

# Study of new perspective on water management

January 27 2015, by Joost Bruysters

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Water management should focus more on how robust different areas are in terms of coping with floods and drought. A robust system means that we can deal better with extreme events. High river discharges and long periods of drought will occur more frequently as climate change continues and inflicts increasing levels of damage. As well as taking action to prevent flooding and water shortages, then, we should be focusing much more on preventing irreversible damage. This new perspective provides inspiration for a different approach.

These are the main conclusions drawn by Marjolein Mens, a researcher with Deltares who will defend her doctoral thesis on 29 January at the University of Twente. Her study on system robustness in [water management](#) is of particular interest to water managers and policymakers. It provides them with three criteria that they can use to appraise interventions in terms of what they contribute to robustness. Marjolein demonstrated that including these criteria can result in different preferred alternatives.

She explains: "Assessing interventions based on risk and cost-benefit analyses alone is no longer sufficient in present-day [water management](#). In order to be adequately prepared for [extreme events](#) with potentially irreversible [damage](#), decision-making needs to take system robustness into account as well. That can lead to very different decisions, because interventions that reduce the risk of floods and drought do not automatically enhance the robustness to extremes. That is why my research looked at preventing unacceptable damage, and not just at

preventing floods or [water shortages](#)."

## **The importance of understanding how damage occurs**

"It is, for example, important to understand how flood damage develops. If damage occurs gradually, there is more time to take temporary measures that will mitigate the impact. A system will also be more robust in terms of flooding if less vulnerable areas flood first so that overall damage levels remain limited. In addition, rapid recovery depends on maintaining proper access to an area, and access to essential services such as the electricity supply."

## **Coping with extreme drought**

In terms of coping with extreme drought, it has emerged that maintaining supplies of fresh water is less important than the absolute demand for water. The usual response to increasing water demands is to increase the water supply capacity, if necessary by installing long pipelines and creating large reservoirs. However, this has no effect on the consequences of extreme droughts. A drought-robust system also keeps a lid on the absolute demand for water. Furthermore, when water shortages are expected, plans should be in place for emergency water supplies and for sharing available water equally among the users.

## **Robust flood defence policy**

To examine how robustness can be included in flood risk management, Marjolein Mens adopted the IJssel valley in the Netherlands as her baseline case. She introduced a number of fictitious changes in a number of areas to study the effects of unbreachable dikes, standard dike raising, and a range of measures from the Room for the River programme. Which measures do best in the end in terms of robustness also depends

upon the location of an area and what it is used for. An uninhabited area where there are hardly any economic interests, for example, can be allowed to flood first to prevent flooding of densely populated and more vulnerable areas. Ultimately, what matters is to limit overall flood damage throughout the IJssel valley so that the area can recover quickly.

Provided by University of Twente

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