

## Measuring flood resilience: Results from across the globe

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Given increasing flood risks worldwide driven by a growing population and assets in high risk areas, as well as changing climate patterns, there is a growing need to better understand the benefits of investments into building resilience. To achieve this, the Zurich Flood Resilience Alliance (ZFRA) has rolled out a community flood resilience measurement tool in 9 countries (Keating et al, 2017). The innovative framework aims to measure community level resilience to flooding, building on the five capitals (5C) of the Sustainable Livelihoods Frameworks – financial, human, natural, physical and social capital and the 4Rs of complex adaptive systems – robustness, rapidity, redundancy and resourcefulness.

The paper reports on the first large-scale analysis of resilience measurement data collected in 118 communities across the world, with the goal to provide a baseline and identify common patterns of how flood resilience learnings can be enhanced across communities.

We present first results using principal component analysis (PCA) for each capital of the 5C frame-work. In addition, a cluster analysis, using three general community characteristics (education, past flood experience and poverty), was conducted to better understand similarities between the 118 communities. Using PCA and cluster analysis we identify distinct community groups in terms of baseline endowments and assess whether the flood resilience measurement tool is consistently measuring the sources of resilience.

The findings of the PCA suggest a 17 component structure distributed across the 5C framework. Based on 3 general community characteristics the cluster analysis identifies 5 clusters for 118 communities defined per performance as: high, robust, physical, unknowable and vulnerable.

Across all cluster groups the two components “financial safety net capacity” and “social contingency planning” show very low performance leading to low marks of flood resilience capacity for the community sample overall. These initial results, to be further corroborated, allow us to maintain the hypothesis that education and flood experience are drivers of risk reduction and thus help to enhance flood resilience.