Fraunhofer Institute for intelligent Analysis and Information Systems IAIS

The Fraunhofer Institute for Intelligent Analysis and Information Systems IAIS researches and develops decision support systems for intelligent products, processes and services. With our expertise in artificial intelligence, machine learning, big data and system modelling, we analyse large amounts of data and tap their potential for decision support. In its business area "Preventive Security", Fraunhofer IAIS researchers the resilience of systems, infrastructures and objects to climate change as well as natural and man-made disasters.

AREAS OF ACTIVITY

Business Development, Climate Modelling, Climate Risks & Responses, Disaster Risk Management Climate Services, Cultural Heritage, Data, Knowledge, Digital Services, EU Projects, Information & Communication Technologies, Urban Planning

O P P O R T U N I T I E S

PROJECT

Adaptation & cultural heritage ARCH HYPERION SHELTER

ARCH is a European-funded research project that aims to enhance the resilience of areas of cultural and historic value against climatic and other natural hazards by providing better information to decision-makers. ARCH combines disaster risk management, climate change adaptation, and heritage management in an overall disaster risk management process. This is supported by a suite of tools: information management systems provide easy access to geo-referenced information; a decision support system supports impact and consequence analyses under different scenarios; an inventory of resilience measures allows identification of resilience enhancing measures; and a strategic resilience self-assessment allows identifying weak spots in resilience strategies and formulating action plans. All results will be accessible via the ARCH Hub, a platform for collaborative resilience building. ARCH's solutions are intended to be used by actors at city and historic area level responsible for heritage management, resilience, climate change adaptation, sustainability, and disaster risk management. To ensure direct applicability of all solutions, ARCH's team includes four European municipalities: Bratislava, Camerino, Hamburg, and Valencia. All solutions are developed together with these municipalities in a co-creation approach. In addition, a Mutual Learning Framework widens the practitioner network to 12 additional European municipalities, ensuring widespread replicability of the project results. Contact: Daniel Lückerath **https://www.ecca21.eu/participants/238** Official website of the

project: **https://savingculturalheritage.eu** HYPERION aims to leverage existing tools and services (e.g., climate/extreme events models, and their impacts, decay models of building materials, Copernicus services, etc.), novel technologies (terrestrial and satellite imaging for wide-area inspection, advanced machine learning, etc.) to deliver an integrated resilience assessment platform, addressing multi-hazard risk understanding, better preparedness, faster, adapted and efficient response, and sustainable reconstruction of historic areas. HYPERION will take into account the local eco-systems in the CH areas, mapping out their interactions and following a truly integrated/sustainable reconstruction approach (technical, social, institutional, environmental and economic level), by incorporating active communities participation (using the PLUGGY social platform3) and by supporting new business models based on the concept of a "load-balancing" economy, (using an algorithm that acts like a "reverse proxy", distributing client traffic across different companies within the same sector) and offering financial risk-transfer tools (insurance, Catastrophe-CAT-bonds4) that can ensure the immediate funds availability to fuel timely build-back-better efforts. The consortium consists of 19 partners from 6 European countries and will demonstrate its results in 4 historic cities: Venice, Rhodes, Granada and Tonsberg. Contact: Antonis Kalis **https://www.ecca21.eu/participants/1091** Official website of the project: **https://www.hyperion-project.eu** SHELTER aims to establish a cross-scale, multidimensional, data-driven, and community-based OPERATIONAL KNOWLEDGE FRAMEWORK for Heritage-led and conservation-friendly resilience enhancement and sustainable reconstruction of historic areas to cope with climate change and natural hazards. It will be the result of the interplay of two processes collaborating to co-create tailored strategies: a data-driven platform for diagnosis, decision making and monitoring based on existing knowledge and heterogeneous data; and an Open Labs approach as a continuous framework for local knowledge extraction, citizen´s engagement, co-creation, capacity building and innovation. SHELTER is developing a highly adaptable and replicable systemic approach based on the identification and activation of the inherent resilient characteristics of historic areas (heritage-led resilience) and the preservation of its values (conservation friendly resilience) through a trans-disciplinary approach that integrates social innovation, data driven technologies, local knowledge, circular economy, innovative resilience financing landscapes and adaptive governance. The case studies have been selected to maximise replicability (Ravenna-IT, Seferihizar-TR, Dordrecht-NL, Baixa Limia-Serra– ES and Sava River Basin) considering natural and cultural diversity (from archaeological to cultural landscapes), exposure to hazards, geographical representability, scale and typology (from building to

transnational regions). Contact: Aitziber Egusquiza

https://www.ecca21.eu/participants/523 Official website of the project: **https://shelter-project.com**

Applies to

Database, Financing, Insurance, Engineering, Local level, ICT solutions, Climate policy, Urban planning, National level, Regional level, Infrastructures, Climate science, Citizen science, Building sector, Climate services, Climate modelling, Earth observation, Cultural heritage, Citizen engagement, Public authorities, Knowledge transfer, Adaptation strategy, Platforms, websites, Agriculture, forestry, Extreme weather events, Demonstration activities, Climate change adaptation, Climate change mitigation, Environmental observation, International cooperation, Networking and cooperation, Legal and regulatory aspects, Marine, coastal, fluvial management, Disaster risk management and reduction, Decision support tools, decision-making, Exchange of knowledge and good practices, Biodiversity, ecosystem restoration, ecosystem services, Assessment of climate change impacts (physical, economic, social...)

ECCA 2021 - Climate change adaptation and cultural heritage – ARCH

Video https://youtu.be/QLpZRESz-j8