

# Lessons learnt across borders

Evaluation model of crisis management in the Euregio Meuse-Rhine (EMR)



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# 1. Introduction

## 1.1 Context

The Euregion Meuse-Rhine (Euregion EMR) covers three countries and is a densely populated area with about 3.9 million inhabitants<sup>1</sup>. The systems and laws in the three countries are so different that cross-border cooperation requires a lot of regulation and organisation. Through EMRIC's efforts, the borders are increasingly getting blurred. Euregional cooperation is based on a few main themes including disasters and accidents, fire fighting, dangerous substances and diseases, and care. In disasters and accidents, cooperation occurs between Euregional emergency services. Disasters or accidents sometimes require more ambulances, hospital beds and firefighting equipment than are available in the home region. Also, a foreign hospital may be closer than a hospital in the region of the incident. In addition to operational cooperation, there is a desire to harmonise the approach to evaluating crises and disasters so that (phases of) the response/control of incidents, crises and disasters can be reviewed together within a shared evaluation framework. The events of recent years (Covid 19, and flooding) have further emphasised the importance of such alignment.

## 1.2. Research questions

The research/study aimed at finding a practical and aligned approach to evaluation of crises, disasters and incidents in Euregional cooperation.

The study sought answers to the following research questions:

- Which evaluation models, or formats for evaluation of crises, disasters and incidents are described in academic literature?
- What requirements for quality of evaluation models aimed at improving cooperation in disaster response and management of disasters, crises and incidents may be derived from these sources?
- Who are key persons in the practice of disaster crisis and incident management within the EMR, especially also where the choice and application of evaluation models and formats are concerned?
- Which evaluation models or formats are currently used by the different partners in the EMR for evaluation of crises, disasters and incidents?
- What wishes and needs exist among the partners regarding future evaluations in cases of crises, disasters, or incidents.
- In the light of the answers to the above questions, what is a well-underpinned, supported and applicable approach to evaluation of responses to future disasters, crises and incidents?

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<sup>1</sup> <https://marhetak.info/about/>

### 1.3. Target group

The aim of the study is to develop evaluation model(s) and formats to facilitate discussions on experiences during processes of crisis management and management of disasters and incidents to:

- Promote reconstruction of the management/control processes.
- Direct discussions about the course of those processes.
- Enhance mutual comparability of experiences.
- Derive Lessons from experiences for future prevention, response and follow up.
- Contribute to knowledge development on crisis and disaster management.

The evaluation is for the benefit of those who are key persons in the processes of crisis, and disaster management in the EMR. These key persons form the target group(s) of the study described here. At the same time, they have been approached as respondents, or participants in discussions to ensure that the approach developed approach matches the organisational culture in which they work, and their needs as EMRIC partners, as well as their visions for the future.

### 1.4. Research design

#### 1.4.1 Background of the research design

In recent years, studies were conducted in the field of crisis management and disaster response. A state-of-the-art study was conducted to analyse international academic literature to gain insights in this field. Subsequently, a study was done on 25 crises in the Netherlands, on how they occurred and how they were evaluated. In 2021, in a collaboration between Item and PLATO, a study was conducted on the Euregional cooperation in managing the COVID 19 pandemic. From these and other studies a solid basis for an evaluation approach has been developed. It was derived from models of crisis management on the one hand; on the other hand, from models on evaluation focused on learning and knowledge development. In dialogues with relevant stakeholders in crisis management/disaster response, a solid, shared and supported evaluation model/format was composed. The approach allows for diversity and yet promotes compatibility of evaluation practices.

Besides a theoretical foundation, existing practices of evaluation and working methods were studied among the partners participating in EMRIC (Zuid-Limburg Safety Region (NL), GGD Zuid-Limburg, Stadt Aachen, Städteregion Aachen, Kreis Heinsberg, Province of Limburg (B), Province of Liège) and additional partners. To arrive at a meaningful, applicable and reliable evaluation model/format, a combination/synthesis was made from the two perspectives outlined (the literature and the practical experiences in the EMR). Thus, a well-founded but also practice-oriented model/format has been established.

#### 1.4.2 Research activities and products

##### 1.4.2.1 *Relevant theory*

The development of model/format started with an inventory of academic literature, policy and other relevant sources. That literature and these documents were systematised and analysed to derive requirements and outlines of an evaluation approach. Thus, a first set of requirements to which a model, and related evaluation formats should meet, emerged.

#### 1.4.2.2 Network

/The second step focused on identifying key people from the areas that need to cooperate at the time of crises and disasters. In doing so, we look for people who:

- Were actively involved in past crises.
- Have experience with international cooperation in the Euregion.
- Can provide us with relevant policy and evaluation documents.
- Have decision-making powers when it comes to model/format choice.

The mentioned respondents were contacted to acquire a clear picture of the types of evaluations that are common in the EMR, and possible variants of them. Through these contacts and conversations, we intended to develop support for the approach through which we want to arrive at a coordinated or aligned practice of evaluation. The contacts/respondents were also approached to get a picture of the work culture in the participating partner organisation, to develop a feeling for the context in which the models/formats and their elaborations will be used. A balance was sought between recognising differences, and nevertheless increasing the alignment among approaches. Interviews with key people involved were eventually meant to identify ideas and wishes regarding the models/formats to be developed.

#### 1.4.2.3 Evaluation of types and phases of crises and disasters

The evaluation model, and formats developed, or compiled relate to the phases and types of crises and disasters that may unexpectedly occur in the region. The requested model/format, though launched in the context of flooding, also applies to other related crises or consequences. Based on our previous study of crises and disasters, we distinguish the following categories in this regard:

- Flooding/flooding including consequences such as:
- Failure of vital infrastructure.
- Social turmoil.
- Health crisis.
- Food crisis.
- Or any combinations of such incidents.

This categorisation does not imply that we assume that different evaluation models are needed for different categories. Different emphases may be needed, but as such the model as developed is meant to be generic and applicable as evaluation approach in all the categories of crises and disasters mentioned.

The same applies to the different phases of crisis management: The distinguished phases are based on a framework of two scientific perspectives <sup>2</sup>(Boin et al., 2013) <sup>3</sup>; McConnell, 2011) and the currently in force assessment framework of the Inspectorate of Justice and Security. These three perspectives together have resulted in the analytical framework: • Crisis management starts with (1) recognition and (2) sensemaking of the nature and extent of a crisis; • Focuses on organizing a response by (3) decision-making, (4) coordination and (5) coupling, or decoupling of actions that

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<sup>2</sup> Boin, A., Kuipers, S., & Overdijk, W. (2013). Leadership in times of crisis: A framework for assessment. *International Review of Public Administration*, 18(1), 79-91.

<sup>3</sup> McConnell, A. (2011). Success? Failure? Something in-between? A framework for evaluating crisis management. *Policy and Society*, 30(2), 63-76.

minimize the impact of a threat; • where (6) communication and (7) meaning-making are crucial to provide a symbolic need for direction and guidance to society; • Ends with organizing the aftermath of the crisis by attributing (8) responsibility, (9) securing lessons learned and increasing (10) resilience to cope better with future crises.

Phases of effective crisis management	Sub-phases
<i>Assessing the crisis</i>	<ul style="list-style-type: none"> <li>• Recognition</li> <li>• Sense making</li> </ul>
<i>Organising the response</i>	<ul style="list-style-type: none"> <li>• Decision making</li> <li>• Coordination</li> <li>• (De)Coupling</li> </ul>
<i>Communicating with society</i>	<ul style="list-style-type: none"> <li>• Meaning making</li> <li>• Communication</li> </ul>
<i>Policy</i>	<ul style="list-style-type: none"> <li>• Accounting</li> <li>• Learning</li> <li>• Resilience</li> </ul>

Phases of crisis management<sup>4</sup>

#### 1.4.2.4 Towards a practical theory and guidelines

After gathering experiences with common evaluation models and formats in the partner areas, and after analysing results from previous studies of literature and of practices, a synthesis was made in an evaluation model allowing for different emphases, when necessary, or preferred, given the kind, or the phase of a crisis/disaster. However, the aim remained to develop a system on the structure of which, there is consensus, which allows for comparison of experiences, and for over all analyses, and which simplifies and promotes dialogues about crises and disasters and their mitigation/management.

The result consists of different components:

#### Model(s)/formats

A model or models, with associated formats, that support planning, execution, data collection, data processing and analysis of evaluations and provide guidance for deriving conclusions, decisions as well as learning outcomes and resulting knowledge development.

#### Tools/Activities

The evaluation provides more than just a model. It is enriched with examples of existing and possible new evaluation tools, and methods.

#### Follow-up

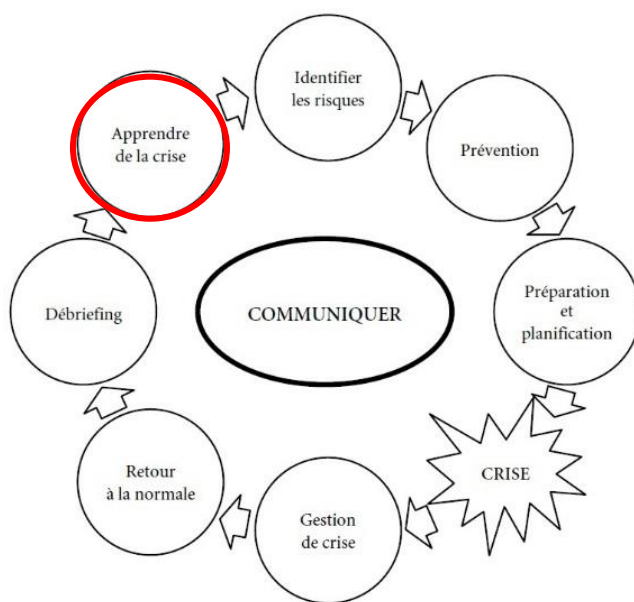
Evaluations are carried out to follow up. Evaluations may lead to decisions, or choices regarding future practices. Evaluation may lead to the identification of training needs, optimisation of exercise policy, adaptation of working procedures. An evaluation therefore also serves as a guide for system should also serve as a guide for this follow-up phase.

<sup>4</sup> Lakerveld, J. V., Wolbers, J., Zonneveld, A., Matthys, J., & Akerboom, M. (2020). State of the art crisisbeheersing-fase 2.

## 2. Administrative and legal context

### 2.1 Wallonia

Emergency planning has developed strongly in Belgium in recent years, partly under European pressure, and as a result of the crises the country has experienced. The Royal Decree of 16 February 2006 on emergency and intervention plans has given Belgium with a genuine crisis infrastructure. It harmonised the terminology and content of emergency and integrated a multidisciplinary approach and risk analysis into the planning process. This Royal Decree was recently updated by the Royal Decree on emergency planning, and the management of emergency situations at local, and provincial level, and the role of burgomasters and provincial governors in the event of crisis situations requiring coordination or management at national level. This system puts in place a structure for communication and coordination between emergency services and authorities throughout the country<sup>5</sup>. In describing this system researchers of the university of Liege refer to a model adapted from Fallon, C., Thiry, A., Brunet, S., "Planification d'urgence et gestion de crise sanitaire, la Belgique



In this model one step is devoted to learning from the crisis, after which transferring the learning result in better prevention and preparation and planning follows. Learning is embedded in this system.

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<sup>5</sup> Organisation de la gestion de crise et la planification d'urgence en Région wallonne1  
20210924 – Aline THIRY – Uliege – SPIRAL

## 2.2 Germany

In Germany the law on Fire Protection, Assistance and Disaster Control (BHKG) of North Rhine-Westphalia state law indicates that the state is responsible for supporting research in the domain of security and safety<sup>6</sup>.

Furthermore, Supervisory authorities are involved in monitoring the activities of the states and the municipal organizations involved in disaster control. These supervisory authorities are:

1. The supervisory authority for the municipalities belonging to the district is the district administrator as the lower state administrative authority.
2. The supervisory authority for the independent cities and the districts is the district government. At the same time, it is the supreme supervisory authority for the municipalities belonging to the district.
3. The supreme supervisory authority is the Ministry of the Interior.

The law also describes the responsibilities at all levels for training and exercising in the domain of disaster control. Through these law articles evaluation and learning from crises has a legal basis.

## 2.3 Flanders

As indicated above in the context of Wallonia, the law on emergency planning is a state law, so it applies to Wallonia as well as to Flanders. The law explicitly states that at each level of authority (federal, provincial and municipal), authorities must evaluate exercises and real emergencies, and adjust existing emergency planning accordingly<sup>7</sup>. The conclusion is that in Belgium as a whole evaluation and learning is an integral part of what crisis managers are supposed to do in cases of emergency and afterwards.

## 2.4 The Netherlands

The Netherlands is divided into 25 safety regions. Each safety region is committed to the safety of the residents and visitors of that area. For example, the safety region ensures that there is a fire brigade. The safety region also makes arrangements for dealing with disasters and crises.

In the Netherlands the crisis management structure is regulated by law. The law, however, is not very clear about evaluation. The word evaluation only is used referring to the evaluation the law itself. This does not mean that evaluation and learning are not embedded in the Dutch structure. In the world of disaster management people use the term cyclic thinking to explain that there is a continuous process of plan do act and check going on in crisis planning. Specific organisations have task to support this process of planning, evaluation and updating the planning given the evaluation results. In the current planning document of the safety region, this is visible since in many instances evaluation results are mentioned as the reason to change and optimize strategies, tactics, training, equipment to be able to cope with future challenges<sup>8</sup>.

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<sup>6</sup> [BHKG,NW - Brandschutz-, Hilfeleistungs- und Katastrophenschu... - Gesetze des Bundes und der Länder \(lexsoft.de\)](#)

<sup>7</sup> [https://etaamb.openjustice.be/nl/koninklijk-besluit-van-22-mei-2019\\_n2019013001.html](https://etaamb.openjustice.be/nl/koninklijk-besluit-van-22-mei-2019_n2019013001.html)

<sup>8</sup> [https://www.vrzl.nl/nieuws/rampenbestrijdingsplan-hoogwater-2022-2025#:~:text=Het%20rampbestrijdingsplan%20\(RBP\)%20Hoogwater%202022,mogelijk%20te%20maken%20en%20houden.](https://www.vrzl.nl/nieuws/rampenbestrijdingsplan-hoogwater-2022-2025#:~:text=Het%20rampbestrijdingsplan%20(RBP)%20Hoogwater%202022,mogelijk%20te%20maken%20en%20houden.)



## 2.5 Euregion

At the level of the EMR it is made explicit that the co-operation across borders is needed. Furthermore, in EMRIC formulates this intention in the aim of the Marhetak project, which is to robustify the cooperation between the Euregional services legally responsible for crisis management and weather, water and soil services in times of a flood crisis<sup>9</sup>.

The Veiligheidsregio Zuid-Limburg in the form of EMRIC, the public service of Wallonia, the Federal public service Home Affairs Belgium and Water Board Limburg will work to align images of forecasts, facilitate uniform information provision, link data sources, harmonize risk assessments and crisis communication. Lastly, emergency response equipment will be inventoried and complemented where necessary. The project will end with a live exercise of better crisis management in the Euregion Meuse-Rhine. In these phrases it is clear, that by studying the course of events during crises, and by seeking to align processes and content imaging, risk assessments and risk communication as well as identifying needs for up gradin the equipment, an evaluative approach is implied.

The conclusion is that in the context of the partner regions, as well as at the Euregional level the need for evaluation is supported in legal structures and in policy statements.

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<sup>9</sup> <https://emric.info/en/citizens/projects/marhetak>

### 3. Evaluation of crises and disasters and incidents

#### 3.1 Main objectives of crisis evaluation

In the title of this chapter the word evaluation is used. In practice it appears that this term brings a lot of confusion. Evaluation is often associated with the search for what went wrong during a crisis; it tends to be understood as an activity to engage in after the crisis is over. Evaluation is often seen as something threatening, something which is about finding out who was responsible and who is to be blamed for the course of events. In this study we focus on the role of evaluation in search of ways to enhance work procedures and competences needed for further optimization of preparation, prevention, response and follow up of crises. Sports as a metaphor may come in handy here to explain how we see the role of evaluation as a tool for professional and organisational learning.

*Professionals in sports permanently work on the improvement of their performance. They train themselves and are being trained; the search for better methods and tools for what they wish to be good at. They continuously monitor their own condition, competences and performance. They do that because they love the sport they are involved in and wish to raise the level of performance to the maximum. They do so as individuals, but also in teams. The level of performance is not only depending on the individual levels the professionals bring. It is the team spirit, the team coordination and the mutual trust that come with it, that makes teams reach levels far beyond the sum of the abilities of its members. In our search for evaluation models and tools we aimed to find ways that provide professionals in crisis/disaster mitigation and management with models and tools to help them experience this spirit of enjoying the process of getting better in the job you are proud, and in which you wish to grow.*

#### *Learning,*

One of the reasons to evaluate is to learn from the experience of dealing with a crisis<sup>10</sup>. This aim to learn from experience may focus on various aspects of a crisis. It may focus on the incident itself. How could this happen, how did it evolve and what was the impact it had. Another focus may be on how the crisis was responded to. What worked and what did not? Furthermore, it may be focussing on the competence of the people involved to identify what competences need to be developed further to be better prepared for future crises or disasters.

#### *Accounting,*

Evaluation may be organized to account for the measures taken. In preparing for crisis, and disaster management procedures and protocols are agreed upon. In the case of an emergency evaluation may be devoted to the extent to which the crisis managers and other professionals involved have complied to these agreements. A reconstruction of the course of events and the decisions made in mitigating, or managing the crisis will be part of such an evaluation. A comparison between the agreed upon protocols and the actual course of events will be included in the analysis in this kind of evaluation.

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<sup>10</sup> Beerens, R.J.J., Tehler, H. & Pelzer, B. How Can We Make Disaster Management Evaluations More Useful? An Empirical Study of Dutch Exercise Evaluations. *Int J Disaster Risk Sci* **11**, 578–591 (2020). <https://doi.org/10.1007/s13753-020-00286-7>

### *Decision-making*

A third kind of evaluation is an evaluation executed to make decisions on work procedures, equipment and tools to be used, and people to involve in case of similar crises. The evaluation will focus on the actual decisions made, the measures and action taken and, on the methods, used. The purpose is to find out what works and what doesn't. The basic purpose of such evaluation is to update and upgrade the level of preparation for future crises and disasters. In some cases, for instance when in the past similar crises led to a change of strategy, the evaluators may already know in advance what choices have been made, so what the alternatives were or may be. The challenge then is to derive from an evaluation the key distinctive effects of the choices made, to be able to make a final choice of strategy for the future. An example of such issue could be do we rely on national weather forecasts or do we also permanently also monitor the forecasts of the other regions included. Would either alternative have had added value given the circumstances. Other issues may be the availability and accessibility of data on how the crisis evolved to the various units involved in fighting the crisis.

### *Knowledge development*

Apart from focusing on crisis management and international co-operation, an evaluation may also be set up to study the crisis as such. In case of floods this may lead to questions on the levels and quantities of water passing by per time unit; the places where the impact is high. Thus, knowledge may be built on how floods or in other cases other crises develop and what that means for future prevention, response and follow up of crises and disasters. Knowledge management may also focus on other domains, such as how do people perform under the circumstances, how long can they perform at a sufficiently high level; How does emotional impact affect the performance and how can this best be taken into account, in allocating and dividing tasks in high impact situation. The crisis as such, the contextual factors influencing the development of a crisis (weather influences, demographic issues, infrastructure, policy issues etc.) the psychological processes involved (health, workload issues, emotional impact etc.) may all be examples of fields of knowledge to which the analysis of a crisis may add. Crises are opportunities for such analyses, at the same time we often see that by focusing on the last crisis as an example, it seems as if the focus is on dealing with a similar crisis instead of on dealing with a range of crises including very dissimilar ones.

The different emphases in the above-described generic objectives of evaluation may be combined in specific situations depending on the phases to be evaluated, the kinds of crisis it concerns and specific set in evaluating a crisis.

## 3.2 Evaluation approaches

### *Summative versus Formative Evaluation*

Evaluation often is done soon, or long after a crisis is over. The focus is on what happened, what went well, what may be improved, and what are the lessons learnt for the future. This kind of evaluation is referred to as summative since it leads to conclusions only to be applied to future incidents. Besides summative evaluation there is formative evaluation, which focusses on understanding the processes people are involved in while fighting the crisis, to improve things in action. For that purpose, it is helpful to already involve a person or allocate an evaluative task to one of the persons involved anyhow, to give feed back to crisis teams possible ways in which things may be enhanced already during the process. In practice this already often happens, since teams constantly are using the cycle

of imaging, assessing and decision making, which implicitly supports constant evaluation. However, to involve someone with an explicit evaluative ask and role may deepen the evaluation and lead to optimization of the actions on the job. Of course, this should be done in a way that contributes to improvement of the team performance and does not slow down the response to the crisis. Taking time outs on well chosen moments may add to such evaluations and may also allow people to share impressions and further build the team spirit mentioned above.

#### *Internal versus External Evaluation*

Evaluation may be done among those who were part of the action, or be done by outsiders, who are brought in, to design, organise, and to do an evaluation for them. External evaluations usually involve evaluators with high level research skills, that may not be available internally. Internal evaluators on the other hand know much more about the specific context, the course of events and the impact it had since they had been part of it and have experienced it all profoundly. Because both external and internal evaluations have their advantages it is best to seek to combine the two. For external accountability, the external evaluation is often recommendable. It will be seen as more objective and independent. For evaluations to be contributing to learning, competences acquisition, and team building, and upgrading of work procedures the internal evaluation may be primarily useful. However, also there it is important to include the views of external evaluators, also involved in roles of moderators of collective learning. The combination of external and internal evaluation supports the depth of the evaluation on one side and validity and credibility on the other.

#### *Operational versus Policy and Governance*

In fighting crises and disasters, we distinguish between professionals actively involved in operations mitigation of crises, and on the other side those who are involved at a level of politics and government. These two groups of people involved have different responsibilities, different time scopes and different communication and co-ordination networks. It is important that evaluations include both levels separately and the interfaces between the levels.

#### *Participative versus Expert Evaluation*

For evaluations to be effective and to contribute to the acquisition of competences for enhanced future performance, it is not enough to contract an evaluator, or to appoint people to do the evaluation. For evaluation to lead to learning it is necessary that the ones who are seen as the learners are actively involved in the evaluation. They are not just respondents, or sources of data; they must be actively participating in the process of reconstruction of what has happened and what was done to prevent, and mitigate, and possibly control it. They must be made part of the interoperation of such reconstruction and be asked to invest efforts in the optimization of their jobs. That will increase the commitment, control, professional pride, and sense of belongingness needed to upgrade their own and their team's performance.

### 3.3 The content of evaluation

#### *Levels*

Evaluation may concern the operational level, to evaluate the operational processes, actions, and means. On the other hand, and often at the same time the strategic/management process may be

evaluated. The interfaces between the operational and the policy level are another theme of evaluation. How do the levels of performance support each other and where not?

#### *Phases*

Evaluations of crisis and disaster management may include all phases of the process including early warning, organising the response, decision making, follow up (recovery, repair, redesign). Many evaluations show an emphasis on the response phase. Often evaluations of different phases are reported on separately. Still, it is important to keep track of the relations between the phases and how they were approached, and how that affected the efficiency, effectiveness and the impact of the measures taken. Evaluation itself may best be included in all phases. That implies that the way the phases are evaluated itself is also a theme of an evaluation. The key question here would be how evaluation was included in the phases and how were evaluation results transferred into improvement of actions, or policies throughout the consecutive phases.

#### *Key-processes*

The processes that may be studied in an evaluation include:

- Early recognition
- Notification
- Alarming
- Up-scaling
- Leadership and Coordination
- Information management

#### *Standards*

Each of these processes may be assessed against criteria of efficiency, deployment of decision making of actions, measures and tools/equipment, and effectiveness<sup>11</sup>.

### 3.4. Quality requirements for evaluation

#### ***Process requirement***

##### *Validity*

The data gathered must give a clear picture of what happened. This means that a re-construction of the course of events is necessary. If no serious construction is made, evaluation will consist of opinions rather than facts, of impressions, rather than observations. Re-construction is needed to make the evaluation valid.

##### *Reliability*

An evaluation is to be organised in a way that allows for clear judgements. Clear criteria to assess data against will see promote consensus on how a specific course of decisions and actions may be assessed.

##### *Feasibility*

Evaluation must be organised in a way that does not interfere with the processes it concerns. It is important to find a balance between efficiency and effectiveness. Too much evaluation will obstruct

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<sup>11</sup> Wein, B., & Willems, R. (2013). Een raamwerk voor het effectief evalueren van crisisoefeningen.

the work, too little evaluation may delay intermediate improvement of decisions made and actions done.

#### Effectiveness of evaluation

Evaluation must allow crisis and disaster managers to see what it brings them. If evaluation is an administrative burden rather than an inspiring impulse, it will eventually sink down the list of priorities. So evaluation must show its added value in an inspiring accessible way.

#### Transferability

Evaluations are not to be kept for oneself. They are supposed to be shared and made subject of consultation. In the context of this study this also implies evaluation should be shared across borders.

#### **Output requirements**

##### Dissemination

The quality of an evaluation depends on the extent to which it provides useful insights to people and perspectives for improved decision making and action. This applies not only to those who were directly involved; it also concerns others who may benefit from lessons learnt.

##### Actual Utilization

Disseminating lessons learnt is one thing; seeing to it that these lessons are turned in to optimization and changes in preparations for the future and in responses during later incidents is what evaluation ultimately is supposed to contribute.

##### Interiorisation/anchoring

The optimizations mentioned above are even more successful if they once they have led to improved performance are made part of future protocols, structure and methods of disaster management.

## 4. Evaluation of crises, disasters and incidents in practice

### 4.1 Evaluation reports in the EMR

In the first part of this study the focus was on analysing the evaluation documents and published reports in the various parts of the EMR. In this section a brief impression is given of the kinds of evaluation documents found.

#### 4.1.1 Wallonia

On 1 September 2021, the Walloon Parliament decided to set up a parliamentary committee of inquiry. Its remit was to examine the causes and evaluate the management of the July 2021 floods in Wallonia. On 31 March 2022, after more than 120 hours of hearings, the committee's work was completed and no less than 161 recommendations were adopted by the plenary session of the Walloon Parliament.

As part of its mandate, the Committee was asked to examine the causes of these floods: assessing the existing tools and measures taken, within the sphere of competence of the Walloon prevention and anticipation of flooding:

- by assessing the context that led to these floods and, more specifically, the extent of the exceptional nature of the rainfall.
- by analysing the causes in relation to the realities and the environmental and land-use planning issues.
- The Commission also had to assess, within the Walloon Region's sphere of competence, the management at the time of the floods:
- by examining the measures taken at Walloon level as well as the interactions with the other competent authorities.
- by analysing the mechanisms (forecasts and meteorological models) for anticipating the threat of and flooding.
- by analysing the interactions, and in particular the operation warning systems and exchanges of information between the regional level, other levels of Belgian and European government involved.
- by analysing the management of tools, in particular water hydraulic infrastructures.
- by examining the management of the crisis in terms of evacuation and rescue operations.
- producing a chronology of the various decisions taken. Finally, based on its work, the Commission formulated recommendations based on its work, to respond to the challenges associated with the Walloon Region, to the challenges associated with the causes and management of flood risks in a context of climate adaptation.

The parliamentary inquiry, is very much focused on the facts, and the reconstruction of the course of events. It concerns the physical backgrounds, the mechanisms, the information exchange systems, the infrastructure. It is an in-depth analytical approach.

Also, In academic literature some evaluations were found. They tend to have a narrower focus on specific municipalities, or areas and with a focus on specific themes, such as resilience of communities, or the issues such as how to adapt the urban planning to flooding given the changing climate. Some studies concentrate on the role of volunteers, or on the role of spontaneous support and help by citizens.

The overall impression is that the evaluation mainly had a rather formal approach, including facts, and figures and technical details. It is all basically retrospective, and summative evaluation. Also, it is either predominantly political evaluation, or natural scientific and technical research.

#### 4.1.2. Germany

*Evaluation by the ministry for the Environment, Agriculture, Nature and Consumer Protection of the State of North Rhine-Westphalia.*

In Germany several evaluations were carried out. One evaluation was conducted by the Ministry for the Environment, Agriculture, Nature and Consumer Protection of the State of North Rhine-Westphalia. It led to recommendation including:

1. The introduction of flood forecasting systems for as many water bodies as possible
2. Standardisation of the flood information service (through a Land ordinance)
3. Updating flood risk management planning to include smaller water bodies.
4. Improvement of on-site flood protection
5. Review of the designated floodplains and consideration of a "climate surcharge"
6. Review and further development of reservoir management and reservoir safety
7. Strengthening the resilience of municipalities to local heavy rainfall events and floods
8. Improving cooperation between spatial planning, urban development and water management in flood protection
9. Strengthening self-help capacity and risk awareness
10. Establishing of a flood protection advisory board.

The evaluation report is named: learning from the flood<sup>12</sup>.

*The federal ministries of internal affaires, and the federal ministry of finance*

The federal ministries of internal affaires, and the federal ministry of finance, also evaluated the crisis. In the evaluation report several aspects of crisis management and flooding are covered<sup>13</sup>. The evaluation led to recommendations at federal, and state level. It also explicitly mentions the international dimension. However not as a dimension that was evaluated, but to engage colleagues across borders in a dialogue on the outcomes of national evaluations. On 28 September 2021, the annual lessons learned programme of the EU Civil Protection Mechanism took place (UCPM), a virtual meeting was held on the topic of "lessons learned from recent Floods in Europe". The evaluation focused on the civil protection aspects of the flood disaster.

Apart from these evaluations several studies were done in the areas of hydrology, meteorology, civil engineering. Also, a review-study was done to on flood risk management along German rivers. Besides evaluations of the crisis management a lot of research was triggered by the floods, including for instance studies on resilience.

The over all impression is that evaluation is often outsourced to external evaluators or done by authorities. Besides all of this, there is boost of academic studies and publications that may be seen

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<sup>12</sup> [https://www.umwelt.nrw.de/fileadmin/redaktion/PDFs/Pressemitteilung/2022-01-19\\_Arbeitsplan\\_Hochwasser.pdf](https://www.umwelt.nrw.de/fileadmin/redaktion/PDFs/Pressemitteilung/2022-01-19_Arbeitsplan_Hochwasser.pdf)

<sup>13</sup> [https://www.bmi.bund.de/SharedDocs/downloads/DE/veroeffentlichungen/2022/abschlussbericht-hochwasserkatastrophe.pdf?\\_\\_blob=publicationFile&v=1](https://www.bmi.bund.de/SharedDocs/downloads/DE/veroeffentlichungen/2022/abschlussbericht-hochwasserkatastrophe.pdf?__blob=publicationFile&v=1)



as a kind of evaluation, however not evaluations of the crisis mitigation process, but rather evaluations of the flood itself and its relation to climate change.<sup>14</sup>

#### 4.1.3 Flanders

In Flanders the flood crisis was evaluated by the Coordination Committee Water Policy. This is a brief overall evaluation done in a workshop with relevant expert participants, but with direct policy suggestions<sup>15</sup>. It resulted in a report with actions and recommendations in line with the three tracks of multi-layer water safety: prevention, protection and preparedness.

Also, the ministry of internal affairs in Flanders appointed an evaluation committee. This multidisciplinary Commission of Experts in Emergency Planning, and crisis management was established at the request of the Minister of the Interior<sup>16</sup>.

The establishment, and missions of this Commission are set out in the Royal Decree of 3 June 2022: "The mission of the Commission of Experts is to examine crisis management in Belgium and prepare a white paper, addressed to the Minister, with recommendations to improve emergency planning and crisis management."

Evaluation was in the hands of experts, and, or authorities and had a policy focus. However, it also included recommendation on training and development of crisis management actors in Flanders.

The evaluation in expert committees in dialogue on the essentials of the crises, its responses, mitigation and follow up, may be seen as a learning experience for those who are members of the committees. In fact, it is referred to as a learning evaluation, but the people actively involved in the crisis, are not included in this experience. That will require an additional dissemination and training effort in the future.

#### 4.1.4 The Netherlands

In the Netherlands various evaluations were found. One big evaluation as an overview of what had happened, the mechanisms at work and the impact the flood had on various domains of society.

*Hoogwater 2021 Feiten en Duiding. ENW-report*

The study was conducted by a broad consortium (TU Delft, Deltares, HKV Lijn in Water, VU Amsterdam, University of Utrecht, KNMI, WUR, Erasmus MC and University of Twente) commissioned by the Expertise Network for Water Safety (ENW)<sup>17</sup>. Waterboard Limburg and Rijkswaterstaat cooperated by providing information, supervising field visits and interviews, among other things. A flood affects the whole of society. Therefore, not only hydrological and civil engineering topics were

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<sup>14</sup> Ludwig, P., Ehmele, F., Franca, M. J., Mohr, S., Caldas-Alvarez, A., Daniell, J. E., ... & Wisotzky, C. (2023). A multi-disciplinary analysis of the exceptional flood event of July 2021 in central Europe—Part 2: Historical context and relation to climate change. *Natural Hazards and Earth System Sciences*, 23(4), 1287-1311

<sup>15</sup> [ciw-evaluatierapport-overstromingen-2021.pdf \(integraalwaterbeleid.be\)](https://www.integraalwaterbeleid.be/ciw-evaluatierapport-overstromingen-2021.pdf)

<sup>16</sup> SCHMITZ, O. et al. (2023). Witboek. Aanbevelingen tot verbetering van het crisisbeheer in België. Commissie van deskundigen inzake crisisbeheer.

<sup>17</sup> Hoogwater, T. F. F. F. (2021). Hoogwater 2021 Feiten en Duiding. *ENW report*.

considered, but also the social consequences of flooding, crisis response and health effects. Although it was an in-depth report still the consortium stated it was still under construction.

#### *Beyond the worst scenario. Learning evaluation of the flood, Safety Region Zuid-Limburg*

Apart from the above mentioned ENW evaluation, an other evaluation focussing on learning was given in the hands of an external agency (COT). This evaluation although, formally an external evaluation, may still be seen as an internal evaluation since the COT set up the evaluation in such a way that it consisted of so-called learning tables where people involved could share impressions ideas and identify lessons learnt<sup>18</sup>.

Apart from the over all evaluations of the work of the safety region Zuid Limburg, we also found examples of more local evaluation initiatives, such as an evaluation by Waterschap Limburg, named *Analyse Overstroming Valkenburg, Watersysteemevaluatie*<sup>19</sup>. This evaluation focused on the city of Valkenburg aan de Geul, a municipality situated in the south-eastern Dutch province of Limburg.

In addition, tot these evaluations, a book was produced with pictures of the flood, its impact and statements made by various actors involved in the process of fighting, and mitigating the flood and its consequences. The book shows with its pictures a realistic and moving impression. This book no doubt has evoked a lot of reflections on how things were, what rescuers could do and what not, and how to approach this process in case it would happen again. This is an example of a very informal, interactive evaluation, with an added value, primarily as follow up care, but also as a trigger for collective learning and team building.

## 4.2 Evaluation processes and consequences

In a series of interviews with several respondents who participated in crisis management during the floods at various levels and in various regions (Cf. appendix 1), questions were asked about the ways in which evaluation have been held. In this section these interviews are summarised as an addition to the previously presented overview of evaluation documents.

### Wallonia

The fact that a parliamentary inquiry was organised, implied that the evaluation had turned political. Consequently, evaluation was taken out of the hands of the ones involved. The evaluation was outsourced to the university of Liege, the study both described the problems and did suggestions for directions in which to move to be better prepared. The evaluation led to legal consequences. Evaluation was not primarily seen as a means for learning, but rather as an accountability tool. Little or no attention was paid to evaluating the international co-operation during the crisis, and after, at least not as part of the initial evaluations. Later, there have been meetings within EMRIC and at conferences where experiences and reports were shared and discussed. Evaluation evaluated the

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<sup>18</sup>. COT Instituut voor Veiligheids- en Crisismanagement. (2022). Veiligheidsregio Zuid-Limburg. Voorbij het ergste scenario. *Leerevaluatie hoogwater Veiligheidsregio Zuid-Limburg*.

<sup>19</sup> Van Heeringen, K.J., Asselman, N.E.M., Overeem, A., Beersma, J.J. & Philip, S. (2021). Waterschap Limburg *Analyse overstroming Valkenburg Watersysteemevaluatie* 11207700-000-ZWS-0014, Deltares.

flood, the measures, the impact, the damage, the causes, but never the performance of the people involved with the aim to improve their competences. Only generic conclusions concerning training in crisis management were drawn.

#### Germany

In the German region of the EMR, internal evaluations were held to identify what went well and what needed to be improved. The fact that there were formal external evaluations and more nonformal internal evaluations (usually conversations) enriched the insights in how the impact of the flood was mitigated and to what extent this had been according to plans, and to what extent the plans worked. Still, in the interviews the respondents stated that evaluation is not a very well embedded part of the work culture. There is always the risk of being held responsible.

Still informally people stated they had learned a lot from the crisis. They learned to extend their network of contacts, they learned about the value of weather forecasts and that they need to be even more local, they learned that co-operation between municipalities along the rivers needs to be intensified and to a higher extent standardised. They learned that for international communication to be optimized, the PARAGON system of information sharing may be a solution, but these are evaluation of things, of tools, of systems and of concepts, but not of professional competences and collective competence performance levels. That, however, is the way to turn the through studies and evaluations gained insights into improved practice.

#### Flanders

In Flanders, and more specifically in the province of Limburg, evaluations were held with each of twelve municipalities involved. This was done to discuss what had happened and to see what conclusions might be drawn, but also, and at first maybe even predominantly, this was done as a kind of aftercare, to allow the people involved to express and share the experiences they had been involved in during the floods. The evaluation did include. At political level it was decided not to have a parliamentary inquiry similar to the one in the Walloon area.

Cross border evaluation, or evaluation of cross border co-operation did not happen during the floods, EMRIC is not involved in the crisis cell. Communication was difficult. It is difficult since regions have different data, different approaches, different languages and work cultures. In case of floods the co-operation usually is bilateral instead of with all regions together. Still, it would be good to share information more intensively.

#### The Netherlands

In the province of South Limburg in the Netherlands. In the week after the flood already meetings were organised in a format of story telling. People were invited to tell what they had been through. This was seen as a possibility to issue steam and to get things off one's chest. Later, evaluation of multidisciplinary performance and of mono performance were held. This happened within the previously mentioned study done by COT<sup>20</sup>. The evaluation also included group sessions, learning tables, that allowed participants to engage in discussions and activities, to turn the experiences into ideas for future improvements, actions, precautions, equipment etc. Although this is a so-called learning evaluation it did not conclude anything on how evaluation had played a part in the process of crisis mitigation, nor in how learning could be made an integral element in future crisis, and

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<sup>20</sup> COT Instituut voor Veiligheids- en Crisismanagement. (2022). *Veiligheidsregio Zuid-Limburg. Voorbij het ergste scenario. Leerevaluatie hoogwater Veiligheidsregio Zuid-Limburg.*

disaster management. The experiences during the floods and afterwards, have led to specific lessons learned not only directly in crisis management, but also in how to communicate, with citizens, with the community and how to empathise with the sense of threat in the region, when it comes to changes in water levels. Of the evaluation reports public versions were made to share the content with each other and with the community. Thus, attempts were made to spread and share the lessons learnt from the floods not only to the politicians, the administrators, the volunteers and the professionals, but also to the press and the public to turn this into lessons shared by everyone, and to include also issues of resilience and spontaneous mutual help.

### 4.3 Overall impression

Overlooking the evaluation reports, publications, and reports of interviews, we see a rich galore of existing evaluation practices.

The most time was invested in systematic summative evaluations, most of the document found and evaluations people talked about focused on technical, weather, hydrology, environmental, damage, health, economical, urban planning and infrastructural issues.

Another kind of evaluations were the ones more oriented around after care, to allow people to share their often-awesome experiences, to share the pride of what they accomplished under the circumstances, to share grief if they themselves, relatives or friends were suffering losses.

In some cases, the role of volunteers, civil protection and spontaneous support by citizens had been included in the response was made part of evaluations.

Seldom, however, the process of Crisis management itself was systematically evaluated. And what's more, even more rare were instances in which the learning from the crisis itself was evaluated as a process. What did we do to gain as many new insights from this as we can, and what did we consecutively do to turn these new insights into new competences and elevate the level of performance already during, the crisis/disaster, and shortly after it and how will we see to it that what we have learned will be kept alive, brought to a higher level, and kept for future members of our units. Evaluations did not identify the available, or less available, competences of the ones involved. Evaluation too seldom did actively involve the crisis fighter themselves in the process of planning, designing, doing, and analysing the evaluation. The evaluations found were often done by external evaluators/experts/committees/researchers.

In response to the impression, we conclude that a shared model of self evaluation with a focus on professional development would be the direction in which to seek the added value necessary, to rebuild trust, a sense of competence, a team spirit and a culture of professionalism. Given the differences of the political landscapes and administrative structures, we do not see any solution in a "one model fits all" approach. We focus our efforts on a model to promote one model for evaluating the processes of crisis/disaster mitigation and management. Furthermore, we suggest this model to be a structure form which partners may pick and choose. It is a model that provides a structure, a language and a conceptual reference framework against which evaluative data may be assessed and compared. We hope in due time when experience in using this model will become more common it will lead to an ever-increasing level of understanding and of co-ordination. Also, we hope this model will add to the professional individual, and collective competences, and growth of all parties involved (politicians, administrators, professionals, volunteers and citizens). The model we refer to is included in appendix 3.

The presented model aims to turn evaluations into learning and/or development events. It will be meant to inspire people in their need to develop themselves in the work they do. To support these processes of learning and development, the model seeks use experiences of people involved in fighting a crisis to develop multiple scenario's, plans and protocols for the future. The model thus moves away from evaluation as a looking back event into a constructive future oriented set of activities in which people are made part of creating the future in stead of part of defending the past.

In evaluations and in further planning for the future it is important never to think in term of single scenarios. To keep an open mind, it is enriching to consider multiple scenario's The question is not how things went, and how well you responded? The question is rather, what other things could have happened, and what else could we have considered, and if so, what might be the best solution for these, and other future incidents?

Evaluations will be interactive; People will engage in evaluation activities together. They will not evaluate other, but they will together build the views, the strategies, the tools, and the protocols for future incidents when they will ben needed. The more active and the more interactive evaluations are the more people will learn from them. Given the culture of organisations in this field it is better to turn evaluation into construction work rather than into reflective work. Once involved in constructing the necessary tools, tactics, strategies, protocols and methods for the future, the reflection will come anyhow and be made operational on the spot. During crisis, however it may sometimes be very helpful to have moment of reflection included, to see whether you are still on track, whether you are contributing to the common goal, and whether you have kept other sufficiently informed, to allow for high levels of performance.

In between the constructive activities included in the evaluations, it is helpful to have such conversations too. By having these, people may cross check the things they develop and get inspired by the directions others have chosen. In having mutual conversations, it is valuable to include multiple disciplines and levels, to guarantee a rich, and supported output.

Last and certainly not least, the model aims to focus on the international communication and co-operation. It makes cross border co-operation an explicit part of evaluations.

In this study we were searching for an evaluation approach that would promote comparability of evaluations, and that would provide all partners with a terminology that may be used in planning evaluations, in executing evaluations and turning evaluation outcomes into enhanced practices.

At the same time the model should allow for partner regions to respect the traditions and work culture of the own region. That is why we propose a model that is flexible.

## 5. A model for the evaluation of disaster management

On the next pages a model is presented. The model is organised according to phases of crisis management. These phases must not be thought of as necessarily consecutive. They may (re-)appear at various moments in the process. When evaluating it is important to first identify which phases you wish to include in the evaluation you wish to plan. (It may not always have to be all phases). So first the phases you wish to evaluate must be selected.

After each phase in the model, a brief description is included of the conditions that need to be met to manage this phase. In the third column of the model evaluative questions are included, as questions that may be part of evaluating this phase (these are questions to be considered by the one who organises the evaluation; not necessarily the formulation of questions to be used in interview, group discussions, or in any other method instrument. The questions are meant to help evaluators plan an evaluation. The actual methods and instruments to be used to do the evaluation are part of the next chapter (Chapter 6.).

Key tasks	Key conditions	Evaluative items
<b>1: Recognition, meaning making</b> <i>Did leaders create conditions that facilitate early recognition and a sensemaking method?</i>	<b>1. Recognition</b> <i>Monitoring, early recognition (methods), alerting and alarming.</i>	<ul style="list-style-type: none"> <li>• Were relevant data available?</li> <li>• To whom were these data available?</li> <li>• Were they made available across borders?</li> <li>• Were people alerted across borders?</li> <li>• Were any guidelines shared on what to monitor specifically under the circumstances?</li> </ul>
	<b>2. Meaning Making</b> <i>Model, expertise, consultation structure.</i>	<ul style="list-style-type: none"> <li>• Could meaning be given to the available data?</li> <li>• Which previous experiences served as reference?</li> <li>• Who were involved in analysing and interpreting the data?</li> <li>• Did any co-operation in analysing and discussing the data occur?</li> <li>• Who were involved, and which expertise/discipline did they represent</li> </ul>
	<b>3. Making Critical Decisions</b> <i>Clear mandates, clear procedures/protocols, awareness of, and insight in problems</i>	<ul style="list-style-type: none"> <li>• What decisions were made?</li> <li>• Who were alerted/alarmed?</li> <li>• What emergency structure was established?</li> <li>• Which disciplines/services were involved</li> <li>• Which tasks were allocated to whom</li> </ul>
	<b>4. Co-ordination</b> <i>Overview of the operations, overview of the governance and political implications, sensitivity to societal and other needs</i>	<ul style="list-style-type: none"> <li>• How was information shared?</li> <li>• How was information shared across borders?</li> <li>• How was information shared at operational level?</li> <li>• How did this happen at governance/political level</li> </ul>
<b>2: Organising the response</b> <i>Did leaders carefully deliberate which decisions they should make, monitor coordination, and connections between critical systems?</i>	<b>5. Coupling &amp; Decoupling</b> <i>Systems knowledge, contacts, Clear view on impact and risks of the crisis</i>	<ul style="list-style-type: none"> <li>• What new partners were added while the crisis went on?</li> <li>• What next levels of impact were identified (flood, infrastructure, health, environment, economy, housing,)?</li> </ul>

<p><b>3: Communication with society</b>  <i>Did crisis leaders offer a clear interpretation of the crisis and explain how they intended to lead their community out of it, based on timely and correct information for dissemination to the public?</i></p>		
	<p><b>6. Giving Meaning and Perspective</b>  <i>Clear narrative, grounded scenario's, action perspectives.</i></p>	<ul style="list-style-type: none"> <li>• What narrative was developed and how did it evolve during the crisis?</li> <li>• What perspectives were given?</li> <li>• What scientific or other sources were used to explain the narratives and perspectives given?</li> <li>• What were people advised to do?</li> <li>• How were people involved in fighting the crisis?</li> <li>• Was any cross-border consideration included?</li> </ul>
	<p><b>7. Communication</b>  <i>Information position, media policies, including social media</i></p>	<ul style="list-style-type: none"> <li>• Was a relevant network of contacts available?</li> <li>• Did partner share information across borders?</li> <li>• Did they attune their communication with public and press?</li> <li>• How did social media function in these matters?</li> <li>• Were any attempts made to include social media?</li> </ul>
	<p><b>8. Attribution of Responsibilities</b>  <i>Overview of accountability processes and requirements, registration of the course of events, monitoring progress</i></p>	<ul style="list-style-type: none"> <li>• What data were gathered to account for the decisions made?</li> <li>• Who were seen as the main audiences to who accountability was required. What elements of international responsibility and accountability were included?</li> <li>• What aspects of accountability were included (safety and security of work/ money spent/ compliance to procedures/ legal liability)?</li> <li>• Hierarchical distribution of responsibilities and decision-making</li> </ul>
<p><b>9. Professional Learning</b>  <i>Monitoring progress and impact, reflection, cross border learning</i></p>	<ul style="list-style-type: none"> <li>• What was done to monitor the progress in mitigating the disaster/crisis?</li> <li>• Were any moments of reflection included?</li> <li>• Who took part and what were the outcomes, or conclusions?</li> </ul>	



<p><b>4: Organising the aftermath/follow-up</b>  <i>Did leaders try to present a transparent account of their (in)actions, allow for reflection on the effects of chosen courses of action, and actively involve themselves in crisis preparations?</i></p>		<ul style="list-style-type: none"> <li>• <b>Did these moments also occur across borders?</b></li> <li>• <b>How did the reflection affect the approaches chosen?</b></li> </ul>
	<p><b>10. Developing Resilience</b>  <i>Systems and vulnerabilities-analysis, Re-consideration and redefinitions of risks and responses</i></p>	<ul style="list-style-type: none"> <li>• <b>What was done to prevent a similar, or other kind of disaster in the future?</b></li> <li>• <b>Were any infrastructural, or technical measures taken?</b></li> <li>• <b>Were any training or exercising measures taken?</b></li> <li>• <b>Which policies have been redefined/ redirected</b></li> </ul>

## 6. Suggested evaluation activities.

In this chapter and more specific in the scheme below suggestions are included on how to organise the evaluations of the phases you wish to include in your evaluation. The activities suggested are included as active, interactive, constructive activities that promote learning and competence development among all who involved in managing/mitigating a crisis.

Phases:	Before	During	After
<p>Recognition</p> <ul style="list-style-type: none"> <li>• Group discussion in expert groups to validate indicators, criteria, signals, information categories, alarm levels.</li> <li>• Update predictive models.</li> <li>• Re- establish or update relevant networks of contacts.</li> <li>• Include the international perspective here.</li> </ul> <p>Meaning Making</p> <ul style="list-style-type: none"> <li>• Create, or update a list of relevant experts.</li> <li>• Collect lessons learnt from the past (during and after previous crises in own region, and elsewhere)</li> <li>• Make an overview of lessons from literature.</li> <li>• Create a set of useful models, tools, and methods.</li> <li>• Search for approaches that are internationally comparable, and compatible.</li> </ul> <p>Making Critical Decisions</p> <ul style="list-style-type: none"> <li>• Update networks of decision makers per level</li> <li>• Update relevant cross border connections (24/7)</li> <li>• Establish a data base of procedures and protocols on either side of the borders.</li> </ul> <p>Co-ordination</p> <ul style="list-style-type: none"> <li>• Create/update a list of relevant partner organizations, persons and mandates they have, per level of responsibility.</li> <li>• Add relevant ways and addresses to connect (phone, mail, other)</li> <li>• Identify a sequence of crucial moments of co-ordination (related to forecasts, how floods developed, the decisions to be made, public and press moments, predicted impact on down stream areas, etc.)</li> <li>• Identify ways information was, and might have been analysed, summarized, stored and made available.</li> <li>• Describe moments and modes to share information that allow for added value of the crisis management.</li> </ul>			

<p>Coupling and Decoupling:</p> <ul style="list-style-type: none"> <li>• Create a sequence of organizations (authorities, services, vital infrastructure, private companies etc.) and persons to be involved while the flood evolves. Discuss why to involve the identified organizations/persons at the distinguished points in time.</li> <li>• Mention reasons why to involve these actors (to help them, to have them help you, to attune the efforts, to get informed, or to inform, to get access to tools, equipment and support etc.)</li> <li>• Describe argument on what determined the choice of the moment to involve these actors?</li> </ul> <p>Giving Meaning and Perspective:</p> <ul style="list-style-type: none"> <li>• Outline the main narrative of the crisis, as provided to the public and press.</li> <li>• Describe in key words how “the story” evolved throughout the duration of the crisis (For instance shifting focus on survival, evacuation, infrastructure, health problems, environmental problems, economy issues, emotional well being etc.)</li> <li>• Reflect upon the sequence of crisis perceptions, and on the choice of moments to change the perspective and involve a wider circle of partners.</li> <li>• Create guidelines on the level at which messages and action perspectives given will have to be shared and attuned across borders.</li> </ul> <p>Communication</p> <ul style="list-style-type: none"> <li>• Determine how partners will have to share and discuss forecasts, data, measures, impact and follow up information.</li> <li>• What are essential items partners will have to communicate about (strategies and action perspectives)</li> <li>• Who are the (most important) partners to communicate with?</li> <li>• How does information (after sharing it with partners) need to be communicated internally in organizations</li> <li>• What media were, and will have to be used to communicate with the distinguished partners/audiences?</li> <li>• How were communications in social media included in the communication strategies and tactics of authorities and organizations?</li> <li>• Were citizens actively involved in communication?</li> </ul>			
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Attributions of Responsibilities

- Create an overview, or update an overview of key persons, organizations and bodies with their formal mandates.
- Specify the international interfaces and key persons involved there.
- Reconstruct the ways in which process information on crisis management and decision making was recorded, monitored analysed and stored.
- Does the information as stored allow for sufficient reconstruction of the processes to be accounted for, if not what should be added/changed?
- To what extent does the information as gathered and stored provide insight in the cross-border co-ordination and decision making? What is needed to properly account for the process?
- To what extent do the ways the course of crisis management was monitored, analysed and stored, show whether the course of event matches the procedures agreed upon in the EMRIC context.
- What were the elements that facilitated or inhibited the international dimension in crisis management?

Professional Learning:

- What were moment during the crisis on which new insights arose about how to approach the mitigation of the crisis?
- Were attempts made to share such new insights, if so when did that happen?
- What methods or activities were set up to promote learning among parties concerned (discussions, inquiries, story telling, analysis of pictures, recordings, news, or social media messages, peer interviews, news flashes, written impressions etc.)
- Make a re-construction of the course of events.
- Describe at what moments after the flood organizations may best reflect on the course of events.
- In what ways may lessons learned best be shared, reported on, or made public?
- Create a strategy together to promote cross border analysis, reflection and learning.
- Elaborate the strategy in specific plan on organizing such learning.

<p>Developing Resilience</p> <ul style="list-style-type: none"> <li>• What measures have been taken, or will be taken to try to avoid similar problems in future?</li> <li>• What plans are made as to how to strengthen artefacts, vital infrastructure, houses, etc.</li> <li>• Which of these plans were implemented thus far and to what extent?</li> <li>• Have any plans been developed to focus on competences in initial, in-service training, continuing professional development, and on the job exercises?</li> <li>• Has the public been approached to help them gain resilience in view of future floods/disasters, if so how was, is or will this be organized?</li> <li>• What has been done or will be done to further extent professional knowledge on floods and how to mitigate the consequences (expert analyses, evaluations, research, publications, scientific programmes, etc.)</li> </ul>			
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## Literatuuroverzicht Veiligheidsregio Z-I EMRIC Marhetak evaluatie hoogwater

- Ballegeer, S., D'Haeseleer, N., De Reuse, A. et al. (2022). *Spontane hulpverlening tijdens de overstromingen juli 2021*. Bachelorproef Sociaal-Agogisch werk, Hogeschool VIVES
- Becker, B., de Bruijn, K., & Slager, K. (2022). Und wenn der Regen woanders gefallen wäre? Das Waterbom-Experiment: Lernen vom Juli-Hochwasser 2021. *Nachhaltigkeit im Wasserbau-Umwelt, Transport, Energie*, (68), 17-26.
- Beerens, R. J. J. (2021). *Improving disaster response evaluations: Supporting advances in disaster risk management through the enhancement of response evaluation usefulness*. [Doctoral Thesis (compilation), Division of Risk Management and Societal Safety]. Division of Risk Management and Societal Safety, Faculty of Engineering, Lund University.
- Bierin hydrology, & Schyns (2022). *Rapport de la Commission d'enquête parlementaire chargée d'examiner les causes et d'évaluer la gestion des inondations de juillet 2021 en Wallonie*. Parlement Wallon. [http://nautilus.parlementwallon.be/Archives/2021\\_2022/RAPPORT/894\\_1.pdf](http://nautilus.parlementwallon.be/Archives/2021_2022/RAPPORT/894_1.pdf)
- Bouwmeester, J., ten Doeschot, F., Stel, M. et al. (2021). *Zelfredzaamheid en burgerhulp bij crises en rampen*. Universiteit Twente, I&O Research. <https://repository.wodc.nl/bitstream/handle/20.500.12832/3054/3056-zelfredzaamheid-en-burgerhulp-bij-rampen-en-crisisvolledige-tekst.pdf?sequence=1&isAllowed=y>
- Boverie, M. (2022). *Focus sur les inondations de juillet 2021*. Union des Villes et Communes de Wallonie / Fédération des CPAS. <https://www.uvcw.be/voirie/articles/art-7881> bibliografie
- Bundesamt für Umwelt BAFU (Hrsg.) 2016: Von der Risikoanalyse zur Massnahmenplanung. Arbeitsgrundlage für Hochwasserschutz-projekte. Bundesamt für Umwelt, Bern. Umwelt-Wissen Nr. 1606: 89 S.
- Civil-Military Cooperation Centre of Excellence. (z.d.). *Resilience through Civil Preparedness*. In *A CCOE Info Sheet*. <https://www.cimic-coe.org/resources/fact-sheets/resilience-through-civilpreparedness>. Pdf
- Cloquet, I. & Braekman, I. (2021). *Analyse van de spontane hulpverlening door vrijwilligers na de overstromingen van 14 juli 2021*. Burgerinitiatief "Hulp voor slachtoffers overstromingen Wallonië vanuit Vlaanderen".
- Commissariat spécial à la Reconstruction (2022). *1 an après les inondations : Bilan de la gestion post-inondations et continuité des reconstructions*. Wallonie, Commissariat spécial à la Reconstruction. <https://www.wallonie.be/sites/default/files/2022-7/Bilan%20complet%20CSR%2026%20juillet%202022.pdf>
- COT Instituut voor Veiligheids- en Crisismanagement. (2022). Veiligheidsregio Zuid-Limburg. Voorbij het ergste scenario. *Leerevaluatie hoogwater Veiligheidsregio Zuid-Limburg*.
- Courant, F., Biscay, J-F., Boutillet, D. et al. (2021). *Mission sur la transparence, l'information et la participation de tous à la gestion des risques majeurs, technologique ou naturels*. Ministère de la transition écologique <https://www.ecologie.gouv.fr/sites/default/files/RAPPORT%20FINAL%20CULTURE%20DU%20RISQUE%20JUN%202021-1.pdf>
- Dix recommandations des sinistrés au Parlement Wallon (2022)
- ESPON (2018). Inspire policy making by territorial evidence. Cross-border Public Services (CPS) Targeted Analysis. Final Report. Scientific Report.
- Gooijer, L., & Veiligheid, A. N. (2019). Geïntegreerde risicoanalyse Nationale Veiligheid.
- Gschrey, S. V. (2022). *The role of institutionalized cross-border cooperation in European transboundary crisis-responses: the case of euroregions along DE-NL border* (Master's thesis, University of Twente).
- Hochwasservorsorge in Deutschland (2002). Overstromingspreventie in Duitsland. *Leren van rampspoed*.
- Hoogwater, T. F. F. F. (2021). Hoogwater 2021 Feiten en Duiding. *ENW report*.

- Lernen aus dem Hochwasser: Umweltministerium legt Arbeitsplan Hochwasserschutz vor  
<https://kommunalberatung-klimaanpassung-nrw.de/> (2021)
- Instituut Fysieke Veiligheid (2021). *Grensoverschrijdende samenwerking bij rampen en crises. Een inventarisatie van mogelijkheden om de samenwerking te versterken*. Arnhem: IFV
- Klöpping, N. (2021). *Meerlaagsveiligheid uitgewerkt-een onderzoek naar de factoren die de uitwerking van meerlaagsveiligheid in de praktijk beïnvloeden*.
- Ludwig, P., Ehmele, F., Franca, M. J., Mohr, S., Caldas-Alvarez, A., Daniell, J. E., ... & Wisotzky, C. (2023). A multi-disciplinary analysis of the exceptional flood event of July 2021 in central Europe—Part 2: Historical context and relation to climate change. *Natural Hazards and Earth System Sciences*, 23(4), 1287-1311.
- Manandhar, B., Cui, S., Wang, L., & Shrestha, S. (2023). Post-Flood Resilience Assessment of July 2021 Flood in Western Germany and Henan, China. *Land*, 12(3), 625.
- Ministerie Infrastructuur en Waterstaat (2020). Landelijk Crisisplan. *Hoogwater en Overstromingen*. Departementaal Coördinatiecentrum Crisisbeheersing, Den Haag.
- Mohammed, M. J. (2022). *Flash flood modeling for geul catchment, considering different mitigation measures for July 2021 extrem rainfalls* (Master's thesis, University of Twente).
- NRC (2022) De Limburgse politie worstelt met zware misdaad criminelen. Zijn hier zo de grens over.
- Perosa, F., Seitz, L. F., Zingraff-Hamed, A., & Disse, M. (2022). Flood risk management along German rivers—A review of multi-criteria analysis methods and decision-support systems. *Environmental Science & Policy*, 135, 191-206.
- Projecten van de EMR van 01.01.2017 - 07.04.2022
- Routekaart Wallonië-Nederland: verdieping van de relaties tussen burens en vrienden. (2020)
- Saadi, M., Furusho-Percot, C., Belleflamme, A., Chen, J. Y., Trömel, S., & Kollet, S. (2023). How uncertain are precipitation and peak flow estimates for the July 2021 flooding event?. *Natural Hazards and Earth System Sciences*, 23(1), 159-177.
- Saurugg, H. (2022). Mehr als nur ein Stromausfall, W. Europa auf dem Weg in die Katastrophe!?. (researchgate.net)
- Schäfer, A., Mühr, B., Daniell, J., Ehret, U., Ehmele, F., Küpfer, K., ... & Kunz, M. (2021). Hochwasser Mitteleuropa, Juli 2021 (Deutschland): 21. Juli 2021—Bericht Nr. 1 „Nordrhein-Westfalen & Rheinland-Pfalz“.
- Task Force Fact Finding hoogwater 2021 (2021). *Hoogwater 2021: Feiten en Duiding*. Expertise Netwerk Waterveiligheid . <https://doi.org/10.4233/uuid:06b03772-ebe0-4949-9c4d-7c1593fb094e>
- Van Heeringen, K.J., Asselman, N.E.M., Overeem, A., Beersma, J.J. & Philip, S. (2021). Waterschap Limburg *Analyse overstrooming Valkenburg Watersysteemevaluatie 11207700-000-ZWS-0014, Deltares*.
- VAN HET, A. T. V., & BELGIË, C. I. (2023). Ter attentie van de minister van Binnenlandse Zaken. Veiligheidsregio Noord-Zuid Limburg. *Rampbestrijdingsplan Hoogwater Maas Limburg 2020-2023*
- Veiligheidsregio Zuid-Limburg – Samen Veilig – *Meerjarenbeleidsplan 2020-2023*.
- Veiligheidsregio Zuid-Limburg (2022) Als het water stijgt komt het beste in mensen boven. *Hoogwaterramp Zuid-Limburg, juli 2021*.
- Waterbeleid, C. I. OVERSTROMINGEN ZOMER 2021.
- Wolbers, J., Kuipers, S., & Boin, A. (2021). A systematic review of 20 years of crisis and disaster research: Trends and progress. *Risk, Hazards & Crisis in Public Policy*, 12(4), 374-392.

#### Duitsland:

BHKG:

[BHKG,NW - Brandschutz-, Hilfeleistungs- und Katastrophenschu... - Gesetze des Bundes und der Länder \(lexsoft.de\)](#)

Evaluatie Bund:

[https://www.bmi.bund.de/SharedDocs/downloads/DE/veroeffentlichungen/2022/abschlussbericht-hochwasserkatastrophe.pdf?\\_\\_blob=publicationFile&v=1](https://www.bmi.bund.de/SharedDocs/downloads/DE/veroeffentlichungen/2022/abschlussbericht-hochwasserkatastrophe.pdf?__blob=publicationFile&v=1)

Evaluatie NRW:

<https://www.land.nrw/media/25821/download>

Nederland:

Wet van de Veiligheidsregio's:

<https://wetten.overheid.nl/BWBR0027466/2023-01-01>

Rampenbestrijdingsplan Hoogwater Limburg:

[https://www.vrzl.nl/nieuws/rampenbestrijdingsplan-hoogwater-2022-2025#:~:text=Het%20rampbestrijdingsplan%20\(RBP\)%20Hoogwater%202022,mogelijk%20te%20maken%20en%20houden.](https://www.vrzl.nl/nieuws/rampenbestrijdingsplan-hoogwater-2022-2025#:~:text=Het%20rampbestrijdingsplan%20(RBP)%20Hoogwater%202022,mogelijk%20te%20maken%20en%20houden.)

Evaluatie Hoogwater VRZL:

<https://www.vrzl.nl/nieuws/dit-wat-wij-leerden-van-de-bestrijding-hoogwater-2021>

Evaluatie Hoogwater Rijkswaterstaat:

<https://www.rijkswaterstaat.nl/water/waterbeheer/bescherming-tegen-het-water/hoogwater-in-limburg-de-aanpak-van-rijkswaterstaat>

Evaluatie Hoogwater Waterschap Limburg:

<https://www.waterschaplimburg.nl/actueel/nieuws/@6942/leerevaluatie-waterschap-limburg>

België:

Wetgeving Noodplanning:

[http://www.ejustice.just.fgov.be/doc/rech\\_n.htm](http://www.ejustice.just.fgov.be/doc/rech_n.htm)

Dit is het meeste recente koninklijk besluit. In de eerste regels worden belangrijke voorgaande koninklijke besluiten en wetten genoemd die voor meer informatie geraadpleegd kunnen worden.

Evaluatie Hoogwater Vlaanderen:

<https://www.integraalwaterbeleid.be/nl/nieuws/downloads-van-nieuwsberichten/ciw-evaluatierapport-overstromingen-2021.pdf>

EMRIC Documenten:

Informatieuitwisselingsdocument

Nederlandse opschalingsstructuren: OCR reader

E-Learning EMRIC:

Duitsland:

[https://elo.brandweer.nl/Pages/View.aspx?cp=%2FCMS%2FVR%20Zuid-Limburg%2F80.%20Multi%2F08.%20EMRIC%2FV2%2F211213\\_VRZL\\_EMRIC\\_DE\\_SCORM2004](https://elo.brandweer.nl/Pages/View.aspx?cp=%2FCMS%2FVR%20Zuid-Limburg%2F80.%20Multi%2F08.%20EMRIC%2FV2%2F211213_VRZL_EMRIC_DE_SCORM2004)

Nederlands

[https://elo.brandweer.nl/Pages/View.aspx?cp=%2FCMS%2FVR%20Zuid-Limburg%2F80.%20Multi%2F08.%20EMRIC%2FV2%2F211213\\_VRZL\\_EMRIC\\_NL\\_SCORM2004](https://elo.brandweer.nl/Pages/View.aspx?cp=%2FCMS%2FVR%20Zuid-Limburg%2F80.%20Multi%2F08.%20EMRIC%2FV2%2F211213_VRZL_EMRIC_NL_SCORM2004)



## Appendix 2

### List of persons interviewed

Name	EMRIC partner/position
Francis Cloth	Fire zone commander German-speaking Community (B)
Petro Winkens	Deputy Chairman Safety Region South Limburg
Ralf Johnen	Command service at the Aachen Fire Brigade Professional Fire Brigade
Frank Wagemann	Volunteer Fire Brigade Kornelimünster Fire Brigade
Thomas Sprank	District Fire Chief City Region Aachen
Andreas Dovert	Project manager for the reorganisation of disaster control StädteRegion Aachen
Michel Carlier	Deputy chief of cabinet governor, District Commissioner. Emergency Planning & Crisis Management Limburg (B).
Didier Sorgeloos	Commissair divisionnaire - Governor's liaison officer, Services Federaux du Gouverneur de la Province de Liège
Leron Vos	Specialist Operational Preparation at Veiligheidsregio Zuid-Limburg, IM ROT during floods
Sarah Jürges	Department 22 Non-Police Hazard Prevention of the Cologne District Government
Silke Roemer	Head of the Public Order Office District of Heinsberg
Leon van Kalmthout	Barracks chief Maastricht-North and Meerssen
Eric Wagemans	Head of Incident Control at VRZL/ROL
Luc Valent	Strategic advisor to VRZL/ROL
Leon Houben	Director Safety Region South Limburg
Miriam van der Tang	Advisor Quality, Safety Region South Limburg
Mark Vos	Mayor of Riemst
Dr. Tim Güttemeier	Aachen City Region Council

## Appendix 3

### Interview protocol

Questions on evaluations, approaches, models, and tools used

#### **Generic**

- In what way were you involved in the evaluation of, or reflection on, flood crisis management?
- Did you play a role in international cooperation in this and in its international evaluation in a Euroregional context?
- Who are, or do you see as Key Persons in solid evaluation(s)?
- What documents (plans, reports, notes) do you consider important in this context and for our research?
- In your opinion, what were the main topics/learning points of evaluation, or of knowledge development resulting from it?

#### **Specific**

- Which specific evaluation activities did you participate in?
- At what stage was this (during the crisis, immediately after, or later)?
- Who led the evaluation?
- Which activities were part of the evaluation?
- What specific methods, tools were used?

#### **Impact/impact questions**

- What was done with the results of the evaluation?
- Were activities organised to enhance its impact?
- Can you mention actions taken as a result of the evaluation?
- Who benefited and who did not?
- Did previous evaluations play a role in this evaluation(s)?
- What are the key points that were raised in report(s)?
- What did you miss?

#### **Issues and suggestions**

- What would you like to see improved?
- What do you think is a successful element of the current evaluations?
- Do you have any comments/suggestions on how evaluations as such could be improved?
- Do you have specific comments/suggestions on how to improve the impact of the evaluations?

