HOW TO RE-OPERATE DAMS FOR E-FLOW IMPLEMENTATION: LESSONS LEARNED FROM SUCCESSFUL AND STALLED CASES OF E-FLOWS IMPLEMENTATION

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Abstract

The design and operation of dams were traditionally based on economic considerations such as hydropower generation, flood control and provision of water for irrigation and domestic use. This led to alteration of river flow regimes and degraded riverine ecosystems. Provision of flows for the environment, e-flows, is a means to restore the benefits of naturally flowing rivers. In recent decades, the call to provide e-flows to mitigate the negative impacts of river regulation by re-operating dams has become stronger. However despite the development of numerous methodologies to determine e-flows and optimise dam releases, actual implementation has not followed suit. This study presents insights into how e-flow recommendations evolve from recommendation into practice by looking at practical experiences to integrate e-flows into operations of existing dams. A literature review of dam re-operation revealed only sixty-two documented cases of successful re-operation spanning the years 1984 to 2014. These successful cases shed light on important factors that facilitate the successful implementation of e-flows, namely, the existence of e-flows legislation or policy, the development of a research base in the form of an environmental impact study and also flow experimentation. They also illustrated the important role of collaboration between various stakeholders and set timelines for successful dam re-operation.The documented cases of successful dam re-operation tell one side of the story, as the literature review did not highlight cases where dam reoperation was attempted but not implemented. This information is crucial to better understand dam reoperation processes and inform dam reoperation attempts. It may be the case that for some dams the process of re-operation to implement e-flows has stalled despite similar inputs, activities and even opportunities being present. This study explores this question by eliciting information through a survey of dam operators, water managers and other stakeholders familiar with wide ranging attempts to re-operate dams. It is found that dam re-operation for e-flows may be impeded for various reasons such as the occurrence of a drought which restricts water allocations to all users; aging infrastructure which limits how often gates can be adjusted to release e-flows; or the presence of an endangered species which must be protected at all costs. These practical insights will inform how to support the process from e-flow recommendation to actual dam reoperation to support more equitable and sustainable management of dams for both humans and the environment.

Keywords
environmental flows, dams, re-operation, river restoration