



Selection of flash flood models in data-scarce regions like Jordan

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Flash flood risk assessment in Jordan





- Arid region, but severe flash floods
- Very limited data availability, e.g. runoff (data-scarcity)
- Very steep and complex topography (e.g. in Petra)

Hydrological models are needed for effective planning of adaptation measures (climate and land use changes)





→ Which models can be applied in Jordan?



Model selection process

			
Objective of model application (Model complexity, knowledge of processes, scale) [e.g. Beven and Young (2013), Ghonchepour et al. (2021)]	Data requirements (availability and quality) [Beven (2011), Ghonchepour et al. (2019)]	Social aspects like user knowledge and modelling group experience [Addor and Melsen (2019), Horton et al. (2021)]	Resources , effort, code availability and licensing (e.g. open source) [Beven (2011), Ghonchepour et al. (2019)]

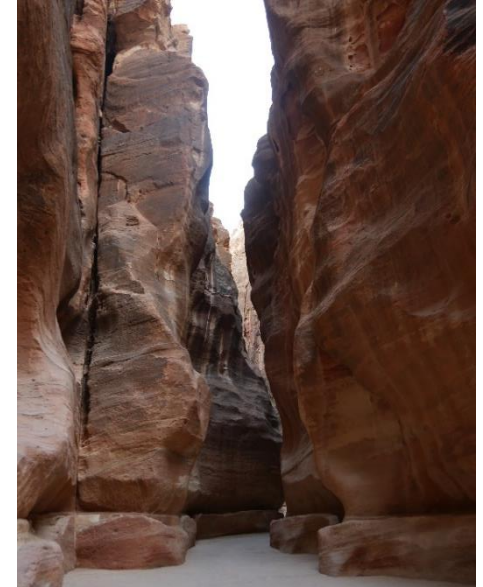
Model selection process in data and water scarce regions for flash flood risk assessment


			
Objective	Data requirements	User knowledge	Resources
<ul style="list-style-type: none"> → Existing gaps in process understanding of arid areas → Not all dominant processes are included in models which are mainly developed for humid areas 	<ul style="list-style-type: none"> → Data scarcity and quality is a dominant issue → Limited runoff data for calibration 	<ul style="list-style-type: none"> → Modelling group experience is limited → Fewer resources for model development 	<ul style="list-style-type: none"> → Financial resources for software are restricted → Cost-benefit even more important in developing countries

Our model selection for flash flood risk assessment for water and data scarce regions

We use a **multi model approach** including

- **HEC-HMS** (with SCS-CN approach, widely used in Jordan)
- **HBV** (semi-distributed, conceptual model, used for flash flood forecasting)
- Rainfall-Runoff-Inundation Model **RRI** (2D-model capable of simultaneously simulating runoff and flood inundation, good performance for flood risk in wadis systems)





Questions? Suggestion?
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