Emergency Management Response to Landslide Dams following the 2016 Kaikoura Earthquake

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Abstract

This research examines the response and emergency management of the Kaikoura earthquake landslide dams formed on the 14th November 2016 by a M 7.8 earthquake which caused extensive damage across Hurunui, Kaikoura and Marlborough. The Kaikoura earthquake caused tens of thousands of landslides and over 200 of those generated dams that blocked rivers. The widespread damage and number of landslide dams was unusual and required a significant response. This involved many agencies and organisations undertaking different aspects of the response.

Following the Kaikoura event, the scientific community responded, identifying the dams before carrying out risk assessments of those dams posing a threat to people and infrastructure. As the scale of the event was discovered the response involved other agencies such as district and regional councils, transport agencies, Civil Defence and Emergency Management and geotechnical consultants.

To evaluate the emergency response and management of the dams, semi structured interviews were carried out with 18 personnel from ten different agencies and organisations involved in the response. The interviews covered seven topic areas which were developed through the literature and news article review. Analysis of the interview data using content analysis involved transcribing each interview before sorting and coding the transcripts.

The analysis highlighted nine main themes. These are: roles and responsibilities; communication; co-ordination; resources; previous experience; community involvement; information and data; relationships; and long-term management. A review and discussion of those themes emphasised the need for improvements in preparedness for future events.

The recommendations developed from the analysis are: clarification of responsibilities; planning of response procedures; hazard modelling; creation of a panel agreement for work-sharing; development of geographic sectors; workshops; training; public communication; resources; development of a database; and information sharing.

The learnings from Kaikoura can be used to improve future responses for both landslide dams and multi-hazard events across large geographical areas. It is predicted that an earthquake generated by the Alpine Fault could cause severe land damage across a vast geographical area. The Kaikoura earthquake has highlighted the need to focus on landslide dams as a significant hazard to communities, infrastructure and transport links.

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