HOW CLIMATE CHANGES THE HISTORIC WATER MANAGEMENT APPROACH IN THE NETHERLANDS

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Abstract. For centuries the Dutch live with water, they protect themselves against water and they make land of water; a rich tradition which became an important trademark. Therefore one of the main UNESCO world heritage themes in The Netherlands is 'Land of Water'. History brought the Dutch not only their water management-reputation; Hansje Brinker, construction works as dikes, polders, windmills and pumping stations. The water management approach was also the origin of Dutch consensus policy.

Introduction

Nowadays a major theme like climate change influences the Dutch way of facing the water. Climate changes and The Netherlands have to anticipate the consequences. Climate therefore changes spatial planning. Water management and spatial planning are again strongly brought together, like they were in the past. Recently studies concluded that it is time to change the way of thinking about living with water in The Netherlands: not only bringing up a threshold against the water, but also thinking about how to deal with a water overflow (Van de Ven et al, 2009). But how does the old tradition with its innovations like dikes, dwelling mounds and pumping stations fits within this new approach? And how will the Dutch bring all the stakeholders together to create consensus decision-making in an urbanizing country? Is the traditionally originated 'polder model' still the basis for water proofing Holland?

Historic threshold approach

Land of Water; this theme exactly records the sense of water management in The Netherlands, namely building up thresholds against water. Dikes, windmills, pumping stations, dwelling mounds, are all measures that has been taken to keep the water outside the low lying areas. These historic elements in Dutch landscape are still playing a vital and essential role in the protection of The Netherlands against river flooding and storm surges from the sea. Climate change makes that role more and more important, and new elements are being built all over the world to play that role for the same reason. Also the consensus approach was unique to create water safety. Though in the low lying areas people from different places had different interests, they all had to cooperate and set aside these differences for water safety in the polder as a whole.

New approaches, historic measures

The focus on building up thresholds against water has been changing since climate change has become an important issue in spatial planning. Not only can the threshold capacity protect us against flooding. Regarding the climate impact, soil conditions and land use, it is possible to create a robust environment by not only focusing on the threshold capacity but also on other capacities like recovery, coping and adaptive capacity (De Graaf et al, 2007). It is a different way of facing water problems in the future. Nevertheless historic principles combined with 'new' measures can provide a robust future safety, not only based on prevention but also on damage reduction, disaster management and rehabilitation. These combined principles can also protect us from other increasing extreme weather conditions like heavy rainfall. This new way of facing water threats requires other design methods. A consensus approach is also necessary nowadays, as it was in history. A new approach means that people have to set aside their usual thinking patterns to create safety for a whole low lying area. Architects, engineers, experts, residents, public authorities together have to make themselves sensitive for new and unusual solutions for water robustness (Luijendijk, 2010). Interactive design (Charrettes) showed that it is a proven method to share insights, to discuss differences, to learn from experts about new technologies and approaches and to create a safe living area with all the people involved. This new approach also requires another approach to water governance. Both local and national authorities have to play an important role in initiating this interactive planning and design processes. Creating water robustness is more than technical innovation. Process innovation is perhaps more important to finally

choose the best solution for each specific location.

Delta dike

Dikes play an important role in the protection of The Netherlands from flooding. We made land of water and dikes kept the water outside new land for centuries. Historically, dikes are built from a technical approach, which evaluated to the present dikes as slim elements, meandering through the Dutch polder landscape. Dikes are heavily protected by the water authorities. Building on dikes is forbidden because it can decrease the stability of the construction. A few years ago the discussion on climate change, the therefore inevitable reinforcement of dikes and at the same time the lack of space in urban areas to broaden the dikes lead to a new concept in water management: the Delta dike (Luijendijk and Hartog, 2007). The Delta dike is a broad dike, that is unbreacheable (indestructible) and on which buildings are allowed. In specific situations the dike can be unbreacheable but overflowable. New measures in urban areas behind the dike can make the buildings robust enough to accept a small amount of water slowly coming into the area without causing damage to the buildings and public space. The Delta dike is a multifunctional element which in fact can be seen as a combination of two Dutch historic elements: the dike and the dwelling mound (or terp). It is the way in which historic principles can play a role in present flood protection.

Next steps from a historic perspective

Both new and historic measures are necessary to protect the existing landscape for the future, not only in The Netherlands. 'Land of Water' is the most important world heritage-theme in The Netherlands. ICOMOS-Netherlands recently adopted this theme as its main focus for the coming years. An important reason for adopting this was the increasing threat of climate change to (world) heritage sites all over the world. Bringing multidisciplinary expertise and local knowledge together is necessary to make an effort to define measures, both new innovative and historic, for the protection of our built heritage against the impact of climate change. Inspiration through open discussion and interactive design will be the basis for starting a movement that protects our (future) heritage.

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References

Graaf, R.E. de, Giesen, N.C. van de & F.H.M. van de Ven, 2007. The closed city as a strategy to reduce vulnerability of urban areas for climate change. Delft, Faculty of Civil Engineering and Geosciences, Delft University of Technology. Water Science & Technology Vol 56 No 4 pp 165173.

Luijendijk, E. (2010), "Nieuwe trends vragen om de kunst van het sensibiliseren." WT Afvalwater 10 (6) p.151-153.
Luijendijk, E., M.P. Hartog (2007), "De Deltadijk." H2O 40 (22), p. 34-35.

Ven, F.H.M. van de, B. Gersonius, R. de Graaf, E. Luijendijk et al. (2010), *Water robust building; a three step approach for The Netherlands linking planning, design, construction and exploitation.* Amsterdam, Klimaat voor Ruimte.