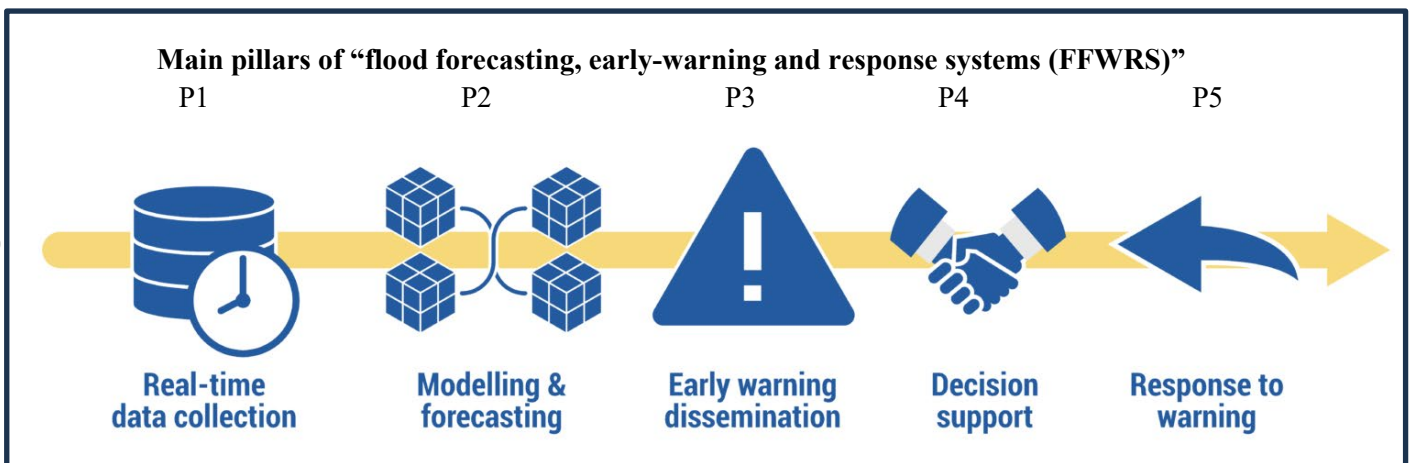


Supplement S1: The interview guideline

Description

Your name	
Organization name	
Date and time	
Your role (Forecast provider, crisis management, policy-maker, researcher)	
Location/ service area	
Years of experience	
Notes	

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Part 1: Background information

1.1 Personal background

Main question: Can you tell something about your work related to flood forecasting, early-warning and response systems (FFWRS)?

Sub-questions:

- Which FFWRS pillar(s) does your work cover?
- What are your main activities related to FFWRS?

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Part 2: The different FFWRS pillars

2.1 (pillar 1): Real-time data collection

Main question: What is the development state of the real-time data collection and assimilation systems?

2.1a The real-time data

- What is the quality of the data itself?
- Is the data accurate, complete and timely distributed?

2.1b The data assimilation and sharing systems

- What is the quality of the data assimilation systems and sharing platforms?
- Is the data quickly and efficiently shared with other countries?

2.2 (pillar 2): Modelling & Forecasting

Main question: Which weather and/or flood forecasts are produced within your organization, and what are their characteristics and quality?

Sub-questions:

- What is their lead time, initiation frequency and horizontal resolution?
- Are they deterministic or probabilistic, and how many ensemble members do they contain?
- How is the forecast validation designed?

- How would you rate the quality of the forecasts and their value for triggering early response? (scale 1-10)

Meteorological forecasts

Hydrological forecasts (small and large rivers)

2.3 (pillar 2-3): The warning levels

Main question: Which warning levels are in place, and what are the thresholds used?

2.3a The current state of the warnings

- On which level of administrative units are the warnings generated?
- In case of hydrological forecasts: are these for small streams (i.e. unnavigable rivers) and large rivers?
- How would you rate the design of the current warning levels (scale 1-10)?

2.3b Improving the warning levels

- What is the most effective way to improve the levels further?
- Are impacts directly incorporated in the design of the warning levels? If not, would including them be of added value (e.g. taking critical infrastructure into account)?
- Do we need to adjust the warning levels under climate change, for example by adding a more extreme warning class (e.g. code black)?

Meteorological forecasts

Hydrological forecasts (small and large rivers)

2.4 (pillar 3): Early warning dissemination

Main question: How are the flood warnings disseminated and are they effectively communicated, both to stakeholders and to the public?

Sub-questions:

- How do warnings flow from the forecasting centers to the crisis managers, other stakeholders and citizens?
- How is ensured that the most vulnerable people will be reached?
- Is a Common Alerting Protocol (CAP) used?
- How would you rate (scale 1-10):
 - The clarity of the warnings (i.e. clear risk information, easy to interpret, and actionable)?

- The coverage of the warnings?
- What would you say are the main bottlenecks in effective warning dissemination, where most information, intended to reach the population and stakeholders, is lost?

2.4a Warning dissemination to stakeholders (e.g. crisis managers)

2.4b Warning dissemination to the public (e.g. with NL/BE alert)

2.5 (pillar 4 and 5): Decision-support and response to warnings

Main question: How effective is the response to flood warnings, and is the response planned in clear contingency or emergency plans?

Sub-questions:

- Are these general contingency plans, or specifically for floods?
 - What is the level of administrative unit of the plans?
 - Can you provide a list of actions that are inside these protocols?
 - Do these actions correspond to hydro-meteorological warning levels?
 - Do flood response trainings take place, including with international partners?
 - How would you rate the overall quality and effectiveness of the early response by organizations and citizens in case of a large flood disaster (scale 1-10)?
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Part 3: How to improve the flood warning and action system

3.1 What should be the priority actions now to improve the FFWRS further? Please come up with a top 3-5 and shortly explain why, for every point.

3.2 Across the five different pillars we covered in this interview, how would you judge the overall preparedness for hydro-meteorological events similar or slightly more intense than the 2021 floods (scale 1-10)?

3.3 Can you recommend other organizations or specific contact persons to include in our study?