On the role of hydraulic engineering to support flood resilience and mitigation

Outline based on discussions held during the IAHR FRM TC on September 6, 2018 during the River Flow conference in Lyon

The motivations for elaborating this document are twofold:

1. highlight the central role of hydraulic engineering for flood risk management (FRM);
2. define the possible role of the IAHR FRM TC in promoting hydraulic engineering in FRM.

1 Challenge n°1: divergence in priorities

1.1 Description of the challenge

Divergence in priorities and communication difficulties between

- managers
    - Who pays for damage?
    - Who is legally responsible for damage?
- and hydraulic modellers.

Lack of standards, competitive market …

1.2 Supporting facts / case studies / references

Report on **case studies** where too crude hydraulic analysis (such as from geoportals) lead to failure / suboptimal decisions in flood protection or FRM.

1.2.1 Case study 1

…

1.2.2 Case study 2

…

1.2.3 Case study 3

…

1.3 Opportunities / possible actions

1. NEED to better highlight that **fit-for-purpose / robust hydraulic models** are vital for FRM.
2. Align modelling with the needs of practitioner / managers ➔ **HOW?**
3. Make advanced hydraulic models more valuable / useful to practice ➔ **HOW?**
4. Showcase reduced construction costs made possible by more refined hydraulic analyses …

2 Challenge n°2: limited validation data

2.1 Description of the challenge

Validation data remain too scare, incomplete and uncertain, so that even a crude model can be parametrized to fit scarce and uncertain validation data.

2.2 Supporting facts / case studies / references

2.3 Opportunities / possible actions

Make optimal use of conventional and innovative (low-cost) data sources (crowd-sourcing, imagery …) ➔ need for new methods?

3 Challenge n°3: communication issues

3.1 Description of the challenge

Communication difficulties between communities:

- hydraulic engineering
- vulnerability modelling
- decision-making

3.2 Supporting facts / case studies / references

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3.3 Opportunities / possible actions

- Interdisciplinary research agenda
- …

4 Challenge n°4: Underfunding of flood risk management

4.1 Description of the challenge

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4.2 Supporting facts / case studies / references

4.3 Opportunities / possible actions

- Emphasize multifunctionality of hydraulic structures (e.g., smart tunnel …)

5 Conclusions

- Possible contributions / actions from IAHR FRM TC
    - …
    - …
    - …
- Possible avenues to disseminate this document:
    - Hydrolink
    - Vision, opinion paper in a journal
    - Communication at IAHR Congress