Roleplay “What is a good model?”

There is no one shoe size fits all and there is not one hydrological model that fits all purposes. A flood hazard manager has different requirements to their model than a water resources planner. The roleplay exercise casts the bridge between the theoretical hydrological modeling lecture and practice by letting students slip into the skins of water professionals they might become in the future. Students will reflect on what information their assumed professional requires from a hydrological model and how to judge if a model is sufficient or not for their use cases.

The roleplay exercise will punctually be taken up again during the course of the training workshop in brief break out sessions where selected key points will be refined.

Student tasks:

- Read the profile of their assigned role
- Describe what information their profile needs a hydrological model for. Examples are:
    - Prediction of volume of seasonal discharge
    - Prediction of future typical and minimum flow in a river
    - Prediction of discharge volume of a rare flood event
    - Early warning of flood events
- Determine the properties of the model that are appropriate for the information your profile requires from a hydrological model. Examples are:
    - Temporal resolution of the simulated discharge: 10 minutes, daily, monthly
    - High predictive capacity of the model for: peak flows, minimum flows, flow volumes
    - Prediction horizon: 1 hour, 1 year, 50 years

Roles

Flood hazard manager

In your district, you are responsible for the planning of infrastructure measures for flood protection. Shakhimardan, an Uzbek enclave in the south of the Fergana valley, is one of the villages assigned to you. Infrastructures along the rivers have been repeatedly damaged by flooding caused by mudflows triggered by heavy rainfall in the upper reaches of the basin. 25 years ago, a large part of the village was devastated by a sudden glacier lake outflow. The village authorities have contacted you to plan flood protection measures to safeguard the community's infrastructure.

Hydropower planner

The government has charged you with finding suitable sites for sustainable small hydropower production. In the past, historical streamflow time series were deemed sufficient basis for the design of small hydropower plants. However, due to changing hydroclimatic conditions, future river discharge may develop differently from past discharge. You will therefore have to estimate, if the future discharge will still be enough to operate a small run-by-the-river hydropower plant. The basin of the river Shakhymardan is among your study sites.

Basin irrigation officer responsible for planning the water distribution

You have a contractual 20% of the annual discharge of the river Shakhymardan at your disposal for distribution to the local farmers. However, in dry conditions this is not enough to satisfy the irrigation demand and you have to make a limit plan.