Flood protection strategy Cost Benefit Analysis, Vendline (JU)

**Context**
Vendincourt, Bonfol and Beurnévésin (JU) experienced heavy flooding in 2007. Updated flood maps revealed important protection deficits and the need for a new flood protection strategy for the Vendline river.

**Objective**
The objective of the project was to determine the best mitigation scenario by performing a Cost Benefit Analysis (CBA).

**Methodology**

<table>
<thead>
<tr>
<th>Scenario 1: Channel widening</th>
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<tr>
<td>Scenario 2: 16 000 m³ RB</td>
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<td>Scenario 3: 14 000 m³ RB and some protection works</td>
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**Results**

**A. Retention Basins Efficiencies**
- Scenario 2: RB has a strong damping effect on peak discharges through Bonfol.
- Scenario 3: RB has no significant damping effect on peak discharge through Bonfol. This is due to the temporal overlaying of discharge from the ponds southeast of Bonfol and the damped discharge from upstream sub-catchments.

**B. Flooded Areas and Damages**
- Actual State: Bonfol presents the highest damages, in particular on city center buildings.
- Scenarios 1 and 2: Efficient flood mitigation at Bonfol thanks to channel widening and peak discharge reduction respectively.
- Scenario 3: Lower flood mitigation because of the inefficiency of the RB despite protection works.

**Conclusion**
Performing the CBA of flood protection strategies entailed extensive modeling, from precipitation to inundated areas and damage calculations.

The results indicate that the best scenario, from an economical point of view, is scenario 2 due to its low investment cost and high mitigation capacity.

Nevertheless this scenario is not economically reasonable and further measures are needed to ameliorate its mitigating capacity, like adding dikes and walls to decrease flooding and increase the utility ratio.