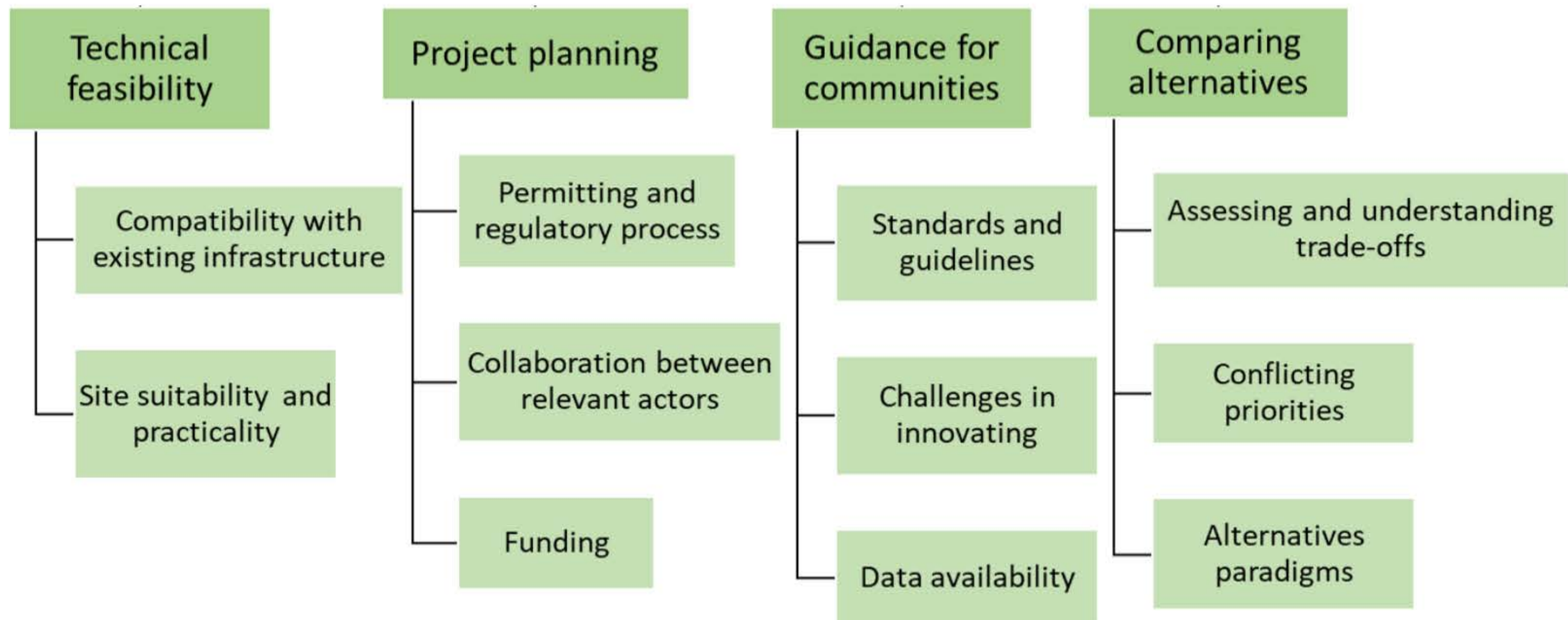


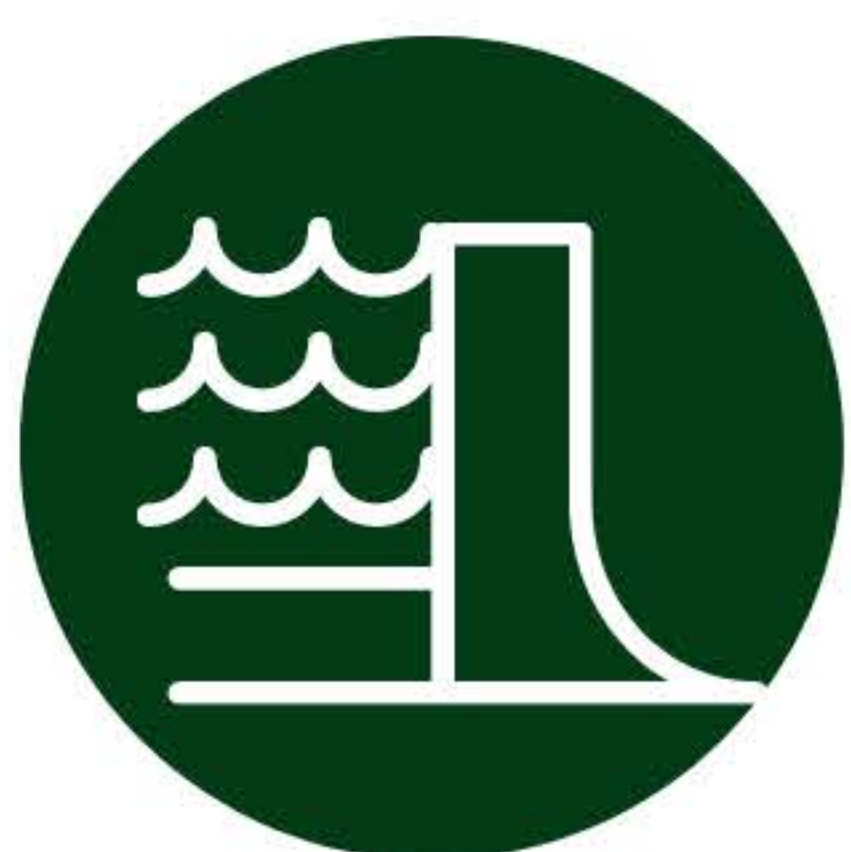
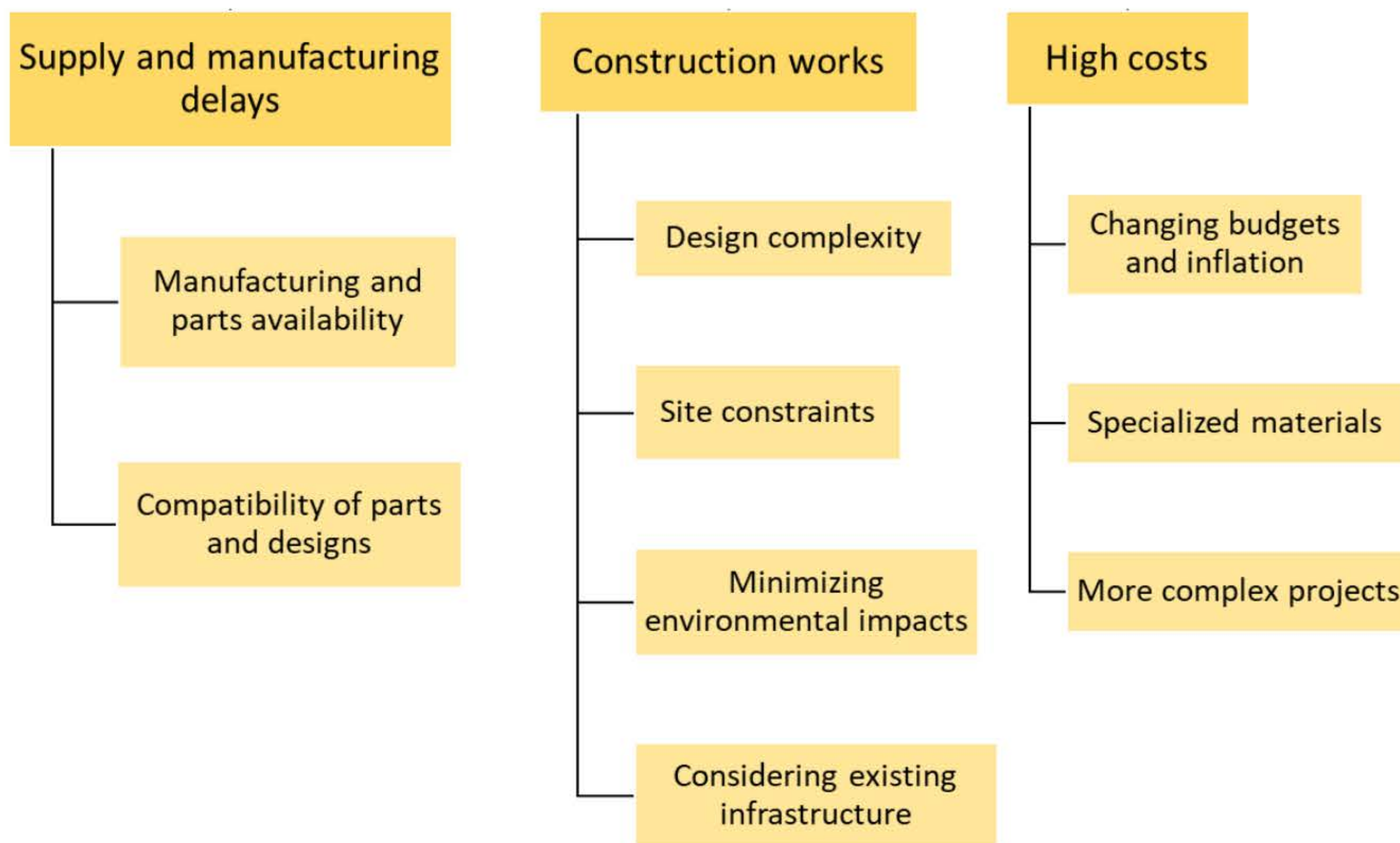
Challenges for implementing flood control infrastructure



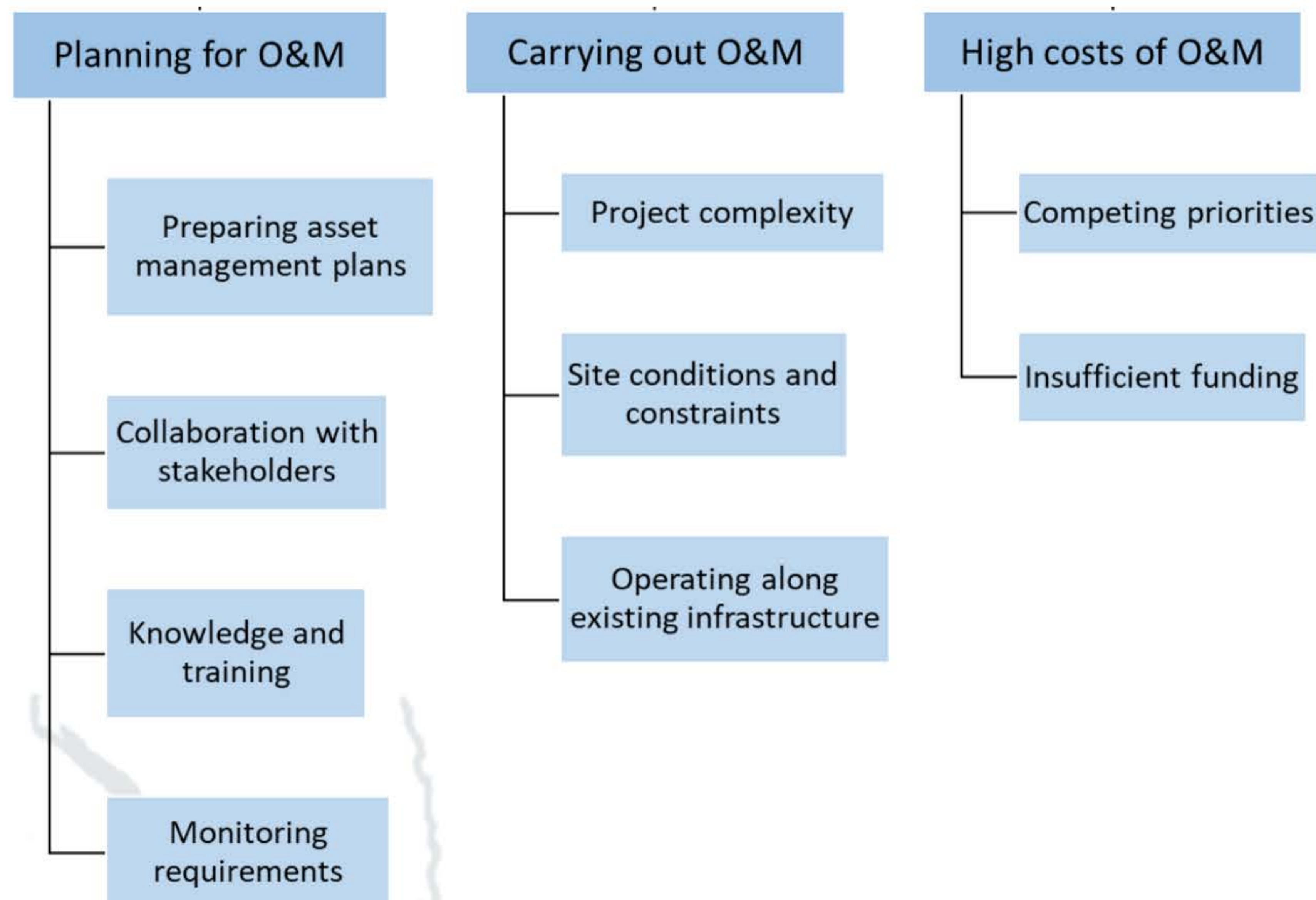
Phase 1: Planning



Phase 2: Construction



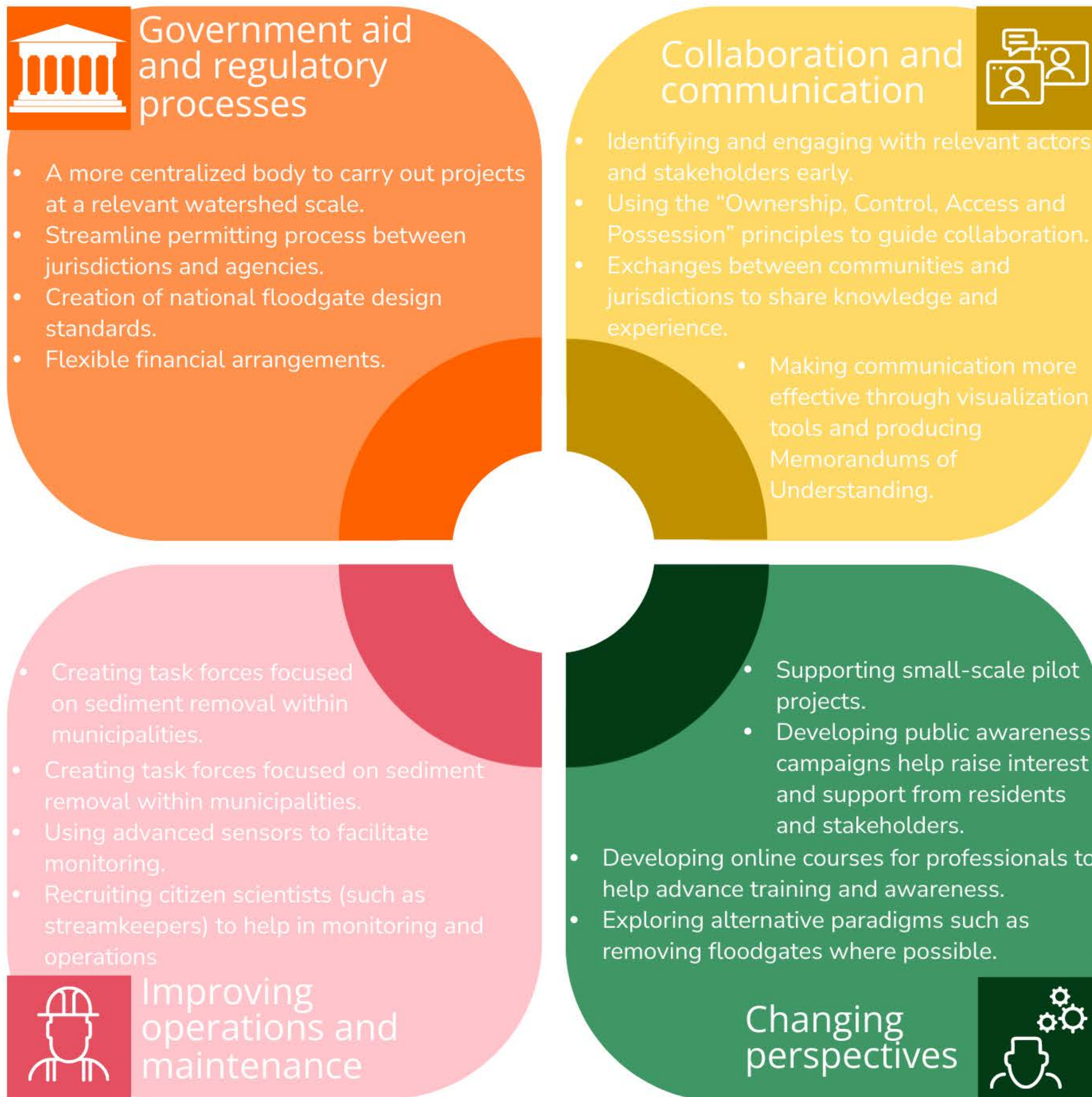
Phase 3: Post construction



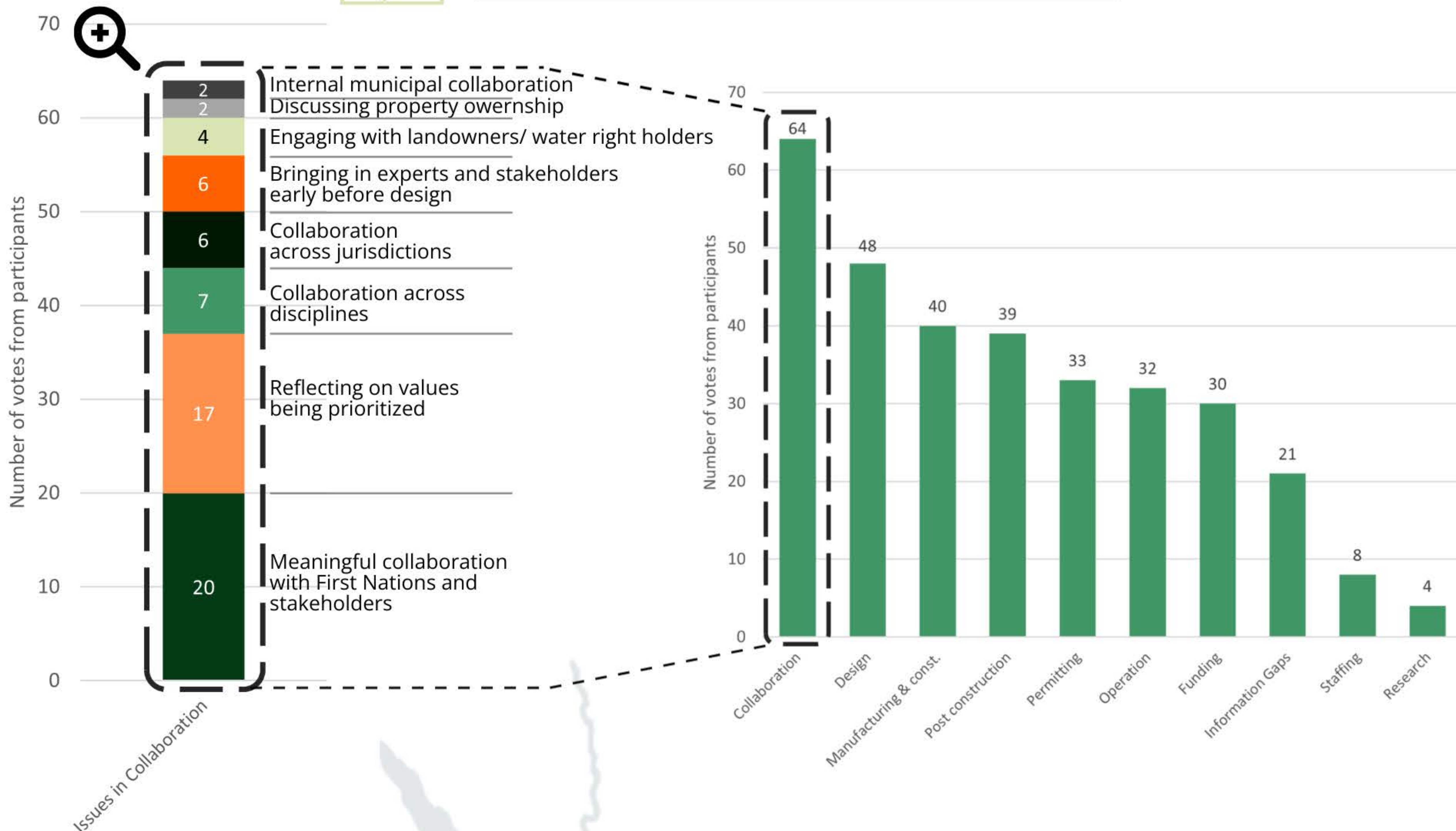
Infographic prepared by Mauricio Carvalho Aceves, based on the results from a cross-sector virtual workshop on flood control infrastructure hosted on April 13th, 2023.



Recommendations to address challenges in flood infrastructure



Which issues do participants think are most important to address?



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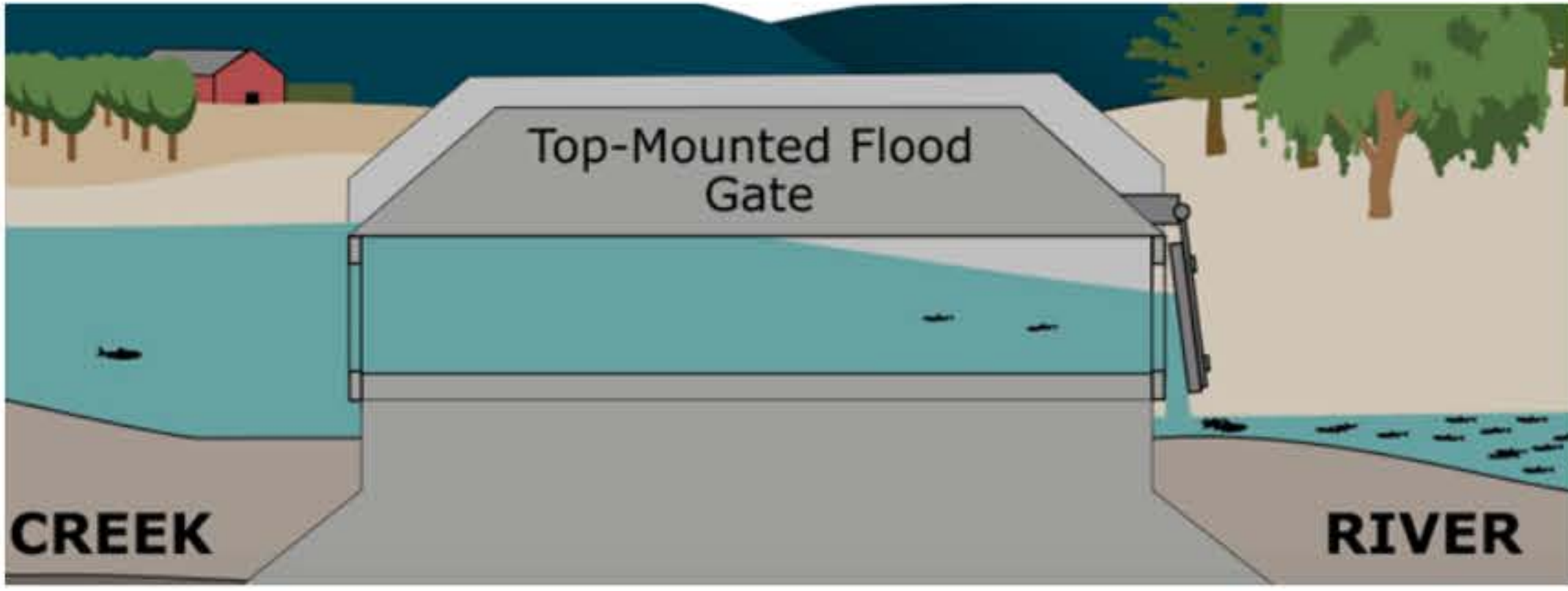
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Problems and solutions for floodgates



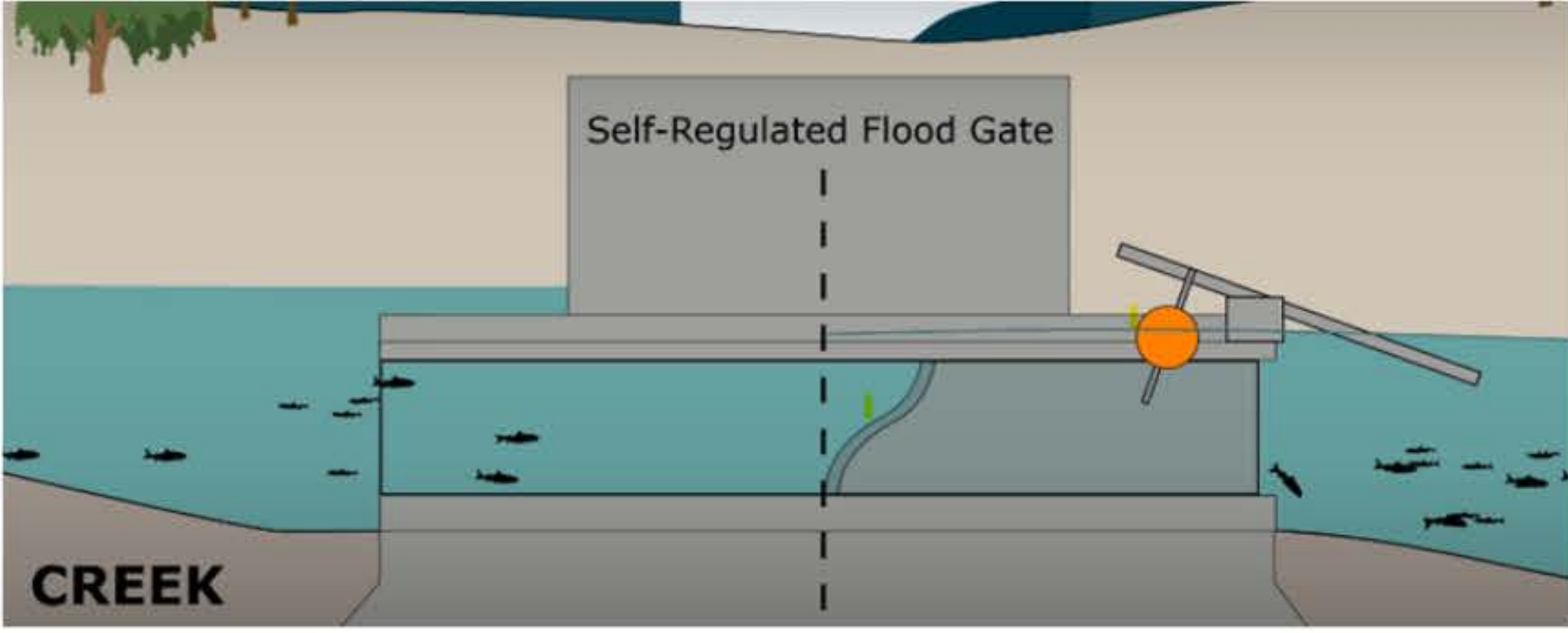
Conventional top-mounted flood gate



- One of the most commonly used designs.
- Often use heavy gates, with iron flaps that rarely open and often for only short periods of time.
- When open, the water rushing out can be flowing too fast for fish to swim into the gate.
- The opening can be too narrow for larger fish to pass through.



Example of fish-friendly design with self-regulated gate



- Modified version of a top or side mounted gate.
- Inclusion of a counter-balance mechanism, such as a float that results in the gate being open more often, and for longer.
- The gate only closes when the water levels on the river gets high enough to push the float up.
- The default position of the gate is open.
- Designs may include remote sensors, floats, or cables sensitive to resistance to activate gate closure and opening.

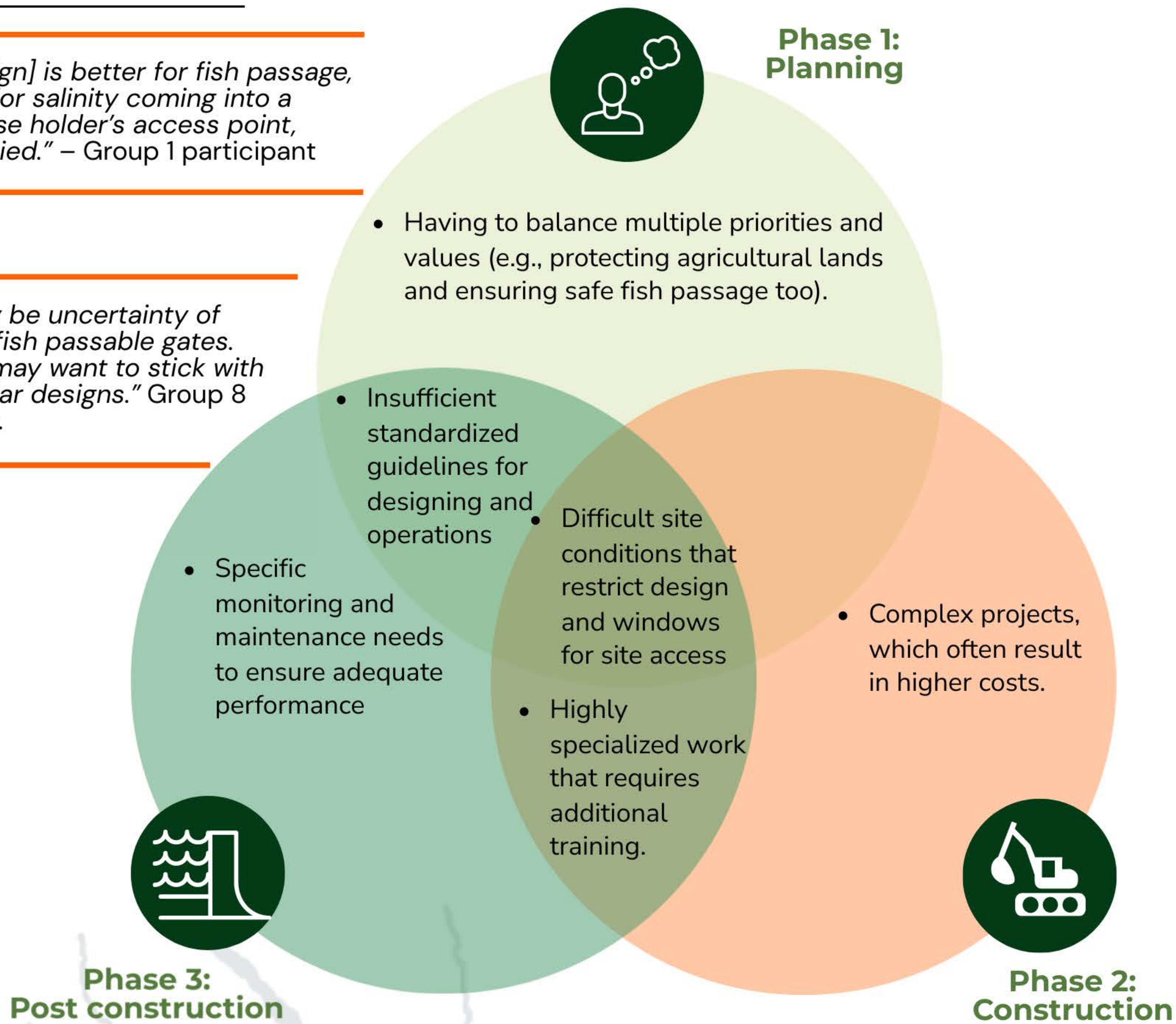
Identified barriers to implementation for each life-cycle phase:



Participant comments:

“... if [a design] is better for fish passage, but worse for salinity coming into a water license holder’s access point, hands are tied.” – Group 1 participant

“There may be uncertainty of design for fish passable gates. Engineers may want to stick with more familiar designs.” Group 8 participant.



Infographic prepared by Mauricio Carvalho Aceves, based on the results from a cross-sector virtual workshop on flood control infrastructure hosted on April 13th, 2023.



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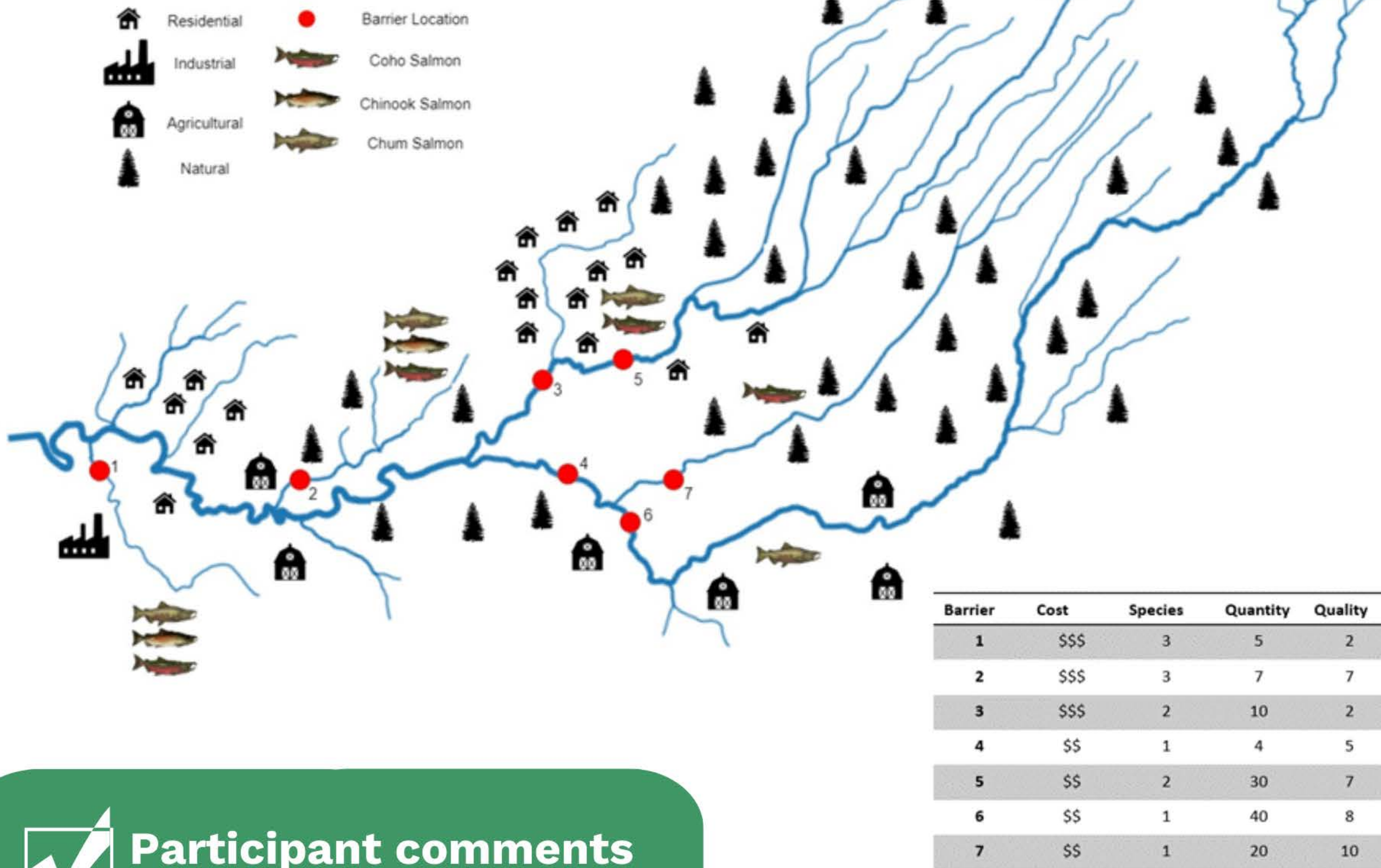
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Prioritizing in-stream barrier removal



Team activity: What barriers would you remove if you had a given budget?



Participant comments and takeaways

- ✓ Prioritization depends on what the objectives are (e.g., protecting farmland). Optimization tools do not provide the “right” answer.
- ✓ Values play an important role in the decision-making process.
- ✓ Information is needed on stream conditions upstream and downstream.
- ✓ Beyond the habitat area or number of species, the health of each species should be considered.
- ✓ It is important to incorporate information on future stream conditions.
- ✓ Different budget levels can result in very different choices.
- ✓ Different budget levels can result in very different choices.

Examples of participant responses:

Budget level	Barriers to remove	Comment
\$\$\$	No.1	It seems like a good balance of habitat size and quality, and it impacts 3 species.
\$\$\$\$	No. 4 & 6	There is large watershed area upstream barrier No.6, but you would need to remove No. 4 for it to be useful.
\$\$\$\$\$	No. 3 & 5	It may be a shorter reach, and it may not include all 3 species, but could have a high social impact given the residential land-use upstream from barrier No. 5

Infographic prepared by Mauricio Carvalho Aceves, based on the results from a cross-sector virtual workshop on in-stream barriers hosted on June 1st, 2023.



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