

Mitigation measure manual

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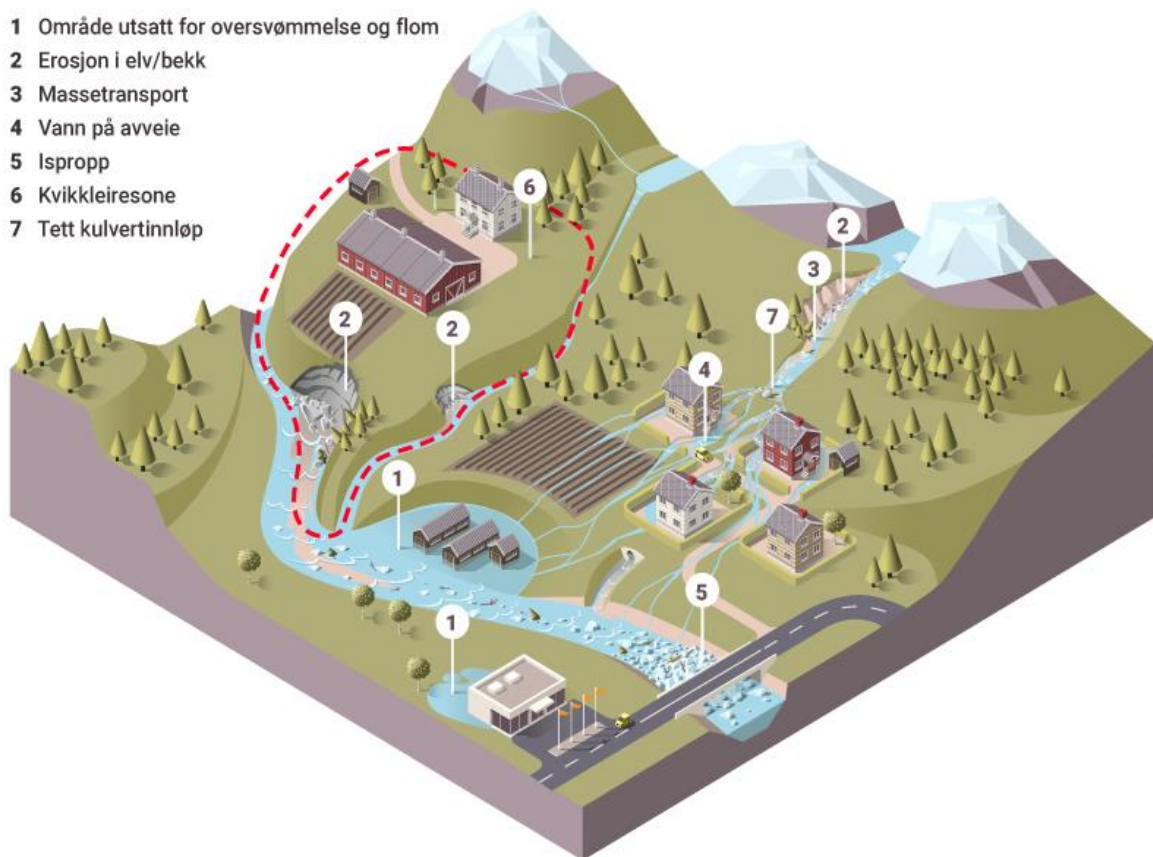
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ABSTRACT

The mitigation measure manual is a digital manual about structural measures to mitigate natural hazards. It is called “sikringshåndboka” in Norwegian and is available on <https://sikringshandboka.nve.no/>. The manual contains three natural hazard topics: “flood and erosion”, “quick clay landslides”, and “landslides, rockfalls and snow avalanches”. The objective of the mitigation manual is to compile existing knowledge and to provide advice during the whole process of establishing a mitigation measure including the four phases: i) planning, ii) design, iii) construction and iv) management, operation and maintenance. Consequently, the manual will contribute to reduce risk from natural hazards.

The main motivation to create the mitigation measure manual was intergenerational knowledge transfer. The project should collect and share practical experience with flood mitigation and erosion protection within the Norwegian Water Resources and Energy Directorate. Furthermore, the knowledge should be shared with the public to build capacity within natural hazard mitigation. In a further step, the topics for quick clay landslides and landslides on steep slopes, i.e., landslides, rockfalls and snow avalanches, were added.

The content of the manual is organized in modules. Each module describes a distinct task. Related modules are linked to facilitate efficient navigation within the manual. Special focus was paid to figures and videos. The figures are a mixture between technical drawings and sketches. This concept shall ease the understanding for more different users e.g., engineers as well as municipal employees or landowners. Figure 1 shows an example of an isometric figure about flood hazard. Furthermore, typical contractor operations are published as short practical videos e.g., an excavator placing stones in an interlocking pattern to protect a riverbank against erosion (available on <https://youtu.be/96p6vqy2i8s>).



- 1 Område utsatt for oversvømmelse og flom
- 2 Erosjon i elv/bekk
- 3 Massetransport
- 4 Vann på avveie
- 5 Ispropp
- 6 Kvikkleiresone
- 7 Tett kulvertinnløp

Figure 1: Isometrical figure showing possible challenges with flood and erosion: 1) Inundation and flooding, 2) erosion, 3) mass transport, 4) water out of riverbed, 5) ice run plug, 6) erosion at a quick clay zone, 7) clogged culvert inlet.

The topic “flood and erosion” was published in 2021. The remaining topics on “quick clay landslides” and “landslides, rock falls and snow avalanches” are scheduled launched in autumn 2023. The digital format as well as the organization in modules will ease adding additional modules also after the launch. Possible extensions are e.g., within natural based solutions or novel mitigation techniques.

Keywords: mitigation measure; flood; landslides