciencedirect.com/journal/international-journal-of-disaster-risk-reduction	WP4, WP6	Hybrid
Engineering Structures	EngStr	https://www.sciencedirect.com/journal/engineering-structures	WP4, WP6	Hybrid
Earthquake Spectra	EqSpectra	https://journals.sagepub.com/home/eqs	WP4, WP6	Hybrid
Journal of Infrastructure Systems	JIS	https://ascelibrary.org/journal/jitse4	WP4, WP6, WP7	Hybrid
Environment Development and Sustainability	Environ. Dev. Sustain.	https://www.springer.com/journal/10668	WP3, WP4, WP5	Open access (APC)
Transportation Research Part E - Logistics and Transportation Review	TRANSPORT RES E-LOG	https://id.elsevier.com/as/authorization.oauth2?platSite=SD%2Fscience&scope=openid%20email%20profile%20els_auth_info%20els_idp_info%20els_idp_analytics_attrs%20urn%3Acom%3Aelsevier%3Aidp%3Apolicy%3Aproduct%3Ainst_assoc&response_type=code&redirect_uri=https%3A%2F%2Fwww.sciencedirect.com%2Fuser%2Fidentity%2Flanding&authType=SINGLE_SIGN_IN&prompt=none&client_id=SDFE-v3&state=retryCounter%3D0%26csrfToken%3D54c4e935-485b-4541-b6d4-	WP3, WP4, WP5	Hybrid

		68a4047121c5%26idpPolicy%3Durn%253Acom%253Aelsevier%253Aidp%253Apolicy%253Aproduct%253Ainst_assoc%26returnUrl%3Dhttps%253A%252F%252Fwww.sciencedirect.com%252Fjournal%252Ftransportation-research-part-e-logistics-and-transportation-review%26prompt%3Dnone%26cid%3Djhp-8eb79886-2a8f-4cbd-a090-df8a56cd3a22		
Water	Water	https://www.mdpi.com/journal/water	WP3, WP4, WP5	Open access
Applied Sciences	applsc	https://www.mdpi.com/journal/applsci	WP4, WP5	Open access
Inventions	Inventions	https://www.mdpi.com/journal/inventions	WP5, WP6	Open access
Sustainability	Sustainability	https://www.mdpi.com/journal/sustainability	WP2, WP3	Open access
Sustainable Transport Using Inland Waterways	Sustainable Transport Using Inland Waterways	https://www.mdpi.com/journal/sustainability/special_issues/1U3486K48Q#info	WP2, WP3	Open access

Table 4: Indicative list of scientific conferences and workshops

Title	Acronym	Link	Relevant WP	Type
International Conference on Natural Hazards and Infrastructure	ICONHIC	https://iconhic.com/2021/	WP4, WP6	In person
40TH IAHR WORLD CONGRESS	IAHR 2023	https://rivers.boku.ac.at/iahr/	WP4	In person
18th World Conference on Earthquake Engineering	18WCEE	https://www.wcee2024.it/	WP4, WP6	In person
"SECED 2023 Conference: Earthquake Engineering & Dynamics	SECED2023	https://registrations.hg3conferences.co.uk/hg3/frontend/reg/thome.csp?pageID=89507&ef_sel_menu=1854&eventID=237	WP4, WP6	In person

for a Sustainable Future"				
14th International Scientific Conference, Transbaltica 2024	Transbaltica2024	https://vilniustech.lt/332103	WP3, WP4, WP5	In person
13th International Conference on Logistics & Transport 2023	ICLT2023	https://iclt.info/	WP3, WP4, WP5	In person
11th edition of the Scientific Conference of the Doctoral Schools	SCDS-UDJG	http://www.cssd-udjg.ugal.ro/	WP5, WP6	Hybrid
The Danube – Axis of European Identity	DAIE	https://conferences.univ-danubius.ro/index.php/DAIE/	WP 2, WP3, WP4, WP5, WP6	Hybrid

3.3.4 PLOTO project events

Events organised as part of the project tasks, such as the series of training sessions and technical workshops will be opportunities to present the project activities and disseminate their results.

The project partners will also be involved in the exchange of expertise and reinforcement of the collaboration with other EU-funded sister projects. PLOTO consortium will liaise with the relevant projects to organise joint events and workshop, supporting the creation of sysnergies with other relevant initiatives, as indicated in the Dissemination KPIs table (Table 6).

3.3.5 External events

Promotion of the project will also take place through presentations at third-party, external conferences and events, to raise awareness of the project activities that rely on stakeholder input and buy-in. This will be done through presentations in sessions or through presence with a stand in the events' exhibitions to distribute and/or display the project printed material.

Table 5 presents a preliminary list of identified conferences & events, where PLOTO partners could potentially promote the project.

Table 5: Dissemination opportunities

Type	Name	Targeted Audience/Stakeholders	Partner
Congress	ITS European Congress	Companies and organisations from the broad spectrum of the ITS	ERTC
Conference	Smart cities symposium 2023 & European Transport Congress 2023	multidisciplinary audience related to smart cities and its resillience	ERTC
Conference	MHEWC-III	International audience / Event organized by United Nations Disaster Risk Reduction	All
Networking	Global Risk Forum Davos	Intenational audience	SORECC
Workshop	49th Risk, Hazard, and Uncertainty Workshop	International audience / Top field experts	NTUA
Summer School / Networking	METIS Summer school 2023	International audience / Top field experts	NTUA
Summer School / Networking	METIS Summer school 2024	International audience / Top field experts	NTUA

3.4 Dissemination Key Performance Indicators (KPIs)

The success of the dissemination actions will be evaluated throughout the project duration based on specific metrics, as outlined in Table 6. The table also shows the current values of the dissemination KPIs that have been achieved in the project so far. The focus of the project during the first 6 months of its lifetime was on creating awareness on its existence and it is expected to enter a phase of producing mature results, which will lead to further improvement of the KPI values. The progress of the KPIs will be further monitored and reported in all future WP8 deliverables (D8.3 “Dissemination, Communication and Exploitation Strategy 2nd version” and D8.4 “Dissemination, Communication and Exploitation Strategy final version”).

Table 6: Dissemination KPIs

KPI	Description	Target	Status M6
Project contacts	Stakeholder database (per year)	≥1.000	7
Publicise Data	Entries in Horizon Results Platform (per year)	≥1	0
	Entries in Open AIRE (per year)	≥1	0
Scientific publications	Publications in open scientific journals/ conferences, Open Research Europe or book chapters (1-M12, 3-M24, 3-M36, 3-M42)	10	0
International Events & Conference	Participation in international events and conferences (per year)	≥ 2	0
Training sessions	Series of training opportunities on the pilot sites that will test the PLOTO AI-based tools (M24, M36)	≥3	0

Workshops	Workshops (physical or virtual) with ≥ 100 Participants (M12, 24, M36)	≥3	0
Clustering with other projects	Joint Clustering Meetings (per year)	1	0
	Joint White paper (per year)	1	0
	Joint Virtual Public Events (per year)	1	0
Consensus workshop	Final Conference (physical or virtual) targeting ≥ 250 participants with key representatives (M42)	1	0

The list of events that the PLOTO consortium has already participated in can be found in Table 7.

Table 7: List of events that the PLOTO consortium has already participated in

Activity type	Activity Name	Target Audience Reached
Conference	KIR Port Digitalisation Conference (07/12/2022 - Budapest)	(50) Research communities, Industry, business partners, Innovators, National authorities, Local authorities

4 Exploitation plan, roadmap to market and business modelling

This Section describes the exploitation plan of the PLOTO project, providing a Key Exploitable Results analysis, the individual exploitation plans of the consortium partners, the IPR Management, roadmap to market & business modelling methodology, as well as preliminary findings from the initial market analysis and initial competition landscape analysis.

4.1 Initial plan to exploitation

While the dissemination and communication strategy aims at creating a market for the PLOTO solution, exploitation focuses on the development of a business plan, so that the consortium can best position the proposed solution for future growth and profitability. Exploitation will involve all partners of the PLOTO project, and Task 8.5 "Exploitation and Business Plan – Development" is dedicated to the collection, analysis and harmonization of the exploitation plans of the various partners and their integration into a common exploitation plan. In this context, it is anticipated that:

- The exploitation plans of the industrial partners can also be divided to direct exploitation of the technical developments and indirect exploitation by leveraging potential business strengths through the association with other partners. Industrial partners will be the main responsible regarding the exploitation strategy. By incorporating the developed components, partners will enhance their portfolio of products and solutions and will strengthen their position in the market.
- Academic partners will also benefit from PLOTO results since they will have the opportunity to use the technological achievements of the project. Academic institutes will strength their position and can attract more students in the relative areas, providing them with unique cutting-edge hands-on experience in a growing emerging area, and by means of future projects and licensing of developed IPR. Students will also have the possibility to use the developed tools in their courses. The academic and research partners will exploit the results of the project both directly and indirectly. While a direct exploitation may be achieved by means of protecting the knowledge created by them in the course of the project (foreground knowledge) (e.g. by patents) and granting licenses for its use (or creating spin-off companies), the indirect exploitation may be realised by increasing leadership in respective areas of research on a global scale.

Figure 8: Exploitation to Commercialization cycle

PLOTO will focus its efforts to address multi-hazard risk understanding, smart prevention and preparedness, as well as faster, adapted and efficient response. Our proposed new integrated system to support operational and strategic adaptation and mitigation measures, by better absorbing and efficiently recovering from climate change impacts (including extreme events), aims to increase the resilience of IWW. To ensure commercialization after the end of the project (Figure 8), PLOTO has formed a consortium with strong industrial and SME presence and experience in the development of new products, supported by academia and research organisations and end-user organisations. Hence, the technology that will be developed within PLOTO is expected to be exploitable and applicable to cost-effective, high-value products. Exploitation activities will last for the entire project duration and will provide significant input for the system design and development, since a system that is not accepted or needed by the market and that cannot be commercialized with a viable business model is of little value.

The exploitation of the PLOTO results is based on the following pillars:

Pillar 1: A comprehensive stakeholder analysis

It will define the wider community that establish the potential users of the PLOTO results. Assess their interest and attitude towards the overall project objectives in general and their interest in adopting the results. In the beginning of the project, the potential stakeholders' community (WP2- User Requirements) will be mapped and contacted to inform them about the project objectives. Interest and attitude will be assessed through feedback questionnaires to create a first interest – influence grid. Based on this analysis these potential users will be invited to participate to the PLOTO stakeholders' groups –sort of Communities of Practice- and dedicated exploitation strategies will be developed. The stakeholder analysis will be part of the Dissemination, Communication and Exploitation Strategy - DCES.

Pillar 2: A detailed exploitation strategy, business plan and roadmap

The market aspects of the PLOTO results will be analysed via the results of the stakeholder interest analyses, subsequent market potential, related costs and main factors influencing the future market take-up. The development and fine-tuning of the exploitation strategy and plan will be supported by a series of exploitation -3 planned- workshops for the consortium. These workshops will also monitor, along the project lifetime, IPR opportunities and risks or deviations compared to the decisions stated in the consortium agreement, and they will provide a final strategy for or the Intellectual Property exploitation beyond the project phase and set up for each identified result a roadmap for exploitation and market deployment. Decisions on IPR matters that come up during this process will pass through the technical committees of the project, which will be responsible for the IPR management and will make sure agreements and rights of all partners are being respected.

The overall PLOTO exploitation plan will be developed during the project lifetime in four iterations as follows:

- **A first draft outline in month 6**, including the results of the stakeholder analyses, the results of the first series of small exploitation workshops and a rough market assessment;
- **A second draft in month 18**, based on the outcome of the second exploitation workshop and further assessments with the wider stakeholder community. In the second version, the project will include an initial assessment of the roll-out plans of the existing users and outline replication potential;

- **A final version of the plan in month 42**, based on the outcome of the third exploitation workshop, and including the strategy for defining measures for exploitation "after the project" phase, providing evidence of best practices in capturing and assessing IP agreements on ownership, rights of use and agreements on maintenance of the PLOTO software and components, the roll-out plans of the end-users and the roadmap for deployment to the external end-users. Additionally, some key parameters from socio-economic aspects e.g., job creation, effects on GDP, import/export will be analysed based on the whole value chains.

4.2 Key Exploitable Results analysis

At the start of the project, the components to be developed during the implementation phase that present exploitation capabilities are the following:

1. Enhanced Computer Vision for damage diagnosis and ML techniques
2. Seamless integration of data from multiple sensors on UAVs, fixed ground stations and moving vehicles for damage mapping and monitoring
3. IWW Simulators with climate scenarios and new data emanating from the project outcomes
4. Multi-Hazard Vulnerability Modules and Assessment Toolkit for IWW
5. COP and IWAT, adapted to PLOTO needs and selected scenarios
6. Middleware and Data Fusion Services
7. Integrated modelling system for the provision of data for the main climatic and meteorological parameters of interest at real time at both local and meso scales
8. Integrated PLOTO platform
9. Risk Assessment Engine
10. Socioeconomic Impact Assessment
11. IWW Digital Twin

The list is non-exhaustive and it is expected to be populated with further results, following the design and implementation phase of the project.

Key Exploitable Results initial analysis

For the PLOTO baseline exploitation plan the methodology followed to further define the Key Exploitable Results (KERs) concerns the identification of the following key aspects of each KER:

- Owner(s)
- TRL: at start (M01) and at the end (M42)
- Type of commercial/business exploitation
- Exploitation potential
- Conflicting Intellectual Property
- Initial SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats)
- Competition (are there any other competitive technologies/ products/ solutions)
- Targeted market (customers, estimation on time to market and expected ROI, path to market).

This exercise has been performed for all KERs by their respective owners, as depicted in the tables that are presented below (Tables 8-18).

Table 8: Enhanced Computer Vision for damage diagnosis and ML techniques

Innovation	Owner	TRL M01	TRL M42
Enhanced Computer Vision for damage diagnosis and ML techniques	National Technical University of Athens (NTUA)	TRL5	TRL7
Type of Commercial/Business Exploitation			
Work Package 5 (WP5) aims to develop a comprehensive monitoring and mapping system of the IWW corridors by enhancing computer vision methods for damage diagnosis and ML techniques by the end of M30. At this stage of the project and based on an initial analysis of the business prospects the exploitation plan of this system may include the following options: Service Delivery: The overall system could be offered as a service to several municipalities, countries and organizations worldwide following a profitable licensing policy. Short/Long-term contract per request: The system or its internal advanced algorithms separately, could be exploited to upcoming projects. These solutions may change or be adjust until the end of the project.			
Exploitation potential			
Developing a system which incorporates novel computer vision and ML methods in parallel with the combined analysis of data from satellites and vehicle-/airborne sensors, under a dynamic perspective of hazard and resilience assessment, offers significant potentials in environmental issues. Of course, the exact potentials will be further determined in the following months.			
Conflicting IP			
At this point of the project there are no conflicting IPs but it will be under investigation during the lifetime of the project.			
Strengths (*What we do well*)			
The developed IWW monitoring system of PLOTO will: Integrate multi sensor data and advanced computer vision algorithms. Perform the flaw and degradation synoptic assessment for different disaster scenarios. Ensure regular and efficient maintenance. Provide early detection of damage, degradation and emerging hazards. Offer rapid post-hazard damage inspection and performance assessment of the assets.			
Weaknesses (*Are we competitive?)*			
The competitiveness of IWW monitoring & mapping system depends on the level of the final product. In general, tech-based solutions are highly regarded projects and so they form a competitive area for everyone. Availability and quality of data can impact the accuracy and results of the system.			
Opportunities (*New stakeholders, Market trends*)			
Successful implementation of the overall monitoring and mapping system or even parts of it (algorithms) may be applicable to other applications such as monitoring cultural heritage assets or mobile mapping applications.			

Any kind of inspection and maintenance industry may be interested in the developed monitoring and mapping system.
Threats (*What are the risks*)
The stakeholders and end-users may not be familiar with this technology and as a result the implementation of the system may face some sceptisism.
Competition *Other competitive technologies/ products/ solutions*
Neurolabs Pagarba Solutions
Targeted Market *Who are the customers?*
Ministries, Municipalities and Organizations which manage or exploit IWW and/or the assets included. IWW and other type of transport operators/authorities. Maintenance and inspection teams of transport infrastructures.
Time to Market estimate
After the development of the IWW monitoring system, a business plan will be made to further investigate the potential commercialization of the products/services during the period M39-M42.
Expected ROI *Initial estimations*
TBD
Path to market *How do you plan to embed results in your organisations (i.e. extend the company's product portfolio, develop new products, etc.)*
The NTUA will ensure that the PLOTO results and especially the monitoring and mapping system as well as the computer vision methods for damage diagnosis and ML techniques will be further diffused and exploited through its networks, products and research. Additionally, the research conducted during PLOTO project will be a valuable addition to the organisation's knowledge domain, resulting in the development of new methods in different or similar scientific areas. Both technical and dissemination activities will assist on that.

Table 9: Seamless integration of data from multiple sensors on UAVs, fixed ground stations and moving vehicles for damage mapping and monitoring

Innovation	Owner	TRL M01	TRL M42
Seamless integration of data from multiple sensors on UAVs, fixed ground stations and moving vehicles for damage mapping and monitoring	STWS	TRL 4	TRL 6
Type of Commercial/Business Exploitation			
The component will, mainly, be exploited only in combination with the COP & IWAT and joint exploitation of the PLOTO platform.			

Exploitation potential
The solution can be utilized to obtain on-site damage information prior to conducting comprehensive surveys in disaster-stricken areas, which is helpful for real-time managing strategies for regional disaster mitigation. Customers for such technologies may benefit by: Enhanced Risk Engineering can be improved through the use of site assessments conducted from both the ground, the air and space. These assessments can help property owners identify features that may reduce risks and take actions to lower overall risk. Satellites and drones can be used to monitor areas threatened by natural disasters in a fast and safe manner. This approach can be utilized by governments, insurance companies, and IWW operators to monitor situations and alert local residents of potential dangers. Site inspections can be conducted more safely, quickly, and cost-effectively by utilizing satellites and drones, especially in large areas with challenging working conditions. Drones can provide high-quality visuals for field assessments, allowing users to engage generalists instead of specialists for risk assessment. Satellites and drones can potentially improve the future analysis and improvement of infrastructure through the precise photos they take.
Conflicting IP
Since 2019 there is increasing growth in patents focused on utilizing drone technologies for rapid damage assessments. A complete assessment of IP landscape will be possible to be done as soon as the designs and concepts of the KER will be developed in the relevant tasks. These tasks have not been initiated yet.
Strengths (*What we do well*)
Experience in providing satellite and UAV-based location assessment. Existing strong know-how on the subject.
Weaknesses (*Are we competitive?)*
IWW is a new market domain for STWS. Regulations on drone flights might be a great obstacle for providing rapid assessments on demand in a very short notice.
Opportunities (*New stakeholders, Market trends*)
Inland waterway transport is still growing and underutilized transportation market with space to provide novel solutions. Good consortium composition to mature the technological solution.
Threats (*What are the risks*)
The solution can be potentially copied by other competitors. Drone-basedsed products are often subject to rapid technological advancements and innovation, which can render existing products obsolete or outdated quickly. The component probably will need to rely on strong IP protection. If a competitor is able to copy or infringe upon this technology, it can seriously undermine the value of the original product and put the company at a significant disadvantage.
Competition

Other competitive technologies/ products/ solutions
Potential companies that could compete the solution provided by PLOTO: AceCore Technologies, Aerialtronics, Aeroscout, AiDrones, Alpha Unmanned Systems, Altavian, Arcturus-UAV, Baykar Machine, COBHAM, Delft Dynamics, DJI Innovations, ERA, Flightech Systems, High Eye, Indela, Innocon, Italdron, Laflamme Aero, Latitude Engineering, MavTech, MERIO, MikroKopter, R4 Robotics, Shandong LongYi Aviation Technology, Steadicopter, Sunbirds, Swift Radioplanes, Threod Systems, UAV Solutions, UAVision
Targeted Market *Who are the customers?*
Inland Waterways infrastructure Operators. Critical infrastructure owners utilizing and operating near inland waterways. First/Disaster Responders organizations. Insurance companies.
Time to Market estimate
5-6 years from the beginning of the PLOTO project.
Expected ROI *Initial estimations*
Our annual target ROI is 20% during the first 5 years after the product launch.
Path to market *How do you plan to embed results in your organisations (i.e. extend the company's product portfolio, develop new products, etc.)*
The module will extend the current STWS product portfolio.

Table 10: IWW Simulators with climate scenarios and new data emanating from the project outcomes

Innovation	Owner	TRL M01	TRL M42
IWW Simulators with climate scenarios and new data emanating from the project outcomes	All	TRL3	TRL7
Type of Commercial/Business Exploitation			
Based on an initial analysis of the business prospects and targets of PLOTO, we foresee the following exploitation paths for the IWW Simulator: Exploitation of the software and data via collaboration with public and private entities by entering licensing agreements.			
Exploitation potential			
Academic: The engine (software) will be exploited by postdoc, PhD students and research team involved in PLOTO, becoming the basis for multiple investigations into the effects of climate change and natural hazards in general. Industrial: The consortium can exploit the IWW simulator as a standalone platform to be used by stakeholders for assessing and monitoring the status of IWW infrastructure, or as a separate module to be tied to other systems in future research projects.			
Conflicting IP			

The consortium is jointly managing the development of the IWW simulator using open-source tools or their own codebase. There is no conflicting IP outside the consortium, while the IP within the consortium shall be managed per the Consortium Agreement.
Strengths (*What we do well*)
Holistic risk and resilience assessment. Unified assessment of impacts between interconnected IWW sites/elements for all pertinent perils. Unique common operational picture and incident management from a single integrated platform.
Weaknesses (*Are we competitive?)*
The software requires specialized analyses to create the input data. It is of general nature but requires non-trivial customization for each client and/or case study. End-users are not always willing to provide detailed information for the assets at risk. Some simplifications are required to tackle large applications, such as an IWW and an associated urban area.
Opportunities (*New stakeholders, Market trends*)
Application to different types of infrastructure is envisioned (highway operators, water systems, urban planners, municipalities, cultural heritage owners, etc.). Emerging markets.
Threats (*What are the risks*)
Large EU, US and Asia-based private companies and reputable universities already working in the field.
Competition *Other competitive technologies/ products/ solutions*
EU, US and Asia-based private companies and universities active in Catastrophe modelling.
Targeted Market *Who are the customers?*
The potential targeted market for the software are: City managers Service providers Civil protection agencies Research institutes, technological centres, universities Related EU-funded projects Government bodies Policy makers, international and national organisations
Time to Market estimate
Three years after the end of PLOTO.
Expected ROI *Initial estimations*
TBD
Path to market *How do you plan to embed results in your organisations (i.e. extend the company's product portfolio, develop new products, etc.)*
Each partner is expected to further develop their own IP and employ it in further research and commercial projects individually. Given the large degree of customization required for a successful application beyond the confines of the PLOTO pilot sites, several partners are

expected to immediately reap benefits by offering associated customization services for their area of expertise. As a consortium, a royalty sharing agreement needs to be reached to allow commercialization of the IWW simulator under the leadership of an industrial partner, or the formation of a new corporate entity co-owned by all relevant partners.

Table 11: Multi-Hazard Vulnerability Modules and Assessment Toolkit for IWW

Innovation	Owner	TRL M01	TRL M42
Multi-Hazard Vulnerability Modules and Assessment Toolkit for IWW	SORECC & NTUA	TRL4	TRL7
Type of Commercial/Business Exploitation			
NTUA will develop the standardized open format for coding Multi-hazard Vulnerability Modules (MHVMs). The plan is to exploit the format by popularizing its use for better interoperability of academic and industrial applications. NTUA and SORECC will co-develop the software for processing and exploiting MHVMs. Together they plan to exploit it as follows: Use the software in future research activities and projects. Exploitation of the software via collaboration with public and private entities by entering licensing or royalty sharing agreements.			
Exploitation potential			
Academic: The software will be exploited by postdoc, PhD students and research teams involved in PLOTO on behalf of NTUA and SORECC. Research-wise, both partners will gain experience and increase their reputation through the project and will make it easier for them to successfully participate in future related R&D projects, thus increasing their resources. The presentation of R&D achievements in public conferences is a further target that will reinforce and expand the partners' visibility in the field. Industrial: NTUA and SORECC will exploit the MHVM handling software as an integral part of the PLOTO IWAT system, following the exploitation potential of IWAT itself, or as a separate module to be tied to other systems in future research projects.			
Conflicting IP			
NTUA and SORECC are leading the development of the multi-hazard vulnerability modules and assessment toolkit for IWW. To the best of our knowledge, at this stage of the project and as foreseen, there is no conflicting IP.			
Strengths (*What we do well*)			
Representation of a vast portfolio of assets at risk, taking into account characteristic IWW elements and interconnected non-IWW components that influence the infrastructure performance. Highly detailed models for critical assets and reliable surrogate models for rest. Correlation with measure data and near-real-time assessment of the vulnerability of IWW infrastructure. Incorporation of environmental model inputs, field data, material parameter uncertainties, and Climate Change effects using diverse sources.			

Development of fully probabilistic age-dependent models for infrastructure. Incorporate of epistemic uncertainties.
Weaknesses (*Are we competitive?)*
Detailed data not always available for critical assets. Hydrological model for IWW is required. Several data sources are protected and may require customization or anonymization for efficient usage.
Opportunities (*New stakeholders, Market trends*)
Successful implementation may be applicable to other applications, such as the effect of Climate Change on critical infrastructure, etc. Emerging markets.
Threats (*What are the risks*)
Large US and Asia-based private companies and reputable universities already working in the field.
Competition *Other competitive technologies/ products/ solutions*
EU, US and Asia-based private companies and universities active in Catastrophe modeling
Targeted Market *Who are the customers?*
The potential targeted market for the software are: Service providers Civil protection agencies Research institutes, technological centres, universities Related EU-funded projects
Time to Market estimate
Two years after the end of PLOTO.
Expected ROI *Initial estimations*
SORECC is a private not-for-profit entity and NTUA is a public university, thus ROI is not applicable.
Path to market *How do you plan to embed results in your organisations (i.e. extend the company's product portfolio, develop new products, etc.)*
SORECC's software will be used in relevant advisory assignments to organisations across Europe and beyond. Also, it will be presented to international conferences. NTUA will use publications in scientific journal and international conferences, as well as other academia-related established channels (e.g., newsletters, EC events) for dissemination of the Multi-Hazard Vulnerability Modules and Assessment Toolkit for IWW. Within the consortium and in terms of non-academic exploitation, the MHVMs are an integral part of IWAT, thus we expect that they will largely follow the same path-to-market as IWAT itself.

Table 12: COP and IWAT, adapted to PLOTO needs and selected scenarios

Innovation	Owner	TRL M01	TRL M42
COP and IWAT, adapted to PLOTO needs and selected scenarios	STWS	TRL 5	TRL 6-7
Type of Commercial/Business Exploitation			
Based on an early assessment of the business potential of the COP&IWAT components and the commercial objectives of the company, we anticipate the following exploitation paths for the integrated COP&IWAT solution: The solution can be utilized as a part of product lines in the below business verticals. Converged Security and Safety solutions. Smart mobility solutions. Smart Cities solution. The improved solution can be exploited by offering new and improved software solutions based on the knowledge and software components of the integrated PLOTO platform. STWS is exploring currently both options for individual and joint (with the consortium) exploitation. Finally, the PLOTO results are expected to contribute to further innovation initiatives in the company.			
Exploitation potential			
The exploitation potential of the PLOTO COP&IWAT can be found in the bellow future market proposition form of software solutions by STWS in: Software for conducting a thorough analysis of the IWW: The component can support our clients to carry out a comprehensive assessment of the IWW infrastructure to identify its strengths and weaknesses, risks, and opportunities. This analysis could eventually cover the entire lifecycle of the IWW infrastructure, including the design of improvements of IWW, operation, and maintenance. Software for developing comprehensive risk mitigation planning and implementation actions: Based on the analysis of the IWW, the COP&IWAT component could be utilized as ca omprehensive solution that addresses the identified issues and risks. This solution could cover all aspects of tnfrastructure management, including asset management, maintenance and repair, performance monitoring, security, and safety. Software for providing ongoing support for maintenance of IWW: Potential opportunity for exploitation is to utilize the COP&IWAT software to provide support and maintenance solution to the clients ensuring ensure that waterways continues to meet the infrastructure's evolving needs. This solution should support regular infrastructure updates and upgrades, as well as incident and issue resolution.			
Conflicting IP			
No Conflicting IP			
Strengths (*What we do well*)			
Providing end-to-end and enterprise-level solutions for the management of large and critical infrastructures.			

PLOTO consortium provides an ideal composition of partners to pilot and deploy the proposed solution in the market. No equivalent direct competition in the market.
Weaknesses (*Are we competitive?)*
Clients may have strong brand loyalty to established firms, making it difficult for new entrants to gain market share. Competitive firms may hold patents that prevent new entrants from competing in certain areas. Fixed costs for research and development to develop solutions in these markets is quite steep.
Opportunities (*New stakeholders, Market trends*)
The new technologies developed in the PLOTO project have the potential disrupt established competition and provide an opportunity for STWS to enter. Established market players are covering existing needs, COP&IWAT solution is catering to an unmet market need.
Threats (*What are the risks*)
Local Governments may have created regulatory barriers that may possess a significant risk for STWS entering the IWW market in different countries, thus limiting the expansion potential. IWW market might have existing monopolies that might be difficult to penetrate.
Competition *Other competitive technologies/ products/ solutions*
While the COP&IWAT solution is very differentiated in comparison in what is available in the inland waterway market, there are key Players in the Waterway Transportation Software and Services Market that could create competitive forces to STWS and PLOTO consortium[1]: Accenture PLC (US) Veson Nautical Corporation (US) Aljex Software Inc. (US) Kirby Corporation (US) American Commercial Lines, Inc. (US) HighJump Software Inc. (US) Trans-i Technologies Inc. (US) Oracle Transportation Management Cloud (US) LogiNext Mile (US) Flexport (US) FourKites, Inc. (US) SAP SE (Germany) Cognizant Technology Solutions Corp. (India) FRETRON (India) Descartes Systems Group (Canada) The Descartes Systems Group Inc. (Canada) Bass Software Ltd. (Malaysia) Zero North (Denmark)

[1] https://www.maximizemarketresearch.com/market-report/waterway-transportation-software-and-service-market/148506/

Maersk Line (Denmark) DNV (Norway) Hidrovuas do Brasil (Brazil)
Targeted Market *Who are the customers?*
IWW infrastructure operators
Time to Market estimate
3-6 years from the beginning of the PLOTO project.
Expected ROI *Initial estimations*
Our annual target ROI is 20% during the first 5 years after the product launch.
Path to market *How do you plan to embed results in your organisations (i.e. extend the company's product portfolio, develop new products, etc.)*
Currently, STWS strategy is to extend the company product portfolio by integrating the modules developed during the PLOTO project and enabling interoperability with the systems of the consortium partners.

Table 13: Middleware and Data Fusion Services

Innovation	Owner	TRL M01	TRL M42
Middleware and Data Fusion Services	RISA, EXUS, INTRA	TRL5	TRL7
Type of Commercial/Business Exploitation			
The PLOTO **Middleware** will incorporate current information systems (IWW, LEAs, Climate and Weather Forecast models, etc.), but also available sensor networks (mobile platforms, Satellite, GPS, cameras, weather-climate stations, etc.). It will coordinate information delivery between control and device planes, accompanied by effective, scalable service assurance. PLOTO middleware will act as a broker across network communication interfaces to ensure that each connected service and information system delivers its information to the appropriate format to PLOTO platform or other IWW information systems. It will consist of: Abstraction layer, Resources Management Framework/Fusion, Complex Event management module, Ontologies and Semantic representation layer, Communication management module and Security and privacy module. The functionality of **Data Fusion** and Middleware (Complex Events management module) are tightly coupled. DF will be designed and implemented in a modular way but also splitted into three different layers in order to minimise complexity. Moreover, the DF Languages (DFL) in PLOTO will be a language that provides the functionality else offered through several engines, considering that not all engines allow all possible operations especially focused on IWW resilience. Therefore, the interpretation of this language shall be aware of the semantics of the operations described, doing so the DF engine is able to "know" if the operation is possible with the engine(s) deployed in the platform.			
Exploitation potential			
RISA will exploit the results of the project on a commercial basis by means of enhancing its existing platforms for the provision of enhanced data management. PLOTO comes as a			

natural continuation of RISA's recent work within various projects dealing with the development of such platforms. As a minimum, RISA expects the PLOTO project to: a) advance the development of its data management software products and participation in more national projects concerning IWW protection, b) raise the profile of RISA's capability in the challenging IWW protection systems market, c) support the employment and development of engineering skills in Germany, d) provide an adaptive platform that could be used with small changes targeting other vertical business sectors. e) develop RISA as a valued contributor to European framework projects further, and f) further propagate the IT and engineering standards used in the PLOTO at a local and international level.
Conflicting IP
TBD
Strengths (*What we do well*)
Integrated and processed data from various sources. Fast and easy access to plenty of pre-processed data per application domain related. Increased efficiency/accuracy of information provided.
Weaknesses (Are we competitive?)
IWW end-users are often not particularly interested in sophisticated ICT solutions, especially given the current level of economic crisis. Easy-to-use and user-friendly platforms exist. Speed of technical evolution in the domain which blocks the end-users (fearing a quick obsolescence).
Opportunities (*New stakeholders, Market trends*)
IWW organizations shall upgrade existing systems/ services to meet the EC standards, as well as the worldwide trends in the specific domain. IWW organizations shall upgrade existing systems/ services to become more resilient and adaptive to climate changes.
Threats (*What are the risks*)
US and Asian-based competitors are already strong in the industrial bot market. Heterogeneous legislation/policies per country. Significant differences in country development, size and number of utilities; European market is still local, not homogeneous.
Competition *Other competitive technologies/ products/ solutions*
TBD
Targeted Market *Who are the customers?*
IWW and other type of transport operators/authorities IWW users: freight and passengers
Time to Market estimate
TBD
Expected ROI *Initial estimations*
TBD
Path to market

How do you plan to embed results in your organisations (i.e. extend the company's product portfolio, develop new products, etc.)
Technical activities to increase the TRL of Middleware and Data Fusion from 5 to 7 Demonstration of the actual system prototype in an operational environment to assess how the technology performs in a realistic setting and make any necessary modifications before deploying it on a large scale Testing of all interfaces individually under stressed and anomalous conditions Qualification and completion of the system Additional features, modules (e.g., cyber security) **Dissemination activities** Organization of workshops and seminars System demonstration using free versions of the tool (online and physical demonstrations) Marketing campaign (social media, paid search, email, videos, SEOs) **Business Plan activities** TBD

Table 14: Integrated modelling system for the provision of data for the main climatic and meteorological parameters of interest at real time at both local and meso scales

Innovation	Owner	TRL M01	TRL M42
Integrated modelling system for the provision of data for the main climatic and meteorological parameters of interest at real time at both local and meso scales	AUTH, FMI	TRL5	TRL7/8
Type of Commercial/Business Exploitation			
The following exploitation prospects for the integrated nowcasting / forecasting modelling system developed within the frame of WP3 are foreseen: Further development and application of the system in future research activities and projects at national and international level. Exploitation of the solution for the provision of consulting services and training to potential clients interested on acquiring the system for their own purposes. Improved research and service portfolio of the owners through the potential deployment of the system towards improving the resilience of critical infrastructures against natural and manmade hazards, in view also of potential climate change impacts.			
Exploitation potential			
Significant potential for further exploitation in new research projects and/or provision of a new service in the market, given the existence of an adequate client base and financial/human resources. Business potential will be investigated at later stages of the project via the PLOTO business models and plan.			
Conflicting IP			
AUTH and FMI, as the two partners mainly responsible for the development of the system in question, act as the core owner of this solution. At this stage of the project, there seems			

to be no conflicting IP. The IPR management activities will be further clarified during the next phases of the project.
Strengths (*What we do well*)
The PLOTO atmospheric modelling system integrates high end – high resolution modelling techniques which focus at the very local scale covering critical infrastructure areas of interest together with operational mesoscale modelling techniques which have the capacity to cover extended areas around the target field sites. The PLOTO atmospheric modelling system is flexible in the sense that it can be easily adjusted towards harmonization with other existing technologies and platforms.
Weaknesses (*Are we competitive?)*
IWW end-users are often not particularly interested in sophisticated modelling solutions, especially given the current level of economic crisis and in many cases, they cannot fully comprehend exactly what the generated modelling data represent. The modelling system is normally operated and maintained by highly skilled – highly trained staff. Potential reliability issues related to maintenance. For example, in cases of power surge or in cases when the installed sensors on site stop transmitting data.
Opportunities (*New stakeholders, Market trends*)
Successful implementation may be applicable to other applications, such as utilities, etc. Emerging markets: developing countries have funding available for similar projects, thanks to banks and programmes for development. May open up markets also in the US and Asia (e.g. through international partnerships).
Threats (*What are the risks*)
In terms of the scientific knowledge needed for the development of the system there already exist other competitors mainly from the US and East Asia who are equally strong. There is a risk that big companies – players at a worldwide level will seek to suppress initiatives in this field which are normally driven mostly by SMEs. Competition for low-cost IWW-oriented platforms.
Competition *Other competitive technologies/ products/ solutions*
To the best of our knowledge, the main competition revolves around US and East Asian-based products / solutions.
Targeted Market *Who are the customers?*
The potential target customers of the integrated operators of critical infrastructures such IWW, road transport, ports, power generation and water facilities.
Time to Market estimate
Following the release of the final version of the modelling system in question and its integration into the overall PLOTO platform, a business plan to investigate potential commercialization and/or utilization in further research activities will be prepared. A pre-commercial version of the solution is expected 1 to 3 years after the project's end.
Expected ROI *Initial estimations*
TBD
Path to market

How do you plan to embed results in your organisations (i.e. extend the company's product portfolio, develop new products, etc.)
All consortium partners will ensure that the PLOTO results will be further diffused and exploited through their networks and products. The partners will also seek to exploit further components that can be individually or, through collaborations within the consortium, sold to interested customers. Finally, as through their participation in PLOTO, the partners will reinforce their product portfolio, addressing solutions for the maritime sector.

Table 15: Integrated PLOTO platform

Innovation	Owner	TRL M01	TRL M42
Integrated PLOTO platform	All partners	TRL4/5	TRL7
Type of Commercial/Business Exploitation			
At this stage of the project, and based on an initial analysis of the business prospects of the solutions and the strategic targets of the company, we foresee the following exploitation paths for the integrated PLOTO platform (which may be changed/ adjusted until the end of the project): Use of the solution in further research activities (internal) and projects (international). Exploitation of the solution via consulting services and training to potential clients (due to the knowledge gained during the project's implementation and during the development of the underlying solution). Improved service portfolio of the company via the investigation of deploying potentially new service or enhancing existing solutions, based on the knowledge and software components of the integrated PLOTO platform.			
Exploitation potential			
Significant potential for further exploitation in new research projects and/or provision of a new service in the market, given the existence of an adequate client base and financial/human resources. Business potential will be investigated at later stages of the project via the PLOTO business models and plan.			
Conflicting IP			
INTRA, as the partner leading the development of the integrated PLOTO platform, acts as the core owner of this solution. To the best of our knowledge, at this stage of the project, there is no conflicting IP. The IPR management activities will escalade during the next phases of the project, and therefore, IP aspects will be further clarified.			
Strengths (*What we do well*)			
The PLOTO platform integrates high technology with easy implementation within existing systems and facilities. The PLOTO platform has the capacity to harmonize with other technologies and existing platforms.			
Weaknesses (*Are we competitive?)*			
IWW end-users are often not particularly interested in sophisticated ICT solutions, especially given the current level of economic crisis. The platform operators need special training.			
Opportunities (*New stakeholders, Market trends*)			
Successful implementation may be applicable to other applications, such as utilities, etc.			

Emerging markets: developing countries have funding available for similar projects, thanks to banks and programmes for development. May open up markets also in the US and Asia (e.g. through international partnerships).
Threats (*What are the risks*)
US and Asian-based competitors are already strong in the market. Big players (worldwide) against the initiatives driven mostly by smaller players (SMEs) in Europe. Competition for low-cost IWW-oriented platforms.
Competition *Other competitive technologies/ products/ solutions*
To the best of our knowledge, the main competition revolves around US and Asian-based products / solutions.
Targeted Market *Who are the customers?*
The potential target customers of the integrated PLOTO platform are IWW operators, as well as maintenance and inspection teams of transport infrastructures.
Time to Market estimate
Following the release of the final integrated PLOTO platform in M38, a business plan to investigate potential commercialization and/or utilization in further research activities will be prepared during the period M39-M42. A pre-commercial version of the solution is expected 1 to 3 years after the project's end.
Expected ROI *Initial estimations*
Expected ROI = 18% (note: these constitute some initial estimations that may change during the project implementation and should not be considered as the final estimation).
Path to market *How do you plan to embed results in your organisations (i.e. extend the company's product portfolio, develop new products, etc.)*
All consortium partners will ensure that the PLOTO results will be further diffused and exploited through their networks and products. The partners will also seek to exploit further components that can be individually or, through collaborations within the consortium, sold to interested customers. Finally, as through their participation in PLOTO, the partners will reinforce their product portfolio, addressing solutions for the maritime sector.

Table 16: Risk Assessment Engine

Innovation	Owner	TRL M01	TRL M42
Risk Assessment Engine	NTUA	TRL4	TRL7
Type of Commercial/Business Exploitation			
NTUA will exclusively develop and own the software for assessing risk by cointegrating exposure, hazard, and vulnerability. Based on an initial analysis of the business prospects and targets of PLOTO, we foresee the following exploitation paths for the software: Use the software in future research activities and projects.			

Exploitation of the software via collaboration with public and private entities by entering licensing or royalty sharing agreements.
Exploitation potential
Academic: The engine (software) will be exploited by postdoc, PhD students and research team involved in PLOTO. Research-wise, NTUA will gain experience and increase their reputation through the project and will make it easier for NTUA to successfully participate in future related R&D projects, thus increasing their resources. The presentation of NTUA R&D achievements in public conferences is a further target that will reinforce and expand NTUA's visibility in the field. Industrial: NTUA will exploit the risk engine as an integral part of the PLOTO IWAT system, following the exploitation potential of IWAT itself, or as a separate module to be tied to other systems in future research projects.
Conflicting IP
NTUA is solely managing the development of the risk assessment engine for IWW. To the best of our knowledge, at this stage of the project and as foreseen, there is no conflicting IP.
Strengths (*What we do well*)
A risk assessment framework will be elaborated pertaining to how risk and impacts are propagated. The modelling framework for assessing the impacts between interconnected IWW sites/elements will be the augmented impact propagation model. Development of solutions concerned with the risk modelling, identification, prediction, improvement and optimization of the safety of the complex infrastructures related to their operation processes and their inside and outside interactions.
Weaknesses (*Are we competitive?)*
The software requires specialized analyses to create the input data. It is of general nature but requires non-trivial customization for each client and/or case study. End-users are not always willing to provide detailed information for the assets at risk. Simplifications are required to tackle large applications, such as an IWW and an associated urban area.
Opportunities (*New stakeholders, Market trends*)
Successful implementation may be applicable to other applications, such as the effect of Climate Change on critical infrastructure, etc. Emerging markets.
Threats (*What are the risks*)
Large EU, US and Asia-based private companies and reputable universities already working in the field.
Competition *Other competitive technologies/ products/ solutions*
EU, US and Asia-based private companies and universities active in catastrophe modelling.
Targeted Market *Who are the customers?*
The potential targeted market for the software are: City managers Service providers

Civil protection agencies Research institutes, technological centres, universities Related EU-funded projects Government bodies Policy makers, international and national organisations
Time to Market estimate
Two years after the end of PLOTO.
Expected ROI *Initial estimations*
NTUA is a public university, thus ROI is not applicable.
Path to market *How do you plan to embed results in your organisations (i.e. extend the company's product portfolio, develop new products, etc.)*
NTUA will use publications in scientific journal and international conferences, as well as other academia-related established channels (e.g., newsletters, EC events) for dissemination of the risk assessment engine. It will also disseminate the findings and success stories via further research projects and its existing partner collaboration network. Nevertheless, as the risk engine in an integral part of IWAT, in terms of non-academic exploitation, we expect that it will largely follow the same path-to-market as IWAT itself.

Table 17: Socioeconomic Impact Assessment

Innovation	Owner	TRL M01	TRL M42
Socioeconomic Impact Assessment	SORECC	TRL3	TRL6
Type of Commercial/Business Exploitation			
At this stage of the project and based on an initial analysis of the business prospects of the targets of SORECC, we foresee the following exploitation paths for the software for assessing socioeconomic impact (which will be updated until the end of the project): Use the software in future research activities and projects. Exploitation of the software via collaboration with public and private entities, such as governments, SMEs institutions to serve the scope of SORECC as a Center of Excellence.			
Exploitation potential			
Significant potential for further exploitation in new research projects, improvement of the portfolio of services offered, and advancing the collaboration with public and private entities.			
Conflicting IP			
SORECC is the sole partner developing of the software for assessing socioeconomic impact and is the owner of this solution. To the best of our knowledge, at this stage of the project and as foreseen, there is no conflicting IP.			
Strengths (*What we do well*)			
Strengths of the software: Supports the resilience of IWW			

Offers a socioeconomic model of residents, IWW-related economy (IWW transportation of goods, services), small businesses and local governance, offering a hierarchical model of the function of the IWW-related community. Can be extended to other applications related to risk & resilience assessment, i.e., highways, urban areas, cultural heritage etc.
Weaknesses (*Are we competitive?)*
The software needs specialized datasets provided by end-users. The software needs modifications for application to other cases than IWW.
Opportunities (*New stakeholders, Market trends*)
Successful implementation can be applied to many other applications, such as the effect of Climate Change on critical infrastructure, etc. Emerging markets.
Threats (*What are the risks*)
Large US and Asia-based private companies already working in the field.
Competition *Other competitive technologies/ products/ solutions*
US and Asia-based private companies and centres of excellence.
Targeted Market *Who are the customers?*
The potential targeted market for the software are: City managers Service providers Civil protection agencies Research institutes, technological centres, universities Related EU-funded projects Government bodies Policy makers, international and national organisations
Time to Market estimate
One year after the end of PLOTO.
Expected ROI *Initial estimations*
SORECC is a private not-for-profit entity and therefore ROI is not applicable.
Path to market *How do you plan to embed results in your organisations (i.e. extend the company's product portfolio, develop new products, etc.)*
SORECC's software will be used in relevant advisory assignments to organisations across Europe and beyond. Also, it will be presented to international conferences.

Table 18: IWW Digital Twin

Innovation	Owner	TRL M01	TRL M42
IWW Digital Twin	EXUS	5	7
Type of Commercial/Business Exploitation			
Software Selling Contract (licensing) and after sales support.			
Exploitation potential			
The exploitation potential for our IWW DT includes:			

Improved safety: Real-time monitoring of navigability parameters, such as water levels and flow rates, can help ensure safe operations in the port, preventing accidents and minimizing downtime. Increased efficiency: Accurate and timely information about navigability parameters can help optimize vessel routing, cargo handling, and other port operations, reducing transit times and improving overall efficiency. Predictive maintenance: By collecting and analyzing data from sensors and historical environmental data, a digital twin can help identify potential issues with infrastructure and assets, allowing for proactive maintenance and repairs. Risk management: The ability to simulate different scenarios and predict the impact of environmental factors can help port operators better understand and manage risks related to floods, droughts, or other potential natural disasters. Environmental monitoring: The digital twin can be used to monitor environmental factors such as water quality, temperature, and precipitation, allowing port operators to take proactive measures to protect the environment.
Conflicting IP
No conflicting IPs are envisaged at this stage of the project. The DT will be owned 100% from EXUS.
Strengths (*What we do well*)
Improved understanding of the port's processes and systems, which can lead to more efficient and effective operations. Prediction of potential flooding or drought can help prevent damage to assets, reduce downtime, and improve safety. Use of ML can help the system learn from real-time data, leading to better predictions and decision-making. Ability to test different scenarios and outcomes, allowing stakeholders to make informed decisions. Use of digital twin technology can enhance communication and collaboration among stakeholders. The use of the digital twin system can lead to increased efficiency and reduced downtime, which can result in cost savings for the port and its stakeholders. The system's ability to predict potential flooding or drought can help the port prepare for and prevent damage to assets, reducing the need for costly repairs or replacements.
Weaknesses (*Are we competitive?)*
Implementation and maintenance of the system may be costly and require a significant investment of time and resources. Availability and quality of data can impact the accuracy and usefulness of the system's predictions. The system may not be able to account for all potential scenarios or factors that could impact the port's processes and systems.
Opportunities (*New stakeholders, Market trends*)
Expansion of the system's capabilities to include other aspects of the port's operations, such as security or cargo tracking. Integration with other digital systems to create a more comprehensive view of the port's operations and potential risks.

The system can be used to identify areas for improvement in the port's operations, leading to increased efficiency and profitability.
Threats (*What are the risks*)
Implementation of the system may face resistance from stakeholders who are not familiar with digital twin technology or its benefits. Data privacy concerns may arise if the system collects and uses personal data of workers or visitors to the port. Cybersecurity risks could pose a threat to the system's accuracy and reliability.
Competition *Other competitive technologies/ products/ solutions*
Traditional risk management methods: Some port operators may still rely on traditional risk management methods, such as manual inspections or reliance on historical data, instead of investing in digital twin technology. Conventional simulation software: Conventional simulation software, such as computational fluid dynamics (CFD) or finite element analysis (FEA), can be used to model and predict certain aspects of a port's processes and systems. However, these methods may not be as comprehensive or flexible as a digital twin system. It is worth noting that digital twin technology is still relatively new in the field of port operations and risk management, so the competitive landscape may evolve as the technology becomes more widely adopted and new innovations emerge.
Targeted Market *Who are the customers?*
the potential customers for our DT can include port operators, shipping companies, logistics providers, government agencies, environmental organizations, advocacy groups, academic and research institutions, and others involved in the operation, management, and regulation of the port.
Time to Market estimate
5-7 years after the project ends, depending on the available funding and validation activities.
Expected ROI *Initial estimations*
TBD
Path to market *How do you plan to embed results in your organisations (i.e. extend the company's product portfolio, develop new products, etc.)*
Our purpose within EXUS AI Labs is to produce AI and ML-based algorithms that can be integrated in our product called EFS (Exus Financial Suite) in order to become a dominant player in debt collection, recovery, and loan management software services in the market. Thus, parts of the ML algorithms that will be used within the DT and can be used for our product will be integrated to our product.

4.3 Individual exploitation plans

Another path to making use of PLOTO results is for all partners of the consortium to plan how the knowledge gained from their participation in the design, development and validation of tools and services are going to be utilized by their organisations. Individual exploitations plans, as formulated at

the start of the project, i.e. before the implementation phase, are described in the following table (Table 19).

Table 19: Individual exploitation plans at the start of the project

Partner	Exploitation Plans
INTRA & INTRA- LU	INTRA expects to gain high knowledge on the PLOTO topics and enhance further our visibility. PLOTO results will be further diffused and exploited in our Network and products. INTRA will also seek to exploit further components that can be individually or in collaboration with the other consortium partners, sold to interested customers. Finally, as through its participation in PLOTO will reinforce its solutions portfolio addressing solutions for the Maritime sector.
EXUS	EXUS will exploit (either independently, or jointly in the suite of tools that will be developed in the project) the Digital Twin solution. EXUS will also use the knowledge obtained in developing relevant AI models and integrating these models in decision support tools for other projects it develops, in particular in the domains of security and crisis response.
FMI	The regional climate modelling method with downscaling in several steps to the local level is expected to be a major outcome of the project that will also be used for other purposes where site-specific information is needed after the project. Additional CORDEX simulations performed within the project will be published through the CORDEX data nodes and thereby made available for a wider user community.
NTUA	NTUA expects to gain high knowledge on above topics and enhance their visibility by collaborating with strategic industrial partners of the consortium in the field of resilience of IWW and hinterland infrastructures. PLOTO results will be exploited by postdoc, PhD students and research team involved in PLOTO. Research-wise, NTUA will gain experience and increase their reputation through the project and will make it easier for NTUA to successfully participate in future related R&D projects, thus increasing their resources. The presentation of NTUA R&D achievements to public conferences is a further target that will reinforce and expand NTUA existence in the field.
RISA	RISA will exploit the results of the project on a commercial basis by means of enhancing its existing platforms for the provision of enhanced data management, visualisation systems and decision support services. PLOTO comes as a natural continuation of RISA's recent work within various projects dealing with the development of such platforms. As a minimum, RISA expects the PLOTO project to: a) advance the development of its data management and decision support software products and participation in more national projects concerning IWW protection, b) raise the profile of RISA's capability in the challenging IWW protection systems market, c) support the employment and development of engineering skills in Germany, d) provide an adaptive platform that could be used with small changes targeting other vertical business sectors. e) develop RISA as a valued contributor to European framework projects further, and f) further propagate the IT and engineering standards used in the PLOTO at a local and international level.
AUTH	Exploitation includes the population of EU climate databases with high resolution data. These data will be available to the scientific community and the relevant stakeholders who participate in policy making. AUTH will also exploit the

	downscaling toolset and methodologies for enhancing its placement as a provider of climate services. The developed know-how and modelling tools are expected to become part of a multiscale simulation platform for providing focused risk assessment and management services.
SoReCC	PLOTO's final core product, shall be used in relevant advisory assignments to organisations across Europe and beyond. All results shall also be presented to public international conference where SoReCC is actively participating for many years now, promoting the resilience concept globally.
DBC	Expansion of existing services: DBC currently provides exploitation services in a number of key areas in Greece. DBC envisages an opportunity to expand their market offerings once the PLOTO innovations are developed. In addition, the knowledge that DBC's involvement in PLOTO will be valuable to expand their market penetration in these activities. DBC sees the potential to be involved in future related R&D and IA projects through their involvement in the PLOTO project. DBC anticipates that if funded PLOTO will develop IP that can be utilized to facilitate the development of new businesses and DBC are highly motivated to be part of such developments.
BME	The results will be available to the scientific community and the relevant stakeholders who participate in policy making. The knowledge will be utilized during study-aid developments. PLOTO results will be exploited by postdoc, PhD students BME will gain experience and reputation through the project which facilitates the participations in future related R&D projects.
ULIEGE	The innovative inundation mapping methodology, combining high resolution climate data and stochastic dike breach modelling, will be a major outcome of the project, which may subsequently be replicated at multiple other locations in Europe for upgrading flood risk maps. Similarly, advances in image-based monitoring of infrastructure will pave the way for new applications in other waterways. PLOTO results will be further exploited by PhD students, postdocs and master students at ULIEGE.
UDG	PLOTO will allow UDG to work closely with industry and countries involved to support partnerships in critical areas such as IWW transport. The R&D results will be exploited by postdoc, PhD students and research team and will be available to the scientific community and the relevant stakeholders PLOTO will be key to leveraging public and private collaboration, to foster the implementation of new technologies, sustainable innovations and spread successful new resilience solutions across Europe and the world.
RRT	Similarly, advances in image-based monitoring of infrastructure will pave the way for new applications in other waterways. PLOTO results will be available for tailored in order to address also the needs of other ports, as for example the ports of Braila and Tulcea.
STWS	STWS develops integrated Geospatial C2C solutions for Security and Public Safety applications and for customers such as police, coast guard, etc. It also develops DSS for natural hazards crisis management. PLOTO will help further enhance its position in the public safety market, enhance its portfolio in the domain of crisis management tools for planning and provide an opportunity for demonstration to international stakeholders. In PLOTO, ENGAGE will be used to create the situational

	picture; prove the opportunity for synergies with other partners to jointly promote related developments as an integrated product. The following actions to support efficient exploitation and commercial utilization are foreseen after the end of PLOTO: a) Marketing and Sales efforts via trade fairs, exhibitions; specific marketing initiatives to address new customers, b) sales activities via our distribution network, c) active participation in industrial seminars to communicate selected exploitable results.
UM	Partners of European associations (OpenEnloCC, EPTS) are heavily involved in activities related to IWW resilience to climate change and other extreme events. The methods and tools developed within the PLOTO project will improve the existing solutions of the University of Maribor in the field of Earth observation. An Earth observation satellite owned by the University of Maribor will be used for the project to prove its feasibility.
ERTC	ERTC will present the PLOTO results to interested ERTC members.
End-users	All end-users (i.e. port, authorities, railway) will cooperate in organizing a meeting with stakeholders to support the extension of PLOTO to other IWW cases.

4.4 IPR Management

Table 20 presents the Intellectual Property Assets of PLOTO as initially described in DoA, and the ways they will be protected, when applicable. At the time of drafting this report, no modifications have been reported. The Intellectual Property Assets included in the table comprise background assets brought into the project, and foreground results that will be developed during the project. In principle, each partner will own the foreground (results of the project such as inventions, software models, databases etc., and attached rights.) it generates. During the Grant Agreement Preparation phase, this table has been further analysed and a legally binding agreement in the form of the Consortium Agreement has been signed between consortium partners to ensure that Intellectual Property will be exploited in an optimal way and without conflicts during the project.

All IP-related aspects of PLOTO are managed horizontally during the lifetime of the project, as part of the exploitation activities and in correlation of the project's KERs. The IP strategy for project results is going to be updated in the context of three (3) exploitation workshops organised by DBC aiming to prepare and improve the exploitation strategies of the project results also monitoring potential IPR opportunities, to account for changing market and competition trends. To support the successful exploitation of project results, partners will seek protection as justified and appropriate.

Table 20: PLOTO Intellectual Property Assets status in M6

No.	Asset	Owner(s)	Project KER	Type of IP/License
1	Enhanced Computer vision for damage diagnosis and ML techniques	NTUA	Computer Vision Detection System	Proprietary
2	Seamless integration of data from multiple sensors on UAVs, fixed ground stations and moving vehicles for	STWS	UAV Inspection	Proprietary

	damage mapping and monitoring			
3	IWW Simulators with climate scenarios and new data emanating from the project outcomes	All partners	IWW simulator	Proprietary
4	Multi-Hazard Vulnerability Modules and Assessment Toolkit for IWW	SORECC, NTUA	Asset physical impact	Open Data, Proprietary source code
5	COP and IWAT, adapted to PLOTO needs and selected scenarios	STWS	Decision Support System and Mission Control	Proprietary
6	Middleware and Data Fusion Services	RISA, EXUS, INTRA	Middleware and DF Services	Proprietary
7	Integrated modelling system for the provision of data for the main climatic and meteorological parameters of interest at real time at both local and meso scales	AUTH, FMI	Atmospheric Impact Assessment	Proprietary
8	Integrated PLOTO platform	All partners	Integrated Inspection System	Proprietary
9	Risk Assessment Engine	NTUA	Software for assessing risk by cointegrating exposure, hazard, and vulnerability	Proprietary
10	Socioeconomic Impact Assessment	SORECC, ULiège	Software for assessing socioeconomic impact	Proprietary
11	IWW Digital Twin	EXUS	ML models for the development of the DT	Proprietary

4.5 Roadmap to market and business modelling methodology and tools

It is in the plans of the consortium to deliver a business plan addressing not only the commercialization of the PLOTO in a midterm horizon, but also 2 to 5-year period beyond project closure, covering thus the long-term vision of the project. The business plan will describe concrete measures of how follow up funding will bring the developed solutions to higher TRLs, before proceeding with the definition of

plans for the economic exploitation of results, either via a joint-venture vehicle or for each partner individually. To achieve this, we are going to use specific business modelling tools, like: PESTLE and SWOT analysis and Lean model canvas.

4.5.1 Pestle analysis

PESTLE analysis is a strategic management tool and assessment framework of the external factors at large, that are customarily affecting the operation of a (new) Business and/or the launch of a (new) product or (new) project.

The current PESTLE analysis examines the following six elements, with their initial letters forming PESTLE's name:

- Political: examining all aspect of policy, government changes, political stability, etc. that are expected to specifically affect the environment in which an organization operates in.
- Economic: including economic per se variables that are expected to affect e.g., consumer demand, supply, prices, etc. Some indicative examples being: inflation, unemployment, recessions, currency exchange rates, etc.
- Social: focusing on societal data such as population, culture, traditions, lifestyle, etc.
- Technological: referring to technological advancements, research and development, new applications of technology, that play a role in shaping the environment where the subject operates in.
- Legal: examining all aspects of legislation and regulations in e.g. copyrights, health and safety, consumer law, industrial relations, market structures, etc.
- Environmental: emphasizing on areas like climate, nature, pollution, sustainable development, ecological footprints, etc.

In the context of future work towards exploitation, we will use PESTLE analysis to assess and evaluate the above elements and how they are expected to affect and interrelate with PLOTO's adoption and overall performance of the project.

4.5.2 SWOT analysis

SWOT analysis is one of the longest standing analytic methods, used extensively in corporate planning, management and marketing.

It derives its name, as an acronym, of the individual elements it examines, namely: Strengths – Weaknesses – Opportunities – Threats. It is of particular relevance when working to strategically assess the competitive positioning of an entire company, a (new) business, a (new) product and/or a (new) project.

A SWOT analysis makes a distinction of the areas examined in two levels, namely: Internal and External, with each of these two taking respectively a look at Internal and External factors, affecting the subject in question.

At the Internal level, factors, which are by definition specific and inherent, to the product / service / project / organization / business, etc. are being examined, and therefore SWOT's following elements fall into this category:

- Strengths: characteristics e.g., features etc., specific to the product / service / project that give a competitive edge vs. other comparable alternative(s)
- Weaknesses: characteristics specific to the product / service / project that weaken its position, or are less favorable vs. other comparable alternative(s)

- At the External level, factors, which are inherently exogenous with the specific product / service / project / organization / business etc. are being examined, and therefore SWOT's following elements fall into this category:
- Opportunities: characteristics of the wider environment e.g., market, industry, trends etc. which are to the advantage of the product / service / project.
- Threats: characteristics of the wider environment, which are disadvantageous and are expected to adversely affect the success of the product / service / project.

A SWOT analysis is traditionally presented in tabular form of a 2x2 table, with the top row featuring the Internal fields of Strengths and Weaknesses, and the bottom row featuring the External fields of Opportunities and Threats, as shown in Figure 9 below.

Figure 9: A SWOT Analysis template (source: semrush[2])

In the present context of our work for PLOTO, we will use SWOT analysis as a framework to facilitate, an, as accurate as possible, appraisal of the above named four fields, influencing the project's eventual competitive, market positioning, to better understand its commercialization prospects and what is to be expected.

4.5.3 Lean canvas

For preparing a PLOTO Business Plan we will be working with the Lean Canvas. Lean focuses on problems, solutions, key metrics and competitive advantages and is the most suited for R&D projects. It presents a valuable tool for consortium partners, which can effectively develop and present the characterization of the main Key Exploitable Result (KER) of the project, the PLOTO Platform as a whole. Since the end goal of the lean canvas is that an unknowing third-party will be able to review the information provided and understand what the KER and its use is about, it is planned to be used by consortium partners when pitching to potential investor and other interested parties, later during the 3rd year of the project, and beyond. A lean model canvas template is shown in Figure 10.

[2] https://www.semrush.com/blog/swot-analysis-examples/

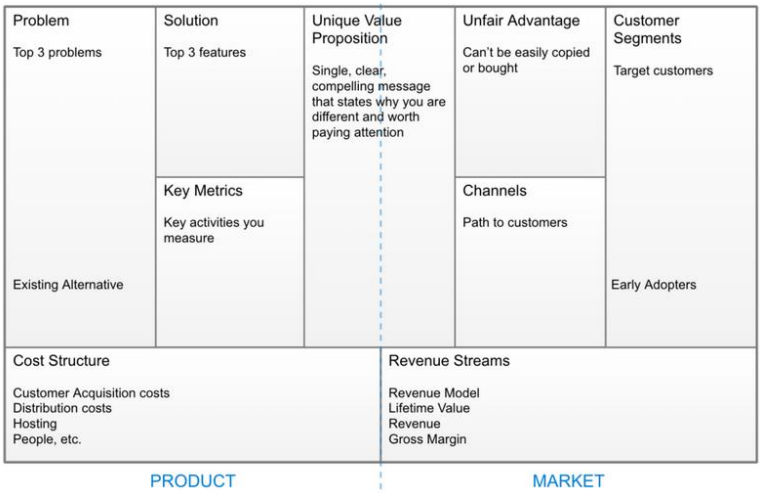

Figure 10: Lean model canvas template

A typical lean Model Canvas is a visual chart template, as the one shown above, which consists of nine main fields, each of them representing the nine building blocks of a Business Model, according to the creators of the Business Model Canvas (BMC). It can, therefore, be seen as a summary representation of a complete Business Plan. Condensed as it might look, it still features all the basic components to be considered for a standard business operation. A completed BMC template is meant to be an overview, addressing the key points of a business model, and its nine building blocks, when grouped together, evaluating the Feasibility, Desirability and Viability aspects of a specific product, service or project.

4.5.4 Stakeholder engagement plan

In order to approach and involve the stakeholders in a successful exploitation for PLOTO platform as a whole, but also for the individual KERs, consortium partners are considering pursuing two paths: i) addressing stakeholders from partners' own networks and ii) addressing stakeholders outside the project. For both paths, the effective dissemination of results plays a key role. PLOTO partners may use appropriate dissemination tactics to easily convey the project purpose, aims and benefits to their own stakeholders and networks. For reaching external interested parties, we need firstly to identify the map of stakeholders potentially interested in the project and its outcomes, engage them in the project's activities and encourage them to regularly interact with the project. For instance, the organisation of industry focused events (workshops and demo events) to showcase and receive feedback of the added value of PLOTO outcomes to different users will be a valuable step towards exploitation. Generally, the ways in which the consortium has planned to raise awareness around the PLOTO platform and solutions by participating to and/or organizing project dissemination events as described in Section 2, are taking into account stakeholders' engagement. To add to this, communication activities, as described in Section 3, are already being used to reach the relevant stakeholders through digitals channels, such as the PLOTO website, social media, newsletters, etc., by:

- Inviting interested parties to subscribe to PLOTO newsletter, thus populating our contacts list,
- Encouraging stakeholders to connect with the project through the social media, and
- Contacting PLOTO followers from social media to invite them to participate in related events.

4.6 Preliminary findings

4.6.1 Initial market analysis - overview and trends

Partners of the consortium are confident that there are a lot of commercialization opportunities related to PLOTO, thus the business prospects of these should be examined and evaluated. According to market research the global IWW transport market is expected to grow from $18.62 billion in 2020 to $19.42 billion in 2021 at a compound annual growth rate (CAGR) of 4.3%. Disruptions to river navigation as a result of environmental phenomena (namely droughts or floods) can cause significant economic losses. For example, Christodoulou et al. analyzed the impacts of droughts on four specific locations of the Rhine and the Danube where a substantial part of the total freight activity in the European Union (EU) takes place. For Ruhrort on the Rhine, where the number of low water days per year is expected to increase, the authors estimated an average annual economic loss of €10 million until the end of the century. In an example at the opposite end, flooding of the Mississipi river in the US in 2019 stranded almost $1 billion of grain destined for overseas markets.

Therefore, efficient monitoring and accurate projections are highly significant for mitigating or preventing economic losses. This can be accomplished in at least four ways: a) by early implementing maintenance works (e.g. dredging, lock upgrading, maintenance of flood drainage channels) to prevent flooding, b) by managing irrigation and water reservoirs to mitigate the number of low water days, c) by helping to programme the loading of vessels (which depends on water levels) from the start of a trip, and prevent accidents or the need to unload cargo during a trip, d) by scheduling transports of goods (especially foods and food products) from the point of production, so that large delays that would render the goods unusable or their value diminished are avoided.

In order for the market potential to be better identified, a market research will be performed under WP8 and more specifically on T8.5. The cooperation between all partners will be based on shared and strong business interests. The consortium is committed to explore and compare the viability, sustainability and scalability of a large number of different exploitation schemes (e.g., direct exploitation by the partners, creation of new ventures) and take clear go- and no-go decisions as far as those are concerned, which will be reflected at the end of the project in the business plan.

4.6.2 Initial competition landscape analysis

A preliminary competition investigation will be performed as a baseline activity towards identifying market technologies landscape relevant to PLOTO KERs. The scope of this analysis will be to identify if there are any major vendors established, that provide any “out-of-the-box” universal product and/or solution or industry-specific niche players, often start-ups, based on EU or abroad. The competition landscape analysis will result in the identification of the companies that offer related solutions, products, and/or services, with the ones offered by PLOTO, through an extensive corporate search. Also, to support our estimation on PLOTO offer as a whole competitive dynamic, there will be an effort in identifying gaps in the existing product /service lines that are addressed by PLOTO.

5 Standardization and liaison plan

This section depicts and details the different envisioned plans to impact in the different communities related with standardization and open-source development. Open standards are essential to achieve interoperability among different systems and devices in a network. Additionally, without open standards, it is strongly difficult (if at all possible) to develop and integrate new security services in any given network infrastructure or existing service. Open-source communities have a similar objective but with alternative approach: providing directly software solutions and its source code that can be directly used and adapted. Finally, the capacity to reach agreements with different organizations, such as public-private partnerships, allows to import and export knowledge. Therefore, it is one of the project strategic goals to transform the developed solutions and frameworks into these open groups, and to create consensus among global players to use the technologies developed by the project.

The different organizations have been grouped in three main categories. Standardization bodies, open-source communities and any other potential collaborations.

5.1 Standardization bodies

This section enlists and elaborates the set of standardization organizations identified by the consortium members in the analysis and strategy phase.

European Committee for Standardization

CEN, the European Committee for Standardization, is one of three European Standardization Organizations (together with CENELEC and ETSI) that have been officially recognized by the European Union and by the European Free Trade Association (EFTA) as being responsible for developing and defining voluntary standards at European level.

CEN is an association that brings together the National Standardization Bodies of 34 European countries. The EN Eurocodes are developed under the guidance and co-ordination of CEN Technical Committee 250 (CEN/TC250) "Structural Eurocodes". Delegates of the CEN National Members are represented in CEN/TC250 and its Subcommittees.

CEN/TC250 has the overall responsibility for all CEN work on structural design codes. Also, it is the responsibility of CEN/TC250 and its Sub-Committees (SCs), under the CEN rules, to maintain the EN Eurocodes within their remit.

It is the responsibility of CEN/TC250 to manage all the work, including establishment of general policies, programmes and strategies for the Eurocodes, and to oversee their implementation.

PLOTO expects to benefit from the European Committee for Standardization in aspects related to the standards that govern all civil infrastructure design and assessment.

5.2 Other cooperation and liaising activities

An essential part of PLOTO project's "Dissemination, Communication and Exploitation Strategy" is to establish synergies and natural links with other EU-funded projects and relevant initiatives. Consortium members will constantly try to get in touch with other relevant projects and initiatives in order to gain knowledge and investigate any potential for joint activities.

Projects in which PLOTO partners already participate or are going to, will comprise a first pool of projects for possible synergies. In addition, PLOTO will try to multiply impact through clustering activities with projects funded under the same call (HORIZON-CL5-2021-D6-01-09) and with projects funded under other calls but with relevance to PLOTO scope. This will ensure identification of a common pool of stakeholders, relevant events (i.e. conferences and exhibitions) and facilitate joint participation in them, co-organisation of special sessions at international conferences and other. Table 21 presents a preliminary list drafted by the consortium partners with projects related to PLOTO.

Table 21: Preliminary list of projects related to PLOTO

Project Title	Link	Relevance to PLOTO	Participating partner from PLOTO (if any)	Responsible partner(s) from PLOTO	Funded under HORIZON-CL5-2021-D6-01-09
CRISTAL	http://www.cristal-project.eu/	Funded under same call.	No	DBC	Yes
ReNEW	https://www.inlandwaterwaytransport.eu/renew-project/	Funded under same call.	No	DBC	Yes
For-Freight	https://www.for-freight.eu/	HORIZON-CL5-2021-D6-01-07	No	DBC	No
HYPERION	https://www.hyperion-project.eu/	Employs similar technologies, but for cultural heritage and urban area risk	NTUA, RISA	NTUA	No
THETIDA	https://cordis.europa.eu/project/id/101095253	Employs similar technologies, but for underwater cultural heritage risk	NTUA	NTUA	No
Green Win	https://www.nweurope.eu/projects/project-search/greenwin-greener-waterway-infrastructure/	Focused on improving management of IWW (although from the perspective of energy efficiency); but it will end in 2023	ULIEGE		No

The PLOTO project is also in the process of liaising with ALICE – Alliance for Logistics Innovation through Collaboration in Europe. ALICE is a European Technology Platfrom set-up to develop a comprehensive strategy for research, innovation and market deployment of logistics and supply chain management innovation in Europe. Through this collaboration PLOTO is expected to be benefited via ALICE in the following ways: a) PLOTO progress and outcomes can be show cased in ALICE events (conferences) at least twice during the project duration, b) Representative/s of the PLOTO will be invited to participate in relevant thematic groups of ALICE in order to properly link the project outcomes to the Thematic group activities and the identification of remaining gaps that would feed ALICE documents including recommendations to Research and Innovation programs, c) PLOTO may use ALICE network (e.g. ALICE Knowledge Platform) to promote its ouctomes through ALICE Newsletter and social media.

6 Conclusions

This deliverable presents the first versions of the dissemination, communication and exploitation plans of the PLOTO project. The plans have been proactive, including:

(a) Dissemination plan: From an early stage, starting with the dissemination objectives definition, the dissemination objectives were linked to tangible dissemination goals, followed by the identification of target groups, key messages to be communicated through the appropriate communication channels and associated activities. The implementation of the dissemination plan will start early in the project until its end and beyond. Targets will be monitored and evaluated regularly, and corrective actions will be applied whenever needed. A number of dissemination activities have already taken place as early as the start of the project.

(b) Promotion tools and materials: Promotion tools and materials concerning project identity, etc., have been produced. A preliminary non-exhaustive list of journals, scientific conferences and workshops has been identified in order to plan and achieve high-impact open access publications.

(c) Exploitation plan: Provides an initial examination of the ways the project's activities can be exploited both by industrial and academic partners, while providing a preliminary market analysis for the proposed PLOTO services. The exploitation plan is further facilitated by the list of exploitable items identified by the consortium.

(d) Liaison with other projects and initiatives: PLOTO has been particularly active into liaison activities at various levels. All three sister projects funded under the same call have formed an ecosystem to promote cooperation, exchange of good practices and boost project outcomes exploitation and outreach.

The PLOTO team will use this document, and, in particular, the guidelines defined in Sections 2, 3, 4 and 5, in order to have a common understanding of the procedures that will be followed during the project's lifetime to maintain a high-quality and constant communication channel with the general public. The document is also considered as a living report, as through the precise monitoring and control of the PLOTO activities, plan adaptations and updates are expected, following related dissemination and communication opportunities, as well as plan alignment with the project's technical outcomes and major dissemination activities (workshops' organisation, participation in large events, organisation of training activities, etc.). Further elaboration on key exploitation aspects, such as PESTLE, business model canvas per KER, value proposition, lean business model canvas, initial patent search, Unique Selling Point, innovation assessment, etc., will be included in future WP8 deliverables (D8.3 "Dissemination, Communication and Exploitation Strategy 2nd version" in M18 and D8.4 "Dissemination, Communication and Exploitation Strategy final version" in M42), thus solidifying the real value of the project outcomes.