

## COASTAL CLIMATE CHANGE ADAPTATION IN EXISTING URBAN AREAS, LESSONS LEARNED FROM DUTCH AND NORWEGIAN PILOTS

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Climate change is expected to have a large impact on coastal cities all around the world. Due to the expected sea level rise for coastal regions new flood defense policies are developed, with emphasis on risk assessment and a multifunctional approach to strengthening existing coastal defenses. Most climate adaptation programs in cities focus on technical measures with little international knowledge exchange of the best management practices and governance. In this article the best management practices of two coastal cities both named 'Bergen' is discussed.

The Dutch pilot 'Bergen' shows that implementing the right combination of sustainable urban drainage systems in a densely built area, is really complex. It seems impossible to make a plan with full support from all stakeholders at once. The whole process has to be organised in an adaptive way, as a learning process. The proposed strategy, that reflects a process of learning by doing, offers good possibilities for other coastal cities. The Norwegian pilot 'Bergen' is a UNESCO World heritage site. Human activities result in lower groundwater levels which are a danger for the preservation of cultural deposits. Higher temperature and longer dry periods due to climate change will require a revisited sustainable water management of the whole area. A selection of sustainable urban drainage systems (SUDS) is made to preserve this unique cultural heritage.

General lessons from both climate adaptation programs can be learned to benefit climate adaptation programs for coastal cities all around in the world.



*flooding of the main shopping street in the coastal city Egmond aan Zee.*