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Circular and Bio-Based Solutions for the Ultimate Prevention of Plastics in Rivers Integrated with Elimination And Monitoring Technologies

Deliverable D6.3
Citizen Engagement and Co-creation

Deliverable information

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Project profile

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Project Coordinator	Fundacion AITIIP

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V0.6	9.8.2024	NIC	Revision and updates
V0.6b	23.8.2024	INEUVO, AITIIP	Revision
V0.7	26.8.2024	VITO	Revision and updates
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Executive Summary

UPSTREAM project aims to improve the cleanliness and water quality of the rivers by deploying and demonstrating into 5 demo sites a suite of 15 advanced solutions to deal with pollution in terms of litter, plastic and microplastic in European rivers. This challenge is afforded by a consortium (22 partners from 11 countries), from top European Research and Technology Organisations (RTOs), specialized Small and Medium-sized Enterprises (SME) technology providers, a large company and completed by promoting a strong engagement of citizens and stakeholders. This complex scenario requires a well oriented organization for implementation and effective monitoring based on efficient and clear management tools and assignments.

Deliverable D6.3: "Citizen Engagement and Co-creation", is implemented under WP6: "Knowledge co-creation, community engagement & dissemination", and in particular under Task 6.3: "Social engagement activities and Citizen Science". This deliverable contains report on Citizen engagement and co-creation guideline.

Deliverable Keywords: UPSTREAM, citizen science, citizen engagement, guidelines, survey.

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Table of Abbreviations

Abbreviation	Definition
DCCES	Dissemination, Communication, Community Engagement strategy
KPI	Key Performance Indicator
KERs	Key Exploitable Results
L	Litter
MP	Microplastic
P	Plastic
RTO	Research and Technology Organisations
SC	Steering Committee
SME	Small and medium-sized enterprises
UKRI	UK Research and Innovation
WP	Work Package
WPL	Work Package Leader

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1. Introduction

1.1. Project overview

UPSTREAM is a European Union Horizon Europe programme with Grant Agreement number 101112877, that will run for 48 months with starting date 1st of September 2023. The current problem of litter (L), plastics (P), and microplastics (MP) in the European river systems needs to be addressed. Isolated actions are not enough, and consequently, actions should be taken along the water supply chain: before wastewater treatment plants (WWTPs), after WWTPs and in the rivers themselves.

The overall objective of UPSTREAM is to (i) address pollution at every point in the path of L, P, and MP, (ii) coupling the technical demonstrations with analysis of circular (bio-based) value chains, environmental and economic sustainability assessments, and focused efforts on knowledge co-creation and replication will accelerate the reduction of pollution in European rivers and (iii) engage stakeholders at all levels – industry, government, and citizens.

To do that, the UPSTREAM project is going to deploy and demonstrate into 5 demo sites a suite of 15 advanced solutions that address the serious issues of pollution from L, P, MP in European rivers along 5 pillars – monitoring, prevention, elimination at wastewater treatment plants, elimination from rivers, and valorisation of collected plastics. Besides, replication across Europe will be enhanced by means of a cascade funding initiative to join early adopters beyond the partnership to quickly scale up the solutions, contribute to the Mission objectives, and expand the water system knowledge base throughout Europe.

UPSTREAM represents a pan-European consortium with 5 demo sites across Europe, including 4 WWTPs (UK, ES, DE, IT), plus a testing area on the Danube in Serbia. The consortium (22 partners from 11 countries) is strengthened by top European Research and Technology Organisations (RTOs), specialized Small and medium-sized enterprises (SME) technology providers, a large company world leader in sustainable bioplastics development, Novamont, and completed by partners dedicated to creating a digital knowledge sharing platform and engaging with citizens and stakeholders.

2. Project communication and dissemination

Project communication and dissemination are crucial aspects of the UPSTREAM project, especially in the context of raising people's awareness of plastic pollution. Effective communication ensures transparency about the project's goals, activities, and outcomes. It allows stakeholders, organisations, RTO's, industry, and the public, to understand what impact the project is expected to achieve.

Dissemination activities are being undertaken to promote and publicly disclose the project results to specific target audiences that may make use of the results and enable their uptake. Specific focus is given to replicating the technologies across Europe, especially in regions not previously active in Mission Ocean projects. Several measures will be planned and undertaken to circulate knowledge and results to those who can best use them.

Communication activities are being undertaken to promote the project and results to a broad audience, including the general public and audiences outside the specialist fields of the project. Efforts are made to demonstrate how EU funding is tackling societal challenges with particular focus on generating support

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for plastics elimination solutions. A key theme throughout the DE&C activities will be increased awareness of the need to prevent pollution in rivers through the engagement of citizens and other key stakeholders.

3. Communication and Outreach

The success of the project hinges on effective communication and community engagement. Our communication and outreach to D6.1 DCESS Strategy is to foster a strong connection between the project team and the local community. By delivering clear and accessible information, utilizing diverse communication channels, and maintaining transparency, we aim to inform, involve, and empower community members. These efforts will not only raise awareness about the project's objectives and the benefits of reducing plastic pollution but also encourage active participation and collaboration in achieving our shared environmental goals. As such UPSTREAM will maintain transparency that is crucial for building trust and ensuring community members feel informed and involved.

3.1. Developing clear messages

To effectively engage the community and ensure widespread understanding of the project's objectives, it is essential to craft simple, jargon-free messages. The project team focus on translating technical terms into everyday language. For instance, instead of referring to "bio-based solutions," the project will describe these as "natural alternatives to plastics made from plants or other renewable resources." This approach makes the information accessible to all community members, regardless of their technical background.

Additionally, the project aims to clearly explain the impact of plastic pollution. This includes highlighting how plastic waste affects local rivers, wildlife, and human health. For example, messaging will emphasize that plastic pollution can harm fish populations, which are crucial for local fishing communities, and can also contaminate drinking water sources, thereby directly impacting public health. The benefits of the project are prominently communicated, focusing on how reducing plastic waste in rivers can improve water quality, protect wildlife, and create a healthier environment for the community. It is also noted that using plant-based materials instead of plastics can support local agriculture and create new job opportunities.

3.2. Diverse Communication Channels

To reach a broad and diverse audience, the project has been utilizing multiple communication platforms described in the following subsections.

3.2.1. Events, workshops & conferences

Scientific and technological events related to the UPSTREAM project are crucial for disseminating the project and its results, as well to create networks and improve direct contacts. This activity strongly relies on the commitment from all the partners, which can contribute by disseminating UPSTREAM, regardless

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of the role they play in the project and specific expertise or tasks. Events such as workshops, conferences, and press releases and social media communication, will be delivered as a main driver to feed dialogues with the private sector and authorities to trigger the innovation. During the first-year partners have already actively participated in several conferences, events, workshops, etc.

The success of the DE&C activities will be achieved by: identifying and regularly updating the Key Exploitable Results (KERs) list; identifying target audiences and specific groups (TG1: Scientific & Research Community; TG2: Industrial users; TG3: Industrial supply and value chains; TG4: Financial actors; TG5: Policymakers; TG6: Consumers & general public), along with organizations and individuals within these; identifying specific channels or measures to contact these audiences; monitoring the success of actions taken and using this to tailor future measures; and strategically planning and delivering specific measures at the best times per audience. A key theme throughout the DE&C activities will be increased awareness of the need to prevent pollution in rivers through the engagement of citizens and other key stakeholders.

3.2.2. Popular science & press articles

The plan is to publish at least 3 popular science articles to inform the audiences about relevant news and to draw the attention to the project and to communicate significant results. All the press releases will be shared with specific media and magazines (online and offline) at regional, national, and European levels.

Consortium partners are also invited to promote the project content via social media, and internal and external newsletter summarizing recent activities, upcoming events, and volunteer opportunities. These newsletters may include stories about residents, organisations who have participated in for example educational programs, further engaging the community. During the first year of the project, and as reported in Section *4. Monitoring of dissemination and communication activities*, we have participated in various outreach activities to promote UPSTREAM project.

A poster campaign could feature visuals of local rivers alongside messages encouraging community involvement, such as "Help us keep our rivers clean - join our community efforts!" Furthermore, public events and information sessions will be organized. These events, including booths at local fairs, markets, or community gatherings, will offer interactive displays or demonstrations of bio-based products, allowing direct engagement with residents.

3.2.3. Social media communication

Engaging various stakeholders in EU project communication is essential for successful project implementation. Social media platforms have billions of active users worldwide, providing a vast audience for communication. This makes it an effective tool for reaching out to a large number of people quickly and efficiently.

Social media allows individuals and organizations to build their brand identity, establish credibility, and increase visibility. Consistent and engaging communication on social media can help attract followers,

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supporters, customers, and stakeholders. Overall, they play a crucial role in modern communication by facilitating widespread, instantaneous, and interactive communication, enabling targeted messaging, amplifying content, building brands, and providing valuable data and insights.

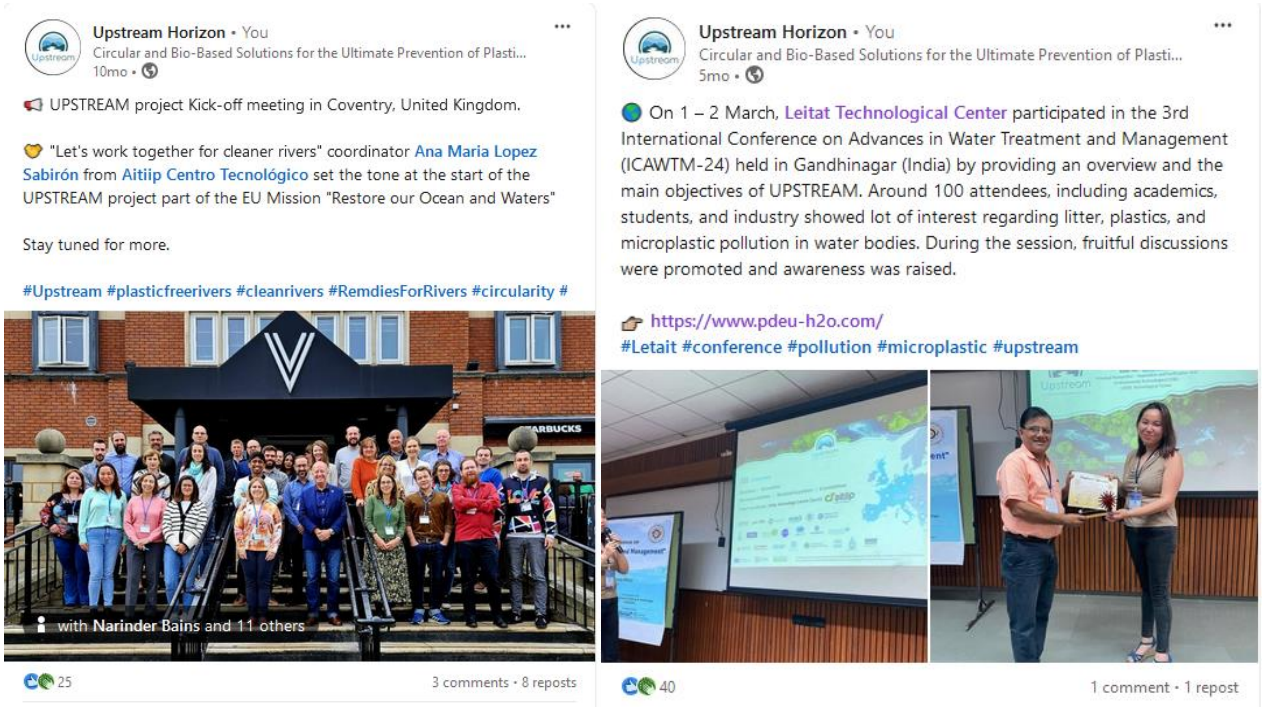


Figure 1: Example of posting in LinkedIn: Announcement of Kick-Off Meeting (left), and promotion of the participation of one of the partners at conference (right).

The Upstream social media (LinkedIn, Facebook, X, and Instagram) play a key role in communicating and promoting of the main objectives of the project. LinkedIn has been selected as the most appropriate social network to promote the project achievements, news and outcomes (Figure 1). Currently, the LinkedIn has already 2738 followers, Facebook 869 followers, X 23 followers and Instagram has 96 followers. Impressions, and followers are monitored monthly. The UPSTREAM social media team invited all members of the consortium to engage with accounts, share updates and increase the followers to the UPSTREAM social media channels by including the tag (@) in their posts and/or by using relevant hashtags. The lead hashtag is **#ForWasteFreeEuropeanRivers.** Other important hashtags are: **#Upstream**, **#CleanRivers**, **#PlasticFreeRivers**, **#PreventPollution**, **#Environment**, **#EUmissions**, **#HorizonProject**, **#HorizonEurope.**

4. Monitoring of dissemination and communication activities

To evaluate the dissemination & communication activities impacts, the monitoring is conducted according to the KPIs listed in the Table 1 and Table 2. The partners are requested to update the Dissemination Log accordingly, and this will be periodically checked by the WP6 leader.

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Table 1: Dissemination activities.

Measure	Implementation	KPI
Scientific publications	Agreed strategy to publish across relevant specialist journals and industry magazines.	At least 10 publications in total, at least 10 citations per paper 12 months after publication. Targeted publications: Environmental Science and Technology (impact factor: 9.028), Science of the Total Environment (IF: 10.75), and Green Chemistry (IF: 10.18).
Online media publications	Share results through a range of online media platforms with both general and targeted content.	At least 3 results-focused online publications.
Attendance at events	Strategy agreed to cover most relevant & important events.	Presentations in at least 8 events in total.
Workshops	Workshops to inform, train, share and gather input from external stakeholders.	10+ workshops held in years 2 - 4 with min. 50 attendees each.
Promotion to professional bodies	Attendance and presentations at industry body events, write articles for newsletters and promotion of learning materials.	Presentation to at least 4 events.
Linking with other EU and regional initiatives	Establishment of contact with other related projects, setup of cross promotional materials, co-organization of events especially with other Mission projects.	At least 2 join events with other projects organised and completed; presence in at least 6 events organised by other projects.

Table 2: Communication activities.

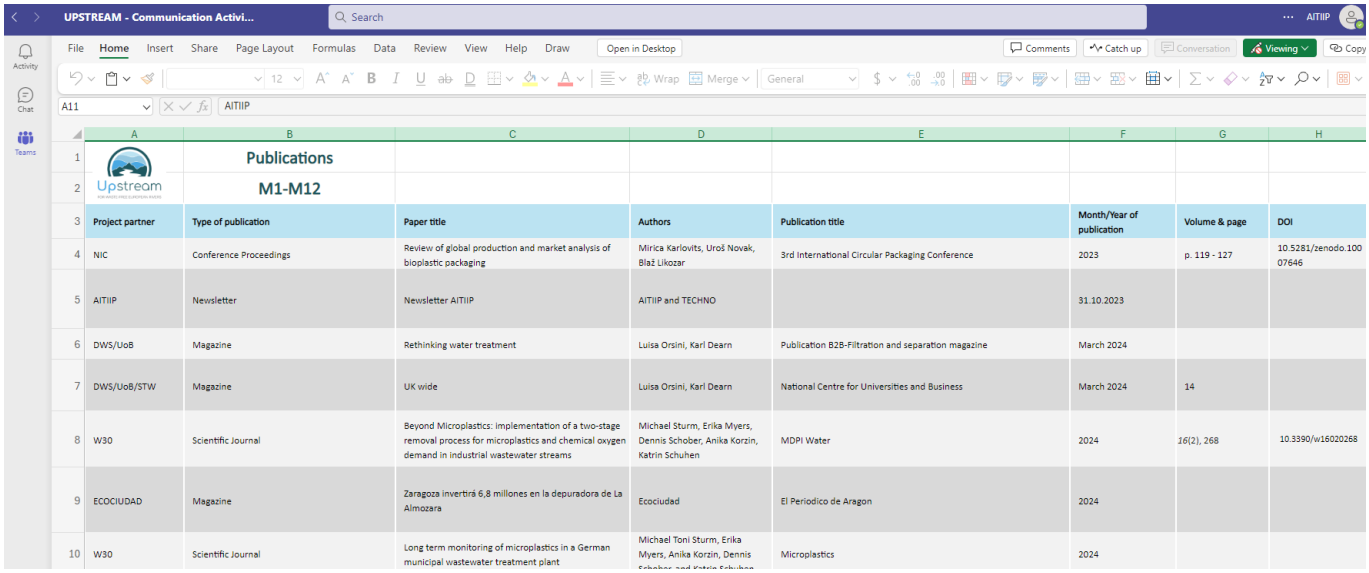
Measure	Implementation	KPI
Visual ID & brand **Project website**	Created at M3 and regularly updated during the project. Website will continue to provide info on project and results after project end.	At least one update per 10 days. From 100 hits/month in year 1 to 800 hits/month in year 4.
General marketing materials	First version of materials will be produced at M6 and updated at regular intervals.	Comprehensive marketing material pack by M6.
Popular science & press articles	Press release and articles.	At least 3 popular science articles.
Social media	Project accounts (LinkedIn, YouTube, etc.) created and strategy to build followers and re-shares by M3. Regular activity and profile building.	At least 1000 (min. 20/month) posts/stories with at least 200000 followers across all channels by M48.

Project partners are asked to fill in the information in the Sharepoint table UPSTREAM - Communication Activities & Publications (M1-M12) each time they submit their relevant event (Figures 2-3, Anexe 1).

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	A	B	C	D	E	F	G	H	I	J
1		Communication activities								
2		M1-M12								
3	Reporting	Project partner	Date	Name of Event	Online / In person	Location (City and Country)	Type of activity	Link to website	Role	Nu. of participants
10		AITIIP	23.11.2023	TECHNOLOGICAL BREAKFAST WORKSHOP on 'Bioeconomy: introduction to new sustainable solutions and technologies to improve plastic circularity and recycling processes'	In person	Zaragoza, Spain	Workshop	https://www.linkedin.com/posts/aitiip-centro-tecnol-gico_residuos-reciclaje-bioeconomaeda-activity-7135991812271292416-YXAy?utm_source=share&utm_medium=member_desktop	Presenter	~15-20
11		UoA	29.11.2023	REMEDIES Cluster Meeting in Oujda, Morocco	online	Oujda, Morocco	Event	https://remedies-for-ocean.eu/news/	Presenter	~100
12		EDEN	30.11.2023	Launch of BlueMissionMed Hub France	In person	La Seyne sur Mer, France	Event	https://lnkd.in/eV-NScTQ	Presenter	~100
13		NVMT	12.12.2023	Post on the social media of Novamont			Social Media	https://www.linkedin.com/posts/novamont_upstream-progect-activity-7140692226623393793-UzRS/?utm_source=share&utm_medium=member_desktop		~1514
14		UNSFS	December 2024	Micro(plastics) is everywhere around us	In person	Beograd, Serbia	Event		Presenter	
15		AITIIP/NIC	Monthly from January 2024	Mission Ocean | Communication Working Group	Online	Online	Workshop		Participant	~50
16		NVMT	16.1.2024 - 17.1.2024	Marca	In person	Bologna, Italy	Fair		Participant	~100
17		EDEN	30.01.2024	Horizon Europe Mission Day "Regenerating our ocean and waters"	In person	Paris, France	Event	https://www.horizon-europe.gouv.fr/journee-mission-horizon-europe-regenerer-notre-ocean-et-nos-eaux-36474	Participant	~200
18	Q2	UNSFS	01.02.2024	UPSTREAM project presentation on SUPRIMES project workshop	In person	Novi Sad, Serbia	Workshop	https://www.linkedin.com/posts/upstream-horizon-project_project-workshop-micropollution-activity-7160243186311823360-UISU?utm_source=share&utm_medium=member_desktop	Presenter	45
19		DWS	08.02.2024	Micropollutants Conference 2024, British Water	In person	Leeds, UK	Conference	https://www.britishwater.co.uk/events/eventdetails.aspx?id=1776724	Presenter	~100

Figure 2: UPSTREAM – Communication activities monitoring.



	A	B	C	D	E	F	G	H
1		Publications						
2		M1-M12						
3	Project partner	Type of publication	Paper title	Authors	Publication title	Month/Year of publication	Volume & page	DOI
4	NIC	Conference Proceedings	Review of global production and market analysis of bioplastic packaging	Mirica Karlovits, Uroš Novak, Blaž Likozar	3rd International Circular Packaging Conference	2023	p. 119 - 127	10.5281/zenodo.10007646
5	AITIIP	Newsletter	Newsletter AITIIP	AITIIP and TECHNO		31.10.2023		
6	DWS/UoB	Magazine	Rethinking water treatment	Luisa Orsini, Karl Dearn	Publication B2B-Filtration and separation magazine	March 2024		
7	DWS/UoB/STW	Magazine	UK wide	Luisa Orsini, Karl Dearn	National Centre for Universities and Business	March 2024	14	
8	W30	Scientific Journal	Beyond Microplastics: implementation of a two-stage removal process for microplastics and chemical oxygen demand in industrial wastewater streams	Michael Sturm, Erika Myers, Dennis Schober, Anika Korzin, Katrin Schuhen	MDPI Water	2024	*16*(2), 268	10.3390/w16020268
9	ECOCIUDAD	Magazine	Zaragoza invertirá 6,8 millones en la depuradora de La Almozara	Ecociudad	El Periodico de Aragon	2024		
10	W30	Scientific Journal	Long term monitoring of microplastics in a German municipal wastewater treatment plant	Michael Toni Sturm, Erika Myers, Anika Korzin, Dennis [illegible]	Microplastics	2024		

Figure 3: UPSTREAM – Publications monitoring.

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Table 3: Overview of communication activities (M1-M12).

Q1-Q4	Project partner	Date	Name of event	Online / in Person	Location	Type of activity	Link	Role	Participants	Target groups
Q1	UKCEH, VITO	11.10.2023	EUROqCHARM Stakeholder workshop 2023	In person	Brussels, Belgium	Workshop	1. link	Stakeholder	~50	Academia, researchers, stakeholders
	NIC	20.10.2023	3. International Circular Packaging Conference	In person	Ljubljana, Slovenia	Conference	2. link	Presenter	200 - 250	Academia, researchers, stakeholders, exibitors, policy-makers
	UoA	16.10.2023 - 17.10.2023	Remote Sensing of Marine Litter Workshop (RSMLW) 2023	In person	Noordwijk, the Netherlands	Workshop	3. link	Presenter	~100	
	NVMT	25.10.2023	"Novamont@school" training project	In person	Terni	Open day		Presenter	~100	Students
	NVMT	7.11.2023 - 10.11.2023	Ecomondo 2023	In person	Rimini, Italy	Fair		Participant	~300	Industry, public
	UKCEH	13.11.2023 - 17.11.2023	ETH-Zurich Early Careers Microplastics Workshop, Monte Verita	In person	Ascona, Switzerland	Workshop	4. link	Presenter	~100	Professionals, academia
	AITIIP	23.11.2023	TECHNOLOGICAL BREAKFAST WORKSHOP on 'Bioeconomy: introduction to new sustainable solutions and technologies to improve plastic circularity and recycling processes'	In person	Zaragoza, Spain	Workshop	5. link	Presenter	~15-20	Professionals, academia

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Q1-Q4	Project partner	Date	Name of event	Online / in Person	Location	Type of activity	Link	Role	Participants	Target groups
Q1	UoA	29.11.2023	REMEDIES Cluster Meeting in Oujda, Morocco	Online	Oujda, Maroco	Event	6. link	Presenter	~100	Researchers, Stakeholders, Academia, Policy-makers
	EDEN	30.11.2023	Lauinch of BlueMissionMed Hub France	In person	La Seyne sur Mer, France	Event	7. link	Presenter	~100	Researchers, Stakeholders, Academia, Policy-makers
	NVMT	12.12.2023	Post on the social media of Novamont	Online		Social Media	8. link		~1514	Public
	UNSFS	December 2023	Micro(plastics) is everywhere around us	In person	Beograd, Serbia	Event		Presenter		Public
Q2	AITIIP/NIC	Monthly from January 2024	Mission Ocean | Communication Working Group	Online	Online	Workshop		Participant	~50	Missions projects, network and EU Missions representatives
	NVMT	16.1.2024 - 17.1.2024	Marca	In person	Bologna, Italy	Fair		Participant	~100	Industry, public, customer
	EDEN	30.01.2024	Horizon Europe Mission Day "Regenerating our ocean and waters"	In person	Paris, France	Event	9. link	Participant	~200	Researchers, Stakeholders, Academia, Policy-makers
	UNSFS	1.02.2024	UPSTREAM project presentation on SUPRIMES project workshop	In person	Novi Sad, Serbia	Workshop	10. link	Presenter	45	Researchers, Stakeholders, Academia, Public water companies

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Q1-Q4	Project partner	Date	Name of event	Online / in Person	Location	Type of activity	Link	Role	Participants	Target groups
Q2	DWS	8.02.2024	Micropollutants Conference 2024, British Water	In person	Leeds, UK	Conference	11. link	Presenter	~100	Industry, academia, regulators
	AITIIP	13.02.2024	Biodegradable Materials	Online	Packnet (Madrid, Spain)	Workshop	12. link	Presenter	~50	Researchers, Stakeholders, Academia, Industry
	DWS/UoB	29.02.2024	Radio interview-BBCRario 4	Online	UK	Media	13. link	Presenter	~1000	Public
Q3	LEI	01.03.2023 - 02.03.2024	3rd International Conference on Advances on Water Treatment and Management (ICAWTM - 24)	In person	Gandhinagar, India	Conference	14. link	Presenter	~70	Researchers, Academia
	DWS/UoB	06.03.2024	TV interview BBC Midlands Today (local news)	Online	UK	Media	15. link	Presenter	~1000	Public
	ZINNAE	18.03.2024	Steering Committee meeting	Online		Website	16. link			Public
	ZINNAE	18.03.2024	Post on the social media of ZINNAE	Online		Social Media	17. link			Public
	NIC	22.3.2024	Secondary school visit	In person	Ljubljana, Slovenia	Open day	18. link	Presenter	~50	Public
	VITO	April 2024	Analytical expert lab: Detection of microplastics and their accompanying additives	In person		Other		Presenter		Oral communications to University of Antwerp students
	UNSFS	April 2024	Microplastics days workshop	In person	UK	Event		Presenter		Public
	AITIIP	2.05.2024	Student engagement in science	In person	Zaragoza, Spain	Open day		Presenter	~30	Students, Academia

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Q1-Q4	Project partner	Date	Name of event	Online / in Person	Location	Type of activity	Link	Role	Participants	Target groups
Q3	DWS/UoB	05.05.2024 - 09.05.2024	SETAC Europe 34th Annual Meeting	In person	Seville, Spain	Conference	19. link	Presenter	~1500	Researchers, Stakeholders, Academia, Policy-makers
	ZINNAE, TECNO, AITIIP	14.05.2024 - 15.05.2024	Challenges, trends and solutions in developing and processing biobased product (2nd IPPT TWIN Conference)	In person	Zaragoza, Spain	Conference	20. link	Presenter	~70	Researchers, Stakeholders, Academia, Industry
	ZINNAE	15.05.2024	Post on website ZINNAE	Online		Website	21.link			Public
	ZINNAE	15.05.2024	Post on social media of Novamont	Online		Social media	22.link			Public
	NVMT	21.05.2024	Post on the social media of Novamont	Online	Novara, Italy	Social Media	23. link		14500	Public
	NVMT	22.05.2024	Induction Novamont-Versalis	In person	Novara, Italy	Event		Presenter	10	Industry
	AITIIP	23.05.2024	SYSTEMIC TRANSFORMATIONS TO ADDRESS MARINE POLLUTION. BlueMisionMED. Spanish Hub Workshop at MARLICE 2024 - III International Forum on Marine Litter and Circular Economy	In person	Valencia, Spain	Conference	24. link	Presenter	~200	Researchers, Stakeholders, Academia, Industry
	W30	24.05.2024	Blue Mission Hub Malta, Italy, Tunesia	Online	Online	Conference	25. link	Presenter		SME, University Water Utilities
	NIC, W30, VITO, TOC, SVT	30.05.2024	EU Green Week 2024 - REMEDIES & UPSTREAM Cluster Meeting	Online	Online	Event	26. link	Presenter	~200	SME, University Water Utilities

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Q1-Q4	Project partner	Date	Name of event	Online / in Person	Location	Type of activity	Link	Role	Participants	Target groups
Q4	AITIIP, NIC, VITO	7.06.2024	Scientific and entrepreneurial approaches for effective communication about microplastics	Online / In person	Ljubljana, Slovenia	Event	27. link	Presenter	~50	Researchers, Academia
	EDEN	10.06.2024	Mobilising stakeholders from Türkiye towards the implementation of transformative innovative solutions for the EU Mission Ocean and Waters within the Mediterranean basin	Online	Turkey	Workshop	28. link	Presenter	~50	Researchers, Stakeholders, Academia, Industry
	W30	17.06.2024	Water Europe	In person	Brussels, Belgium	Conference	29. link	Other	~500	SME, University, Water Utilities
	UKCEH	21.06.2024	WEPAL-QUASIMEME/NORMAN Interlaboratory Study on the Analysis of Microplastics in Environmental Matrices. ROUND 2024 - Development Exercise DE 17	In person	Netherlands	Other		Other	~90	Researchers
	NIC	30.06.2024	48th FEBS Congress	In person	Milano, Italy	Conference	30. link	Presenter	~250	Researchers, Academia

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Table 4: Overview of publications (M1-M12).

Project partner	Type of publication	Paper title	Authors	Publication title	Month / Year of publication	Volume & page	DOI	If it's open access - link
NIC	Conference Proceedings	Review of global production and market analysis of bioplastic packaging	M. Karlovits, U. Novak, B. Likozar	3rd International Circular Packaging Conference	2023	p. 119 - 127	10.5281/zenodo.10007646	1. link
AITIIP	Newsletter	Newsletter AITIIP	AITIIP and TECHNO		31.10.2023			2. link
DWS/UoB	Magazine	Rethinking water treatment	L. Orsini, Karl Dearn	Publication B2B-Filtration and separation magazine	March 2024			
DWS/UoB/STW	Magazine	UK wide	Luisa Orsini, K. Dearn	National Centre for Universities and Business	March 2024	14		3. link
W30	Scientific Journal	Beyond Microplastics: implementation of a two-stage removal process for microplastics and chemical oxygen demand in industrial wastewater streams	M. Sturm, E. Myers, D. Schober, A. Korzin, K Schuhen	MDPI Water	2024	16(2), 268	10.3390/w16020268	4. link
ECOCIUDAD	Magazine	Zaragoza invertirá 6,8 millones en la depuradora de La Almozara	Ecociudad	El Periodico de Aragon	2024			5. link
W30	Scientific Journal	Long term monitoring of microplastics in a German municipal wastewater treatment plant	M. Toni Sturm, E. Myers, A. Korzin, D. Schober, K. Schuhen	Microplastics	2024			tba

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Project partner	Type of publication	Paper title	Authors	Publication title	Month / Year of publication	Volume & page	DOI	If it's open access - link
AITIIP	Magazine	Combatir la contaminación en ríos y océanos desde la I+D+i	AITIIP and TECHNO	Interempresas - Plasticos	29.05.2024			6. link
NIC	Scientific Journal	Hierarchically Porous Polyacetylene Networks: Adsorptive Photocatalysts for Efficient Bisphenol A Removal from Water	D. Šorm, J. Brus, A. Pintar, J. Sedláček, S. Kovačič	ABCPolymers	June 2025			7. link

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4.1. Survey on Citizen Engagement and Citizen Science Activities

Citizen Science has a significant role to play in achieving a wide range of outcomes for people and environment. In order to obtain the data from consortium partners, an online survey was conducted.

The questionnaire was sent to all consortium partners and 22 people responded. This survey was carried out to see how many partners have already been involved in any Citizen Science and if they are interested in establishing a living lab within the Upstream project?

Table 5 contains the list of questions and answers (link to questionnaire).

Table 5: Survey on Citizen Engagement and Cititzen Science Activities.

Nu.	Questions	Answers
1.	Have you been involved in any citizen science projects in the past?	3 (Yes) 19 (No)
2.	Have you been involved in any citizen engagement activities?	9 (Yes) 13 (No)
3.	Are there any specific areas or topics where you think citizen science could be particularly impactful?	Green technology, AI, general information on plastics impact on the environment In the green transition Microplastic detection Awareness raising, getting people invested in their local environment e.g. for the Danube river case study The ones that directly affect the population, like the lack of drinking water, the emissions to the atmosphere, the petrol price growth, etc. Topics related to exploitation of traditionally rejected sources (in terms of social acceptance), like waste streams, for human products (water, food, fertilizers, clothing, etc). Growth of self-consciousness about environmental problems, water and air quality Climate change Acceptation of new products Data collection, sampling, prevention Global Map of Microplastics - Sampling & Monitoring Deprived areas, those with water scarcity. LMIC's Yes, almost in all topics citizen science could contribute in one way or another Co-design of communicating results on monitoring of plastic/microplastic pollution
4.	What resources or support do you think would be necessary to facilitate successful citizen engagement initiatives within Upstream project?	Training workshops, reporting activities to keep people engaged Communication campaigns oriented to citizens and using communication channels that are close to them i.e. newspapers Visibility, SOPs Having a dedicated lead to these activities who has the time to focus on this Concise readable information about the status of European rivers Collaboration with local city councils and local universities or even with high schools directly

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		I think online visual media (diagrams, short videos) would be helpful to engage younger generations while in person meetings, like congresses, would be helpful with older generations. A digital framework (mobile app) would encourage and ease the citizen engagement in the project A network able to clearly explain the focus of the initiative, which should be smart in terms of people's engagement Contacts with citizens' organisations or associations interested in participating. The involvement of local and regional authorities would be positive. Develop more playful activities to "engage" citizens. Have the collaboration of interested organisations Education Streamlined systemic change initiatives aligned with policymakers Since we don't have a product for direct public use, the target would be entities in charge of the discharged water quality and water bodies. We have to agree on the activities and see if we will act locally or on a EU level Communication, Wasser 3.0 App, Engagement Physical Demonstrators I'm not sure Not sure
5.	Are there any successful examples of citizen engagement that you think we could learn from?	12 (Yes) 10 (No)
6.	Are you interested in establishing a living lab within the Upstream project?	10 (Yes) 12 (No)

Survey shows that only 13.6 % from 22 participants have been involved in any citizen science projects in the past, 40.1 % have been involved in any citizen engagement activities, 45.4 % of participants are interested in establishing a living lab within the UPSTREAM project (see Table 5).

Communication is a vital aspect of citizen science, 95% of citizen science is communication. In the next Section “5. Citizen engagement and co-creation guidelines”, the next plans are described to improve citizen engagement and citizen science activities.

5. Citizen engagement and co-creation guidelines

The project's engagement action plans and campaign strategies are tailored to the specific contexts of the case studies. These plans outline targeted actions and approaches to effectively engage different community segments and stakeholders. The strategies will include educational campaigns, workshops, and public forums, designed to disseminate information, gather feedback, and foster collaboration among

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participants. Each campaign will focus on raising awareness about the project's goals, the benefits of bio-based solutions, and the importance of preventing plastic pollution (Figure 4).

Through these efforts, the project aims to not only educate and inform but also to inspire active participation and support for sustainable practices. By involving the community in a hands-on and meaningful way, the project seeks to create lasting change and foster a collective commitment to environmental stewardship. During the first year of the project, we have already initiated activities at schools and organized clean-up campaigns (see Annex), which will continue throughout the project's duration. The initial concepts of the UPSTREAM Co-Labs were discussed during the 2nd general assembly, and further development will take place in the next general assembly. Design thinking workshops are planned for the end of the first half of the project to further extend engagement activities. Impactoverse platform will be utilized in the second half of the project as partners begin sharing their results.

Additionally, the project will leverage social media and digital platforms to broaden its reach and engage a wider audience during the whole duration of the project. Regular updates, success stories, and interactive content will be shared to keep the community informed and motivated. Collaborations with local organizations and influencers will also be pursued to amplify the project's message and encourage broader participation.



Figure 4: Citizen Science.

5.1. UPSTREAM Co-Labs - living lab

Citizen science is any activity that involves the public in scientific research and thus has the potential to bring together science, policy makers, and society in an impactful way. Through citizen science, all people

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can participate in many stages of the scientific process, from the design of the research question to data collection and volunteer mapping, data interpretation and analysis, and to publication and dissemination of results. Citizen science is also an approach of scientific work that may be used as a part of a broader scientific activity.

The UPSTREAM project plans to establish three 'UPSTREAM Co-Labs' living labs in collaboration with local research institutions such as VITO, NIC, AIT, LEI, and UoB. These living labs will serve as dynamic platforms for empowering citizen science initiatives and facilitating the investigation of local projects at demonstration and replication sites. By creating these Co-Labs, the project aims to engage approximately 2000 individuals from various communities, fostering a participatory approach to scientific research and environmental monitoring.

The UPSTREAM Co-Labs will provide the infrastructure and support needed for citizens to actively participate in scientific activities. This includes contributing to data collection, analysis, and interpretation, as well as collaborating on the development of innovative solutions to local environmental challenges. The labs will also serve as hubs for knowledge exchange and capacity building, enabling participants to gain practical experience and skills in areas such as environmental monitoring, sustainable practices, and the application of bio-based solutions.

A key component of the UPSTREAM Co-Labs initiative is the involvement of TOC, which has extensive experience in educational outreach. TOC's efforts will focus on educating primary school children, with a network that reaches more than 8000 students in partner schools across the UK, as well as in Chile, India, North America, Brazil, and Bangladesh. This educational component will be complemented by the training of elders and community leaders, particularly those responsible for the wellbeing of entire communities and fishing villages. The training will cover topics such as sustainable fishing practices, waste management, and the importance of maintaining healthy river ecosystems.

These educational and training activities will be seamlessly integrated with the Co-Labs established by NIC under Task 6.3. This integration aims to fully engage various segments of society, including children, adults, and the elderly, thereby increasing awareness and fostering the adoption of sustainable solutions. The Co-Labs will not only serve as a platform for scientific inquiry but also as a community centre for dialogue and collaboration. They will host workshops, seminars, and public forums to disseminate knowledge and discuss the outcomes of citizen science projects.

In addition to fostering local engagement, the Co-Labs will also serve as a model for cross-cultural and international collaboration. By connecting with similar initiatives in other countries, the project will create a global network of living labs focused on tackling plastic pollution and promoting bio-based solutions. This network will enable the sharing of best practices, data, and experiences, thus amplifying the impact of the project on a global scale.

Ultimately, the establishment of the UPSTREAM Co-Labs aims to create a lasting legacy of community-driven environmental stewardship. By empowering citizens with the tools and knowledge to address local environmental issues, the project seeks to inspire a new generation of environmental leaders and advocates, committed to sustainable living and the protection of natural resources.

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5.2. Activities in schools

Implementing pilot activities in schools offers a unique opportunity to directly engage students and raise awareness about environmental issues, specifically focusing on the challenges of plastic pollution and the benefits of bio-based solutions. Schools are pivotal in shaping young minds and instilling values that will guide future behaviors. By providing a structured learning experience, students can internalize the triad of experience: "knowledge-attitude-behavior," thereby becoming active citizens capable of making informed environmental decisions. To ensure the effectiveness of these awareness-raising activities, it is essential to adhere to the triad methodology and address the cognitive, moral, and emotional aspects of learning. This holistic approach will help students not only understand the environmental challenges but also foster a sense of responsibility and emotional connection to the issues.

Some examples of potential actions include incorporating education and information sessions both inside and outside the classroom. These sessions can cover topics such as the impact of plastic pollution on rivers and ecosystems, and the principles of the circular economy. Schools can organize workshops where students can learn about and promote the circular economy by creating projects with recyclable materials or through upcycling. Activities might include building traditional or classic games using recycled materials, as well as engaging in Lego and STEM projects that emphasize sustainable practices.

Moreover, creative communication campaigns can be developed to further engage students and the wider community. These could involve creating content for social media, producing videos, songs, poems, or organizing painting competitions, theatrical productions, and storytelling sessions. Such activities not only educate but also empower students to become advocates for environmental protection in their communities.

To conduct these activities, it is crucial to obtain the necessary approvals from relevant educational and governmental institutions. This ensures that all activities are conducted in a safe and appropriate manner, aligning with educational standards and regulations. By carefully planning and executing these school activities, the UPSTREAM project can effectively foster a new generation of environmentally conscious individuals who are knowledgeable and motivated to make positive changes in their communities.

5.3. Cleanup activities and awareness-raising

Organizing effective cleanup activities and awareness-raising campaigns is essential for reducing plastic pollution in aquatic environments. This activity is already well established by TOC. Clear goals include reducing plastic waste, improving water quality, engaging the community, and educating the public about the impacts of plastic pollution. Choosing strategic locations is crucial; focus on areas along rivers and coastal regions that are heavily impacted by plastic waste, ensuring they are accessible, safe for volunteers, and highly visible to maximize awareness. In addition, #EUBeachCleanup - featuring beach, riverbanks and various clean-up events across the world guideline can be followed (Organizing Your Own Event Guidelines for the General Public and for Institutional Partners), as well as guidelines of Clean Europe Network.

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Collaboration with local governments, environmental organizations, schools, and community groups can provide additional support and resources, enhancing the reach and impact of Upstream activities (see also 5.1 and 5.2). The necessary permits and permissions from local authorities, especially when planning to work in protected or sensitive areas must be obtained. Developing a detailed timeline that includes planning stages, promotional activities, the day of the cleanup, and post-event follow-up will ensure a well-organized initiative.

Recruiting volunteers is a key step that TOC and NIC have high experience with, and utilizing various channels such as social media, community bulletin boards, and local events can help in gathering a motivated team. Clearly communicated purpose, date, time, and location of the cleanup to all participants is beneficial. Providing training and resources is crucial for safety and effectiveness; offer informational materials to educate volunteers about safe cleanup practices, proper waste segregation, and the environmental impact of plastic pollution. Supply necessary equipment such as gloves, bags, tongs, and safety vests, and ensure there are adequate facilities for waste collection and disposal.

Safety should be a top priority. Conduct a safety briefing before the event to highlight potential hazards and safety protocols and have first aid kits and trained personnel on site. Encouraging volunteers to work in pairs or groups and to stay hydrated and protected from the sun is also important. To document and share the event, assign volunteers to take photos and videos, and record the amount and types of waste collected. Sharing these results on social media, local news outlets, and community newsletters helps raise awareness and celebrate the collective effort.

Educational workshops can be organized in schools, community centers, and online platforms to inform people about the sources and impacts of plastic pollution and ways to reduce it. Social media campaigns are effective in spreading awareness; use engaging content, hashtags *(#ForWasteFreeEuropenRivers,* #CleanRivers, #PlasticFreeRivers, #PreventPollution, #Environment), and challenges to increase visibility and participation. Hosting community events such as movie screenings, panel discussions, and art exhibitions focused on plastic pollution and environmental conservation can also engage and educate the public. Engage local influencers, experts, and activists to participate in these events for added impact.

Creating and distributing informational materials such as leaflet, poster, roll-up, flag, and infographic (Anexe 2) that highlight the importance of reducing plastic use, proper disposal methods, and alternatives to single-use plastics can further enhance public knowledge. Partnerships with local businesses can promote plastic-free practices, encouraging them to reduce plastic packaging, offer reusable alternatives, and participate in cleanup activities.

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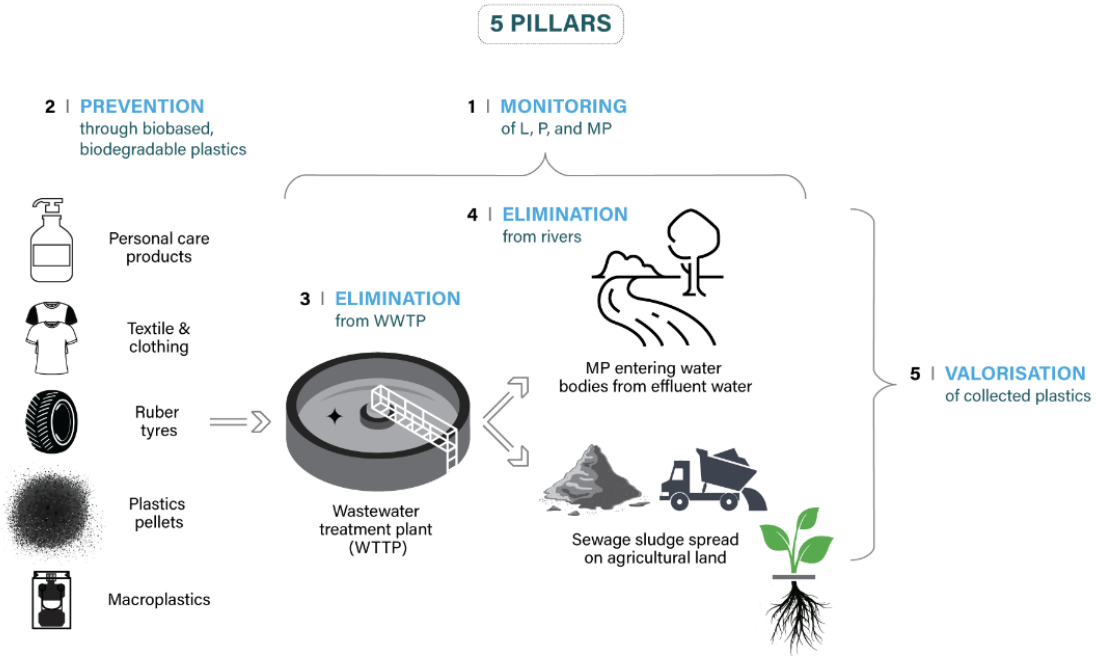


Figure 5: UPSTREAM Infographic.

After the event, involved partners will analyze the data collected during cleanup activities to understand the extent and types of plastic pollution. This information can help refine future strategies and inform stakeholders about the impact of the initiatives. Gathering feedback from volunteers, partners, and participants is essential for continuous improvement, helping to identify areas for enhancement in future events and campaigns.

5.4. Design Thinking Workshops

Design thinking workshops aim to drive innovation and foster meaningful solutions for environmental challenges. These workshops will engage citizens in a collaborative process to develop and refine ideas that extend beyond traditional approaches, with a focus on promoting bio-based products and effective mitigation of microplastics. To maximize the impact of these workshops, they will be customized to address the specific needs of different community groups. The project will categorize participants into at least three distinct groups based on their needs and interests. For instance, groups might include local business owners interested in sustainable practices, school children and educators focusing on environmental education, and community leaders or elders responsible for local waste management.

The design of each workshop will be tailored to the unique characteristics and requirements of these groups. For example, workshops for business owners might focus on integrating bio-based materials into their operations and developing sustainable supply chains, while sessions for school children could emphasize interactive activities that make learning about analysis of microplastics. Workshops for community leaders might center around strategies for improving local waste management practices and

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fostering community-wide adoption of bio-based solutions. To ensure effective participation, the workshops will be scheduled at times and locations that are convenient for each group. This might involve evening sessions for working professionals, daytime workshops for school groups, or community meetings in easily accessible local venues.

By leveraging design thinking, these workshops aim to not only generate innovative solutions but also to build community buy-in and encourage the widespread adoption of sustainable practices. Participants will be guided through a structured process that includes defining problems, brainstorming potential solutions, prototyping ideas, and testing them in real-world scenarios.

5.5. Think Ocean: Partnerships and Engagement Resource

TOC has worked in partnership with organisations locally and internationally to further on-the-ground activity, empowering communities through programmes focused on education and community action. Summary of activities:

- **Cleanup activities and awareness-raising with students in the UK:**

Tackled a number of locations, ranging from parks, city centres and along river banks. Engaged in activities and shared information on the threat of plastic pollution in our environments and the work being done to tackle this. Total attendance 350 students and over 150 members of the community

- **Water stations in Pakistan:**

During a period of excessive heat and many poorer communities being affected by dehydration and heatstroke, TOC worked with volunteers to set up water stations (serving water with an electrolyte mix), which served the dual purpose of educating communities around the importance of clean water, and the threat of pollution in our waterways on the health of people and the environment, as well as sharing more on projects. Engaged over 450 members of the community.

- **Cleanup and Zero Waste programmes in Bali:**

With the support of volunteers, Think Ocean coordinated cleanup activities on beaches in Bali. This is accompanied by waste sorting and education programmes focused on Zero waste. There is a targeted kids programme too. Participation from 120 youth to date.

- **Environmental Education School Visits:**

Visits to schools to support with training, education and workshops. Gave overviews of the problems, how students could take action to scale solutions, the projects and technologies being developed and opportunities to get involved. 80 students engaged through the programme to date.

- **Media and Influencer Engagement:**

Interviews on BBC, and working with influencers with green credentials, like Max McMurdo to raise awareness around the work being done and how everyday citizens can get involved and make a difference.

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- **Other Outreach Activities:**

Took part in student Sustainability and Green week activities at Derby College and University of Derby, as well as a community fair day to share information on projects, and engage students around activities they could get involved in. Engaged with 70 students and approx. 50 members of the community.

Additionally TOC is actively utilising the Impactoverse (www.impactoverse.com) platform to support the aims of the UPSTREAM project and it's partners. The platform is a cutting-edge ecosystem designed to harness technology and creativity to drive positive real-world outcomes, and committed to informing, inspiring, connecting, and collaborating to tackle pressing environmental and social challenges. By leveraging the engaging, interactive, and immersive technologies of the platform, TOC sees a unique opportunity to amplify UPSTREAM's efforts in combating pollution from litter, plastics, and microplastics (L, P, and MP) in European rivers. TOC intends to work with interested partners to harness the potential of the platform to support UPSTREAM in the following ways:

Interactive and Educational Experiences for Engagement: A core element of UPSTREAM's strategy for impact includes engaging and educating both the public and youth audiences about the dangers of plastic pollution and the innovative solutions UPSTREAM is deploying. TOC will support UPSTREAM in developing and piloting immersive experiences in collaboration with schools and communities. These experiences, designed to raise awareness around litter, plastic, and microplastic (L, P, and MP) pollution, and showcase UPSTREAM solutions. By utilisng Impactoverse, these initiatives aim to inspire action and empower individuals, including the next generation, to take active roles in preserving their local environments. UPSTREAM partners also have the option to leverage the platform in the same way, making environmental education a dynamic and rewarding experience across diverse communities.

Campaign Launches for Initiatives: By leveraging the platform's engagement and outreach capabilities, (such as art for impact), TOC intends to drive collective action specifically tailored to the UPSTREAM project's objectives, making environmental engagement accessible and rewarding.

Stakeholder Engagement and Town Halls/Events for Collaborations: UPSTREAM aims to engage a wide range of stakeholders—from local communities to policymakers and industry partners. TOC intends to work with partners to offer the opportunity to build community and showcase solutions through experiences. It will also be possible to create more engaging ways to monitor, report on, and implement the scaling of solutions to reduce L, P, and MP pollution, for those partners that are interested in doing so. TOC can also assist UPSTREAM partners who are interested in utilising the platform's virtual town hall and events features to host discussions with a broad range of stakeholders, including youth representatives. These town halls will facilitate collaborative decision-making, ensuring that the ideas and perspectives of young people. This approach enhances transparency and encourages active participation from younger generations.

Crowdsourced Mapping and Environmental Monitoring: It is possible for UPSTREAM to benefit from crowdsourced mapping tools by involving citizens in data collection efforts. TOC can support interested

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partners in creating engaging experiences that encourage the mapping of pollution hotspots, as well as the outcomes of solutions. This involvement will not only enhance data accuracy but also foster a sense of responsibility and ownership among participants.

TOC's collaboration with Impactoverse is a strategic move to maximise the reach and effectiveness of the UPSTREAM project. By leveraging the platform's diverse features, the goals of reducing L, P, and MP pollution in European rivers will be furthered, and a culture of environmental stewardship and engagement that supports long-term sustainability will be fostered.

6. Conclusions

Given the complexity of the environmental challenges addressed by Upstream - specifically, pollution from litter, plastic, and microplastics - these challenges cannot be met solely through technological innovation. Instead, they require a holistic approach that includes the active participation of citizens, who are often the first to experience the impacts of pollution and can play a crucial role in monitoring and mitigating its effects. The purpose of Deliverable D6.3 is to serve as a guide and reference for planning the described activities throughout the project. As we commence the initial rounds of community engagement and co-design activities in the coming months, the plan will be continuously reviewed and refined as necessary.

The immediate next steps include continuing the stakeholder mapping process and identifying potential events for community engagement. This will be an iterative process maintained throughout the project's duration. Additionally, we will begin planning the first activities across the various phases of the co-design process.

The report emphasizes that effective citizen engagement is not just about raising awareness but about fostering a collaborative process where citizens are co-creators of the solutions. By involving citizens in data collection, monitoring activities, and decision-making processes, the project aims to empower communities, giving them a stake in the success of the initiatives being implemented. This approach helps to ensure that the solutions developed are not only technically sound but also socially acceptable and sustainable in the long term.

The citizen engagement and co-creation guidelines also highlight the importance of inclusivity, ensuring that all voices are heard, particularly those of marginalized or underrepresented groups. This inclusive approach is crucial for achieving the project's objectives, as it brings in a wide range of perspectives and knowledge that can enhance the effectiveness of the interventions.

In conclusion, the success of the UPSTREAM project in improving the water quality of European rivers hinges on its ability to effectively engage and involve citizens and stakeholders. Deliverable D6.3 provides a comprehensive framework for achieving this goal, offering practical guidance on how to create a dynamic and participatory process. By integrating citizens into the heart of the project, UPSTREAM is not only addressing the immediate challenges of river pollution but also building a foundation for sustained

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environmental stewardship and resilience. This deliverable, therefore, represents a critical step towards ensuring that the project's outcomes are not only innovative but also deeply rooted in the communities they aim to serve.

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Annex 1: Highlights of communication activities

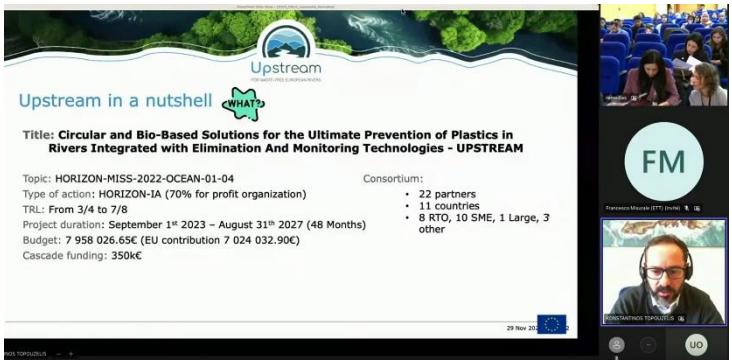
Some examples of communication and dissemination activities during 12 months of the project.





Left: 3. International Circular Packaging Conference (20.10.2023, Ljubljana / Slovenia)
Right: Secondary school visit (22.3.2023, Ljubljana / Slovenia).





Left: Technological breakfast workshop on 'Bioeconomy: introduction to new sustainable solutions and technologies to improve plastic circularity and recycling processes' (23.11.2023, Zaragoza / Spain)
Right: REMEDIES Cluster Meeting (19.11.2023, Oujda / Maroco).





Left: Horizon Europe Mission Day “Regenerating our ocean and waters” (30.1.2024, Paris / France).
Right: UPSTREAM project presentation on SUPRIMES project workshop (1.2.2024, Novi Sad / Serbia).

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Left: Workshop on biodegradable materials (13.2.2024, online).
Right: Radio interview-BBCRario 4 (29.2.2024, online).





Left: 3rd International Conference on Advances on Water Treatment and Management (ICAWTM - 24) (1.-2.3.2024, Gandhinagar, India).
Right: TV interview BBC Midlands Today (local news) (6.3.2024, online).





Left: Big River Clean-Up, Derby Derwent River (March 2024, United Kongdom).
Right: Challenges, trends and solutions in developing and processing biobased product (2nd IPPT TWIN Conference) (14-15.5.2024, Spain).

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Left: EU Green Week 2024 - REMEDIES & UPSTREAM Cluster Meeting (30.5.2024, online).
Right: Scientific and entrepreneurial approaches for effective communication about microplastics (7.6.2024, Ljubljana / Slovenia).



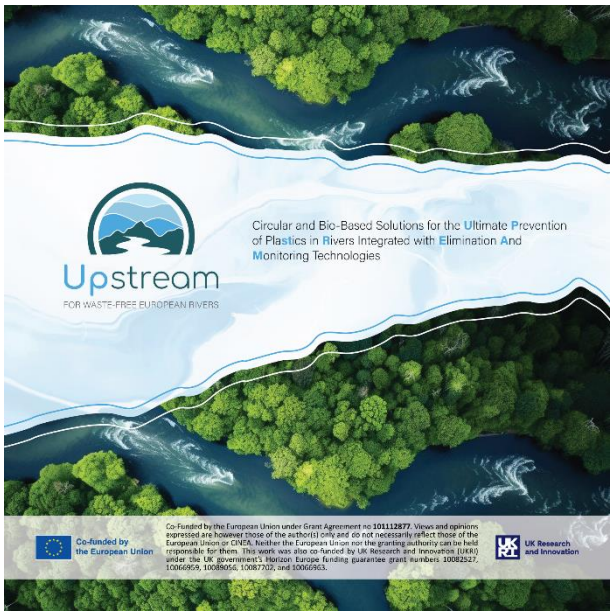


Left: Water Innovation Europe conference (19-19.6.2024, Brussels / Belgium).
Right: Water stations In Faisalabad, Pakistan (July, Pakistan).

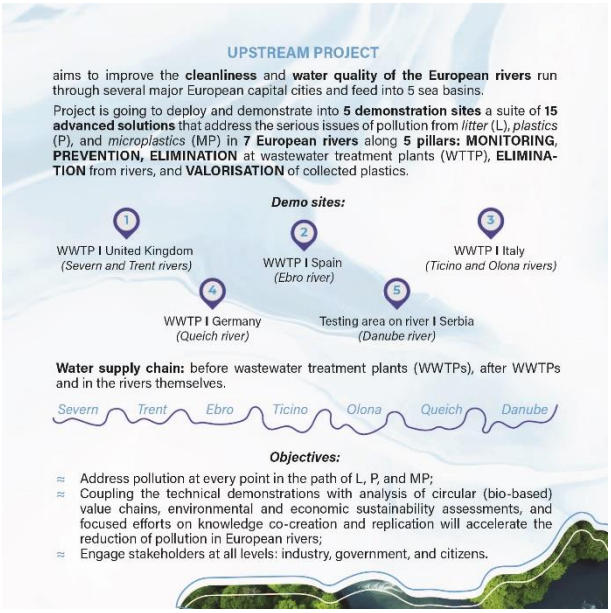
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Annex 2: Printed promotional materials

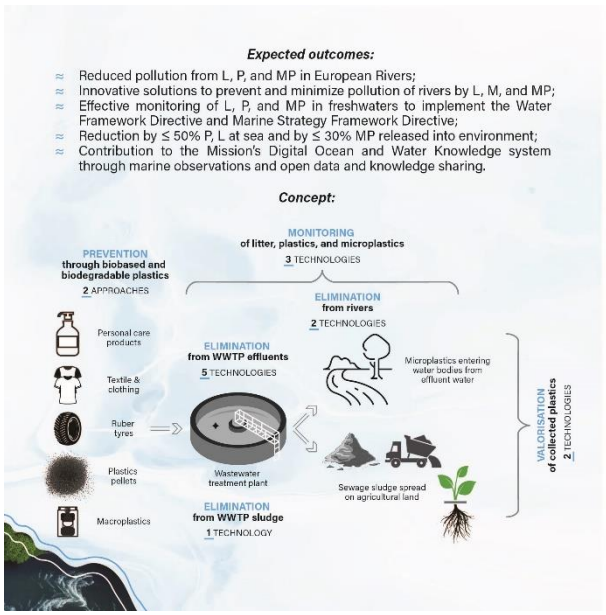
P.1



P.2



P.3

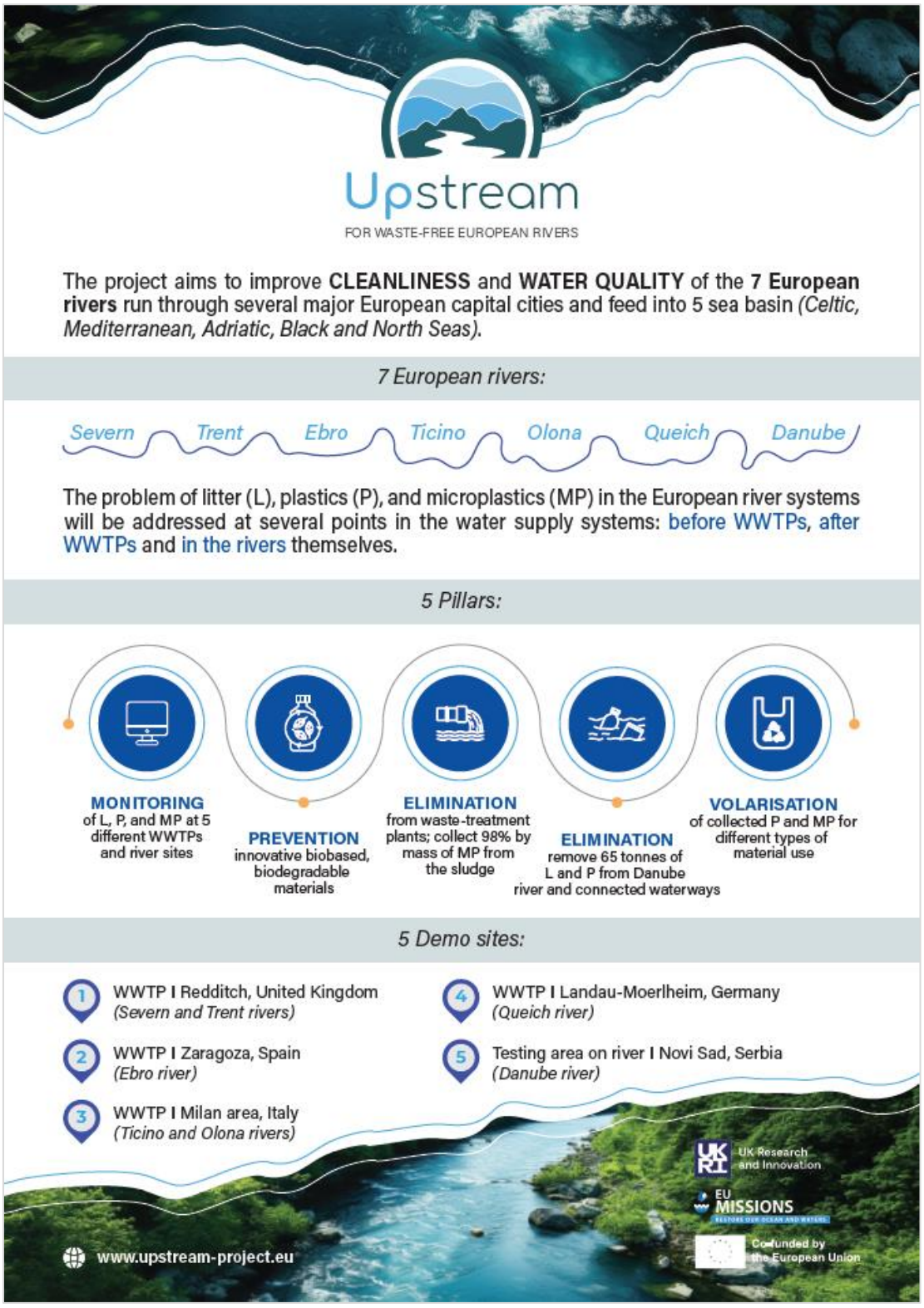


P.4



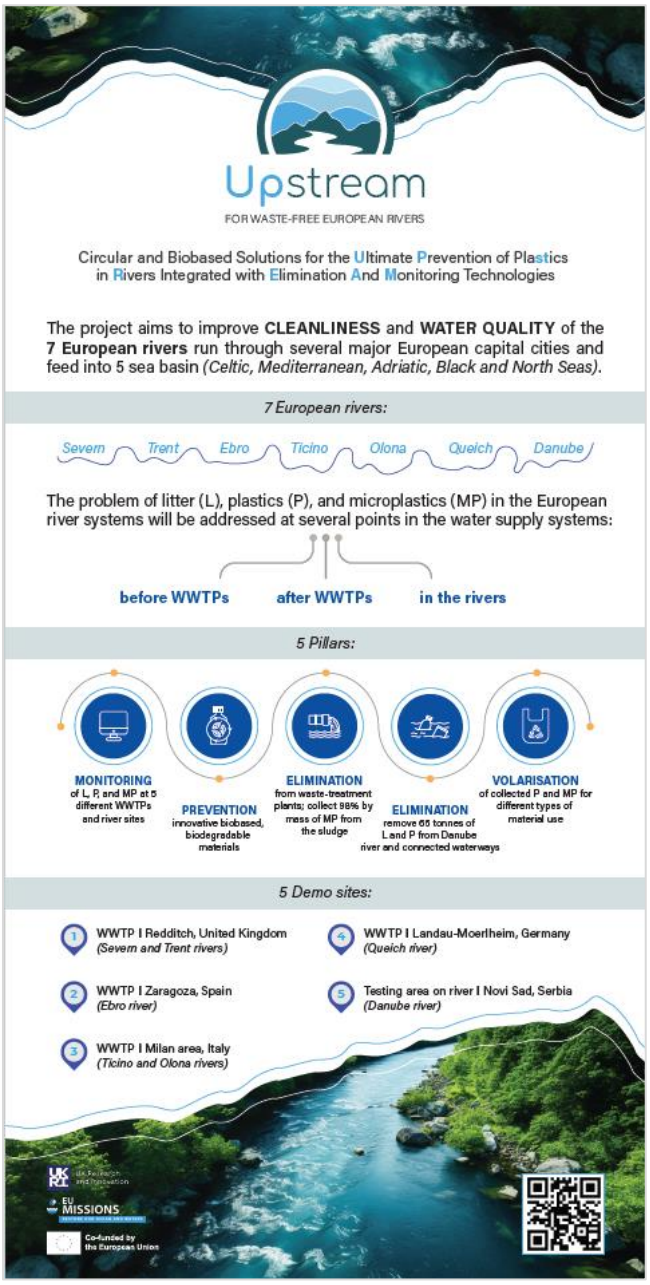
UPSTREAM Leaflet

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UPSTREAM Poster

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UPSTREAM Roll-up

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UPSTREAM Flag

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