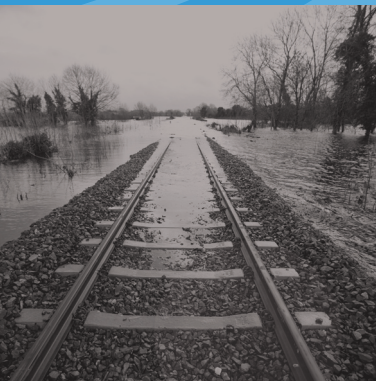




Risk-Based Approach for the **Protection of Land Transport Infrastructure against Extreme Rainfall**

The main objective of the RAIN-EX project is to ensure the availability of transport infrastructure with regards to extreme rain-induced hazards, especially floods of river systems, through a risk-based design of the former.

The results of this development will culminate into a risk-based approach for the assessment of the design of infrastructures along a river system and the development of a decision support tool for owners and operators of these infrastructures.

Currently, owners and operators of land transport infrastructures exposed to rainfall-induced hazards are rarely aware of risk-related concepts when assessing protection goals for their structures with regards to flooding events. Thus, the current practice is mostly based on a deterministic mindset designing and protecting all infrastructure elements to the same level of security regardless of the actual vulnerabilities and criticalities.

Project objectives

- To advance the design of new land transport infrastructure towards a risk-based approach with regard to security aspects caused by rainfall-induced natural hazards.
- To develop a comprehensive approach for a risk-based assessment and adaptation of existing land transport infrastructure with respect to rainfall-induced security aspects.
- To foster the awareness of land transport infrastructure owners and operators for a

risk-orientated mindset on security to ensure the availability of their networks.

- To support the dissemination and implementation of the envisaged methodology via a user-friendly handbook.

Methodology

RAIN-EX will concentrate on developing a practical methodology for the identification and assessment of both vulnerable transport infrastructures towards extreme rainfalls as well as critical ones, in terms of criticality of an ob-

ject to the functionality and operation of the whole transport system. The proposed methodology will be based on expert knowledge and will include qualitative and quantitative analyses regarding the assessment of the vulnerability and criticality of relevant transport infrastructures. In order to accomplish these methodological objectives, a holistic approach will be deployed, bringing together interdisciplinary experts from across Europe.

WP 0

WPO Management & Coordination

WP 1

State of the Art & Input Data

Identification of currently applied practices for the identification, assessment and protection of critical transport infrastructure against flooding events, as well as identification and assessment on how probabilities were/are calculated.

WP 2

Natural Hazards Related Scenarios

Development of relevant natural hazard related scenarios, based on the results of WP1, i.e. past extreme rainfall events and climate change induced impacts.



Impact

Based on an analysis of the state of the art, RAIN-EX aims at developing a detailed assessment of regionally differentiated extreme rainfall scenarios throughout Europe and link them with the identification of types of infrastructures and their vulnerabilities. RAIN-EX will assist the design of new or the adaptation of existing infrastructures using a risk-based approach.

Results

The main result of the project is a ready for practice handbook on risk management of land transport infrastructure against extreme rainfall events. This guide will enable owners and operators to assess their existing infrastructure regarding protection goals with respect to criticality of the structures.

Furthermore, an approach will be developed on the ad-

aptation of land transport infrastructure design, including criticality as a decisive element.

Target groups

- Public and private owners / operators of road and rail transport infrastructure in Europe.
- Authorities, responsible for the implementation of design standards for land transport infrastructure.

WP 3

Vulnerability & Criticality of Transport Infrastructures

Based on the developed scenarios, an approach for the identification of land transport infrastructure along a river system which might be of high concern for the functioning of the transport network will be developed.

WP 4

Risk Assessment

Additional risk mitigation & measures applying current codes and regulations mitigate only a part of the actual risk. No new measures will be developed, but an approach for linking measures to the developed methodology will be established.

WP 5

Demonstration & Handbook

This WP serves as a framework. Here, the output of the different WPs will be connected and combined into a comprehensive and applicable methodological approach. The methodology will be applied to an existing transport system close to a river system.



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