

# **Developing a dynamic framework to examine the interplay between environmental stress, stakeholder participation processes and hydrological systems**

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**Abstract** Stakeholder participation is increasingly discussed as essential for sustainable water resource management. Yet detailed understanding of the factors driving its use, the processes by which it is employed, and the outcomes or achievements it can realise remains highly limited, and often contested. This understanding is essential to enable water policy to be shaped for efficient and effective water management. This research proposes and applies a dynamic framework that can explore in which circumstances environmental stress events, such as floods, droughts or pollution, drive changes in water governance towards a more participatory approach, and how this shapes the processes by which participation or stakeholder engagement takes place, and the subsequent water management outcomes that emerge. The framework is able to assess the extent to which environmental events in combination with favourable contextual factors (e.g. institutional support for participatory activities) lead to good participatory processes (e.g. well facilitated and representative) that then lead to good outcomes (e.g. improved ecological conditions). Through applying the framework to case studies from the literature it becomes clear that environmental stress events can stimulate participatory governance changes, when existing institutional conditions promote participatory approaches. The work also suggests that intermediary outcomes, which may be tangible (such as reaching an agreement) or non-tangible (such as developing shared knowledge and understanding among participants, or creating trust), may provide a crucial link between processes and resource management outcomes. If this relationship can be more strongly confirmed, the presence or absence of intermediary outcomes may even be used as a valuable proxy to predict future resource management outcomes.

**Key words** water resource management, stakeholder involvement, collaboration, participation