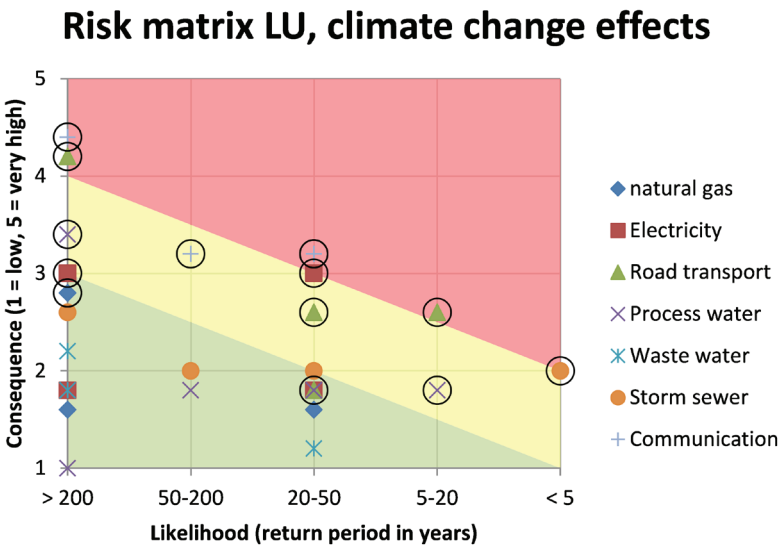
BUILDING RESILIENCE
TO EXTREME WEATHER AND CLIMATE CHANGE INTO CRITICAL INFRASTRUCTURES

Infrastructure is the backbone of our modern societies. The general public, industry and government depend on the safety and availability of infrastructure systems. Extreme weather is often a stress factor affecting those systems, and therefore their reliability. Given the critical role of infrastructure for society and climate change, timely adaptation is required.



In recent years, Deltares has been involved in several European research programmes such as RIMAROCC (Risk management for roads in a changing climate), ROADAPT (Roads for today, adapted for tomorrow) and INTACT (impact of extreme weather on critical infrastructures). These projects have resulted in both practical guidelines for infrastructure owners and operators, and an adaptation strategy tool. After the successful implementation of the guidelines in the Netherlands, for example in the InnovA58 project, the next step was to apply the approach outside Europe.

In Istanbul (Turkey), these methods have been used to develop a Business Continuity Plan (BCP) for the management of an industrialised area. A risk assessment was carried out first to identify natural hazards threatening lifeline utilities (such as the electricity supply, ICT, and water treatment). A central element in the approach is a collaborative process in which stakeholders' experiences are used to assess the consequences of failure of the lifeline utilities in terms of the costs of the destruction of business and damage to the reputation of the industries. Several workshops were organised for the purposes of implementing this process. In addition, the level of acceptable risk was determined in consultation with the local industries. Where unacceptable risks were identified, a 'recovery time objective' was established and measures were described to ensure that the recovery from a failure of the lifeline utilities will be achieved before outage times become unacceptable. The results of the project will directly benefit area management and should enhance the competitiveness of the area and its industries. The approach developed will be implemented in other organised industrial areas in Turkey.

In Paraguay, the approach has been used in a pilot project to develop an adaptation strategy for the national road operator. This strategy is needed to ensure the implementation of a proper maintenance plan for the road network. The first step was to establish a picture of the risks for the road network associated with natural hazards and climate change. A collaborative approach with the road operator and other stakeholders was also adopted in this project. This was necessary to establish an awareness of the effects of climate change and extreme weather, to establish a picture of the consequences of any outage of the roads and to collect data. The vulnerability assessment method developed in the ROADAPT project was used for the last of these goals since it makes it possible to identify vulnerable locations on the basis of limited data. Adaptation strategies were developed for the main risks identified. The method used here was the Dynamic Adaptation Policy Pathways approach for decision-making under uncertainty that explicitly considers decision-making over time. The output is used by the road operator in the implementation of its maintenance plan and contracts.

Contact:
Thomas Bles, Thomas.Bles@deltares.nl,
t +31 (0)6 1173 4843

Further reading:
https://www.deltares.nl/en/projects/climate-change-risk-assessments-and-adaptation-for-roads-the-roadapt-project/