Relative impacts of climate and landuse changes on future flood damage along River Meuse in Wallonia

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1. Modelling the present day and future (2100) 100-year flood
   - IPCC wet climate scenario
   - Regional climate model
   - Future precipitations
   - Hydrological model
   - Present day and 2100 discharges (+30%)
   - Hydraulic model
   - Flooded area + water depths

2. Modelling the evolution of residential areas by 2100
   - 3 urbanization scenarios families
     - (A) Current trend: full urbanization of the residential areas available according to the wallonian land-use allocation plan
     - (B) Sustainable planning, regional development: concentration of residential areas in cores (criteria of density, urban function diversity and proximity to employment)
     - (C) Sustainable planning, local development: concentration of residential areas in cores, non consideration of the proximity of employment

3. Damage evolution between 2009 and 2100 for a 100-year flood
   - Multiplication of flood damage by 6 to 7 between 2009 and 2100, whatever the urbanization scenario
     - Globaly, low influence of urbanization (11 to 19 %) but impact locally greater than 40% in some municipalities (see map)
     - Inadequacy of the present day restrictions (flood hazard map) in view of the increase of flooded areas by 2100
   - - Multiplication of damage by 6 to 7
   - - Mainly because of climate change
   - - Low influence of urbanization, except locally

Damage evolution between 2009 and 2100 (M €)

Largest contribution of new urbanized areas on damage increase by 2100 (%)