

# Balancing dimensions of vulnerability, coping ability and adaptive capacity for realising social justice in climate change adaptation policy

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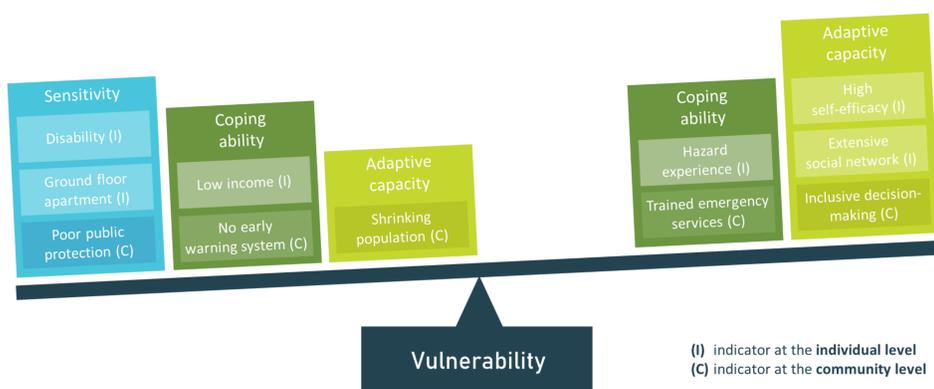
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## Background

Risk governance is facing the difficulty that vulnerabilities to climate-related risks are not distributed equally among the population. To decide where and to which extent protective interventions are required, policy makers need reliable vulnerability indicators. Existing indices (e.g., Cutter et al. 2003) primarily operate on the country or community level, or are limited to cost-benefit analysis, but do not take into account the multitude of resources at the individual level (e.g., social networks, past experiences, self-efficacy beliefs).

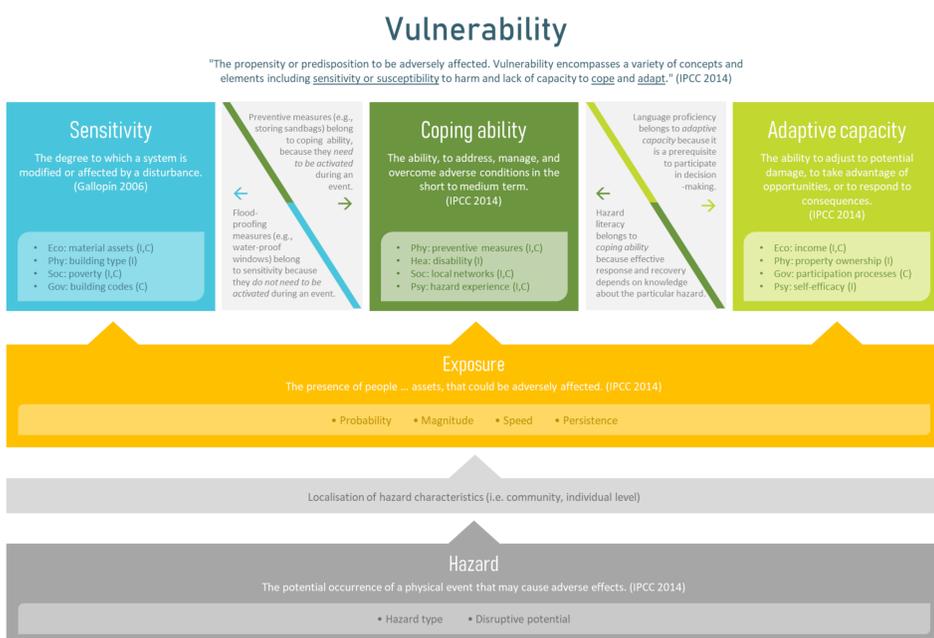
## Objective

JustFair aims to fill this gap by combining a series of indicators at both the community and individual level. The premise is that these factors can be balanced out against each other in determining overall vulnerability. A negative ranking in one aspect (e.g., disability) may be compensated by a positive ranking in another (e.g., social capital). This approach allows policy makers to capture vulnerability in a more comprehensive way and design interventions targeting specific aspects of vulnerability.



## Conceptual framework

Vulnerability consists of three components: *sensitivity*, *coping ability* and *adaptive capacity* (IPCC 2014). Sensitivity indicators capture the characteristics that make a system currently susceptible to harm. Coping ability indicators describe a system's ability to overcome adverse conditions in the short-term (reactive), while adaptive capacity refers to long-term adjustments (pro-active) (Gallopín 2006). In JustFair, vulnerability indicators are measured on two scales, *community* (C) and *individual* level (I), and are categorized into economic (Eco), social (Soc), health (Hea), physical (Phy), governance (Gov) and psychological (Psy) dimensions. The mapping of an indicator to a vulnerability component is not always clear-cut: e.g., storing sandbags reduces sensitivity, but since this measure needs to be activated during an event, it is more appropriately incorporated into the coping dimension.



## Next steps

### Indicator selection

Refinement of indicator selection based on data availability checks

### Case study screening

Screening of potential municipalities for household survey

### Operationalisation

Operationalisation of indicators based on existing studies

### Data collection

Conducting data collection on the community and individual level

### Indicator analysis

Clustering communities and individuals by patterns of vulnerability components

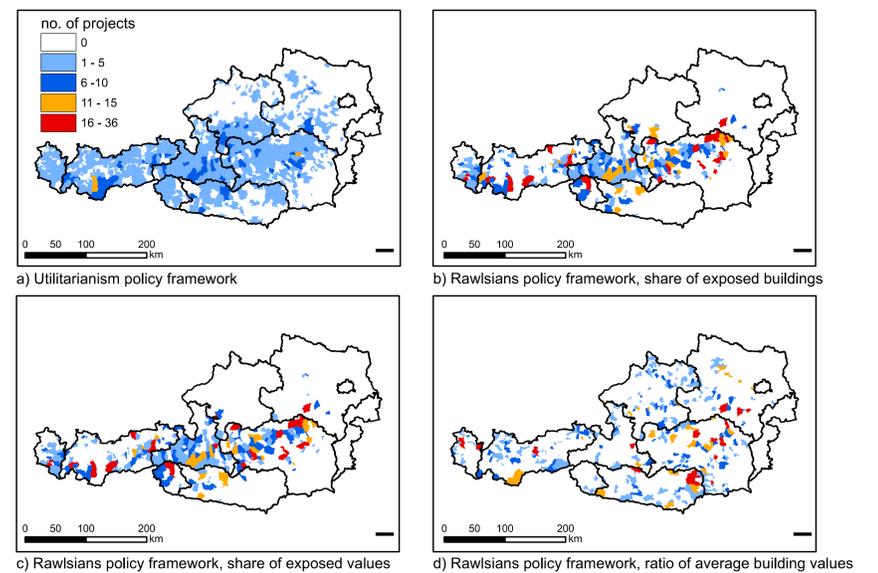
### Validation

Weighting of vulnerability components

## Social justice in resource allocation

Policy decisions about resource allocation require reliable information about which areas are most and least vulnerable. Vulnerability, however, is a fuzzy concept and depending on its conceptualisation, vulnerability assessments may lead to different and even contradicting results. Findings from the pre-project SHARED demonstrate that vulnerability maps may look differently, depending on the selected data (see maps below). JustFair acknowledges this challenge by incorporating a broad spectrum of indicators to arrive at a clearer and more comprehensive understanding of vulnerability.

Whether vulnerable areas receive state support for risk reducing measures also depends on the underlying social justice principle. JustFair will identify the notions of social justice behind the predominant instruments of flood management in selected countries. An international comparison of risk governance practice will provide important insights into effective arrangements and potential pitfalls in policy implementation that may be transferred to the Austrian context. Moreover, results from the international comparison can be used to inform a normatively-driven weighting of the vulnerability indicators.



Thaler et al. (2018)

## Preliminary indicator structure

### Interaction between indicators and across levels

Indicators can be balanced across dimensions: E.g., a low-income household (Eco) may reduce its vulnerability with a strong social network (Soc). On the other hand, a high-income household might be more vulnerable than expected because of a lack of social resources. Indicators can also interact across levels: E.g., a person with poor physical health can have a poor vulnerability rating on the individual level, but an effective mobile care system on the community level may partially or fully compensate for this lack.

### Indicator mapping

Indicators are not exclusive to a certain component. E.g., self-efficacy beliefs are important for households to cope with a given hazard situation (+), but even more so for adapting to future events (+++). The importance of each indicator for the respective vulnerability component can be determined by an expert survey, an underlying fairness principle or by statistical weighting (e.g. Principal Component Analysis).

			Vulnerability components		
Level	Dimension	Indicator	Sensitivity	Coping ability	Adaptive capacity
Community	Economic	High per capita income		+	++
		High unemployment rate			--
	Governance	Effective building codes	--		+++
		Trained emergency serv.		+++	
Social	Community engagement		++	++	
	Inclusive decision-making			+++	
Individual	Health	Respiratory disease	++	--	--
		Mobility handicap		--	--
	Physical	Ground floor apartment	+++		
		Building owner			+++
	Psychological	Self-efficacy beliefs		+	+++
	Hazard experience		+++	+	