

How to manage the cumulative flood safety of catchment dams

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Abstract

Dam safety is a significant issue being taken seriously worldwide. However, in Australia, although much attention is being devoted to the medium- to large-scale dams, minimal attention is being paid to the serious potential problems associated with smaller dams, particularly the potential cumulative safety threats they pose in catchments. This paper establishes the significance of this problem and reviews various Australian policies, including consideration of evidence from past research, to identify the potentially more effective policies with respect to smaller dams/cumulative safety assurance. New 'case studies' research that recently tested the effectiveness and coverage of the "strong" dam-safety policy of New South Wales (NSW) is then reported. The case studies comprised 2 samples of 10 hazardous private reservoirs investigated for spillway adequacy in line with state-of-the-art practice: one sample comprised dams supervised under the NSW policy, while the other sample comprised only non-supervised dams. The case studies show the potential effectiveness of strong policy, but also the importance of registering all dams and the need for some form of supervision of even small dams due to either their individual or cumulative hazard potential. The State of Tasmania provides a 'model' on how this can be best achieved in line with international best-practice, and this recently became the focus of a comprehensive study. This study involved strategic consideration and assessment of policy responses to the varying issues associated with small-dam safety and practical feedback from key policy actors. The results of this study are also reported here to provide guidance to any other jurisdiction world-wide needing to manage numerous small dams posing cumulative safety threats in catchments.

Keywords: catchment dams, flood safety, cascade failure, cumulative risks, model policy