



Climate forecasts enabled knowledge services

CLARA

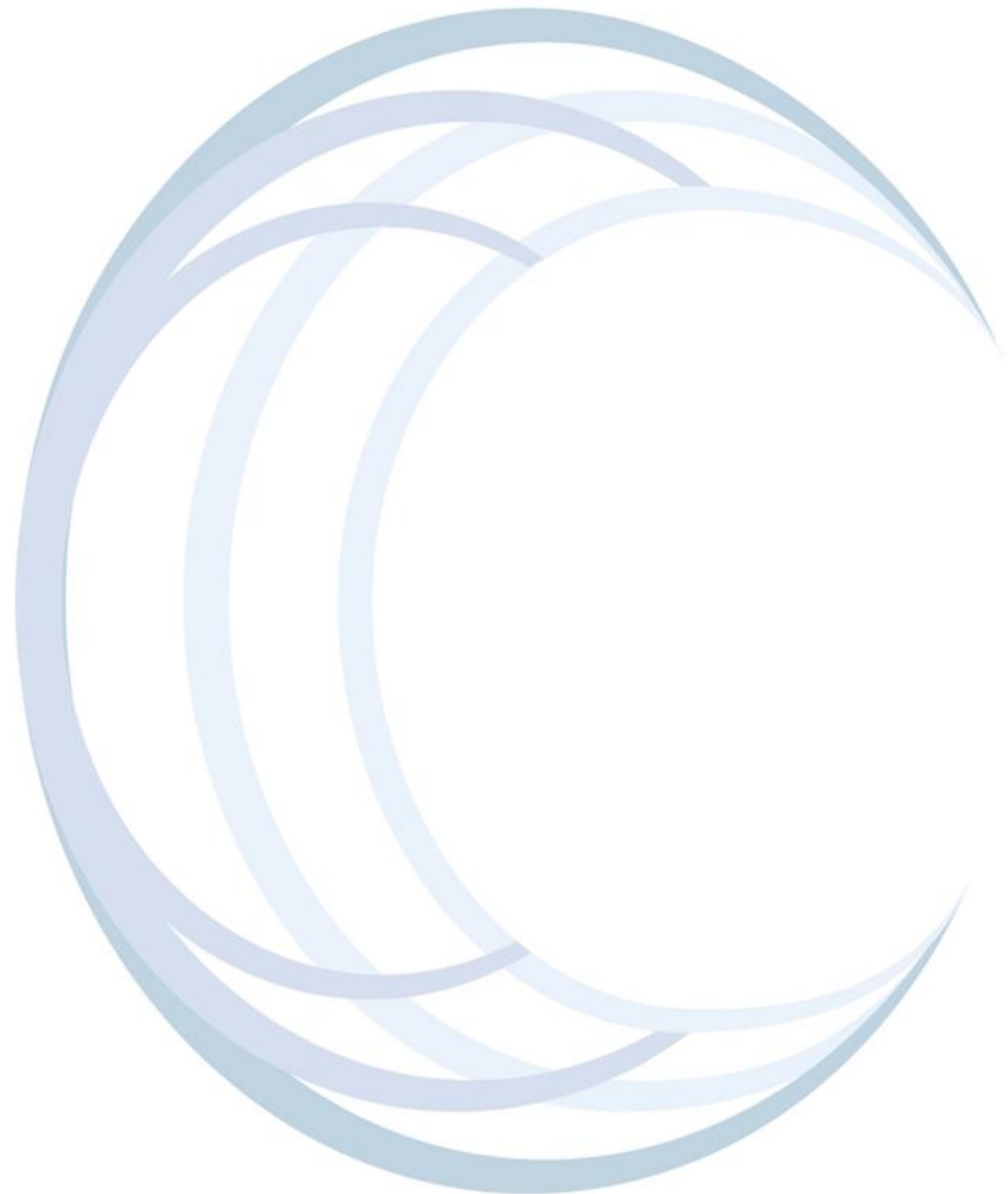
*Co-design and co-development between
service providers and end users*

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RAAS Division – Risk Assessment and Adaptation Strategies



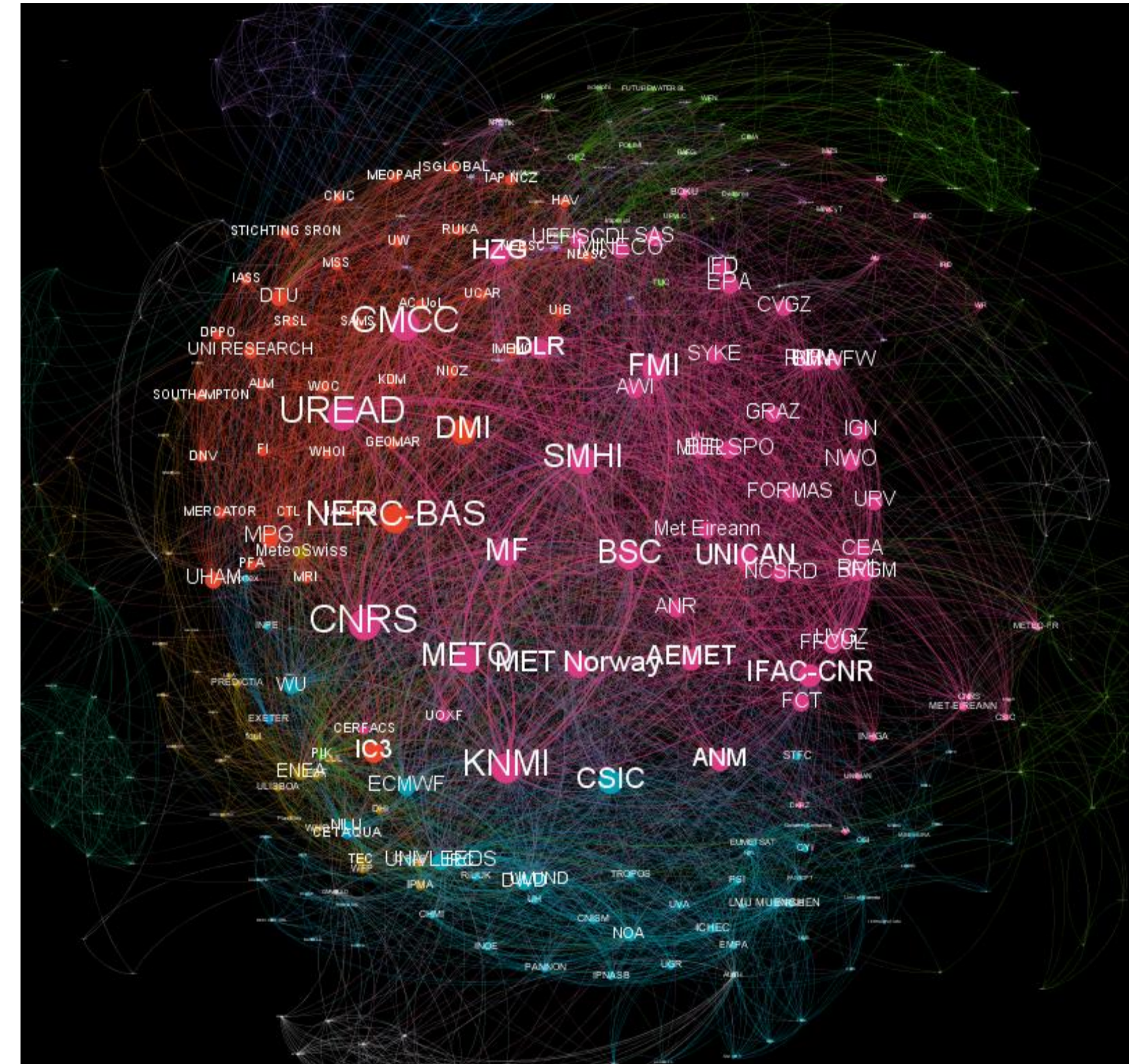
CLARA GRANT AGREEMENT N° 730482



WHY CLIMATE SERVICES?

- Adaptation in is essential to face current and future climate change and climate variability.
- Climate services a fast evolving area – through advancement of science and business cases.

“There is the need to deliver climate services that are co-generated by partnership-driven methodologies that closely engage service providers and end users, thus fostering a mutual appreciation of the knowledge needs and requirements, technical and technological opportunities, and the involved costs.” (EU Roadmap for Climate Services)



Network Analysis of 63 projects and more than 400 organisations associated with the development of climate services, FP7/H2020 (Mysiak and Larosa, under preparation).

CLIMATE SERVICES AS KIBS

Climate services as Knowledge-Intensive Businesses – KIBS

«clients routinely play a critical role in co-producing the service solution along with the service provider. This can have a profound effect on both the quality of the service delivered as well as the client's ultimate satisfaction. By strategically managing client co-production, service providers can improve operational efficiency, develop more optimal solutions, and generate a sustainable competitive advantage» (Harvard business online).

Supporting co-production **innovative** processes (Amara et al., 2008). → **Knowledge**

Including **feedbacks** (“intensive interactions”) from clients and users to shape innovative patterns (Xu and Strom, 2016). → **Intensive**

Operational through viable **business** models to overcome existing market barriers. → **Business**



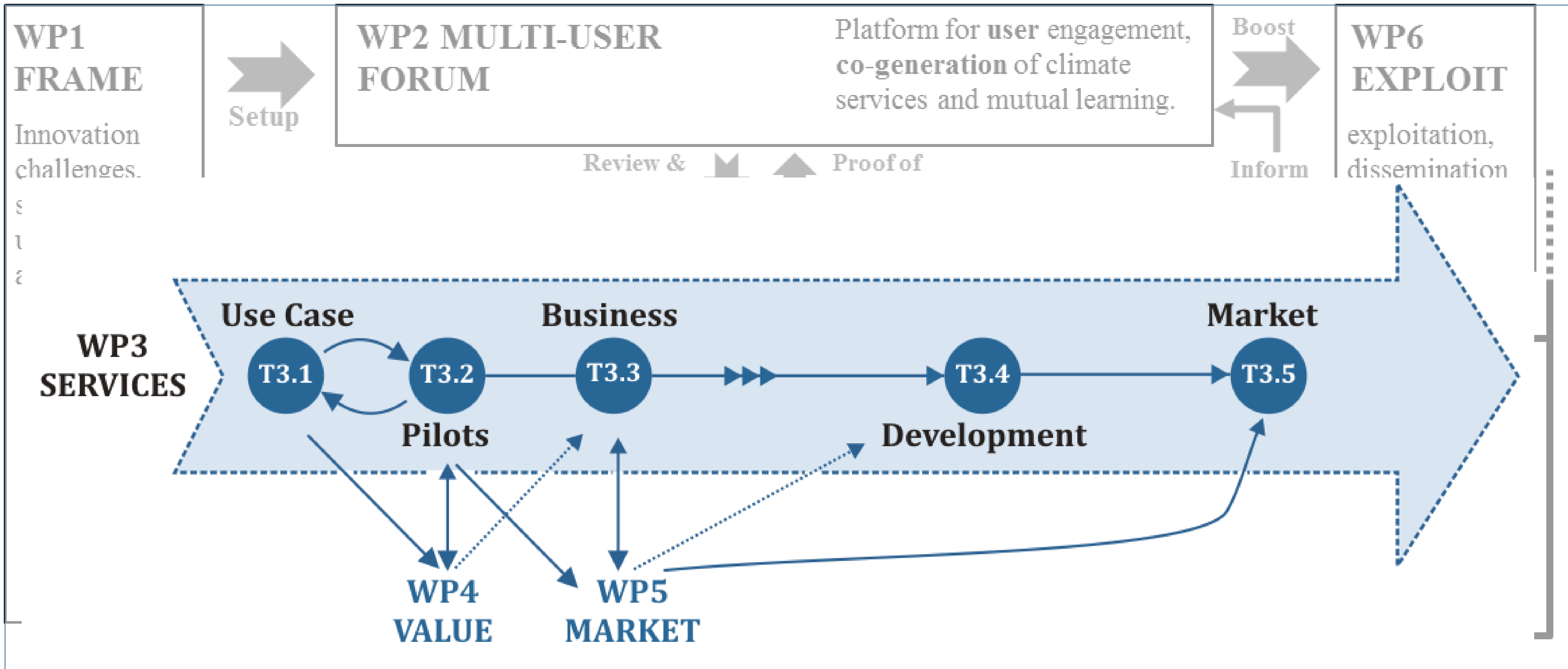
CLARA

Main objective » to develop a set of climate services building upon the Copernicus C3S seasonal forecasts and sectorial information systems, to demonstrate their value and to ensure their viability.

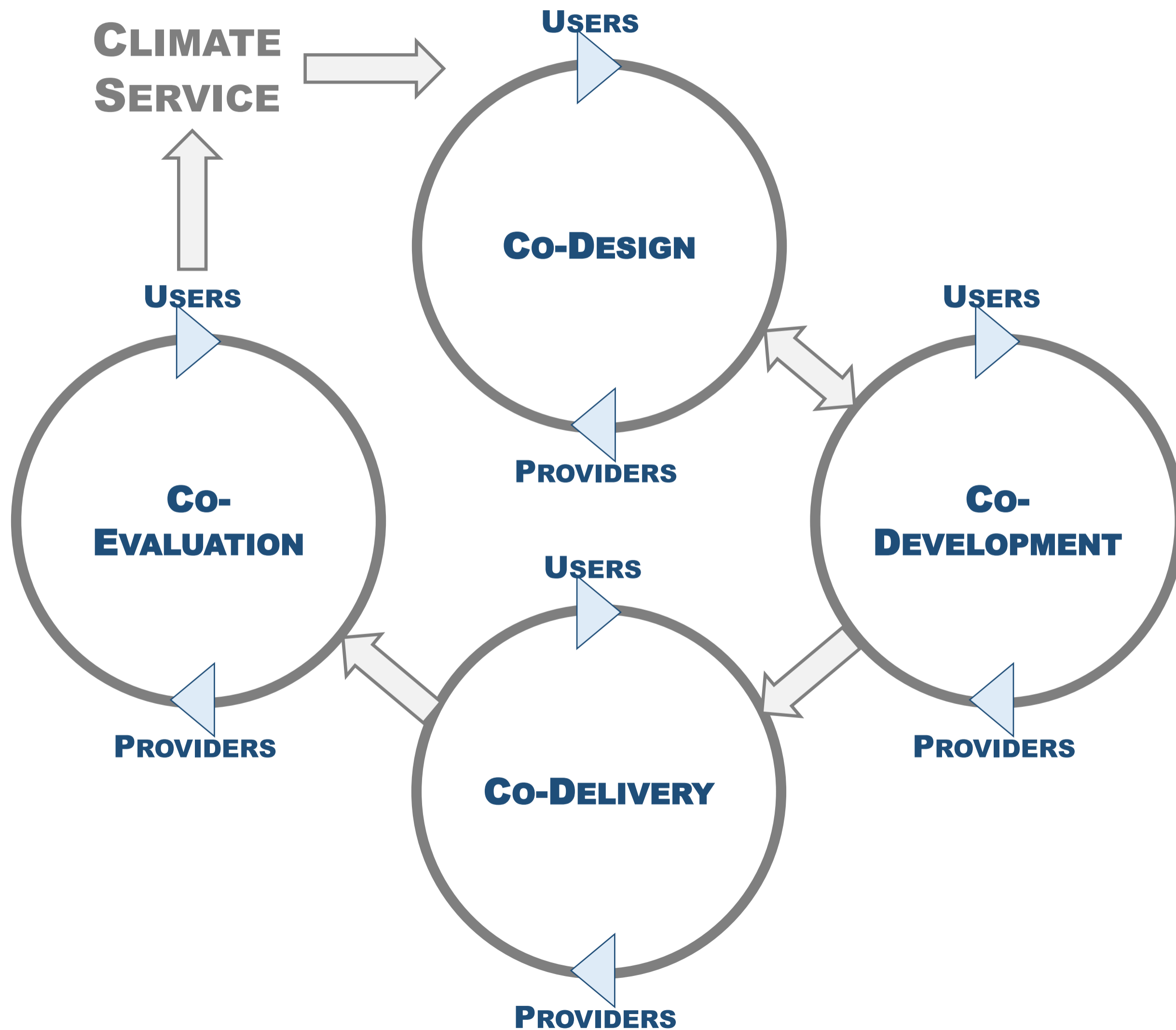
» H2020 innovation action (IA),
06/2017 – 05/2020

» 11 partners from academy, business and public administration

- » Develop new and enhance existing climate services
- » Analyse and demonstrate the **economic and social value** unleashed by climate forecast enabled climate services and corroborate their direct and indirect benefits
- » Engage service developers, purveyors and end-users in **mutually beneficial collaboration and partnerships**
- » Contribute to advancing the European **innovation, competitiveness and market performance** for climate services



CO-GENERATION: CLARA'S FRAMEWORK



- **Co-design:** Creative cooperation between users and providers to elaborate a conceptual solution for a problem that is stated in the form of requirements.
- **Co-development:** Execution of the design elements through collaboration between users and providers.
- **Co-delivery:** Process through which the service is put into operation through the collaboration between users and providers.
- **Co-evaluation:** joint development and application of agreed upon criteria for the measurement of results by providers and users.

MUF – THE MULTI-USER FORUM

The CLARA Multi-User Forum – MUF is a **platform** for **user engagement**, **co-generation** of climate services and **mutual learning** involving providers and users.

MUF promotes **workshops**, organised per taskforce, to facilitate the dialogue between providers and users.



MUF-1

Co-generation

03/2018

MUF-3

Market

09/2019

MUF-2

Value added

11/2018



The Impact and Stakeholder

Committee's members ensure that

Work Package leaders take into account and respond to MUF's recommendations.



14 climate services from among the Global Framework for Climate Services priorities

LOGO							
PARTNER	CMCC	ARPAE	ARPAE	GECOS	SMHI	UCO	GECOS
ACRONYM	FloodMage	PWA	WRI	IRRICLIME	Aqua	ROAT	SCHT
LOGO							
PARTNER	UCO	SMHI	ARPAE	TCDF	CMCC	SMHI	UCO
ACRONYM	SHAT	AirCloud	AQCLI	PPDP	Clime	Hydro Gwh	SEAP



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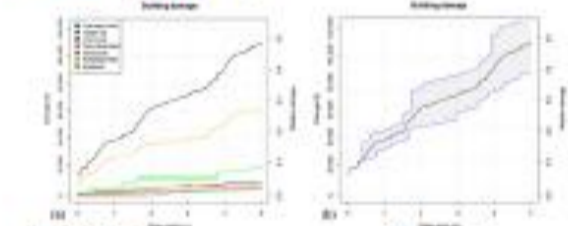
CLARA sets to develop fourteen climate services building upon the Copernicus seasonal forecasts, and demonstrate their marketability and value.

Italy is notoriously prone to flood hazard risk, as a result of its peninsular and mountainous conformation. Since 1980s, the average annual damage exceeded 1 billion Euro.



Damage and losses

Damage » economic value of impaired physical assets, assessed using an empirically validated **multivariate damage model (INSYDE)**.

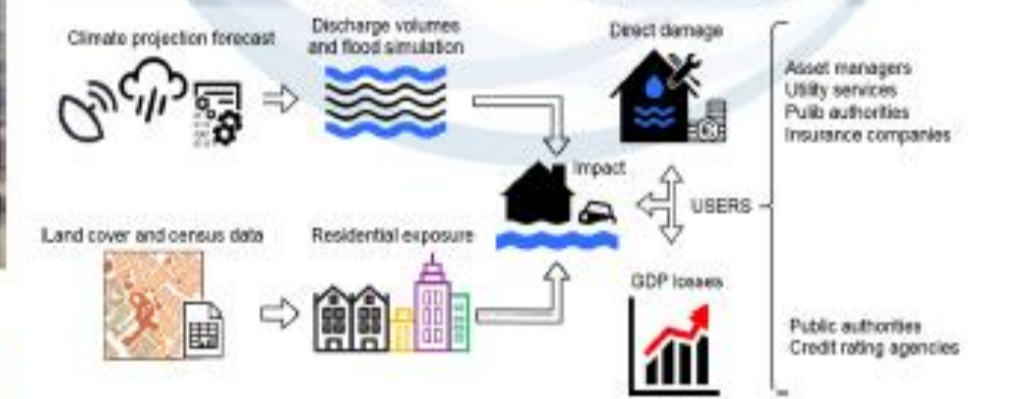


INSYDE: an open-source flood damage model based on explicit cost analysis (Debban et al. 2019)

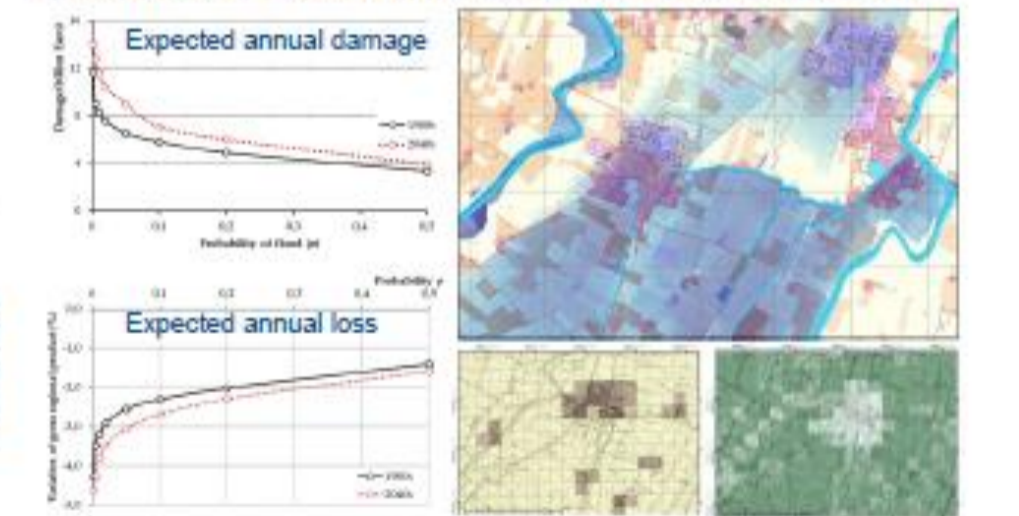
Loss » second-order impacts caused by business interruption and disruption of lifelines (e.g. transport, water and energy supply). Indirect losses are estimated using regionalized **computational general equilibrium (CGE)** model.

FLOOD MAGE Flood damage and loss service

This service estimates financial and economic impacts of floods driven by environmental changes and post-disaster recovery pathways. The modular design uses high resolution assets mapping, climate risk and flood hazard modelling, statistical analysis, catastrophe loss modelling, and recursive dynamic general equilibrium modelling.



The services builds upon the knowledge gained from reconstruction of past flood events and their impacts. The scale of analysis varies from asset to city-wide, inter-regional, national and pan-European levels, and is complemented by coping/adaptive capacity analysis.

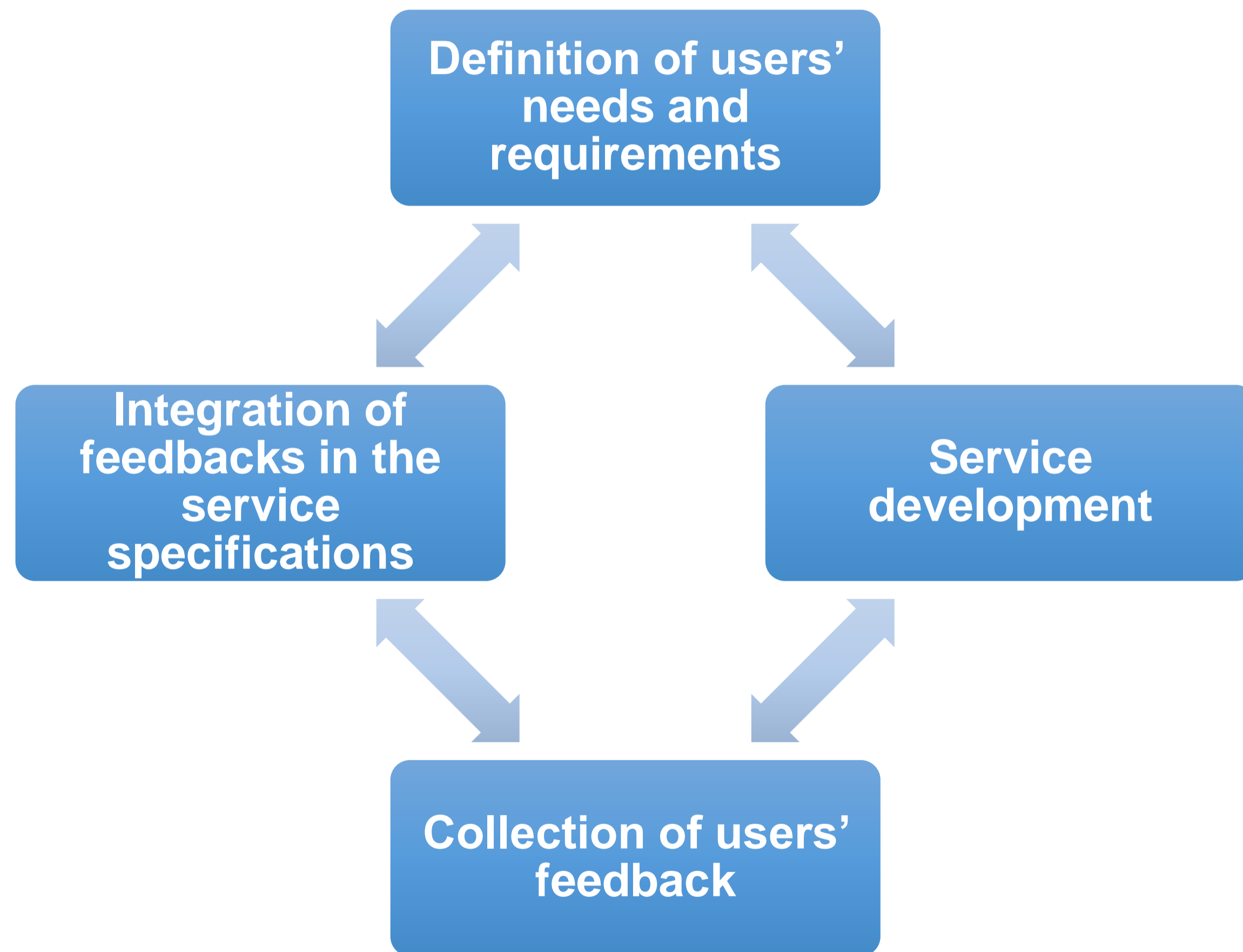


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The CLARA project has received funding from the European Union's Horizon 2020 research and innovation programme under the Grant Agreement No 730482.

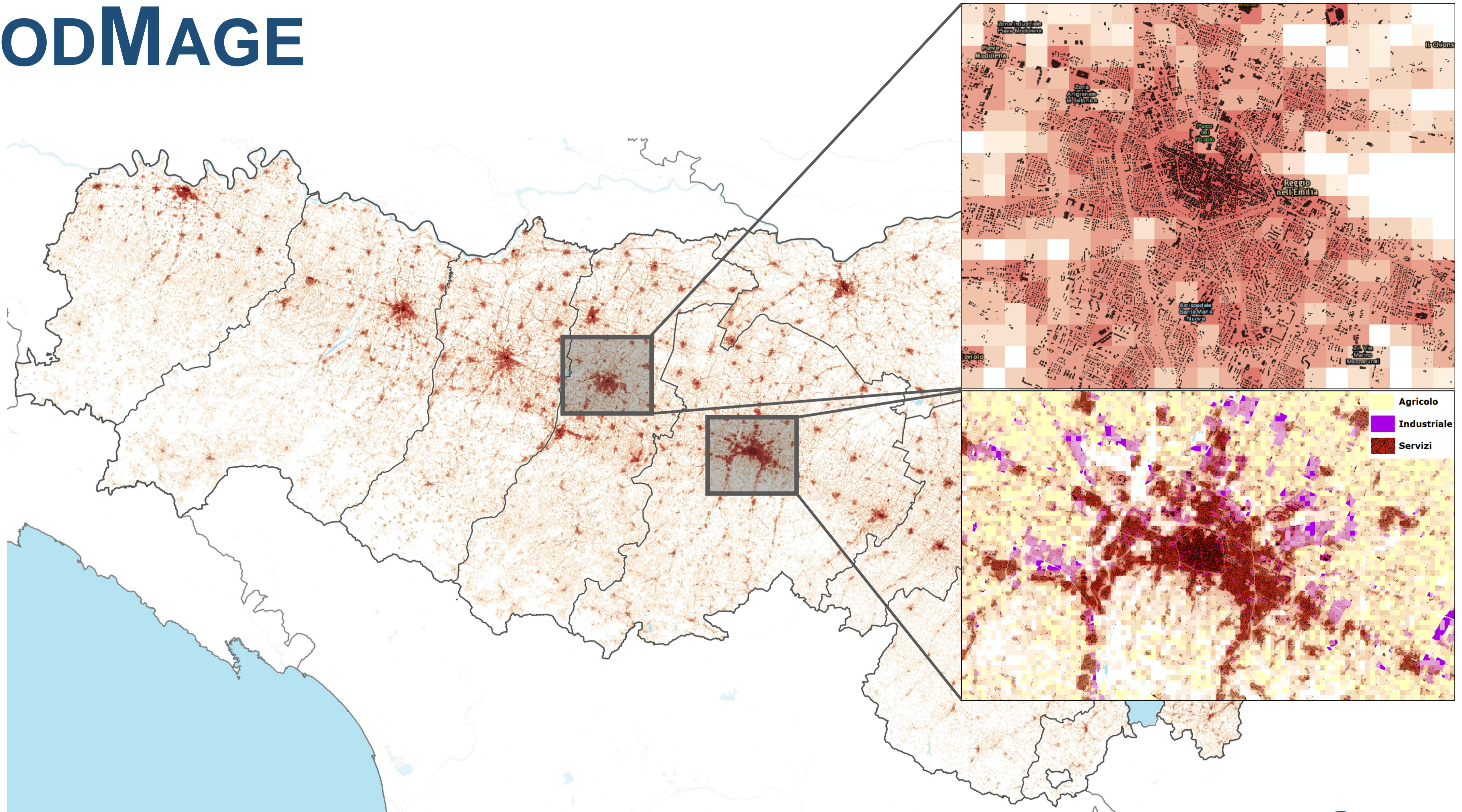


CO-GENERATION IN CLARA: FLOODMAGE

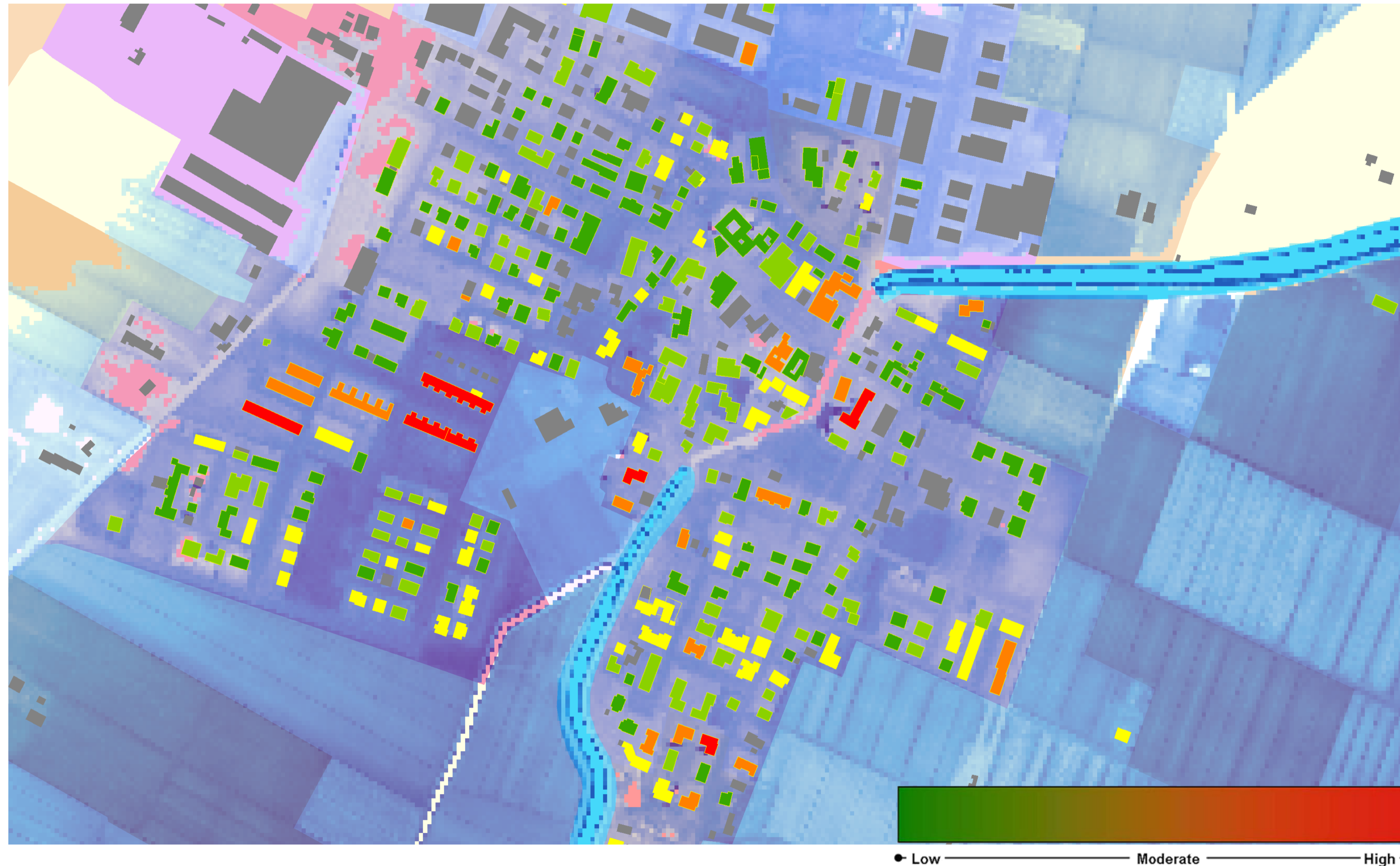


- **Co-design phase:** Users' needs assessed through face-to-face conversations, meetings and workshops organised between September and October 2017.
- **Co-development phase:** Bi-monthly bilateral meetings with users to collect and incorporate feedbacks from the users throughout the development stage ("feedback loop").
- **Co-evaluation phase:** end-phase reflections with the identified user and extension of the service to other potentially interested stakeholders to evaluate usability.

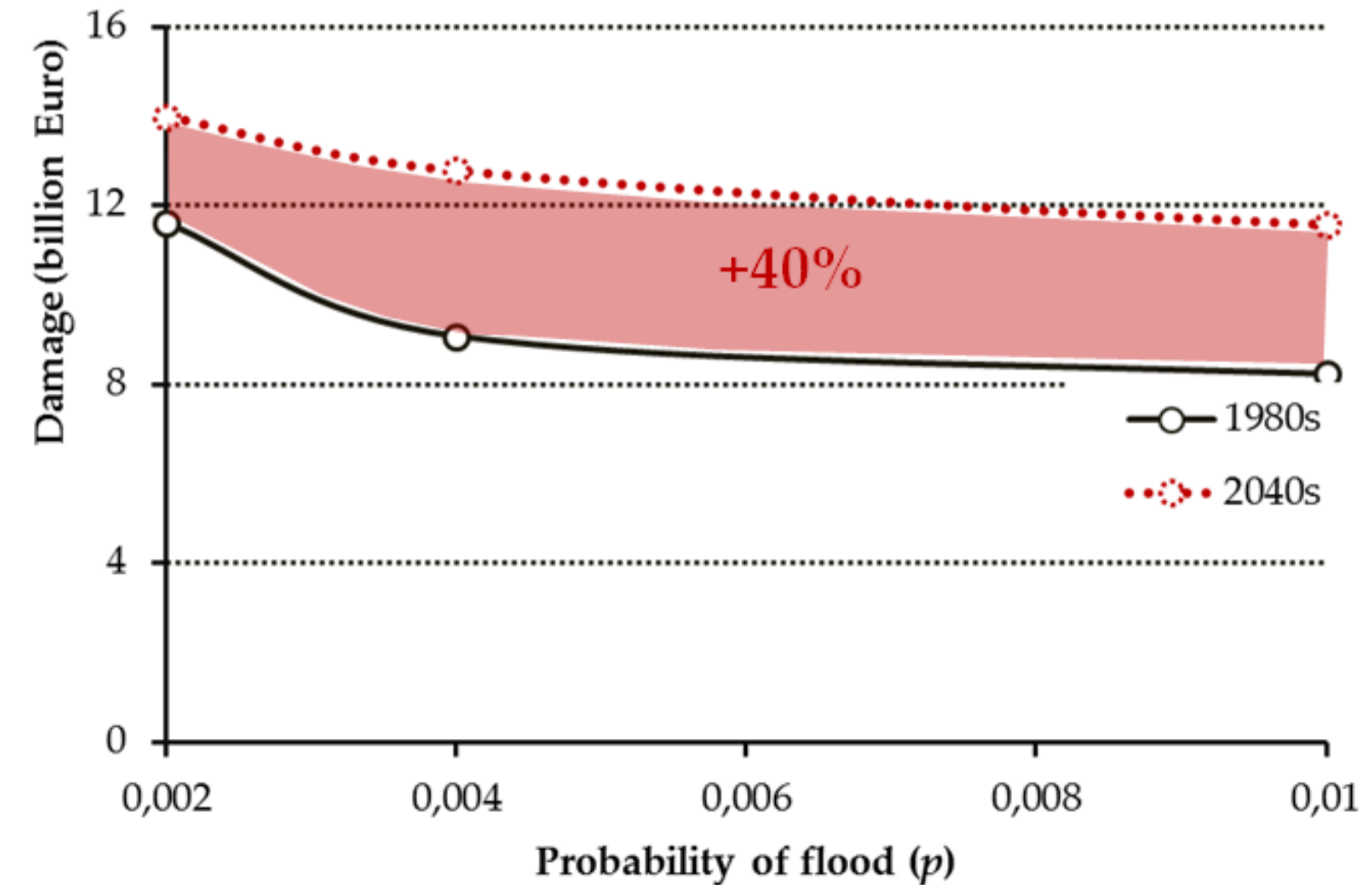
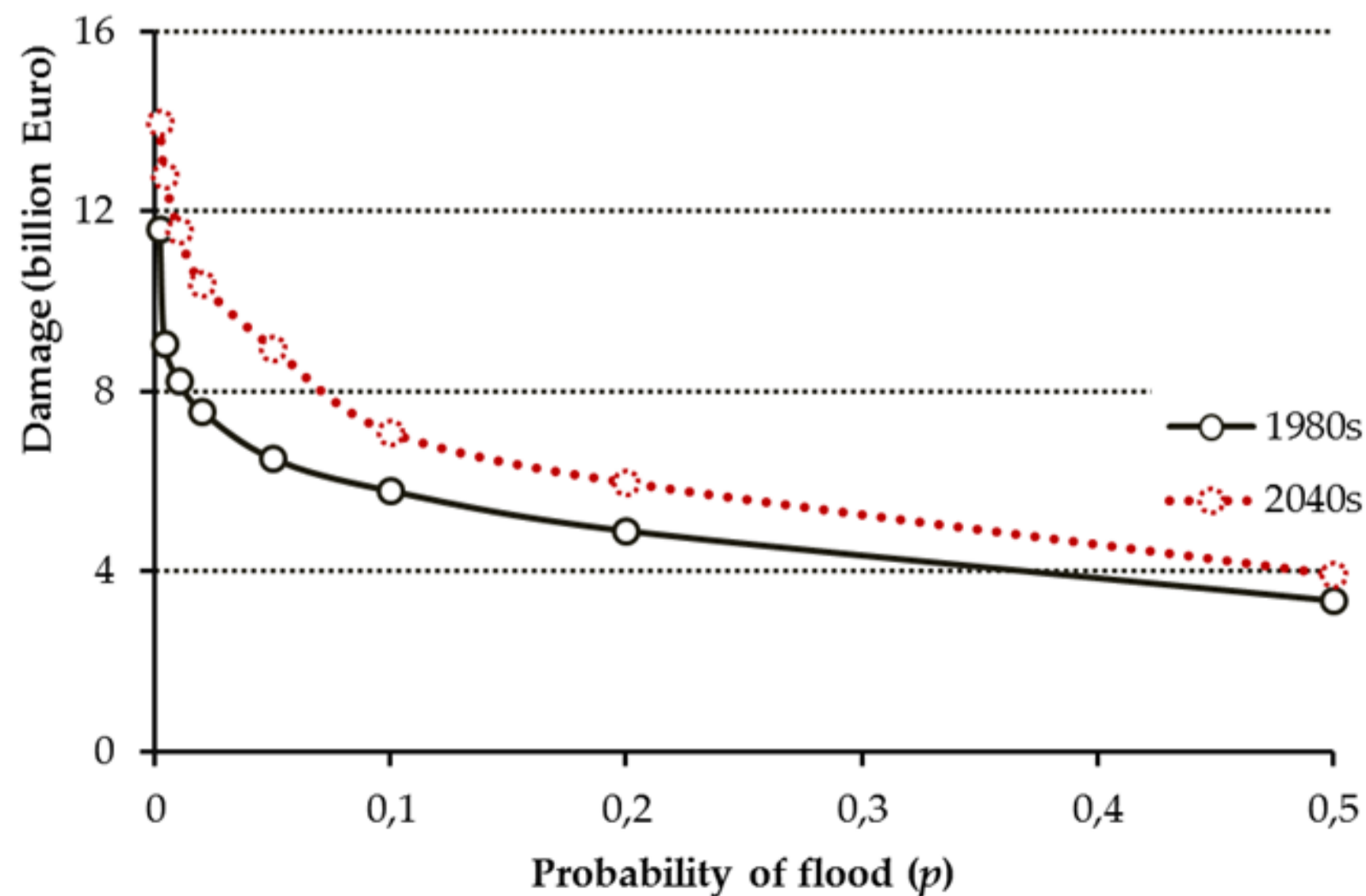
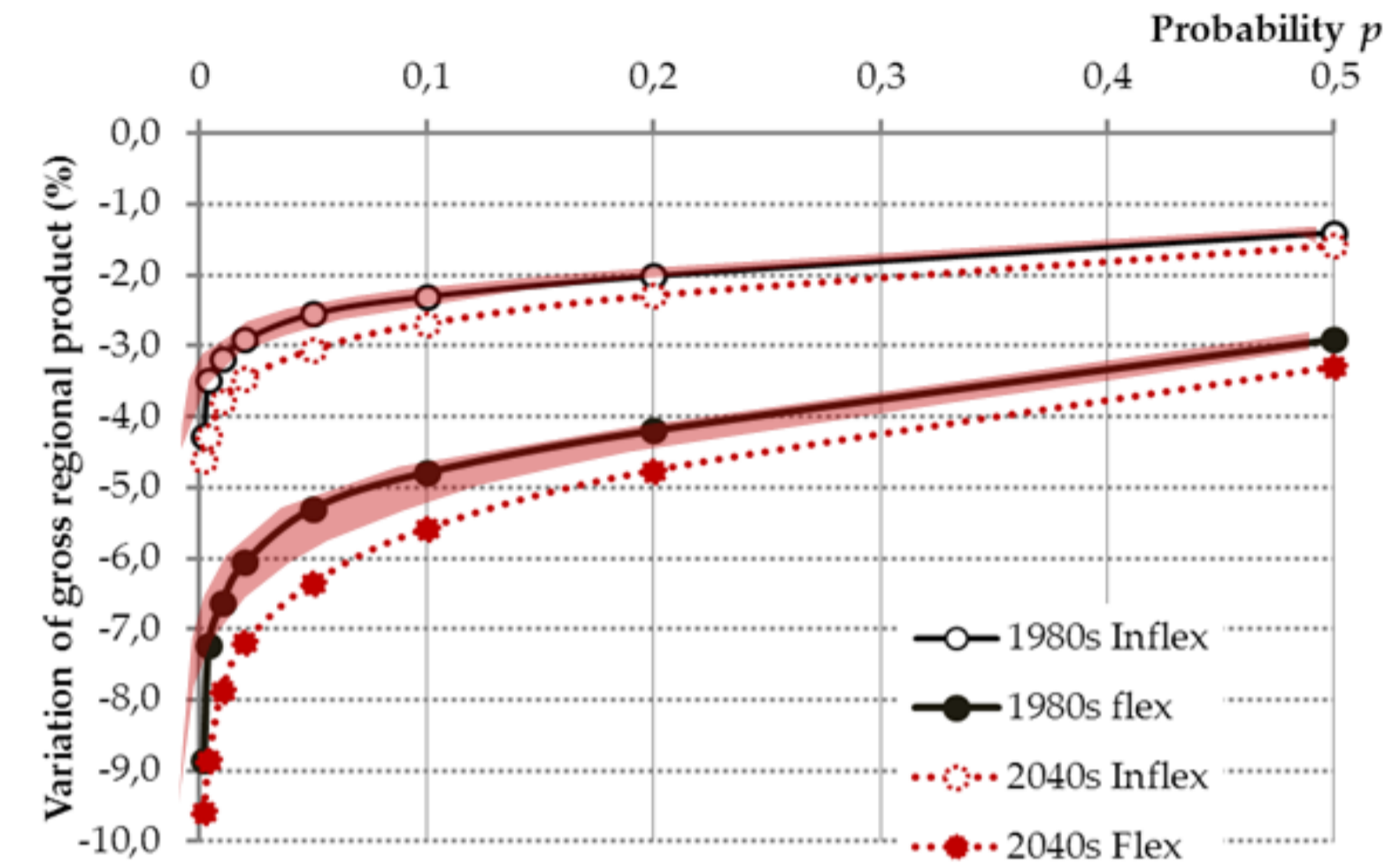
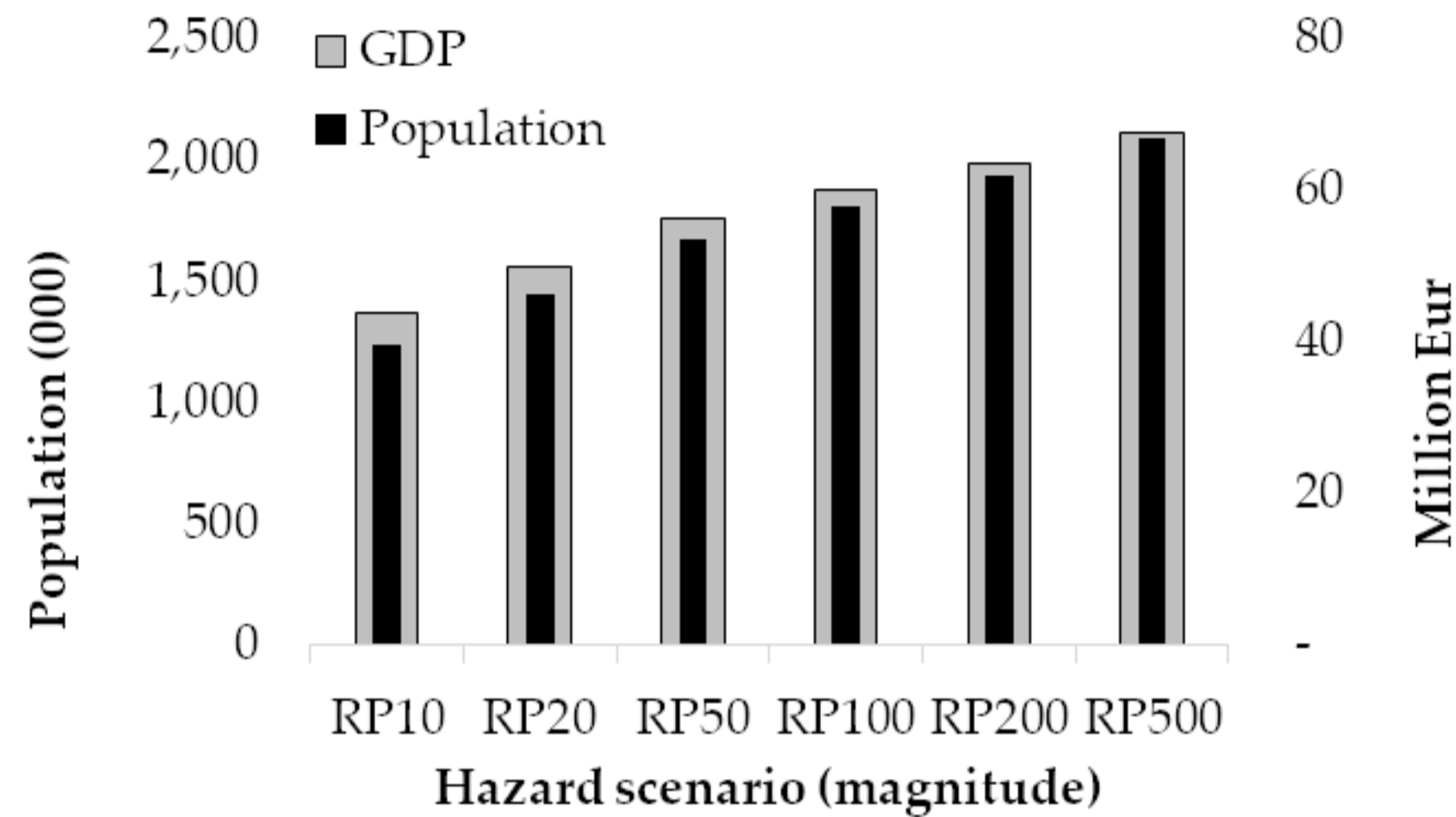
FLOODMAGE



FLOODMAGE



FLOODMAGE



Thank you for your attention!

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More information about the CLARA Project can be found here:

<http://www.clara-project.eu/> #CLARA_H2020, #Clara_MUF @ClaraProject

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