Session DD 4.3: Climate change assessment and adaptation methods

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Speakers	Fransje Hooimeijer, Delft University of Technology /TNO, the Netherlands
	Dr. Jeroen Kluck, Tauw BV, the Netherlands
	Frederik Treuel, Technical University of Hamburg, Germany
	Aart Overeem, Wageningen University, the Netherlands
	Jaap Kortman, IVAM UvA BV research and consultancy on sustainability, the Netherlands
	Peter Bosch, TNO, the Netherlands
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A city should be seen as a system, according to Jim Hall. The study looks at the drivers for long-term change. Important drivers are population and economic circumstances. It was modelled that average heat emissions will be 60 – 140 W/m^2 in the city centre, fresh water demand is calculated to increase by 20% in 2020 up to 35% by 2035. Flood risk related damage due to sea level rise is estimated to increase by a factor 5-10 in 2100 without adaptation. These damages mainly depend on the socio-economic scenario and much less on the SLR scenario. The study shows that many mitigation options also lead to adaptation en vice versa. This is an important lesson learned. Many research questions on a.o. system feedbacks and connections still remain. Nonetheless, the results are already used for revising the London City plans.

The goal of the framework says Fransje Hooimeijer, is to integrate climate tasks into city development. The framework includes the city as a clear build up system and includes both mitigation and adaptation measures. The climate sensitivity factors of the functions of the city are modelled. Vulnerability, impacts and responses (mitigation and adaptation) are calculated and presented in simple tables. The tables can be used as a stakeholder participation tool. Work in progress includes the development of a visualisation tool.

Jeroen Kluck: Increased urban storm water flooding is caused by a.o. increasing impervious area's, street layout and climate change. The uncertainty in rainfall in climate models is very high. However, measures can be taken based on past flooding intensities with an assumed increase. Measures are fairly easy to identify by using map modelling of water flows.

Elastocoast is found to result in strong bonding, states Frederik Bruel. A field test site is located in a sandy beach in Germany with high dunes and strong wave impacts. The elastocoast looks a promising innovation for coastal protection.

Aart Overeem: Using cellular telephone networks for rainfall measurement would increase the rainfall measurement network immensely. Tests results for 18 day measurements on 27 commercial microwave links compared to radar data shows a good fit. Hence, the technique looks very promising and tests will be expanded in the coming year.

According to Jaap Kortman the DPL tool offers a language for dialogue between stakeholders. It contains 9 indicators, a.o. energy consumption, car ownership, renewable energy generation, rain water catchment and delayed water drainage. The model gives flood risk and intensity, heat stress, drought prevention and climate robust ecology. The tool is to be used as a monitoring and gauging tool.

The research is part of the Climate Proof Cities Project tells Peter Bosch. In the study an integrated approach is used including issues such as urban city systems, sensitivity of the systems, impacts and vulnerability, policy and governance and mitigation and adaptation measures. Four case studies all layers from the buildings up to the city region. While using the tool it became clear that communication of uncertainties is an important issue for the end-users such as policy makers end decision makers.