



## **Insurance portfolio diversification through bundling for competing agents exposed to uncorrelated drought and flood risks**

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Reported global economic losses from climate disasters have substantially increased in the recent decades mainly due to economic growth, along with greater concentrations of people and property in threatened areas and increased weather extremes. In this context, conflict among competing water users in shared water systems can be exacerbated by a perceived increase in financial vulnerability. Risk management tools such as insurance contracts play a critical role in reducing weather related financial vulnerability and promoting risk reduction. However risk diversification is key to guarantee a functioning and sustainable insurance market. In this work we explore the potential of risk diversification strategies involving index-based insurance bundled contract solutions, to manage financial risk in a multi-purpose water system prone to both drought and flood risk. Risk diversification can allow for reduced insurance premiums in situations in which the bundled risks are entirely, or mostly, uncorrelated. Jointly covering flood and drought related risks from competing users in the same geographic area represents a novel application. The approach is demonstrated using a case study on Lake Maggiore, a regulated lake whose management is highly controversial due to numerous and competing human activities. In particular we focus on the ongoing conflict among the lakeshore population, affected by flood risk, and the downstream farmers' districts, facing drought related losses. Results are promising and indicate that bundling uncorrelated risks from competing users is beneficial to both promoting insurance premium affordability and facilitating collaboration schemes at the catchment scale.