

David Pacheco (Cetaqua), 30 June 2023

D5.1 Dissemination and Communication Plan

INITIAL VERSION



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D5.1 Communication and Dissemination Plan

Initial version

Summary

The Communication Plan of the ICARIA project is the main document outlining the communication and dissemination activities that will take place throughout the project. This material should be used regularly by the partners to keep track of the activities, responsibilities and cooperation needs between their dissemination tasks. The Communication Plan will be updated periodically.

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Executive summary

The Communication Plan for the ICARIA project is the main document outlining the communication and dissemination activities that will take place throughout the project. This material should be used regularly by the partners to keep track of the activities, responsibilities and cooperation needs between their dissemination tasks. The Communication Plan will be updated periodically.

The Communication Plan includes dissemination activities which connect research outputs and the relevant target audiences by means of appropriate communication tools. By doing so, the dissemination strategy serves as the main guiding document with the following aspects:

- WHO is the target (audience)
- WHAT the project is disseminating (key message)
- HOW to reach these audiences (strategy)
- WHICH materials will be used to approach the audience (actions and communication tools)
- WHEN will the different actions and activities take place (timing)

Finally, an evaluation process outlines simple monitoring and evaluation methods and specifies how risks and difficulties can be addressed. This process is crucial for a successful dissemination strategy, which needs to be regularly reviewed and updated, according to new developments in the project, sector and market.

1 Introduction to the ICARIA project

1.1 ICARIA in short

The number of climate-related disasters has been progressively increasing in the last two decades and this trend could be drastically exacerbated in the medium- and long-term horizons according to climate change projections. It is estimated that, between 2000 and 2019, 7,348 natural hazard-related disasters have occurred worldwide, causing 2.97 trillion US\$ losses and affecting 4 billion people (UNDRR, 2020). These numbers represent a sharp increase of the number of recorded disaster events by comparison with the previous twenty years. Much of this increase is due to a significant rise in the number of climate-related disasters (heatwaves, droughts, flooding, etc.), including compound events, whose frequency is dramatically increasing because of the effects of climate change and the related global warming (UNDRR, 2020 and IPCC, 2021). For the future, by mid-century, the world stands to lose around 10% of total economic value from climate change if temperature increase stays on the current trajectory, and both the Paris Agreement and 2050 net-zero emissions targets are not met (Guo et al., 2021).

In this framework, **Project ICARIA** has the overall objective to promote the definition and the use of a comprehensive asset-level modeling framework to achieve a better understanding about climate related impacts produced by complex, compound and cascading disasters and the possible risk reduction provided by suitable, sustainable and cost-effective adaptation solutions.

Special regard is devoted to critical assets and infrastructures particularly susceptible to climate change, in a sense that its local effects can result in significant increases in cost of potential losses for unplanned outages and failures, as well as maintenance – unless an effort is undertaken in making these assets more resilient. Therefore, ICARIA aims to understand how future climate might affect life-cycle costs of these infrastructures and assets in the coming decades and to ensure that, where possible, investments in terms of adaptation measures are made up front to face these changes. This requires forward planning that considers a comprehensive multi-risk assessment and the uncertainties associated with climate change, rather than reliance on models solely based on past events and single climate hazards.

1.2 Project objectives

The ICARIA project, launched in January 2023, seeks to **increase knowledge of the impacts of natural disasters on critical assets in different sectors such as water, energy, transport, waste and housing**. The initiative also seeks to shed light on how these events could affect the lifecycle costs of these infrastructures in the coming decades and to ensure investment in sustainable adaptation measures to address these risks.

ICARIA will propose a comprehensive framework for the analysis of climate resilience and the assessment of economic and social impacts. This includes the development and validation of state-of-the-art models capable of simulating the risks to regions associated with extreme climate

events, with special focus on compound events and cascading impacts on strategic services and infrastructures, as well as on the environment.

The **strategic sub-objectives (SSO)** of the ICARIA project are:

- **SS01:** Achievement of a comprehensive methodology to assess climate related risk produced by complex, cascading and compound disasters.
- **SS02:** Obtaining tailored scenarios for the case studies regions.
- **SS03:** Quantify uncertainty and manage data gaps through model input requirements and innovative methods.
- **SS04:** Increase the knowledge on climate related disasters (including interactions between compound events and cascading effects) by developing and implementing advanced modeling for multi-hazard assessment.
- **SS05:** Better assessment of holistic resilience and climate-related impacts for current and future scenarios.
- **SS06:** Better decision taking for cost-efficient adaptation solutions by developing a DSS to compare adaptation solutions.
- **SS07:** Ensure the use and impact of the ICARIA outputs.

1.3 Methodology

The project involves an **innovative modeling approach**, where models will be developed to perform risk assessment analyses at asset level of complex extreme weather events including compound events. The models developed will take account of a wide range of climate hazards, from pluvial and coastal flooding to heatwaves, forest fires and droughts. In terms of climate scenarios, high-resolution local climate forecasts based on statistical and dynamic downscaling techniques will be used to simulate the impacts of local events, i.e., coincident and consecutive events. This will enable the triggering mechanisms of cascading events to be identified in terms of risk and probability of occurrence.

In order to facilitate the applicability of the research work, a **common methodology for assessing climate risk in the different case studies** will first be established and a shared approach for the definition of climate scenarios adapted to each region will be proposed. Methods to deal with uncertainties due to lack of data and intrinsic errors in climate models will also be proposed. Subsequently, asset level modeling tools will be developed to simulate the impact on critical assets associated with extreme weather events. This will involve the quantification of the direct and indirect impacts of such situations. The probability of single and compound extreme events will be estimated and tailored multi-hazard simulations will be performed to achieve a better understanding of the potential losses associated with these phenomena. The cascading associated between initiated by an impact on a specific asset will also be assessed.

The results of these simulations will be incorporated into **a tool that will enable detailed and holistic assessment of the potential impacts of different socio-economic and climate scenarios**, taking multiple hazard management into account. On the other hand, a Decision Support System will also be developed in order to enable the comparison between adaptation scenarios in order to choose the

most effective, sustainable and cost-effective measures, through cost-benefit and multi-criteria analysis. It will, therefore, be a valuable decision-making tool for planning action to improve the climate resilience at regional level, and providing a probabilistic and uncertainty analysis associated with each scenario.

1.4 Case studies

ICARIA will work on **three case studies** in three different regions across Europe. Two of them, the **Barcelona Metropolitan Area** in Spain and the **South Aegean Archipelago** in Greece, are located in coastal areas of the Mediterranean, one of the most vulnerable regions in terms of exposure to extreme events, particularly bearing in mind the high asset and population density. It is home to over half of the continent's population. The **Salzburg Region**, the third case study, is located in Austria and represents an area severely affected by the climate crisis, with melting glaciers and heatwaves directly impacting assets associated with energy production and other strategic sectors.

To validate the replicability of the tools and methods developed, the case studies will include two cycles of comprehensive risk and resilience assessments. In a first assessment cycle, in the so-called Trials, risk assessment for specific climate hazards will be conducted to achieve the highest possible quality of predictions, so that the results can be used "as is" for operative decision making. In a second phase, so-called Mini trials, other hazards will be assessed following the methods and tools implemented in other regions during the Trials phase. In the two assessment cycles, the participation of local actors will be encouraged through the creation of Communities of Practitioners (CoP). In these groups, which will include scientific experts, public and private entities responsible for strategic assets and services, citizen associations and other relevant stakeholders, a large set of activities will be carried out to identify needs, improve understanding of risk awareness and ensure the co-creation of adaptation solutions.

The project will also **foster the replicability of the proposed solutions**, first within the different case studies and then in five other selected "follower" regions: Great London in the United Kingdom; the Vega Baja region in the Autonomous Community of Valencia in Spain; the central region of Macedonia, the South Aegean region and Crete in Greece; the Campania region and the Metropolitan Area of Naples in Italy and the region of Upper Austria.

Results

1.4.1 Scientific results

The **scientific results of the ICARIA project** are listed below:

- **RES-SCI1. Project framework:** ICARIA will provide a climate-change multi-hazard framework to ensure a holistic assessment at regional level that considers also potential cascading effects and compound events. This framework will cover any hazard impacting in any service or CI, although in the ICARIA project it will be developed and implemented for some selected single or compound hazards impacting on a wide range of assets and services.

- **RES-SCI2. Climate scenarios methods and results:** Downscaling methods will be proposed for near and long-term climate projections considering different emission scenarios at large scale and socio-economic ones at local scale. The methods will be applied to the three case studies and tailored local climate projections will be achieved up to 2100 for long-term and from 15 days to 6 months for short-term.
- **RES-SCI3. Methods for mending the data gaps and uncertainty analysis:** Methods to mend the data gaps and define the uncertainty cascade related to the inputs, methods used and missing and quality of data will be defined and tested in trials and mini-trials by cross validations measuring the effects of considering different scenarios related to regional data availability (from best case where all data is provided and worst-case scenario where minimum data is used).
- **RES-SCI4. Climate-related multi-risk tangible impact assessment method:** Based on ICARIA and other relevant recent projects, ICARIA will provide an improved comprehensive method to consider direct and indirect tangible losses for assets and CI affected by different climate-related extreme events. The losses will include the reconstruction costs, the costs of not providing the service and the knock-on effects on other systems.
- **RES-SCI5. Multi-risk and resilience assessment for the 3 EU case studies:** The previous ICARIA results (mainly methods and tools) presented in this table will be tested, implemented and replicated in the three case study regions for different hazards and assets to show the versatility and adaptability of the results. For the three regions a set of adaptation solutions will be chosen as the most cost-effective ones in relation to the hazards and assets evaluated.
- **RES-SCI6. Replication, sustainability and exploitation of ICARIA results** Delivery time: M36; WP4 SCI/POL. Results previously implemented in one of the case studies for some hazards and assets will be replicated in other regions with other hazard-assets combinations choosing again the most cost-effective adaptation measures but, this time, with less data and resources. Replication guidelines will be elaborated and a sustainability and exploitation plan will be also delivered to detail how these results are envisaged to be improved, used by the case studies and extended to other European regions in the next coming years to accomplish with the general Mission goal to help at least 150 European regions and communities towards climate resilience by 2030.

1.4.2 Technological results

The **technological results of the ICARIA project** are listed below:

- **RES-TEC1. Multi-Hazard modeling tools:** A modeling chain tool will be developed for temporal and spatial coupling of several climate-related hazards reflecting the probability for one hazard triggering others under certain conditions. This will allow us to assess impacts of combined or compound events.
- **RES-TEC2. Holistic climate resilience assessment:** ICARIA will develop and test a method that combines the approaches and metrics used in RESCCUE and EU-CIRCLE projects to assess resilience of complex systems focusing on main services and critical infrastructures.

The method will have the versatility to be adopted in a wide range of scopes (from district/city to regional/national level) and will consider different climate-related stressors as single or compound events.

- **RES-TEC3. Portfolio of adaptation solutions:** Existing portfolios from previous projects will be expanded to include natural areas and integrate relevant solutions for the hazards studied within ICARIA, with a special focus on Nature-Based Solutions (NBS). Portfolio will include the description of the solutions, their effects and co-benefits on relevant assets, construction and maintenance costs and guidance on how to be modeled.
- **RES-TEC4. ICARIA DSS:** ICARIA will develop a web-based Decision-Support System (DSS) based on resilience indicators, Cost-Benefit Analysis (CBA) and Multi-Criteria Analysis (MCA) to compare several adaptation measures and strategies to cope with extreme climate and compound events and their cascading effects on strategic assets and services, and thus facilitating the planning process by helping decision makers to choose the most cost-effective solutions.

1.5 Project consortium

The project consortium is made up of the following participants:

Table 1. List of project partners

Partner	Description	Website	Social media accounts
Cetaqua, Water Technology Centre	Cetaqua is a model of public-private collaboration that was created to ensure the sustainability and efficiency of the water cycle while taking regional needs into account.	Cetaqua >	Twitter: @CETAQUA LinkedIn >
AQUATEC	Aquatec is part of the Agbar Group and is a hydrogeological consulting and engineering firm that provides global solutions that contribute to sustainable development in the water sector through innovation in the design, construction and operation of drinking water treatment plants, wastewater treatment plants, groundwater, and tertiary treatment of reuse and reverse osmosis desalination plants.	Aquatec >	Twitter: @Agbar LinkedIn >
Aigües de Barcelona	Aigües de Barcelona is a Spanish water utility that manages the complete water cycle, from catchment to drinking water treatment, transport, and distribution, to sewerage, wastewater treatment, and reclamation, either for return to the natural environment or reuse. Around 3 million people are served drinking water by the company in the Barcelona metropolitan	Aigües de Barcelona >	Twitter: @aiguesbcnclient LinkedIn >

	<p>area, distributed in 23 municipalities. Further, regarding sewerage management, a population of 3.4 million people is covered, distributed in 40 municipalities, with a network of a total length of 300 Km and 7 wastewater treatment plants.</p>		
<p>Austrian Institute of Technology GMBH</p>	<p>The Austrian Institute of Technology GmbH (AIT) is Austria's largest non-university research institution. It specializes in applied research and development, focusing on technology-based solutions and innovation. Established in 2009, AIT operates as a limited liability company and is owned by the Republic of Austria. The institute covers various fields such as energy, mobility, health, digital safety, and innovation systems. AIT collaborates with national and international partners to conduct research, develop technologies, and support innovation processes for sustainable development.</p>	<p>AIT ></p>	<p>Twitter: @AITtomorrow2day</p> <p>LinkedIn ></p>
<p>Àrea Metropolitana de Barcelona (AMB)</p>	<p>The Area Metropolitana de Barcelona (AMB), also known as the Metropolitan Area of Barcelona, is a regional government entity in Catalonia, Spain. It comprises 36 municipalities, including the city of Barcelona, and covers an area of approximately 636 square kilometers. The AMB is</p>	<p>AMB ></p>	<p>Twitter: @sostAMB</p> <p>LinkedIn ></p>

	<p>responsible for coordinating and managing various aspects of regional development, including urban planning, transportation, waste management, and environmental policies. It aims to promote sustainable growth, improve quality of life, and enhance cooperation among the municipalities within its jurisdiction. The AMB plays a crucial role in shaping the economic, social, and environmental development of the Barcelona metropolitan region.</p>		
<p>Ethniko Kentro Erevnas Kai Technologikis Anaptyxis</p>	<p>CERTH (CEntre for Research & Technology Hellas) was founded in 2000 and has since been established as the leading research facility in Greece, achieving substantial scientific and technological achievements in a broad range of fields, including but not limited to Energy, Environment, Industry, Information & Communication, Agro-biotechnology, Safety, and Security, as well as several cross-disciplinary scientific areas. In ICARIA, CERTH participates through ITI (Information Technologies Institute), one of the leading Institutions of Greece in the fields of Informatics, Telematics, and Telecommunications, and specifically through the M4D (MultiMoDal Data Fusion and Analytics)</p>	<p>ITI > MKLAB > M4D ></p>	<p>Twitter: @CERTHellas</p> <p>LinkedIn:</p> <p>ITI > MKLAB > M4D ></p>

	<p>group. ITI's research has delivered novel and innovative tools and methodologies in a variety of areas through a number of publications including scientific publications in peer-reviewed journals, conferences, and books. Additionally, M4D develops cutting-edge algorithms and solutions in the areas of Multimodal Data Fusion and analytics, Web Data Mining, Big data, and Artificial Intelligence, applied in a range of domains including Arts and Media, Security, Health, Earth Observation, and Smart Manufacturing.</p>		
<p>National Center for Scientific Research "DEMOKRITOS"</p>	<p>The Environmental Research Laboratory (EREL) of NCSR is an established RTO combining complementary expertise in atmospheric research and environmental decision support systems with important research potential (awarded the largest FP7-REGPOT ENTEC for climate research and coordinated the H2020 project EU-CIRCLE). EREL follows an integrated R&D approach to environment and climate, contributing for environmental protection, climate change adaptation and sustainable development in regional and global terms. EREL carries expertise in climate change and regional models, including dynamical and statistical downscaling, prognostic -</p>	<p><u>DEMOKRITOS ></u></p>	<p>Twitter: @NCSR_Demokritos</p> <p><u>LinkedIn ></u></p>

	<p>diagnostic meteorology and data assimilation, decision support systems integrated with advanced multi-hazard risk analysis and impact assessments, and climate resilience of infrastructures, cities and communities.</p>		
<p>Draxis Environmental</p>	<p>Founded in 2000 in Thessaloniki, DRAXIS focuses on developing real life environmental ICT solutions and providing specialised environmental consultation services. Looking always ahead, we keep up with and interpret what is happening in day-to-day business, so as to offer custom-made tools, reflecting our commitment to be of service to the environment we live in.</p>	<p>DRAXIS ></p>	<p>Twitter: @DraxisEnv</p> <p>LinkedIn ></p>
<p>Fundación para la Investigación del Clima (FiC)</p>	<p>FiC is a non-profit, private and fully independent foundation whose objectives are focused on research and innovation in climatology, meteorology and the environment. FiC specializes in the development of tailored climate services to foster the adaptation to and mitigation of climate change, and increase the resilience of multiple sectors.</p>	<p>FiC ></p>	<p>Twitter: @FiClima</p> <p>LinkedIn ></p>
<p>Fundació Institut de Recerca de l'Energia de Catalunya (IREC)</p>	<p>IREC (Institut de Recerca en Energia de Catalunya) is a research institute in Catalonia, Spain, focused on energy research and innovation. It addresses renewable energy, energy efficiency, energy storage,</p>	<p>IREC ></p>	<p>Twitter: @IREC_Energia</p> <p>LinkedIn ></p>

	<p>and sustainable technologies. Collaborating with academia and industry, IREC develops practical solutions and contributes to the transition to a sustainable energy system. The institute conducts fundamental and applied research, aiming to advance knowledge and bridge the gap between research and application. IREC's work supports global efforts for a cleaner and more sustainable energy future.</p>		
<p>Laboratório Nacional de Engenharia Civil (LNEC)</p>	<p>LNEC is a public research institution devoted to science and technology, established in 1946 and located in Lisbon. LNEC's activity includes public works, infrastructures, housing and urban planning, hydraulics and water resources, transportation, environment, construction materials and other products, giving it a unique multidisciplinary perspective.</p>	<p>LNEC ></p>	<p>Twitter: @LNEC_PT</p> <p>LinkedIn ></p>
<p>South Aegean Region</p>	<p>The Region of South Aegean is one of the thirteen regions of Greece. It consists of the Cyclades and the Dodecanese island groups in the central and south-eastern Aegean Sea, with a total of 52 inhabited islands. The region was established in the 1987 administrative reform and since 2011 is divided into 13 regional units, formed</p>	<p>PNAI > Aegean Islands ></p>	<p>No Twitter No LinkedIn</p> <p>Instagram > Facebook ></p>

	<p>around major islands: Andros, Kea-Kythnos, Syros, Thira (Santorini), Milos, Mykonos, Naxos, Tinos, Paros, Rhodes, Kos, Kalymnos and Karpathos. The Region's capital is situated in Ermoupoli on the island of Syros. SAR is responsible for these five key areas at regional level: Administration, Environment, Infrastructure and Planning, Transportation and Communications, Agricultural Economy and Veterinary, Public Health and Social Welfare.</p>		
<p>University of Exeter</p>	<p>The University of Exeter is a prestigious public research university located in Exeter, Devon, England. It was founded in 1955 and has since gained a strong reputation for academic excellence and research quality. The university offers a wide range of undergraduate and postgraduate programs across various disciplines. With campuses in Exeter and Cornwall, the university provides a vibrant learning environment and state-of-the-art facilities. Exeter University is known for its strong emphasis on research-led teaching and its commitment to global challenges and sustainability.</p>	<p>UNEXE ></p>	<p>Twitter: @UniofExeter</p> <p>LinkedIn ></p>
<p>Università degli studi di Napoli Federico II (PLINIVS)</p>	<p>The University of Naples Federico II is one of Italy's oldest and largest</p>	<p>UNINA ></p>	<p>Twitter: @UninaIT</p>

	<p>universities, founded in 1224. Located in Naples, it offers a wide range of undergraduate and postgraduate programs in various fields. The university is renowned for its excellence in research and education, attracting both national and international students. With numerous departments, research centers, and institutes, it fosters collaboration and contributes to scientific advancements and cultural development. The University of Naples Federico II aims to provide high-quality education, promote research, and contribute to societal progress.</p>		<p>LinkedIn ></p>
<p>VERBUND Energy4Business GmbH</p>	<p>VERBUND is Austria's leading electricity company and one of the largest producers of hydropower electricity in Europe. 95% of VERBUND's electricity is generated through hydropower, supplemented by wind and solar power. VERBUND operates more than one hundred hydropower plants in Austria and Bavaria and these hydropower plants have a combined capacity of about 8200 megawatts. The electricity is generated in highly efficient storage power plants high up in the Alps (in Salzburg, Tyrol, Carinthia and Styria) as well as on the large rivers (the Danube, Drau, Enns,</p>	<p>VERBUND ></p>	<p>Twitter: @verbundag</p> <p>LinkedIn ></p> <p>Instagram ></p> <p>Facebook ></p>

	<p>Inn, Mur and Salzach). Via the subsidiary Austrian Power Grid (APG) VERBUND also operates the Austrian extra-high voltage grid with power lines totaling around 3,500 km in length.</p>		
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2 Communication and Dissemination objectives

2.1 Communication vs dissemination

Given the nature of European projects, it is imperative to ensure that dissemination and communication go hand-in-hand. Nevertheless, the difference between these two terms sometimes is not entirely clear. Based on the definitions provided by EC, in the ICARIA framework, **communication** is understood as a tool for introducing to the general public the most crucial concepts the ICARIA project is built upon, such as urban resilience and climate change. In other words, the driving purpose of all communication activities described in this deliverable is to raise awareness and to highlight the need for initiatives such as ICARIA. **Dissemination**, instead, is focused on the disclosure of knowledge, such as achievements and results of the project, trying to ensure its greatest possible resonance among their potential end users and the scientific community.

2.2 Global vs. local

In general terms, the core essence of project ICARIA is to contribute to build more resilient regions against climate change. The global concept of a smart, citizens-friendly and resilient city will cover all the communication activities. Besides that, specific communication and dissemination activities will be focused on a regional level in three research sites – Barcelona Metropolitan Area (Spain), South Aegean Archipelago (Greece) and Salzburg (Austria) – in order to make the project more tangible by presenting its real benefits for each case study. These kinds of activities are expected to help engage local communities, relevant stakeholders and key decision makers.

The communication and dissemination objectives of the ICARIA project are:

1. **Allow** both the general and specialised public to **access information** about the project progress and its outcomes.
2. Develop a Dissemination and communication Plan to **define the strategy and specific actions** related to the outreach of the results of the ICARIA project.
3. **Promote and encourage communication** among stakeholders and **share knowledge** with similar projects.
4. **Raise awareness** among different audiences, including public administration, stakeholders and general society, on the need of long-term planning to improve resilience and reduce the impacts of climate change.
5. **Promote and encourage the widest possible application of project methods and tools** beyond the lifetime of the project.

3 Target groups

This plan identifies the following **target audiences** for the ICARIA project:

Table 2. Target audiences

Target audience	Objective(s)
Public Administration	Engaging public administration as a target audience ensures that research findings are effectively translated into practical solutions, policy improvements, and capacity-building initiatives within the public sector.
Potential end-users	Targeting potential end-users in European research projects ensures that the research is relevant, impactful, and user-centered. It facilitates validation, testing, knowledge transfer, and long-term sustainability of the research outcomes, ultimately benefiting the intended beneficiaries and addressing real-world challenges.
Associations and platforms	Associations and platforms are targeted as audiences to facilitate knowledge exchange, collaboration, policy influence, networking and implementation within specific industries or sectors. By engaging these stakeholders, ICARIA can increase its reach, relevance, and impact.
Scientific community	It is highly important not to overlap research efforts within the European research community and to identify synergies that can lead to fruitful collaborations in the future. Networking activities and wide dissemination of the project in conferences and congresses, as well as possible publications in scientific journals, are planned.
General public	Targeting general audiences on a project related to urban resilience helps raise awareness, disseminate knowledge, encourage behavioral change, gain public support, and foster interdisciplinary collaboration.
Dissemination multipliers	Targeting dissemination multipliers enables researchers to amplify their findings, enhance public awareness and engagement, translate knowledge effectively, influence policy decisions, and facilitate stakeholder collaboration. By leveraging the reach and influence of dissemination multipliers, the ICARIA project can achieve broader impact and ensure that their research outcomes are effectively communicated and utilised by a wider audience.

4 Key messages

The **key messages** of the ICARIA project are the following:

Main messages

1. In recent years, there has been a **significant increase in climate-related disasters**, causing widespread damage and economic losses.
2. ICARIA is a European project funded by the European Commission's Horizon Europe program, aimed at **improving the climate resilience of strategic assets**.
3. The ICARIA project addresses the **need for improved understanding of the impacts of natural disasters on critical assets** in sectors such as water, energy, transport, waste, and housing.
4. ICARIA proposes a **comprehensive asset-level modeling framework** to understand the impacts of complex, compound, and cascading disasters and to **assess the effectiveness of adaptation measures**.
5. The project includes **three case studies in Europe**: Barcelona Metropolitan Area, South Aegean Region, and Salzburg Region, aiming to understand impacts, assess risks, and co-create adaptation solutions in these vulnerable regions.
6. The ICARIA project will **assess the replicability of proposed solutions** by evaluating their effectiveness across different case studies and in five additional regions: the Vega Baja region in the Valencian Community (Spain), the South Aegean region and Crete (Greece), the Campania region and the Metropolitan Area of Naples (Italy), and the region of Upper Austria.
7. The main outcome of the ICARIA project is a **decision-support system** for assessing potential impacts, selecting adaptation measures, and facilitating decision-making to improve climate resilience at the regional level, as well as the holistic climate resilience assessment

Secondary messages

- The project involves the development of **state-of-the-art models to simulate risks associated with extreme climate events**, focusing on compound events and cascading impacts on strategic services, infrastructures, and the environment.
- **15 entities collaborate in this initiative**, including research institutes, universities, private companies, and public entities with expertise in climate resilience and critical infrastructure management.
- **The project builds upon previous initiatives like RESCCUE**, focusing on modeling and assessing climate impacts on critical infrastructure and cascading effects at a regional scale, considering compound events and their associated risks.

Table 3. Key messages

Duration	Phase	Description	Message to be delivered
M1-M12	<p>Phase 1</p> <p>Development of social engagement through awareness raising and introduction of the ICARIA concept.</p>	<p>When the project begins, communication efforts focus on creating awareness and generating anticipation. This stage involves developing a project website, social media presence, and promotional materials. Researchers may engage with stakeholders and dissemination multipliers to build interest and excitement around the upcoming research.</p>	1, 2 ,3, 4, 5, 6, 7
M12-M24	<p>Phase 2</p> <p>Dissemination of the project progress and expected results</p>	<p>Once the research project is underway, communication efforts aim to engage the target audience(s) and stakeholders. This may involve sharing progress updates, preliminary findings, and relevant news through various channels such as newsletters, social media, press releases, and events. When the ICARIA project reaches significant milestones or generates key findings, communication efforts will focus on sharing the results. Researchers disseminate research papers, reports, presentations that highlight the outcomes, implications, and applications of the research. This stage may involve targeted outreach to media outlets, policymakers, critical infrastructure operators, regional governments, and other stakeholders.</p>	3, 4, 5, 6, 7
M24-M36	<p>Phase 3</p> <p>Dissemination of the ICARIA results and potential impact.</p>	<p>Communication efforts in this stage concentrate on translating research findings into accessible and actionable knowledge for various audiences. Researchers will create practical guidelines that distill the research into user-friendly formats. Engagement with policymakers, critical infrastructure operators, regional governments and other potential end-users to facilitate the uptake and application of research outcomes, ensuring the project's impact beyond the research community, will be fostered.</p>	5, 6, 7

5 Communication and dissemination strategy

Within the ICARIA project, WP5, which stands for Work Package 5, focuses on dissemination, communication, outreach, and stakeholder engagement. The partners have specific roles and responsibilities within this work package.

The **Communication and Dissemination Plan** has been elaborated at the beginning of the project (M6), outlining the key elements of the overall strategy, including dissemination and communication channels and tools to be implemented (HOW), target audiences to be reached (WHO), key messages to be conveyed to those targets (WHAT), timing (WHEN) and location (WHERE) of the planned activities.

Cetaqua (CET) will be in charge of the communication and dissemination activities and the organization of a calendar of activities, **with the support of all the partners**. Cetaqua, together with the rest of the consortium, will update the draft plan to introduce the latest advancements on the project, and to make sure that no communication and/or dissemination opportunity is missed.

Several actions will be performed to spread the project benefits, raise awareness on climate hazards and foster the replicability of the developed tool and methodologies. All the communication and dissemination activities carried out will be tracked in a **Communication Database** (separate document).

WP5 is divided in **4 tasks**:

- **Task 5.1 - Communication tools and materials:** This task involves creating communication tools such as a graphic identity, website, and various materials like brochures and videos. The goal is to develop appealing content for target audiences and provide access to project-related resources.
 - **Duration:** January 2023 - December 2025
 - **Leader:** Cetaqua
 - **Contributor(s):** All partners
 - **Deliverables:** The results of this task are reported in deliverables D5.1 and D5.2.

- **Task 5.2 - Dissemination plan and activities:** In this task, all the planned dissemination activities are gathered, including the publication of articles, participation in events and conferences, publication of scientific papers, conduction of social media campaigns, networking with other projects, and the organization of presentation events and a final conference.
 - **Duration:** January 2023 - December 2025
 - **Leader:** Cetaqua
 - **Contributor(s):** All partners
 - **Deliverables:** The results of this task are reported in deliverables D5.1, D5.2, and D5.3.

- **Task 5.3 - Strengthening ICARIA outreach:** This task aims to leverage the partners' community contacts to promote the project outcomes. Specific meetings and forums will be organised to facilitate the spread and further use of the project results.
 - **Duration:** January 2023 - December 2025
 - **Leader:** Aquatec
 - **Contributor(s):** All partners
 - **Deliverables:** The results of this task are reported in deliverables D5.1, D5.2, and D5.3.

- **Task 5.4 - Stakeholders engagement:** This task focuses on engaging stakeholders through the creation of Communities of Practice (CoPs) in the three case studies. Workshops and related communications will be organised to improve risk perception, raise awareness, co-create adaptation solutions, and evaluate stakeholder satisfaction. Local authorities and their communication channels will be involved in citizen engagement activities.
 - **Duration:** January 2023 - December 2025
 - **Leader:** Università degli studi di Napoli Federico II (PLINIVS)
 - **Contributor(s):** Cetaqua, Case Study Facilitators, and Risk Owners
 - **Deliverables:** The results of this task are reported in deliverables D5.4 for the stakeholders' engagement plan and D5.5 for the stakeholders' events reports.

A detailed description of the materials and activities planned for each task can be found **in the following sections.**

Task 5.1 - Communication tools and materials

Cetaqua will coordinate the development of the following materials. The content will be provided by all partners. These materials will be produced in English and translation to other languages will be done depending on the material and the local impact expected.

Table 4. List of materials and actions of Task 5.1

Material or action	Description	Objective(s)	Target audience(s)	Timing	Specific KPI(s)
Logotype and templates	A graphic identity and a strong and recognizable brand (project logo, color palettes and templates). All this information will be gathered in the ICARIA Identity Manual, which will serve as the guide to apply the project brand.	To achieve fast identification of the project through visual identity elements (logo and applications). To give the project its unity, coherence and identity.	All the parties involved and the whole identified target audience.	M3	Creation of 1 set of logos and templates.
Roll-up	A printed material including the branding of the ICARIA project, the partner's logos and a QR code to access the project website.	To identify the project at meetings, congresses and other events.	All audiences.	M6	Production of 1 roll-up.
Project website	A specific website hosted under the following domain: www.icaria-project.eu . The ICARIA website will be the keystone of the project's digital communication. It is planned to become a reference portal about climate multi-hazards and related impacts on strategic assets, its impacts on key infrastructure and services and adaptation measures. It will include not only general	To provide updated information for the audience.	All audiences.	M6	250 single visits/month

	<p>information on the project but also complementary sections offering appealing content for the target audiences. A digital press room will be created to gather all the news related to the progress of the project. A blog section, including articles written by all the partners, will also be created. The website will also include a downloads section, where the main dissemination materials, deliverables, scientific publications, and other files will be available. It will be periodically updated by Cetaqua and all the partners will contribute with news, pictures, and other content. Partners will use their own corporate websites and other communication channels to promote the website and the ICARIA project.</p>				
Infographics	<p>Digital static graphics showing the project's case studies, methodologies and expected results in a visual and easy-to-understand way.</p>	<p>To help to understand the project in a graphical way.</p>	<p>Potential end-users, interested audiences and general public.</p>	<p>M6</p>	<p>Creation of 1 set of infographics.</p>
Informative leaflet	<p>A digital and printed document that will explain the project in an easy-to-understand way. Inside this leaflet, readers will find an overview of the project's objectives, expected results and details about the research.</p>	<p>To introduce the project in an informative way.</p>	<p>Potential end-users, interested audiences and general public.</p>	<p>M6</p>	<p>500 downloads or copies</p>
Posters	<p>A generic poster including the main information on the project.</p> <p>A poster including the results of the project.</p>	<p>To introduce the project and its results to technical audiences.</p>	<p>Potential end-users, scientific community.</p>	<p>M6 M36</p>	<p>Production of 2 posters.</p>

Short promotional video	A short animation video explaining the project’s context, objectives and expected results.	To introduce the project in an informative way for all audiences.	Potential end-users, interested audiences and general public.	M6	500 views on Youtube.
Newsletter	Annual digital newsletter to describe the project’s progress and milestones. It will include links to the project’s main news, results and contents of interest on the website	To disseminate the project progress, milestones and results.	All audiences.	M12 M24 M36	3 newsletters. 3.000 recipients across Europe.
Technical leaflet	A digital and printed technological-oriented leaflet outlining the project results and experiences from the case studies.	To disseminate the project results.	Potential end-users, scientific community and interested audiences.	M36	500 downloads or copies
Final video	A filmed video including interviews with the project partners explaining the main results and potential applications of the project outcomes.	To disseminate the project results.	Potential end-users, interested audiences and general public.	M36	500 views on Youtube.

Task 5.2 - Dissemination plan and activities

The research progress and outcomes of ICARIA will be presented throughout the project duration, including major international conferences and exhibitions, workshops and webinars organised by ICARIA members or external institutions. A significant coordinated effort will be made among the partners to impact technical and generalist media. Additionally, work will be carried out on various scientific publications in high-impact journals.

Table 5. List of materials and actions of Task 5.2

Material or action	Description	Objective(s)	Target audience(s)	Timing	Specific KPI(s)
<p>Media</p>	<p>Different press releases will be sent to technical and general media.</p> <ul style="list-style-type: none"> ● M1 - Project launch ● M18 - Start of trials ● M36 - Project results <p>List of some targeted technical media:</p> <ul style="list-style-type: none"> ● RETEMA (Spain) ● IndustriAmbiente (Spain) ● Aguas Residuales (Spain) ● TecnoAqua (Spain) ● FuturEnviro (Spain) ● EFE Verde (Spain) ● eSMART CITY (Spain) ● iAmbiente (Spain) ● IWA (international) ● Smartwater (international) 	<p>To disseminate the project’s approach, objectives and results.</p>	<p>All audiences.</p>	<p>M1-M36</p>	<p>Production of 3 press releases</p>

	<p>List of some targeted general media:</p> <ul style="list-style-type: none"> • La Vanguardia (Spain) • Europa Press (Spain) 				
Social Media	<p>Social media campaigns will be carried out through the partners' accounts, taking advantage of World Days and project's milestones, among others, to reach a wider audience. Specific hashtags (i.e. #IcariaEU) will be created and used to share contents and ease the tracking of the project's publications.</p>	<p>To disseminate the ICARIA project and attract traffic to the website.</p>	<p>All audiences.</p>	<p>M3-M36</p>	<p>50 posts</p>
Final event	<p>An event, focused on climate-proofing assets and main ICARIA outputs, will be organised at the end of the project. This event will target public authorities, problem owners and managers of private industries and other key actors. In the framework of the conference, networking, synergy-building and clustering initiatives with other successful proposals in the same area will be carried out, so that links to potential final beneficiaries will be strengthened and future actions for encouraging further implementation of the project will be planned.</p>		<p>Potential end-users, associations and platforms, dissemination multipliers and scientific community.</p>	<p>M36</p>	<p>200 participants</p>

Task 5.3 - Strengthening ICARIA outreach

This task aims to leverage the partners' community contacts to promote the project outcomes.

Table 6. List of materials and actions of Task 5.3

Material or action	Description	Objective(s)	Target audience(s)	Timing	Specific KPI(s)
Attendance to conferences	<p>Different events, congresses, workshops and conferences will be attended by the project partners. with the objective of disseminating the project to potential end-users, specialised audiences and the scientific community through presentations and posters.</p> <p>List of some conferences of interest:</p> <ul style="list-style-type: none"> • Resilient Cities congress series • European Climate Change Adaptation conferences • European Forum for Disaster Risk Reduction • Jornadas de Ingeniería del Agua • ESReDA Seminars • European Week of Regions and Cities • UHINAK (Spain) • Spanish Climatology Association (AEC) congress 	Disseminate the project’s approach, objectives and results to potential end-users, specialised audiences and the scientific community.	Potential end-users, associations and platforms, dissemination multipliers and scientific community.	M1-M36	Participation in 20 conferences and scientific events.

	<ul style="list-style-type: none"> • LESAM2024 - Leading Edge Strategic Asset Management Conference (IWA, Jordan) • CONGREGA2024 - Sustainable and Digital Innovation in Engineering Asset Management (Portugal) 				
Scientific publications	<p>Several scientific papers in relevant journals will be published.</p> <p>A position paper will be submitted by M6 in the special issue “Reshaping Infrastructure for a Sustainable and Resilient Future” of the Sustainability journal.</p> <p>High-level peer-review international open journals of interest:</p> <ul style="list-style-type: none"> • Natural Hazards (Springer) • Journal of Hydrology (Elsevier) • International Journal of Disaster Risk Reduction (Elsevier) • Climate Risk Management Journal (Elsevier) • Journal of Flood Risk Management (Wiley) • Environmental Research Letters (IOP Science) • Urban Climate (Elsevier) 	<p>To disseminate knowledge, validate the project’s approach and results, contribute to the body of knowledge, recognition, impact, and career advancement. They ensure that research findings are shared, evaluated, and built upon, ultimately advancing scientific understanding and benefiting society as a whole.</p>	<p>Scientific community, potential end-users.</p>	<p>M6-M36</p>	<p>Publication of 15 papers in peer-review journals.</p>

Task 5.4 - Stakeholders engagement

Stakeholders involvement and engagement will be carried out via different levels of interaction in Work Package 4 (WP4) through trial methodology, ensuring participatory process within the **local Communities of Practice (CoPs)** within WP5.

The task will ensure the stakeholders engagement by creating CoPs at the 3 case studies and organizing workshops and related communications in each one. These workshops will be addressed to third parties and stakeholders and will aim to improve risk perception and awareness and to foster the co-creation of adaptation solutions and risk awareness and testing the ICARIA outputs which includes the training and use of ICARIA DSS; the workshops will also be used to conduct the polls to evaluate the stakeholders satisfaction with the different project results related with the project KPIs. Specific activities related to citizens engagement will be developed through the local authorities and their communication channels.

Specific information on Task 5.4 can be found in **D5.4 - Stakeholders Engagement Plan**.

6 Calendar

The forecast for communication and dissemination actions is as follows:

Table 7. Calendar of materials and actions

M	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	
Task 5.1																																					
Logo & templates			X																																		
Roll-up						X																															
Project website						X																															
Infographics						X																															
Informative leaflet						X																															
General poster						X																															
Short promotional video						X																															
Newsletter											X																										X
Technical leaflet																																				X	

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More info: www.icaria-project.eu



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