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Next generation paradigm for urban pluvial flood modelling, prediction, management and vulnerability reduction - Interaction between RainGain and Blue Green Dream projects

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The effects of climate change and increasing urbanisation call for a new paradigm for efficient planning, management and retrofitting of urban developments to increase resilience to climate change and to maximize ecosystem services. Improved management of urban floods from all sources in required. Time scale for well documented fluvial and coastal floods allows for timely response but surface (pluvial) flooding caused by intense local storms had not been given appropriate attention, Pitt Review (UK). Urban surface floods predictions require fine scale data and model resolutions. They have to be tackled locally by combining central inputs (meteorological services) with the efforts of the local entities. Although significant breakthrough in modelling of pluvial flooding was made there is a need to further enhance short term prediction of both rainfall and surface flooding. These issues are dealt with in the EU Iterreg project Rain Gain (RG).

Breakthrough in urban flood mitigation can only be achieved by combined effects of advanced planning design, construction and management of urban water (blue) assets in interaction with urban vegetated areas' (green) assets. Changes in design and operation of blue and green assets, currently operating as two separate systems, is urgently required. Gaps in knowledge and technology will be introduced by EIT's Climate-KIC Blue Green Dream (BGD) project. The RG and BGD projects provide synergy of the "decoupled" blue and green systems to enhance multiple benefits to: urban amenity, flood management, heat island, biodiversity, resilience to drought thus energy requirements, thus increased quality of urban life at lower costs.

Urban pluvial flood management will address two priority areas: Short Term rainfall Forecast and Short term flood surface forecast. Spatial resolution of short term rainfall forecast below 0.5 km2 and lead time of a few hours are needed. Improvements are achievable by combining data sources of raingauge networks with C-Band and X-Band radars with NWP and pluvial flood prediction models. The RG project deals with the merging and providing synergy of these technologies. Combined effects of BG technologies can totally reduce the risk of surface flooding for low return period events and up to 50-80% for high return periods.

Demonstration technology testing sites for both BGD and RG projects will be established in 5 participating countries. Decision Support Systems will enhance full scale implementation of both BGD and RG project deliverables. A BGD efficiency rating scheme and training guidelines and e-learning tools will be developed.
Experimental/demo sites for BDG and RG technology development and testing in Rotterdam, Paris, Berlin, Leuven and London and the expected results with concepts of RG and BGD projects and the initial results will be presented in the paper.