

COLLABORATIVE DOCTORAL PARTNERSHIPS – CALL 2020

THEMATIC FIELD 8: Resilience of built infrastructure to natural and man-made hazards

JRC RESEARCH AREA DESCRIPTION

The built environment – where we spend the majority of our time for work, rest and recreation – is essential for economic activities, social services and the well-being of people. In our advanced societies, it is not tolerable by citizens, and for economic considerations alike, that critical functions, lifelines, essential services, industrial production, business operations and everyday life are disrupted for long after a natural or man-made disaster. The concept of resilience has therefore been introduced worldwide to address the post-event recovery phase. Besides, resilience is a major opportunity to Build Back Better after a disruptive event.

The Collaborative Doctoral Partnership (CDP) programme will develop a codified methodology for resilience-based design of new and existing physical assets and critical infrastructure of the built environment in a multi-risk perspective. It will:

- focus on natural and man-made hazards, including the impact of climate change;
- capitalise on the available fundamental research results, concepts and frameworks;
- account for the different hazards, hazard levels and typologies of exposed assets across European countries;
- examine the potential for the use of innovative or disruptive technologies to satisfy the societal need for minimal disruption and fast recovery of services and everyday activities;
- develop tools and guidelines for practical applications.

The CDP will also aim to transfer knowledge to standards and contribute to the objectives of relevant European policies.

The JRC has remarkable experience in the field of safety, security and recovery of critical infrastructure and physical assets in the built environment and in particular on modelling, hybrid simulation and large-scale experimental testing, development of methodologies and frameworks, validation of innovative technologies, preparedness, protection and standardisation. The CDP will build on the multi-disciplinary scientific knowledge of the JRC and the expertise in interfacing science and policy, including through the Disaster Risk Management Knowledge Centre and the Community of Practice on Resilience, and benefit of the established collaborations with major international partners.

MAIN POLICY FIELDS

The topic of the CDP is relevant to the prevention and reduction of human, economic and material losses from disasters according to the objectives of the EU Civil Protection Mechanism and the Sendai Framework for Disaster Risk Reduction. It also supports the achievement of Sustainable Development Goal 11 for safe, resilient and sustainable cities. The CDP will contribute to the renovation initiative of the European Green Deal and the climate-proofing of the built environment.

LINKS / URL WEBSITES

- <https://eurocodes.jrc.ec.europa.eu>
- <https://ec.europa.eu/jrc/en/research-topic/improving-safety-construction>
- <https://ec.europa.eu/jrc/en/research-topic/critical-infrastructure-protection>

LINKS / REFERENCES TO PUBLICATIONS

- European Commission (2020) Towards a more resilient society – Navigating a challenging future together, Publications Office of the European Union (in print)
- Tsionis G, Caverzan A, Krausmann E, Giannopoulos G, Galbusera L, Kourti N (2019) Modelling of physical systems for resilience assessment. In: Life-cycle analysis and assessment in civil engineering: Towards an integrated vision, Taylor & Francis, ISBN 978-1-138-62633-1
- Kourti N, Kempner T, Marin Ferrer M, Luoni S, Antofie T, Tsionis G, Negro P, Giannopoulos G,

Galbusera L, Krausmann E, Girgin S, Theocharidou M (2019) Strategies for improving urban resilience in Europe. 13th International Conference on Applications of Statistics and Probability in Civil Engineering

- Cimellaro GP, Caverzan A, Tsionis G, Solomos G. (2017), Proceedings of the 1st International Workshop on Resilience. Publications Office of the European Union, ISBN 978-92-79-73635-3
- World Bank (2017) Promoting resilience through post-crisis recovery – Building regulations and standards for long-term resilience