

## **Abstract**

### **Cost and benefits of urban adaptation to climate change**

Climate change presents numerous challenges to the different actors. Rainfalls will intensify in the future and we will see more frequent incidents of extreme rainfall. The capacities of sewer systems cannot respond adequately to these pressures which will again result in flooding. Past experience in Denmark, not least in Copenhagen on 2<sup>nd</sup> July 2011, has pointed to the vulnerability of infrastructures, buildings and society to these events.

Many measures can be implemented to strengthen a community's resilience to these negative impacts. Extending the capacity of sewer systems would be a necessary action to take – even if the ambition is only to maintain the current level of protection in the future. However, other measures can be taken as well which can positively contribute to a better protection vis-à-vis rainstorms and torrential rain. The effectiveness of each individual measure cannot be assessed in isolation as their effectiveness is to some extent inter-dependent.

Benefits from an adaptation measure can be assessed through considering the value of the avoided damage. This includes for example physical damage to buildings and physical items; damage in terms of disrupted services due to damaged infrastructure and damage in terms of time loss due to break-down of traffic. Other types of benefits could also relate to for example health impacts, avoided transition costs and less damage to cultural heritage and nature apart from what is immediately quantifiable.

Adaptation costs include the investment and operation costs of a particular measure as well as possible financing costs.

Climate change impacts are not stable over time. Not only are the climate change developments uncertain, but so are also their impacts. Nevertheless, it is within reasonable certainty that their severity will increase over time.

This paper/presentation will provide illustrate these complexities and inter-linkages and discuss the regulation framework through specific examples of cost-benefit assessments of climate change adaptation in regards to water in urban areas.

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