RESCCUE - RESilience to cope with Climate Change in Urban arEas

a multisectorial approach focusing on water

DRMKC workshop with FP7 and H2020 projects on critical infrastructure protection
Brussels, 17th March 2017
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RESCCUE IN BRIEF

Budget: 8 M€

Requested EU contribution: 6,9 M€

Number of partners: 18

Main structure: 8 WP

Coordinator: Pere Malgrat (Aquatec – Suez Water Advanced Solutions)

Main objective: To help cities around the world to become more resilient to physical, but also social and economic challenges by generating models and tools to bring this objective to practice and make them applicable to different types of cities, with different climate change pressures. RESCCUE will also assist cities preparing their resilience plans.

3 research sites: Barcelona, Bristol, Lisbon

Starting date: 01/05/2016
RESCCUE CONSORTIUM

- RESCCUE Coordinator: Mr. Pere Malgrat (Aquatec-SUEZ)
- Key role of CETaqua in the scientific, administrative and financial issues
- Project management team (WP leaders): a consolidated team with successful collaborations (LNEC, University of Exeter, FIC and Opticitics)
The RESECCUE research sites

- Members of 100 Resilient cities network (program pioneered by Rockefeller Foundation)
- Strong commitment with resilience and climate change
- CRO (City Resilience Officer) with a clear role in the city strategies to improve urban resilience
- Different climate variables and affected services considered in the RESECCUE project
- Urban water cycle in the core
- Flooding and urban drainage are the links among the three cities
- Need to develop RAPs
RESCCUE APPROACH

Generation of climate change scenarios in the three RESCCUE cities (WP1) considering different weather variables (temperature, rainfall, sea rise, etc.)

Through statistical downscaling of GCMs results by FIC-method

Implementation of the RESCCUE roadmap in the three research sites (WP6) achieving Resilience Action Plans according to the commitment of 100 Resilient Cities program

Elaboration of a manual about resilience best practices for implementation in other cities

Development of detailed sectorial models (WP2) to describe the behaviour of strategic urban services during extreme events (heavy storms, heat wave, etc.) and assess hazard levels for current and future scenarios

Through advanced tools and integrated models with high TRL

Definition of Adaptation strategies (including NBS, structural and non-structural measures) to face with climate change reducing risk impacts and increasing resilience (WP5)

Through a measures database and the implementation of MCA for prioritizing

Risk assessment (WP3) of the climate change impacts on the urban services crossing local vulnerability at the three research sites and hazards inputs provided by sectorial models.

Through risk maps crossing vulnerability and hazard inputs

Analysis of the interdependencies among critical urban services and infrastructures and possible cascade effects during crisis episodes (WP4) using a holistic approach

Through a specific software for urban resilience analysis: the HAZUR tool
HOW CAN WE BUILD RESILIENCE THROUGH SECTORIAL MODELS?
The example of urban drainage

- **Traditional tools**
  1D sewer models allow the analysis of the behavior of underground pipes

- **Advanced tools**
  1D/2D coupled models allow the hydraulic analysis of the urban surfaces where urban activities occur and goods and properties are concentrated

- **Integrated models**
  Surface overland flow can be linked to damage and transport models.
  1D/2D model can be linked to marine (COWAMA)
HOW CAN WE BUILD RESILIENCE THROUGH SECTORIAL MODELS?

The HAZUR Tool

Main features of HAZUR:

✓ Applications in several cities
✓ GIS platform for geopositioning critical infrastructures
✓ Assessment and manager modules already existing
✓ New modules about CC and Adaptation measures in the RESCCUE framework
✓ Possibility to include HAZUR tool in the control centers of the cities
CRITICAL INFRASTRUCTURES AND OTHER CHALLENGES IN RESCCUE

• It seems extremely complicated to undertake a detailed multisectorial resilience assessment, because of the difficulty of linking different sectorial models. This is due to:
  • Mismatch between the level of detail of different models
  • Lack of integrate vision of municipalities and / or service operators
  • Lack of computational capacity to undertake such couplings

• This leads to two different situations:
  • A set of sectorial models with a lot of information and high level of detail
  • A model that integrates all the urban services at a very general level, being able to understand the city as a whole but unable to take advantage of the strengths of the detailed sectorial models

• When Critical Infrastructures are part of the urban services considered, complexity increases:
  • How is possible to, at the same time, comply with the Directive 2008/114/EC and properly analyse the cascading effects on (critical) infrastructures?
  • If information is anonymized or not geolocalized, how can the interdependencies be represented?
  • How to convince the service operators to contribute to such integrated projects?
RESILIENCE TO COPE WITH CLIMATE CHANGE IN URBAN AREAS.