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How drought affects flood risk: positive / negative effects and feedbacks in different cases

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Droughts are long-lasting and have a range of cascading impacts on society. These impacts and their responses can influence the further development of the drought itself, but also continue into the period after the drought ended. Especially if society is hit by a next hydrological extreme event, heavy rainfall resulting in flooding, the effects of this may be increased or decreased by the preceding drought and its impacts and responses. We here present a review and a global assessment of cases of these events, based on scientific literature, NGO and governmental reports, and newspaper articles, to study the diversity of how drought affects flood risk. We find that the balance between the positive and negative effects of extreme rainfall after a long dry period is mostly dependent on the underlying vulnerability and the effect of specific responses, and is different for different countries, and for different sectors and groups in society. Based on our initial analysis of the collection of case studies, we see some emerging patterns. For example, in Europe, the USA and Australia, the highly managed water system with hard infrastructure and early-warning systems makes that in most cases the rainfall after drought are managed and adverse effects mitigated, but also lock-ins exist that can make feedbacks of either inaction or maladaptation result in increased economic losses. In Africa and Latin-America, with a fragile governance system, less hard infrastructure, and a more exposed population, extreme rainfall after drought brings relief and replenishment of water resources, but also increased impacts, conflict and displacement. Here, we hypothesise that impacts are unequally distributed in society, because of issues of power, access to land and water resources, inadequate soft infrastructures, etc. We will test this hypothesis with an in-depth qualitative study of local stakeholder knowledge of these human-water processes in selected case studies. The typology of drought-to-flood events that we developed can serve as a starting point for further research on the complexity of these cascading events.