RISK ASSESSMENT AND DECISION SUPPORT IN URBAN WATER SYSTEM

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ABSTRACT

In the urban runoff system different things can go wrong, -different failures can occur such as oxygen depletion or hydraulic damage in the receiving river, flooding of the urban catchment etc.

Risk assessment of urban water systems can be divided into three different parts:
1. Identifying failures
2. Determining probability of failure
3. Estimating the consequences of the failures

By definition failures occur when stress exceeds resistance, then values are permanently lost or things are damaged to such an extent that measures have to be taken in order to restore the damage. The receiving part of the system has a certain capability of resisting the stress that the pressuring part of the system imposes on the receiving part. An example: a lake can absorb a certain load of phosphorus before it is influenced to such a degree that conditions in the lake change significantly – eutrophication occurs. When uncertainty is included in the analysis the probability of failure is equal to the probability of the stress exceeding the resistance. The risk can then be calculated as the probability of a failure multiplied by the expected cost associated with failure. This way of calculating the risk corresponds well to the definition that risk is equal to probability times consequence.

Construction and improvement of urban runoff systems is very expensive. It is therefore interesting to find a runoff system that reduces environmental risks as well as possible, and at the same time keeps the expenses for construction and maintenance at a minimum.

With the above described way of assessing risk, by estimating the expected cost of failure, risk can by included in a traditional Cost-benefit framework. A Cost-Benefit-Risk analysis can then serve as decision support for decision-makers in urban water systems.

This paper discusses the first two parts of risk assessment: different failures that can be identified in the urban water system and methods to calculate probability of failure.

Key words: .