Natural water retention through restoration of the sponge function of drained soils in the Rhine basin

Eef Silver – Wetlands International - European Association

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Dutch consortium promoting climate adaptation measures upstream in Germany

Why?
- Increase in climate risks
- Strategic measure (high precipitation and extensive land use)
- Cost-effectiveness
- Additional benefits

Basin approach
Rhine basin

- 1,230 km long
- 60 million inhabitants
- 180,000 km² catchment -> 50% agriculture

Land-use in the catchment

Loss of functional floodplains
Room for the River 2007-2017

Netherlands

1000 m³/s additional volume safely discharged

6.7% higher safety level

Costs € 2.3 billion

Positive effects for flood management and nature, but…

1% extra safety = € 345 million

• End-of-pipe solution
• “Room for the River 2” estimated cost € 1 billion for 1% extra safety
Restoration of the sponge function of drained soils

Restoring natural drainage conditions allows for peak flow reduction.
Restoration of the sponge function of drained soils
Four questions

1. Does it work?
2. Is there enough space?
3. Is there support?
4. Is it affordable?

What we know…
1. Does it work?
2. Is there enough space?
2. Is there enough space?

Figure 9. Synthetic hydrograph based on the time travel concept, for the situation with and without sponge restoration in the Prüm catchment. Blue = situation without sponge restoration, green = situation with sponge restoration. Y-axis = discharge X-axis = time. Development of sponges would lead to 5-8% lower peak discharges.

Remember: Room for the River achieved 6.7%!
3. Is there support?

Stakeholder consultation

- Extensive agriculture
- No large connected area needed: “coalition of the willing”
- Positive local benefits
- Better data needed:
  - Area, size, costs, benefits
4. Is it affordable?

<table>
<thead>
<tr>
<th>Rhine basin</th>
<th>185,000 km²</th>
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<tbody>
<tr>
<td>Part contributing to peak discharges</td>
<td>108,000 km²</td>
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<tr>
<td>6-8% of suitable area needed for natural retention</td>
<td>6,480-8,640 km²</td>
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<tr>
<td>Price/km² (purchase)</td>
<td>€ 1 million</td>
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<td>Total (theoretical) costs</td>
<td>€ 6,5 – 8,5 billion</td>
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<td>Cost of 1% increase in safety level</td>
<td>Approx. 1 billion</td>
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<td>Cost of 1% with Room for the River</td>
<td>Approx. 345 million</td>
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<td>Benefits for nature and climate</td>
<td></td>
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<tr>
<td>Conservative value used for calculating discharge delay</td>
<td>Approx. 1 billion</td>
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</tbody>
</table>
Conclusions

• Integral approach: flood risk management and nature

• What we don’t know: closing the evidence gap

• Transboundary cooperation

• Stakeholder engagement
Thank you!

Eef.silver@wetlands.org
https://europe.wetlands.org