Analysis of disaster management structures and cross-border collaboration in the Benelux and its bordering countries
Acknowledgements

After having completed my Bachelor of Science at Maastricht University in 2016, it is a wonderful moment for me to complete my Master of Science in Healthcare Policy, Innovation and Management with this thesis. I would like to take the opportunity to express my gratitude to my supervisors who guided me with their knowledge and experience through this project. My university supervisor Thomas Krafft and external supervisor Marian Ramakers offered me a perfect mixture between space and guidance to write this thesis. Moreover, I would like to thank Kim Worseling for sharing her feedback, knowledge and experience with me during the thesis writing process. Furthermore, I would like to thank all institutions that participated in this study through interviews or their support.
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List of acronyms

BENELUX Belgium, The Netherlands, Luxembourg
COD Departmental Operations Centre (F)
COGIC Interministerial Crisis Management Operations Centre (F)
COPI Local Command Post (NL)
COZ Zonal Operations Centre (F)
DOS Rescue Operations Director (F)
EC European Commission
EU European Union
GBT Municipal Policy Team (NL)
GRIP Coordinated Regional Incident Control Procedure (NL)
HCNP High Commission for National Protection (L)
ICE Incident Evaluation Cell (L)
IROT Interregional Operational Team (NL)
NOVI Mass Casualty Plan (F)
ORSEC Organization of the Civil Security Response (F)
PCC Communal Command Post (PCC) (F)
PCO Operational Command Post (PCO) (F)
PCS Communal Protective Plan (F)
RBT Regional Policy Team (NL)
ROT Regional Operational Team (NL)
UNISDR United Nations Office for Disaster Risk Reduction
WHO World Health Organization
Abstract

Background: Disasters are the cause for a high number of fatalities, injuries and economic losses. As disasters are characterized by overwhelming a society’s resources to cope with the incident, effective disaster management is essential to the reduction of the vulnerability of a society to hazardous risks. Preparedness and response measures enacted by governments do not only include measures on national level, but also in a cross-border setting, as disasters do not know borders.

Objective: This study aims to analyse the disaster management structures of Belgium, The Netherlands, Luxembourg (Benelux) and France as well as the current state of cross-border cooperation in the field of disaster management in the study region. Additionally, the underlying obstacles that hinder cross-border cooperation and the functioning of these structures are explored. The future of cross-border cooperation and the role the Benelux and EU could play in this cooperation are investigated in the scope of this study.

Methods: A qualitative research approach is used to answer the research questions of this study. In addition to a literature review, fourteen semi-structured expert interviews were conducted and complemented with data collected by the Benelux Union through open questionnaires.

Results and Conclusion: Cross-border cooperation in disaster management exists under different forms in an unstructured fashion in the study region. Despite efforts to standardize agreements and cooperation forms, every region has their own approach to cooperation. These differences are due to specific characteristics (population density, risk areas) of each region and the factors influencing the willingness and ability to cooperate. The main obstacles to cross-border cooperation include insufficient knowledge on reciprocal systems, lack of structure in cross-border agreements, lack of concrete operational cross-border plans, lack of joint exercises and communication problems.
1. **Introduction**

This first section will provide background information on the reasons for research, the research setting and research goals and questions.

1.1. **Background**

In recent times, the European Union (EU) has been struck by multiple terror attacks, causing mass casualties and war injuries, often spread over multiple sites. Examples of these include the 2015 Paris and 2016 Brussels terror attacks. These large-scale incidents receive a lot of media coverage, and emphasize the need for well-functioning emergency systems, especially in times of disasters.

Disasters have been occurring for a long time, our own existence could be seen as the result of a disaster, the big bang (Pinkowski, 2008). The Latin terms “dis” and “astro” are at the origin of this word, and refer to an incident linked to an unfortunate astrological configuration (Coppola, 2011). Before explaining the term disaster in more detail, one has to consider the terms hazard, risk and vulnerability. According to the World Health Organization (WHO) (2007, p.7), a hazard is ‘any phenomenon that has the potential to cause disruption or damage to people and their environment’, while vulnerability is defined as ‘the degree to which a population is unable to anticipate, cope with, resist and recover from the impact of a disaster’. A risk is proportional to the hazards a population is exposed to, and the vulnerability of the latter to those hazards (WHO, 2007). Hence, disasters are the result of a hazardous risk turning into reality (Coppola, 2011).

According to Tulchinsky and Varavikova (2014), disasters are classified into two main categories: Natural disasters are incidents caused by a natural phenomenon, like earthquakes, floods, storms, and others. Man-made disasters are defined as catastrophic events caused by human activity, be it voluntary or non-voluntary. Examples of man-made disasters include war, industrial accidents, terrorist attacks and others. Moreover, a further classification divides disasters on a time scale; sudden and slow onset (Tulchinsky and Varavikova, 2014). The United Nations Office for Disaster Risk Reduction (UNISDR) notes that not every incident qualifies as a disaster, but it is defined as ‘a serious disruption of the functioning of society, causing wide-spread human, material, or environmental losses which exceed the ability of the affected society to cope using only its own resources’ (UNISDR, 2007, pp. 12). According to this definition, only incidents overwhelming the response capacity qualify as disaster (Coppola, 2011).

In the WHO European region, 2,202 disasters have been documented between 1990 and 2012, causing 192,006 fatalities, 47,785,865 affected citizens and an economic loss of 298,830,395 USD (WHO, 2013). As reported by Coppola (2011), the number of disasters is rising, while the number of deaths is decreasing. This is explained by enhanced
emergency management and a multitude of preparedness measures allowing societies to lower their vulnerability to hazards and to cope better with disasters when they occur (Coppola, 2011). In line with the former, the WHO (2007) confirms that emergency preparedness initiatives are essential to reduce the impact of disasters and that it is an essential part of guaranteeing the right to life with dignity, which is the responsibility of states.

1.2. Disaster Management Cycle

The disaster management cycle, depicted in figure one, is a visual representation of the continuous and inter-related actions required in the management of disasters (Carter, 2008). The activities to be taken include prevention, mitigation and preparedness before the disaster impact; once the disaster has happened, response, recovery and development are the subsequent phases, which eventually again lead to the first three measures. This study will only focus on preparedness and response measures, highlighted in figure one, which stand in relation to disaster management structures.

![Figure 1: The disaster management cycle (Carter, 2008)](image)

According to Carter (2008), preparedness includes all measures facilitating governments, rescue organizations and the society as a whole to be able to respond efficiently and effectively in case a disaster strikes. Examples of preparedness measures are operational and updated counter-disaster plans, emergency communications and corresponding exercises and tests (Carter, 2008). In continuation of preparedness, response measures take place right after a disaster has happened and focus on saving life and managing the immediate effects of the incident (Carter, 2008).
### 1.3. Disaster Management Structures

As disasters have extensive negative effects on the functioning of society, the government should bear the main responsibility for disaster management, while cooperating with non-governmental organizations, private stakeholders and foreign partners (Carter, 2008). According to Carter (2008), it is essential for national governments to clearly define disaster management policy and have arrangements on all levels of government and society in place, to be able to respond adequately to the threat of disasters. This process includes the identification of threats, the effects the latter would have on the community and an evaluation of existing resources required for the response to the threat (Carter, 2008). A key aspect of this process is to have organizational arrangements in place to prepare, respond and recover from disasters, which are in balance with other national policies (Carter, 2008).

In case of international incidents requiring rescue efforts from multi-national rescue forces, functional mutual-aid agreements had to be in place before a disaster strikes (Edwards, 2009). Factors to be taken into account for such agreements include liability issues, financial issues and the need for regular multi-national exercises on the management, coordination and operational level (Edwards, 2009).

As stated by Carter (2008), in case of disasters, the coordinating institution has to at all times be able to keep track of resources needed as a consequence of the disaster and react appropriately to these needs; this situation is called operational coherency. A loss of operational coherency can consequently lead to serious disruptions in rescue operations.

### 1.4. Research Setting

This study focusses on the disaster management structures and cross-border cooperation in this field in the geographical region of the Benelux States (Belgium, The Netherlands, Luxembourg) and bordering countries. Due to vastness of the region and word count restriction, this study will only cover the Benelux countries and France. However, to ensure completeness of the analysis, the Western border along the Benelux states will be covered by another author. The complete study region is visualized in figure two.

![Fig. 2: The study region (Wikia, n.d.)](image)

The disaster management structures under analysis include those of ambulance services, rescue services and firefighters, while those of police and army are excluded. This
exclusion criterion is necessary to reduce the vastness of this topic and because this study takes place in the scope of projects focusing on ambulance, fire and rescue services. Moreover, the focus of this study is on the strategic coordination and management of disasters and not on the operational work of rescue forces at the incident site, as there is a need for scientific data on this vital part of disaster management. This study takes place in the scope of a number of projects. Firstly, the Benelux Union’s working group ‘Senn-Secours’, which includes representatives on ministerial level from Belgium, The Netherlands, Luxembourg and the German federal state of North-Rhine-Westphalia (NRW), currently analyses the different fire rescue and ambulance systems. This study will contribute to this effort by contributing data concerning the different systems and current cross-border cooperation in the field of disaster management. Secondly, the results of this study will later be used in the scope of the EMRIC cooperation. EMRIC stands for Euregio Meuse-Rhine Incident control and Crisis management. EMRIC is a cooperation between all public partners in the Euregio Meuse-Rhine, that are legally responsible for ambulance care, firefighting, technical assistance and/or disaster management (EMRIC, 2016). The EMRIC partners include the following public entities: In the Netherlands the 'Veiligheidsregio Zuid-Limburg', 'GGD Zuid-Limburg’. In Germany the Region of Aachen (Stadt Aachen, Städteregion Aachen, Kreis Heinsberg, Kreis Düren, Kreis Euskirchen). In Belgium the Province of Liège and its rescue zones II and IV, the Province of Limburg and zone Oost-Limburg. EMRIC is an example of active cooperation in a part of this study’s geographical region. Hence, this study will expand the knowledge on similar projects in the rest of the study region. Thirdly, this study contributes to a new project in the Euregio Meuse-Rhine, the International Knowledge and Information Centre (IKIC), which aims to improve cross-border collaboration by educating professionals about the different national emergency response systems in the Euregio Meuse-Rhine. The results of this study will help improve knowledge on disaster management structures in this region and is developed in close collaboration with EMRIC.

1.5. **Research goals and questions**

This study aims to analyse the disaster management structures of the Benelux States and France as well as the current state of cross-border cooperation in the field of disaster management in this region. Moreover, the underlying obstacles that hinder cross-border cooperation and the well-functioning of these structures are explored. Additionally, this study analyses what potential impact the recently published White Paper on the future of Europe (European Commission (EC), 2017) and its hypothetical five strategies would have on cooperation for cross-border disaster management. This study uses the same research questions used in the partner study being conducted simultaneously.
What are the differences in disaster management structures in Belgium, the Netherlands, Luxembourg and France, and how does this affect cross-border collaboration?

a. Which national and regional policies regulate disaster management in the study region?

b. What cooperation forms exist between the different responsible authorities?

c. What are barriers regarding cross-border cooperation in disaster management?

d. What role can the Benelux and NRW region take in cross border cooperation in the field of disaster management?

e. What impact could the five strategies on the future of the EU have on cross-border cooperation in the field of disaster management?

1.6. **Research approach**

This explorative study uses a qualitative research approach to gain more knowledge in the field of disaster management structures. Consequently, the research paradigm to be applied in this study is constructivism. According to Polit and Beck (2012), this paradigm is based on the assumption that the researcher and those involved in the affected field of study, can best expand knowledge by working closely together. Moreover, subjective interaction between study participants and researcher are considered to be of importance to gain knowledge and understand the findings of the data collection (Polit & Beck, 2012).
2. Theoretical Considerations

The following section elaborates on the theoretical background and the newly developed conceptual model to be used in the scope of this project.

2.1. Theory

This study uses the Resource Dependence Institutional Cooperation (RDIC) Model developed by De Rijk et al. (2007) to analyse the differences and similarities in crisis management structures and the impact of the latter on cooperation. According to De Rijk et al. (2007), this model is considered a valid instrument for the analysis of cooperation between multiple actors or groups. As depicted in figure three, the model constitutes of three levels of analysis.

![Diagram of RDIC Model](image)

*Figure 3: The Resource Dependence Institutional Cooperation Model (De Rijk, van Raak, & van der Made, 2007)*

Level one examines cooperation, which is defined as intentional acts or agreements of different groups about a common cause. The number and variety of agreements as well as the practical application of the latter are evaluation factors that determine the level of cooperation (de Rijk et al. 2007). Level two identifies the willingness and ability to cooperate as influential factors for cooperation. Finally, the level two factors are influenced by a third level, which incorporates goals, perceptions, dependence, legislation and resources (de Rijk et al., 2007). These factors not only set the foundation for the willingness and ability to cooperate, but also the degree to which cooperation has developed. The different factors in this model are backed by four sociological theories: the network theory, organizational behaviour theory, resource dependence theory, and the new institutional theory.
2.2. Conceptual Model

The RDIC model has been adapted to the context of cooperation in the field of rescue services, to better serve the context of this study. As depicted in figure four, the newly created model, hereinafter called the cooperation circle, places cooperation in the centre. The model assumes that cooperation is not a linear process, but rather a continuous circle. This idea is inspired by the EMRIC cooperation in the Euregio Meuse-Rhine, which is an example of continuous work to improve and expand cooperation in the field of firefighters and ambulance services.

![Figure 4: The Cooperation Circle adapted from the RDIC-Model (De Rijk et al., 2007)](image)

It is assumed that the factors dependence, need, goals and perception influence the willingness to cooperate. If the latter is established, the focus is on the harmonization and reduction of barriers in terms of legislation, system characteristics, languages and finance. Legislation includes barriers in national laws that hinder cooperation from being established. The factor system characteristics describes issues such as communication tools, qualification levels of personnel, material and work processes. Moreover, language differences can create an important barrier in cross-border cooperation. Finally, financing is an important factor, as reimbursement has to be clarified in case of cross-border missions. After these factors are clarified, the cooperation circle assumes that ability to cooperate is established and cooperation is henceforward established. However, even if cooperation is reached, continuous work on all factors in this circle is required to keep collaboration at a high level.
3. Research Methods

The following part provides information on the research design, data collection and data analysis of this proposed study.

3.1. Research Design

This study aimed to explore the current situation of disaster management structures, as well as the underlying obstacles that hinder cooperation and the well-functioning of these structures. Considering the explorative nature and research aim of this study, a qualitative research approach was used. According to Polit and Beck (2012), explorative studies are most effectively executed using qualitative methods, as they try to gain a holistic understanding of a phenomenon and its related factors.

This study made use of triangulation, which is defined as data collection based on multiple sources with the goal to establish the truth and eliminate bias (Polit & Beck, 2012). The used methods include a narrative literature review and semi-structured interviews. The literature review aimed to determine and understand the current situation of disaster management structures in the study region, while the semi-structured interviews were used to complement and confirm the data collected through the gathering of relevant literature. Especially the current situation of cross-border cooperation and the understanding on facilitators and barriers for cooperation in the field under investigation were explored through the semi-structured interviews.

3.2. Data Collection and Sampling

As suggested by Polit and Beck (2012), data collection in qualitative research allows a certain flexibility, but at the same time requires preparedness to prevent problems from arising during the study period. Hence, the following section elaborates on the different data collection methods and how the chosen design tried to prevent problems from arising.

3.2.1. Literature Review

Data on current policies and cooperation arrangements were collected using a narrative literature review performed using a systematic approach. The disaster management structures in the different countries were assessed using databases of the respective national governments, namely ‘gouvernment.lu’ for Luxembourg, ‘gouvernement.fr’ for France, ‘belgium.be’ for Belgium and ‘government.nl’ for the Netherlands. References and documents found on those official government websites were used within a snowball sampling method to gather more data. With this sampling method, references and sources found in literature pieces were used to find more relevant documents and data. Furthermore, websites and databases of regional, provincial and supranational authorities were used to gather additional documents of relevance for this proposed study. This
included databases of the United Nations (UN), World Health Organization, EU and other relevant institutions. Additionally, relevant scientific literature was retrieved from the databases PubMed, Science Direct and SpringerLink to complement the reports and documents with scientific research on the subject. The search strategy is displayed in Table one.

**Table 1: Search Strategy**

<table>
<thead>
<tr>
<th>Search Terms:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Disaster Management OR Crisis Management</td>
</tr>
<tr>
<td>2. Disaster Management OR Crisis Management AND Cross-Border OR Collaboration</td>
</tr>
<tr>
<td>3. Plan Catastrophe OR Plan Nombreux Victimes OR Catastrophe OR Plan Crise</td>
</tr>
<tr>
<td>4. Crisisbeheersing OR Crisis</td>
</tr>
</tbody>
</table>

**AND**

<table>
<thead>
<tr>
<th>Belgium</th>
<th>France</th>
<th>Luxembourg</th>
<th>Netherlands</th>
<th>Benelux</th>
</tr>
</thead>
</table>

**Inclusion Criteria:**

- Publication Date: >2000
- Language: English, French, German, Dutch, Luxembourgish
- Systematic Reviews, Narrative Literature Reviews, Official Reports and Documents
- Disaster Management Structures

**Exclusion Criteria:**

- Publication Date: <2000 & Language Criteria not met
- Non-scientific publications and non-official or unknown sources
- Daily Collaboration in Emergency Care

**3.2.2. Semi structured Interviews**

Semi structured interviews were chosen for triangulation, by providing an additional data collection tool. This ‘ensures that the researcher will obtain all information required, while at the same time it gives the participant freedom to respond and illustrate concepts’ (Morse & Field, 2002, p. 94).

The interviewees were recruited using a purposive sampling strategy, partly by using the network of the EMRIC Bureau and SENN Secours. In a second stage, more contacts were gathered using snowball sampling, by asking the first set of interviewees for more contacts. The interviewees were contacted via a standardized email in two languages, French and Dutch, which included information on the subject of the study. In total, 18 experts were contacted via e-mail, resulting in a positive response of twelve willing to participate. According to the national disaster management structures, the author targeted
to include experts from all relevant levels. This resulted in interviews in Belgium on national level and provincial level; the level of the “zones de secours” had been covered in the Benelux questionnaires. In the Netherlands, interviews were conducted on the level of the “Veiligheidsregios”. In Luxembourg, interviews were directed on national level at two different institutions. The Belgian-French border zone was mainly covered by using data collected in interviews with Belgian experts located in this border region. The program manager of a regional Interreg project, located in France, completed the interview questionnaire in writing. Table two gives an overview of the interviewees.

Table 2: Interview Details

<table>
<thead>
<tr>
<th>Country</th>
<th>Institution</th>
<th>Interviewee</th>
<th>Interview Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luxembourg</td>
<td>High Commission for National Protection</td>
<td>Guy Bley</td>
<td>✓ In person</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Myriam Heirendt</td>
<td>✓ In person</td>
</tr>
<tr>
<td></td>
<td>Ministry of Interior – Rescue Services Department</td>
<td>Michel Feider</td>
<td>✓ In person</td>
</tr>
<tr>
<td>Belgium</td>
<td>Province of Luxembourg</td>
<td>Anne Dalemans(^1)</td>
<td>✓ Written</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Michaël Gemenne(^1)</td>
<td>✓ In person</td>
</tr>
<tr>
<td></td>
<td>Province of Namur</td>
<td>Jean-Yves Deffrasne(^1)</td>
<td>✓ In person</td>
</tr>
<tr>
<td></td>
<td>Province of Hainaut</td>
<td>Céline Delarue(^1)</td>
<td>✓ Written</td>
</tr>
<tr>
<td></td>
<td>Province of Liège</td>
<td>Anne Dassy(^1)</td>
<td>✓ In person</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Valentin Niselli(^1)</td>
<td>✓ In person</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Olivier Lambiet(^2)</td>
<td>✓ In person</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Holger Pip(^3)</td>
<td>✓ In person</td>
</tr>
<tr>
<td></td>
<td></td>
<td>L. Scevenels(^4)</td>
<td>✓ In person</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>Veiligheidsregio Zeeland</td>
<td>Jeroen Zonnevijl</td>
<td>✓ Skype</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Patrice Troost</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Veiligheidsregio Midden- en West Brabant</td>
<td>Cindy Brandon de Jongh</td>
<td>✓ Skype</td>
</tr>
<tr>
<td></td>
<td>Veiligheidsregio Brabant Zuid-Oost</td>
<td>Kees van Bockel</td>
<td>✓ In person</td>
</tr>
<tr>
<td></td>
<td>Veiligheidsregio Zuid-Limburg</td>
<td>Jan-Willem Gootzen</td>
<td>✓ In person</td>
</tr>
<tr>
<td>EU</td>
<td>European Parliament</td>
<td>MEP Charel Goerens</td>
<td>✓ Telephone</td>
</tr>
<tr>
<td>Euregio Meuse-Rhine</td>
<td>EMRIC</td>
<td>Marian Ramakers</td>
<td>✓ In person</td>
</tr>
<tr>
<td>Anonymous</td>
<td>National Institution</td>
<td>Interviewee 1</td>
<td>✓ In person</td>
</tr>
<tr>
<td>France</td>
<td>EMIZ 59</td>
<td>Chloé Deruyter</td>
<td>✓ Written</td>
</tr>
<tr>
<td>TOTAL</td>
<td>14 Institutions</td>
<td>21 stakeholders</td>
<td>14 interviews, 3 written</td>
</tr>
</tbody>
</table>

\(^1\) SPF(Service Public Fédéral) Intérieur  \(^2\) SPF Santé  \(^3\) Zone VI  \(^4\) Zone II
Eight interviews were conducted in person at the participant’s workplace. Due to scheduling issues, two interviews were conducted via the software Skype and three additional interviews were filled out by the interviewees via e-mail conversations. According to Meho (2005), interviews via e-mail constitute a new, efficient and effective qualitative data collection strategy, especially in combination with a mixed mode interviewing strategy. Additionally, this method gives access to stakeholders which would otherwise not be accessible due to time, geographical and financial limitations (Meho, 2005).

Prior to the interview, interviewees were provided with an explanation on the topic of this study and the interview questions, allowing the interviewees to prepare themselves beforehand. The language of the dialogue could be freely chosen by the interviewee, resulting in interviews in English, French and Luxembourgish. The questionnaire, which is available in appendix one, was split into three parts: National Disaster Management Structures, Cross-Border Cooperation and European Union. This structure allowed a flexible adaptation to the expert’s field of knowledge in case only one part had to be covered. The questionnaire was based on the Benelux questionnaire and was evaluated by two experts with an academic background.

At the beginning of the interviews, interviewees were again informed about the thesis topic in detail and this study’s approach to the expert interviews. Additionally, they were asked to fill out an informed consent form, which gave them the option to either be anonymised or not, to allow the recording and storage of an audio file and to get the opportunity to see the transcript. In case of skype interviews, informed consent was given orally and in the case of written interviews, informed consent was given in writing. The interviews were recorded using a microphone and a laptop.

3.2.3. Benelux Questionnaires
The Benelux working group “Senn Secours” recently collected data from its members via an open questionnaire about disaster management structures. The questionnaire was created by the Senn Secours working group. The general secretariat of the Benelux Union sent the document to the responsible national authorities, which transferred the questionnaires to the competent regional stakeholders. In Luxembourg, the questionnaires were filled out on the municipal level, in Belgium on the level of “zones de secours” (rescue zones) and in the Netherlands on “Veiligheidsregio” (Safety Zones) level. This data was assessed within this study. The original questionnaire can be found in appendix two.
3.3. **Data Analysis**

Data analysis in qualitative research aims to organize, structure and interpret the collected data and is considered to be more challenging than data analysis in quantitative research (Polit & Beck, 2012). The following section will give insight into the approaches for data analysis for the used methods.

3.3.1. **Literature Review**

Data was assessed in a systematic way. The selected documents were first generally screened and relevant sections were selected. The latter were analysed in depth and important parts were highlighted using colour coding. Finally, the highlighted parts were used in the results part of this study.

3.3.2. **Semi-Structured Interviews**

The interview recordings were transcribed on the same day of the interview, to ensure accuracy of the transcript. As agreed upon with the interviewees, the full transcripts are only available in the appendix of the secret version of this study, which is not accessible to the public. All interviewees have been provided with an electronic copy of the transcript and had the opportunity to rectify the content if necessary. Moreover, in the scope of member check, interviewees were sent a copy of the thesis before publication to ensure the authenticity of the translations and representation of their quotes in the context of this study. An open coding strategy was utilized to establish codes while reading the transcripts in depth. The codes were selected to ensure that the research aim and questions were appropriately covered. After completing the first phase of coding, axial coding was used to match codes created in the initial phase. The data of the coding is represented in coding tree, available in appendix three. This manual coding strategy was selected in favour of using an electronic software, as it better fitted the experience of the author.

3.3.3. **Benelux Questionnaires**

The questionnaires of the Netherlands were already analysed by the Dutch authorities and transferred to the author in the form of a structured table. The questionnaires from Luxembourg and Belgium were analysed by the author of this study. The document was assessed using open and axial coding; the results of this analysis were presented in the form of a table and is available in appendix four.

3.4. **Validity and Reliability**

The careful description of the research design, data collection and analysis aims to increase the reliability of the study and would allow future researchers to replicate this study. The interviewees were free to choose the language of the interview, which allowed them to
express themselves easily and allow an extensive and complete data collection. Moreover, this study used the method of triangulation to ensure the collected data is authentic and credible. According to Polit and Beck (2012), authenticity and credibility are two out of five criteria that establish trustworthiness of qualitative studies; other factors include dependability, transferability and conformability. Triangulation was executed using multiple methods, including a literature review, semi-structured interviews and the Benelux questionnaires, to ensure the data collected is valid and reliable. Additionally, member checks were used to increase internal validity and the conformability and authenticity of the semi-structured interviews. Conformability ensures that the presented data is an objective interpretation of the interviewees words, and not a subjective interpretation by the interviewer (Polit & Beck, 2012). In line with this, interviewees had in a first phase the possibility to assess the transcript of the interview to assure the correct transcription of the recorded audio file. In a second phase, the interviewees had the opportunity to read the parts of the study in which quotes or data of the interview are used and correct or accept the translation and interpretation.
4. Results
In this section, the findings of the literature review, expert interviews and Benelux questionnaires are described based on the research aim and questions of this study.

4.1. National Disaster Management Structures
This first part of the results section will elaborate on the national disaster management structures, its functioning and legal basis.

4.1.1. Belgium
The Kingdom of Belgium has a multi-level administrative structure, with the Federal State, Communities and three regions at the macro level, enacting an equal legal power with differing responsibilities (Belgian Federal Government, 2017). On the meso level, the ten provinces are situated, followed by the municipalities at the micro level. According to the EC (2015), the municipal, provincial and federal level are involved in disaster management.

Legal Basis
The main laws regulating and describing the disaster management structures in Belgium are described in table three. The main legal basis is formed by two laws, namely the Royal Decree of January 31st of 2003 and the Royal Decree of February 16th of 2006. The 2006 decree elaborates in a detailed way on the disaster management structures, emergency plans and responsibilities in place, depending on which emergency phase is activated (Moniteur Belge 2, 2006). In line with this, the 2003 decree describes the disaster management structures specific to situations in which national coordination is required (Moniteur Belge 1, 2003).

Due to changes in the Belgian rescue system, the two laws have been partly updated by the royal decree of the 10th of June 2014, detailing the role of the newly created rescue zones [zones de secours], particularly from an operational point of view (Moniteur Belge 4, 2014). This law is subsequently based on the law of the 15th of May 2007 on civil security, reorganizing the Belgian rescue system and establishing the rescue zones. Additionally, the civil safety law elaborates on emergency intervention plans and the roles of provinces and municipalities in this matter. Lastly, the royal decree of the 1st of May 2016, a reaction to the terror attack in Brussels in 2016, sets down the special procedure in case of terror incidents (Moniteur Belge 5, 2016).
Table 3: Legal Basis in Belgium

<table>
<thead>
<tr>
<th>Legal Basis</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Royal Decree of the 31st of January 2003</td>
<td>Law describing the emergency plans for crisis incidents requiring coordination on national level</td>
</tr>
<tr>
<td>Royal Decree of the 16th of February 2006</td>
<td>Law on the emergency plans and intervention</td>
</tr>
<tr>
<td>Law of the 15th of May 2007</td>
<td>Law on civil safety and creation of rescue zones</td>
</tr>
<tr>
<td>Royal Decree of the 10th of June 2014</td>
<td>Law updating the 2006 law on the role of the new rescue zones in disaster management</td>
</tr>
<tr>
<td>Royal Decree of the 1st of May 2016</td>
<td>Law on the national emergency plan in case of terror attacks</td>
</tr>
</tbody>
</table>

**Functioning**

The Belgian disaster management system functions in three phases and on three government levels. In phase one, coordination of disaster management is to be found on municipal level, with the local mayor in charge. The subsequent phase involves coordination on provincial level by the governor, while in phase three, coordination is transferred to the national level, with the Minister of Interior in command (Moniteur Belge 1, 2003).

However, this ascending phase system is inversed in case of nuclear or radiological events, incidents involving multiple provinces or certain sensitive government institutions (Moniteur Belge 1, 2003). The law of 31st of January 2003, lays down the procedure for the immediate activation of the federal phase, bypassing the usual ascending phase system in these cases (Moniteur Belge 1, 2003). In non-nuclear incidents, the decision which phase to activate depends on the scale of the incident, the geographical range, the number of victims and the resources needed (Moniteur Belge 2, 2006).

The decision to activate phase one, is taken by the mayor of the affected municipality, while the governor of the affected province can decide to phase up to the provincial phase if multiple municipalities are involved or the scale of the incident requires provincial disaster management (Moniteur Belge 2, 2006). Finally, the federal phase can be activated by the minister of the interior according to pre-specified criteria, namely the involvement of two or more provinces, lack of resources on provincial level, high number of victims, threat to national security and others (Moniteur Belge 1, 2003). The strategic coordination role is subsequently taken by either the mayor, governor or minister of interior, as displayed in figure five below.
As can be seen in figure five, the management body differs per phase, but is responsible for the same pre-defined tasks, the five disciplines, executed according to the emergency planification. Each discipline includes a number of tasks and is organized according to pre-determined operational plans. The disciplines are composed of assistance operations, medical, sanitary and psychosocial assistance, police, logistical support and information (EU, 2015). The emergency planification concerns all phases and includes plans for monodisciplinary interventions of one discipline and multidisciplinary plans for disasters requiring multiple disciplines to be executed (Moniteur Belge 2, 2006). The 2007 law fixes the responsibility on the creation of a general emergency intervention plan for the provinces and municipalities, which both have to create these plans and have to be approved by the governor for towns and the minister of the interior for provinces (Moniteur Belge 3, 2007). Additionally, internal emergency plans exist for specific high-risk companies and institutions. The Belgian law defines emergency situations, where the above procedure is executed, as 'any incident which causes or is likely to cause damaging consequences for the social life, like a serious problem of public security, a serious threat against the life or health of people and/or important material interests, and which require coordination of the disciplines in order to eliminate the threat or to limit the malign consequences.' (Moniteur Belge 2, 2006, art 6, § 2).

4.1.2. France

The French Republic is structured into multiple administrative levels, namely the municipal, departmental, regional and the national level (Assemblée Nationale, 2016). In addition to this structure, the defence and rescue zones [zone de défense et de sécurité]
are of importance to disaster management in France as an intermediary between the ministry of the interior at national level and the regions and departments (Préfecture Grand-Est, 2016). The defence and rescue zones, departments and regions are lead by prefects (Direction de l'information légale et administrative, 2012).

**Legal Basis**

The laws regulating disaster management in France have been reformed over the last decade. Currently, the most important legal document is the Decree on the ORSEC plan of 2005, describing in detail the disaster management structures and other aspects of the ORSEC plan (Legifrance, 2005). In addition, the law 2004-811 on the modernization of civil security (Legifrance, 2004) and the Decree 2005-1156 on the communal protective plans are relevant in the field of disasters (Legifrance, 2005). An overview of the legal situation in France can be found in table four below.

**Table 4: Legal Basis in France**

<table>
<thead>
<tr>
<th>Legal Basis</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decree 2005-1157</td>
<td>Decree describing and regulating the disaster management under the ORSEC plan</td>
</tr>
<tr>
<td>Law 2004-811</td>
<td>Law on the modernization of Civil Security</td>
</tr>
<tr>
<td>Decree 2005-1156</td>
<td>Decree on the communal protective plans</td>
</tr>
</tbody>
</table>

**Functioning**

In France, the management of disasters is based on the ORSEC mechanism, which stands for Organization of the civil security response [Organisation de la Réponse de Sécurité Civile]. This mechanism organizes the coordination and implementation of all actions contributing to protection of the population and is an umbrella mechanism containing multiple operational plans for different incident types and requirements (Direction de la Sécurité Civile, 2013).

Depending on the severity of the incident, the responsibility of disaster management is found on different governmental levels. As displayed in figure six, if the disaster only affects one municipality and can be dealt with using available resources, the mayor is in charge. The Communal Command Post directs the forces located on site at the Operational Command Post [PCO= Poste de commandement opérationel] (Direction de la Sécurité Civile, 2013). On the municipal level, operations get directed according to a communal protective plan which differs per municipality and risk profile of the area. (Direction de la Sécurité Civile, 2013).
In phase one, the mayor has the position of rescue operations director [DOS = Directeur des Opérations de Secours], who's role is to direct and coordinate the actions of all involved, insure and coordinate the communication and inform the administrative superiors (Direction de la Sécurité Civile, 2013). If the incident overwhelms local resources or affects multiple municipalities, the prefect of the department takes over the DOS position and responsibilities and manages the incident through the Departmental Operations Centre [COD = Centre Opérationnel Départemental], which directs the PCO according to ORSEC plans. In the logic of the ascending system, if the department’s resources are overwhelmed, it is the prefect of the defence and security zone and the Zonal Operations Centre [COZ = Centre Opérationnel de Zone] which manage the disaster. Finally, at national level the minister of the interior would be in charge through the Interministerial Crisis Management Operations Centre [COGIC = centre opérationnel de gestion interministérielle des crises] (Direction de la Sécurité Civile, 2013). An example of an ORSEC plan is the mass casualty plan (NOVI plan), which sets down the procedure to be followed by the DOS in directing the rescue efforts in case of a high number of victims (Ministère de l'Intérieur, 2016).

4.1.3. Luxembourg

The Grand-Duchy of Luxembourg is divided into 12 cantons and 105 municipalities (Service Information et Presse, 2015), with the national level being solely of importance for disaster management.
**Legal Basis**

Disaster management in Luxembourg is based on the law of the 23rd of July 2016, creating the High Commission for National Protection [HCPN= Haut-Commissariat à la protection nationale], which has as a mission the initiation, conduct and coordination tasks related to disaster management and to ensure that decisions are executed (Legilux, 2016). In addition, the law of the 12th of June 2004 describes the role of the Rescue Services Administration [Administration des Services de Secours] in disaster management, which concerns mainly operational aspects (Legilux, 2004). The concrete functioning of disaster management structures, roles and operational aspects are laid down in multiple operational plans per incident type; the basic structure remains the same. The plan most applicable to this study is the mass casualties plan, decreed by the Government Council on July 24th, 2015 (HCPN, 2015).

**Table 5: Legal Basis in Luxembourg**

<table>
<thead>
<tr>
<th>Legal Basis</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Law of the July 23rd, 2016</td>
<td>Law on the creation the High Commission for National Protection</td>
</tr>
<tr>
<td>Law of the June 12th, 2004</td>
<td>Law on the creation of the Rescue Services Administration</td>
</tr>
<tr>
<td>Mass Casualty Plan (July 24th, 2015)</td>
<td>Description of disaster management and operational aspects of rescue efforts in case of incidents involving mass casualties</td>
</tr>
</tbody>
</table>

**Functioning**

In Luxembourg, the mass casualties plan describes the activation procedure, coordination and operational aspects in case of disasters (HCPN, 2015). The management of disasters is located in all cases on national level, with the only difference in the activation and supervision of the crisis cell (HCPN, 2015).

![Diagram](Figure 7: The functioning of the Luxembourghish system)
As can be seen in figure seven, it is the director of the Rescue Services Administration who triggers the mass casualty plan after a call indicating a relevant incident received by the dispatch centre CSU 112. The latter also alerts the Incident Evaluation Cell [ICE= Cellule d’évaluation de l’incident], composed of experts from the Rescue Services Administration, Police, the Ministry of the Interior and the High Commission for National Protection. This cell initially assesses the severity of the incident and determines whether a crisis situation is present and coordination by the Prime Minister is required (HCPN, 2015).

A crisis under the mass casualty plan is defined as ‘any event which, by its nature or effects, threatens the vital interests or essential needs of all or part of the country or population, which requires that urgent decisions be taken and that the actions of the Government and agencies, departments and bodies connected with the public authorities be coordinated on a national and international level if required’ (HCPN, 2015, p.6). In case the ICE determines a crisis situation, the high commissioner for National Protection recommends to the Prime Minister to activate and preside the crisis cell. Moreover, in case of terror incidents, the VIGILNAT plan managing terror situations is applicable (HCPN, 2015). The activation and supervision of the crisis cell is in the responsibility of the Minister of Interior for all other incidents involving mass casualties and not constituting a crisis as by the definition above (HCPN, 2015).

The crisis cell’s mission is to ‘initiate, coordinate and monitor the execution of all the measures intended to deal with the crisis and its effects in order to return the situation to normal’ (HCPN, 2015, p.7). Additionally, the crisis cell reports its decisions to the government for approval before communicating them to the operational command post on site. Finally, the communication and information cell is responsible for external communication (HCPN, 2015).

4.1.4. The Netherlands

According to the EC (2015), 12 provinces and 431 municipalities currently constitute the Netherlands. Additionally, the country is divided into twenty-five security regions, which play a pivotal role in disaster management (European Commission, 2015).

Legal Basis

Roles, responsibilities and other aspects of disaster management in the Netherlands are described in the Safety Regions Act [Wet veiligheidsregio's] (Ministry of Security and Justice, 2010). This law establishes the safety regions and elaborates on the mission, responsibilities and roles of the different stakeholders involved in managing disasters.
**Functioning**

Disaster management structures in the Netherlands are determined in the coordinated regional incident control procedure [GRIP=Gecoördineerde Regionale Incidentbestrijdings Procedure]. This procedure is followed in any type and scale of disaster and follows an ascending level structure (Institut Fysieke Veiligheid, 2014). The Dutch disaster management plan differentiates the source area, which is defined as the place of incident and the the effect area, which are areas that are or could be concerned by the incident (Institut Fysieke Veiligheid, 2014). The GRIP levels range from local disasters, GRIP 1, to national disasters, GRIP 5. If at a source area multiple rescue disciplines and structural coordination between those involved is required, a local command post [COPI=commando plaats incident] is set up at the incident place. The person in charge of the COPI is a COPI leader (Institut Fysieke Veiligheid, 2014). As soon as additional structural coordination in the effect area is needed, the disaster management system gets levelled up to GRIP 2. Additionally to the COPI, a regional operational team [ROT= regionaal operationeel team] is set up, with a regional operational leader (Institut Fysieke Veiligheid, 2014).

If the incident is threatening the safety of larger groups of the population and administrative coordination and important decisions are to be made, the level raises to GRIP 3. In this case, a municipal policy team [GBT=gemeentelijk beleidsteam], chaired by the affected mayor, is set up in addition to the ROT and COPI. (Institut Fysieke Veiligheid, 2014). Incidents that affect more than one municipality, get levelled up to GRIP 4, where the regional policy team [RBT= regionaal beleidsteam] takes over the work of the GBT. The RBT is chaired by the chair(wo)man of the safety region. The law on safety regions sets down minimum standards of the members of the different coordination teams (Institut Fysieke Veiligheid, 2014).

![Figure 8: The functioning of the Dutch system](image)
As can be seen in figure eight, GRIP 5 involves multiple safety regions, in which case all RTBs coordinate rescue efforts in their region, while one of the ROTs will take over the lead of the overall rescue operations. The coordinating safety region, which is usually the region encompassing the source area of the incident, will have a coordinating operational leader, who manages the communication between the different operational leaders in other regions. If needed, an additional interregional operational team (IROT) can be put into place (Institut Fysieke Veiligheid, 2014). According to Gootzen (personal communication, May 24th, 2017), the GRIP State [Rijk] level, in which the national government would have to agree on all actions taken on the ground, due to national security threats, has been abolished in October 2016.

The Dutch safety regions act defines a disaster as a ‘serious accident or other incident whereby the lives and the health of many people, the environment or significant other material interests have been harmed or are threatened to a serious degree. Coordinated deployment of services or organisations from various disciplines is required to remove the threat or to limit the harmful consequences’ (Ministry of Security and Justice, 2010, p. 60).

4.2. Cross-Border Cooperation

This part will explore the current state of cross-border cooperation in the four border zones of the study region. Information in this chapter is based on data collected through semi-structured expert interviews, Benelux questionnaires and documents provided by different government stakeholders.

4.2.1. Belgian-French Border

The 620 km border between Belgium(B) and France(F) stretches from the North Sea to Luxembourg (SDIS 59, 2017). On the Belgian side, two regions, namely Wallonia and Flanders, four provinces and seven rescue zones [zones de secours] are located (Belgian Federal Government, 2017). In France, two defence and rescue zones, namely the defence and security zone north and defence and security zone east and six departments stretch along the Belgian border (Legifrance, 2015).

Agreements

Cross-border cooperation in case of disasters is regulated by a convention between the governments of Belgium and France of the 21st of April 1981, which is supplemented by two regional agreements with the Belgian provinces of Hainaut (August 30th, 1999) and West-Flanders (October 15th, 1999) (Deruyter, personal communication, April 3rd, 2017). Moreover, a regional agreement signed on the 9th of December 1997 between the Belgian
province of Namur and the French Ardennes department exists (Deffrasne, personal communication, May 19th, 2017). The 1981 bilateral convention regulates that each state shall grant the neighbouring country cross-border assistance in case of disasters. Additionally, financial agreements, regulation of medical drugs, responsibilities and border crossing procedures are elaborated on (Legifrance, 1984). The responsible institution to request assistance on national level is the Minister of the Interior of the affected country, while in the border zone the French departmental prefect or the Belgian governor are in charge (Legifrance, 1984). The regional agreements clarify responsibilities on regional level and include further details and plans specific to the different regions.

**Regional Projects and current cooperation state**

In the Belgian-French border region, two Interreg project concerning disaster management have been identified. The 2009-2012 Apport project included the geographical territory of the Belgian Province of Hainaut and a number of departments of the defence and security zone north in France (Van De Vloet, 2014). The goals of this project included the optimization of intervention and coordination conditions at disaster sites in the project region by harmonizing the emergency plans and alert procedures (Apport, 2013). As the result of this project, a common risk map of the border zone was developed, which is expected to improve the work of rescue forces. Moreover, a common multidisciplinary training centre for rescue forces of both countries has been established. At the end of the project plans existed to establish a bilateral liaison team of fire fighter officers, which aims to facilitate the supervision of foreign rescue forces and the information flow to the operational centres on both sides of the border (Apport, 2013). Whether or not this has been established was not reported.

The follow-up project of Apport is the Interreg 2016-2020 Alarm Project, which covers in comparison to the latter almost the complete border region (SDIS 59, 2017). This project aims to develop an operational cross-border collaboration on the levels of risk analysis, planification and crisis management. Additionally, it is intended to improve communication and collaboration in daily operations to enhance the collaboration in crisis situations. Disaster management is specifically mentioned as one of the focal points by a joint risk management and the creation of a joint information exchange platform, accessible to stakeholders on both sides of the border. This platform will include information and maps of risk sites and allow information exchange for operational disaster management (SDIS 59, 2017).

Another focal point is the creation of a joint disaster management plan, which includes the identification of cross-border risks and corresponding operational plans. In the scope of Alarm, it is planned to create and sign a new bilateral framework agreement on civil security between the governments of France and Belgium (Deruyter, personal
Meetings between officials from both countries take place at least once per month, while practical trainings of disaster scenarios are planned to take place during the project. Additionally, courses and awareness actions directed at elected officials and rescue forces intend to develop a common culture of cross-border assistance (Deruyter, personal communication, April 3rd, 2017).

In addition to this project, good contact between the governor of the province of Namur (B) and the prefect of the department of Ardennes (F) has been in place for a long time (Gemenne, personal communication, May 19th, 2017). The two cross-border partners also consult each other for the creation of their respective emergency plans and organize exercises every four years (Gemenne, personal communication, May 19th, 2017). Collaboration is especially strong in the field of preparedness for nuclear incidents, as a French nuclear power station (Chooz) is located right at the border to Belgium. In this scope, detailed plans for disaster management, exchange of liaison officials and information management exist, which are also applicable to other kinds of disasters through the 1997 regional agreement (Gemenne, personal communication, May 19th, 2017). In the province of Luxembourg, good contacts exist between authorities, in particular with the French departments of "Meuse" and "Meurthe et Moselle" (Dalemans, personal communication, July 4th, 2017). This cooperation has not yet been formalised in an agreement, but an operational convention for urgent medical aid exists. Meetings between the different partners take place on a regular basis (Dalemans, personal communication, July 4th, 2017).

4.2.2. Belgian-Luxembourgish Border

The Belgian-Luxembourgish border is 148 km long, with the Belgian provinces of Luxembourg and Liège being located in this region. The border with the province of Liège in the northern tip of Luxembourg is only 17 km long (Ullrich, GR-Atlas: Zone frontière Belgique / Luxembourg, 2009).

Agreements

Cross-border disaster management is mainly regulated through the accord of the 15th of February 2015, ratified through the law of 31st of August 2016 by the Luxembourgish government (Legilux, 2016). This agreement has not yet been ratified by the Belgian government (Feider, personal communication, June 9th, 2017). This framework agreement regulates the mutual assistance in case of disasters or other incidents, in particular the dispatching of human and material resources and the exchange of information and expertise. Moreover, the possibility to create additional operational agreements on regional level is given (Legilux, 2016). However, a regional agreement is currently not planned (Feider, personal communication, June 9th, 2017).
Regional Projects and current cooperation state

According to Feider (personal communication, June 9th, 2017), the need for cooperation is quite low in this region, due to the low population number and the absence of risk zones. Consequently, contact to the regional Belgian authorities is practically non-existing, while a good contact exists with the national level, for example with the National Crisis Centre (Feider, personal communication, June 9th, 2017). In line with this, Lambiet (personal communication, May 29th, 2017) confirms that as there is little between Luxembourg and Belgium, collaboration is low in that region. If a need would arise, a pragmatic solution is usually chosen (Feider, personal communication, June 9th, 2017).

4.2.3. Luxembourgish-French Border

This border has a length of 73 km and is situated between Belgium on the west, and Germany on the east side (Ullrich, 2009). The French defence and security zone East and the départements of “Meurthe et Moselle” and “Moselle” are located at the border with Luxembourg (Legifrance, 2015).

Agreements

On the 26th of May 2015, a new agreement on assistance and cooperation in the domain of civil security has been signed on national level between France and Luxembourg (Legilux, 2016). This framework agreement also opens the opportunity to conclude specific agreements on regional level with the defence and security zone East (Feider, personal communication, June 9th, 2017). A draft agreement has already been created by Luxembourgish authorities and will be discussed with the French colleagues (Feider, personal communication, June 9th, 2017). The 2015 agreement covers among others the prevention of risks and the mutual assistance in case of disasters and major accidents (Legilux, 2016). Furthermore, the assistance includes human and material resources, information exchange and technical expert advice, while also promoting periodic meetings and contact (Legilux, 2016). This agreement has been ratified by the Luxembourgish government with the law of the 12th of April 2016 on the agreement on civil security between Luxembourg and France and has to be still ratified by the French authorities this year (Feider, personal communication, June 9th, 2017).

Regional Projects and current cooperation state

In contrast to the Luxembourgish-Belgian border, contact between the Luxembourgish and French authorities is very good at national level and even better at regional level. This is explained by the characteristics of this border region, which has a higher population density, more risks and more commonalities (Feider, personal communication, June 9th,
Furthermore, there is a high willingness to cooperate in the region, even though the tendency to use own resources first is still existent and could be seen as a natural reflex (Feider, personal communication, June 9th, 2017). In the scope of the Greater Region, a working group used for exchange purposes meets twice a year; further contacts exist on a more operational level. Moreover, a joint GIS-platform (Geographic Information System) is currently being created (Feider, personal communication, June 9th, 2017).

4.2.4. Belgian-Dutch Border

The Belgian-Dutch border stretches from the North Sea to Germany and has a length of 451 km (Mission Opérationnelle Transfrontalière, n.d.). On the Dutch side, the following “Veiligheidsregio’s” [Safety Regions] are located (from North to South): “Zeeland, Midden-en West Brabant, Brabant Zuid-Oost, Limburg Noord” and “Limburg Zuid” (Nationale Coördinator Terrorismebestrijding en Veiligheid, n.d.). On the Belgian side, the provinces of “West- and Oostvlaanderen, Antwerpen, Limburg” and “Liège” can be found (Belgian Federal Government, 2017).

Agreements

The main bilateral framework agreement on national level between Belgium and the Netherlands is the agreement of the 14th of November 1984 on cooperation in the field of prevention of disasters and disaster management (Ministerie van Binnenlandse Zaken, 1984). This agreement regulates mutual assistance in case of disasters and elaborates on formalities and rules for the provision of help by foreign rescue forces. Additionally, this agreement stimulates cooperation in joint trainings, information management, the creation of further regional agreements and more detailed operational plans (Ministerie van Binnenlandse Zaken, 1984). A number of supplementary agreements on national level based on this the 1984 convention exist (EMRIC, 2017).

On regional level, a number of agreements have been identified: The “Veiligheidsregio Zeeland” (NL) is currently negotiating an agreement with the Belgian provinces of East and West Flanders and Antwerp (Troost, personal communication, June 14th, 2017). The goal of this agreement is to join all three existing agreements with the individual Belgian provinces into one joint agreement (Troost, personal communication, June 14th, 2017). Between the “Veiligheidsregio Midden- en West Brabant” (NL) and the province of Antwerp (B) an agreement on disaster management has been signed on the 9th of February 2017 (Brandon, personal communication, June 13th 2017). This agreement sets the basis for cooperation in the field of disaster management and is complemented by detailed operational plans (Brandon, personal communication, June 13th 2017).

The “Veiligheidsregio Brabant Zuid-Oost” (NL) and the provinces of Antwerp and Limburg (B) have an agreement on disaster management, including procedures on how to organize
the help so that the two different structures “can find each other” (van Bockel, personal communication, May 31st, 2017).

In the Euregio Meuse-Rhine, the most recent regional agreements on disaster management have been signed on the 29th of November 2013 (EMRIC, 2017). The agreement on close collaboration in the field of disaster prevention and crisis management has been signed by the Dutch “Veiligheidsregio’s Zuid-Limburg, Limburg-Noord, Brabant-Zuidoost” and the Belgian province of Limburg; the same agreement has been signed in a separate document between the “Veiligheidsregio Zuid-Limburg” and the province of Liège (B) (EMRIC, 2017). In contrast to this, the “Veiligheidregio Limburg Noord” (NL) indicated in the Benelux questionnaires that no formal regional agreements exist in the field of disaster management (Benelux, 2017). The Euregio Meuse-Rhine agreements describe the functioning of cross-border collaboration in the field of disaster prevention and disaster management and response, in particular on information exchange, joint risk assessment, creation of operational plans and joint exercises (EMRIC, 2013).

**Regional Projects and current cooperation state**

The province of Zeeland collaborates in the scope of the MIRG-EX (Maritime Incident Response Groups) with fire and rescue services from Belgium, France and the UK. This collaboration stems from the Interreg Project MIRG-EU and contains joint training exercises at sea for maritime incident response on ships (MIRG-EX, 2015). Collaboration in the region itself functions as an informal organization, which is chaired by a board composed of the governors of the provinces of Antwerp, East- and West Flanders (B), the Queen’s Commissioner of Zeeland, the chairman of the board of mayors of Zeeland and the mayors of border municipalities. In addition to annual board meetings, a number of working groups for different subjects meet during the year (Zonnevijlle, personal communication, June 14th, 2017). Moreover, the “Veiligheidsregio Zeeland” and the Belgian authorities consult each other transparently for the creation of crisis plans, so that these plans function with each other and allow a response in case of cross-border effects (Troost, personal communication, June 14th, 2017). Joint exercises also take place in this border region (Zonnevijlle, personal communication, June 14th, 2017). In case of a disaster, it is planned to exchange information managers to ensure a good information exchange flow (Zonnevijlle, personal communication, June 14th, 2017).

Collaboration between the province of Antwerp (B) and the “Veiligheidsregio Midden- en West Brabant” is estimated by Brandon (personal communication, June 13th 2017) as quite intensive, with an annual strategic meeting, the “commissie grensoverschrijdende samenwerking” (Commission for cross-border collaboration), where all the mayors of border municipalities and heads of emergency services take part. This commission creates an annual activity plan, which sets the agenda for other meetings during the year. Projects
and subjects are discussed at least twice a year by assigned officials from municipalities, dispatch centres, emergency, fire and ambulance services, communication, military and police officials (Brandon, personal communication, June 13th 2017). Moreover, a three-year cycle of exercises is in place in this border region, which includes all levels, namely exercises in a table top setting with municipalities and disaster management structures, dispatch centre exercises and operational exercises with a “real life” scenario (Brandon, personal communication, June 13th 2017). The exchange of liaison officials between the disaster management structures is also arranged (Brandon, personal communication, June 13th 2017). In the border region between the “Veiligheidsregio Brabant Zuid-Oost” (NL) and the provinces of Antwerp and Limburg (B), meetings take place a few times a year and joint exercises are also part of the collaboration. A number of procedures and plans regulate the operational details and the exchange of liaisons also takes place in this border region in case of disasters. The “Veiligheidsregio Limburg Noord” indicates in the Benelux questionnaire that cross-border cooperation is not necessary, and only maintains a few informal contacts across the border (Benelux, 2017).

According to Ramakers (personal communication, May 24th, 2017), cross-border cooperation has been taking place since a long time in the Euregio Meuse-Rhine, in particular in the field of disaster management. Concrete operational plans for disasters, namely the EUMED plan for urgent medical help, the EMRIC plan for fire and technical assistance and the information exchange plan (Ramakers, personal communication, May 24th, 2017). Contact between the partners is very frequent in the scope of the EMRIC cooperation. The steering group composed of directors and decision makers of all partner organizations define the strategic outline of the cooperation and create a multi-annual plan (Ramakers, personal communication, May 24th, 2017). In addition to this group, 14 additional working, focus and project groups exist, which meet on a regular basis; the complete EMRIC structure and examples of working groups are displayed in figure nine (Ramakers, personal communication, May 24th, 2017). Exercises used to take place irregularly, but are now being formalised by the steering group into a two-year exercise cycle, where the EMRIC, EUMED and information exchange plans will be practised and evaluated (Ramakers, personal communication, May 24th, 2017).
4.3. Obstacles for Cross-Border Cooperation

This chapter will elaborate on the obstacles for cross-border cooperation in the field of disaster management, identified in semi-structured expert interviews and government documents provided by the interviewed government officials.

Administrative Structures

Interviewees in all regions have elaborated on minor and major difficulties with administrative structures in the different countries. As an example, Lambiet (personal communication, May 29th, 2017) describes that their “SPF Santé Publique” (Belgian Ministry of Health), which organizes urgent medical aid, is confronted to difficulties negotiating matters with foreign institutions, as their competences are spread over multiple government entities (Lambiet, personal communication, May 29th, 2017). Additionally, it is very difficult to get in contact with one’s exact counterpart from a foreign country, as competences also differ from country to country; this also applies to the EMRIC cooperation in the Euregio Meuse-Rhine (Lambiet, personal communication, May 29th, 2017). In consonance with the latter, Dassy (personal communication, May 29th, 2017) confirms that the Belgian structures are complicated, but adds that those of other countries are complicated as well. On the Dutch side, Brandon (personal communication, June 13th, 2017) and Zonnevijlle (personal communication, June 14th, 2017) express difficulties to understand the functioning of the Belgian government. Brandon (personal communication, June 13th, 2017) adds that as soon as higher levels of government get involved, for example the Dutch national level, they tend to get lost and take more time. But as long as cooperation stays small and practical, cross-border collaboration works fine (Brandon, personal communication, June 13th, 2017).
Legal Differences

According to Deffrasne (personal communication, May 19th, 2017), the biggest obstacle they encounter are legal problems. An example includes agreements between France and Belgium, where France requires framework agreements on national level, before regional entities can pass regional agreements. In contrast, in Belgium the “zones de secours” have the legal capacity to sign agreements without a framework agreement on national level. This difference can lead to long waiting times, as agreements on national level take more time than regional agreements (Deffrasne, personal communication, May 19th, 2017). In line with this, Feider (personal communication, June 9th, 2017) agrees that framework agreement take a lot of time administratively, as legal obstacles first have to be solved. Moreover, these framework agreements have to pass both national parliaments and other institutions, which is a lengthy process (Feider, personal communication, June 9th, 2017). Another legal difference is that in Belgium, everything is done by laws, while in the Netherlands plans are created without having to be agreed on by the parliament (Troost, personal communication, June 14th, 2017). As an example, the nuclear federal emergency plan in Belgium is in form of a law, while in the Netherlands it is published in form of plan. This gives the Dutch stakeholders more flexibility (Troost, personal communication, June 14th, 2017).

Differences in National Disaster Management Structures

In addition to the administrative structures, the differences in national disaster management structures lead to difficulties in cross-border cooperation. According to Brandon (personal communication, June 13th, 2017), these differences constitute an obstacle to cooperation. She argues that it is not always clear who to talk to, as for example the crisis committees differ between countries. An example at the French-Belgian border, is the French local information commission (“Commission locale d’information”), which does not exist in Belgium; this creates difficulties to “mirror” their work on the other side of the border, as this entity is non-existent (Deffrasne, personal communication, May 19th, 2017). Furthermore, the competences and working strategies of rescue forces are different from country to country, which can lead to insecurities (Scevenels, personal communication, May 29th, 2017). This applies predominantly to ambulance personnel, which is very different between Belgium and the Netherlands (Scevenels, personal communication, May 29th, 2017). However, a certain insecurity among firefighters exists, as it is unclear in terms of liability in how far they are covered in case of problems (Pip, personal communication, May 29th, 2017). This insecurity is based on not knowing if their own working method, like for example extinguishing a fire with a certain foam, is accepted abroad (Pip, personal communication, May 29th, 2017).
Lack of structure in mutual assistance conventions

According to Benelux (2011), the lack of structured mutual assistance agreements leads to major differences in existing arrangements. Moreover, Gemenne (personal communication, May 19th, 2017) explained that existing agreements on municipal level between Belgium and France are not applicable anymore, due to reforms and consecutive changes of responsibilities on both sides of the border. This would currently cause a lot of work to translate these local agreements onto the level of the new and bigger responsible institutions.

According to multiple interviewees, agreements are often not concrete enough on operational level, as concrete operational aspects and plans are lacking (Scevenels, Lambiet, Niselli, personal communication, May 29th, 2017). If existing, those plans are often not or incorrectly executed as they are not well known (Benelux, 2011). In the Benelux questionnaires, stakeholders on local level expressed a demand for more information on existing agreements and more concrete operational agreements.

Lack of joint exercises

The best practice for well-functioning cross-border collaboration are real interventions (Ramakers, personal communication, May 24th, 2017). In case of disasters, opportunities to test what has been planned are not frequent (Niselli, personal communication, May 29th, 2017). According to Dassy (personal communication, May 29th, 2017) complying to national requirements for exercises is already challenging. Additionally, such exercises would require resources, which are not present in Belgium. In line with this, Lambiet (personal communication, May 29th, 2017) reports that if an ambulance crosses the border, communication with their own rescue team is not possible. While acknowledging that junctions can be created, this would be very complicated. Moreover, in the Euregio Meuse-Rhine a procedure for cross-border communication exists, but in case of a disaster, it would be questionable if managing 20-30 rescue vehicles via the neighbouring dispatch centre is manageable (Lambiet, personal communication, May 29th, 2017). The lack of joint exercises is also described on local in the Benelux questionnaires.

Communication Systems

As reported by the Benelux (2011), the radio communication systems in the different countries are insufficiently harmonized, which leads to operational problems for rescue forces. In consonance with this, Lambiet (personal communication, May 29th, 2017) reports that if an ambulance crosses the border, communication with their own rescue team is not possible. While acknowledging that junctions can be created, this would be very complicated. Moreover, in the Euregio Meuse-Rhine a procedure for cross-border communication exists, but in case of a disaster, it would be questionable if managing 20-30 rescue vehicles via the neighbouring dispatch centre is manageable (Lambiet, personal communication, May 29th, 2017). In line with this, Niselli (personal communication, May
(29th, 2017) adds that these procedures have too many “links in the chain”, which leads to unnecessary loss of information and time. In case of a disaster, having one central management point that can dispatch all of its rescue resources is essential (Lambiet, personal communication, May 29th, 2017). These findings are confirmed by the Benelux questionnaires, in which multiple stakeholders on local level mention problems with cross-border communication.

**Language & Culture**

Language barriers constitute a major obstacle for collaboration. According to Ramakers (personal communication, May 24th, 2017), collaboration between “Zuid-Limburg” (NL) and the province of Liège is difficult, due to the two languages (Dutch and French) spoken in the border region. As teams on the incident site do not get mixed, the language problem is mainly to be located between the disaster management structures, for example between heads of operations at the on-site command post or between two crisis cells (Ramakers, personal communication, May 24th, 2017). In the region of the “Veiligheidsregio Midden-en West Brabant” and the province of Antwerp (B), “the same language is spoken but not the same language” (Brandon, personal communication, June 13th, 2017). Even though the languages (Flemish and Dutch) are very similar, they still differ and interpretation issues exist, even in meetings (Brandon, personal communication, June 13th, 2017). Additionally, Brandon (personal communication, June 13th, 2017) and Zonnevijlle (personal communication, June 14th, 2017) describe cultural differences between Belgium and the Netherlands. The Dutch characterise as planners, while the Belgians would be pragmatic; both sides would have a lot to learn from each other (Brandon, personal communication, June 13th, 2017).

**Low Priority for Cross-Border Cooperation**

According to Lambiet (personal communication, May 29th, 2017), the priority to cross-border cooperation is low, due to the high number of national issues, notably terrorism. In the case of the 2016 Brussels bombings, the situation was already complex to manage on national level and bringing foreign rescue forces into danger, in addition to national forces, is very difficult in terms of responsibility (Lambiet, personal communication, May 29th, 2017). Feider (personal communication, June 9th, 2017) adds that countries have the tendency to first get additional resources from within their own country, instead than from across the border. Moreover, in case of existing cross-border plans, the responsible firefighter or dispatcher might not even think about asking for cross-border assistance, either because of not knowing the existing procedures and agreements or not daring to ask due to insecurity if the incident applies to the procedure (Niselli, personal communication, May 29th, 2017).
Lack of human and financial resources

In order to progress with cross-border projects, it can be helpful to receive additional funding, for example from Interreg (Zonnvijle, personal communication, June 14th, 2017). In the region of Zeeland, experiences show that it can be difficult for their Belgian counterparts, who are willing to collaborate, to work together due to budget constraints; progress was made with the help of Interreg funding (Zonnvijle, personal communication, June 14th, 2017). However, the current Interreg programs in the Euregio Scheldemond, which run until 2020, do not include emergency preparedness in their goals, making the introduction of projects in that field impossible (Zonnvijle, personal communication, June 14th, 2017). Budget constraints are confirmed by Belgian interviewees (Deffrasne, personal communication, May 19th, 2017; Dassy, personal communication, May 29th, 2017) and by the Benelux inventory of obstacles, stating a lack of human and financial resources in multiple Belgian provinces (Benelux, 2011). Brandon (personal communication, June 13th, 2017) also estimates that the Netherlands have more human resources available than their Belgian colleagues. She emphasizes that the willingness to cooperate in Belgium is there, but not always possible, due to a lack of resources.

4.4. Future of Cross-Border Cooperation

This chapter explores the future of cross-border cooperation according to data collected in the semi-structured interviews, with a focus on the involvement of the EU and Benelux. The EU Commission published the White Paper on the future of Europe on March 1, 2017, which elaborates on five scenarios the EU could develop to until 2025 (European Commission, 2017). The data presented in this chapter explores the hypothetical impact of these five strategies on cross-border collaboration in disaster management.

4.4.1. Impact of five EU strategies

According to Ramakers (personal communication, May 24th, 2017), the first strategy, carrying on like now, would most likely have no impact, as one would continue the current work. The second scenario, nothing but the single market, would not fall under the domain of disaster management (Feider, personal communication, June 9th, 2017). However, interviewee 1 (personal communication, May 18th, 2017) estimates that if the EU would only focus on the single market, one would potentially lose the EU Emergency Response Coordination Centre (ERCC) and corresponding aid modules. This change in the EU alignment would constitute an important brake to the establishment of common resources (interviewee 1, personal communication, May 18th, 2017).

As stated by a Member of the European Parliament (MEP), the third strategy, those who want more do more, is actually the same as the first scenario (MEP Goerens, personal communication, May 11th, 2017). Furthermore, the five scenarios are not be seen as
isolated, especially not the first and third scenario (MEP Goerens, personal communication, May 11th, 2017). In confirmation to this, Feider (personal communication, June 9th, 2017) affirms that scenario three already corresponds to today’s situation and that everyone collaborates according to the risks present in their own country. Moreover, the reason that some do more than others, is linked to a higher need; if no need is present one would only run into additional problems and questions by starting a collaboration (Ramakers, personal communication, May 24th, 2017). Interviewee 1 (personal communication, May 18th, 2017) adds that already today, the five countries in the study region are at different levels of cooperation; this is explained by obstacles, like for example languages. The interviewee adds that it is in the own interest, especially in the domain of disasters, to do the most possible, or even more than now, together. However, in the European ideal of cooperation, this third strategy would be a bit of a pity (Interviewee 1, personal communication, May 18th, 2017).

The fourth strategy, doing less more efficiently, is open to multiple interpretations. According to MEP Goerens (personal communication, May 11th, 2017) a positive reading of this scenario could mean that administrative obstacles could be eliminated with the goal to speed up administrative processes. In this spirit, doing one’s work with less obstacles, more could be done with less (MEP Goerens, personal communication, May 11th, 2017). Feider (personal communication, June 9th, 2017) notices that the interpretation on this scenario depends on what one defines as being efficient. Besides, doing less in safety would not be an option as it is the greatest good of a modern society (Ramakers, personal communication, May 24th, 2017).

Finally, the fifth scenario, doing much more together, is an ideal scenario, but light years away (MEP Goerens, personal communication, May 11th, 2017). Similarly, Ramakers (personal communication, May 24th, 2017) adds that she is of the opinion that more should be done together on a European level, but that it would be very difficult as the EU has restricted mandates in the domain of health and rescue services.

4.4.2. Impact of EU

In general, the role of the EU in cross-border collaboration is estimated as positive and necessary. Multiple interviewees noted that especially through EU funding programs, notably Interreg, cross-border projects get facilitated and also lead to an improvement of working conditions of rescue forces on the ground (Interviewee 1, personal communication, May 18th, 2017; Zonnevijlle, personal communication, June 14th, 2017). Lambiet (personal communication, May 29th, 2017) estimates that the EU is needed to harmonise national legislations, especially in the field of professional titles and competences of rescue professionals. However, a complete harmonisation of legislation would be rather difficult (Deffrasne, personal communication, May 19th, 2017). An
additional role the EU could invest in, is knowledge exchange and networking between rescue professionals (Zonnevijlle, personal communication, June 14th, 2017). As an example, Troost (personal communication, June 14th, 2017) names knowledge exchange in the domain of terror incidents.

Without the EU, Deffrasne (personal communication, May 19th, 2017) estimates that bilateral collaboration would continue, as the need from an operational point of view to communicate and plan together is present; the border would not disappear with less Europe. Nonetheless, less Europe would lead to a reduced and less structured cooperation (Interviewee 1, personal communication, May 18th, 2017). According to Brandon (personal communication, June 13th, 2017) cooperation on larger scale is positive, but also notes that as soon as you collaborate on higher governmental levels, everything gets more complicated and tends to take more time. In her eyes, the ideal collaboration is on a small and practical level (Brandon, personal communication, June 13th, 2017). Additionally, if collaborating on a bigger scale, one should focus on knowledge and best practice exchange, something that is not happening at the moment (Brandon, personal communication, June 13th, 2017).

### 4.4.3. Impact of the Benelux

The view on the work of the Benelux Union differs per region. At the Belgian-French border, interviewees noted that the Benelux in their region could only take a role of best practice example and not its usual role of harmonization. This is due to the fact that France is not a member of this union (Deffrasne, personal communication, May 19th, 2017). Interviewee 1 (personal communication, May 18th, 2017) states that it would be beneficial to work in a structure where Germany and France would be included as well. The interviewee adds that France and Germany would then possibly like to include all its neighbouring countries, which would consequently bring us back to the European Union. Nevertheless, the work of the Benelux is seen as positive, and the interviewee estimates that Benelux should be more active in the operational field, in guiding joint collaboration projects, instead of focussing on strategic matters (Interviewee 1, personal communication, May 18th, 2017.

As stated by Lambiet (personal communication, May 29th, 2017), the role of the Benelux as a facilitator in the creation of an agreement between the three Benelux states in urgent medical aid was very positive. The after work for operational aspects slowed down, as this is not necessarily the role of Benelux (Lambiet, personal communication, May 19th, 2017). Moreover, a major problem for the Euregio Meuse-Rhine was that Germany was not collaborating with Benelux yet, when negotiations for an agreement debuted in 2009 (Lambiet, personal communication, May 19th, 2017). In consonance with this, Feider (personal communication, June 9th, 2017) estimates that the role of the Benelux is especially interesting for knowledge exchange and networking and connecting with
stakeholders from different countries. An additional role for the Benelux Union could be to keep the issue of cross-border collaboration in disaster management on the political agenda on the EU level (Zonnevijlle, personal communication, June 14th, 2017).
5. Discussion

This study aimed to analyse the disaster management structures in the Benelux States and France and the current state of cross-border cooperation in this field. In this chapter, the research questions will be answered, while discussing the results of this study in a broader context and in relation to the RDIC-Model and the cooperation circle.

National Disaster Management Structures

In pursuance of answering the main research question on the differences in disaster management structures and its impact on cross-border cooperation, the sub-questions leading up to this question will be discussed in detail. The first aspect this study focussed on, was the legal situation and functioning of the different disaster management structures. A notable difference in the four countries is the use of different legal instruments. In Belgium, the whole structure, plans, missions, roles and functioning of the management of disasters is laid down precisely and clearly in a number of laws. In contrast, the Netherlands and Luxembourg only provide missions, roles and general descriptions in laws creating the responsible institutions; further details are regulated through plans established by the institutions in charge. While both methods are characterized by positive and negative points, this study suggests that the Dutch and Luxembourgish approach seems to provide more flexibility in case of adaptions compared to the Belgian approach, as legal procedures tend to be long processes. Furthermore, it is noteworthy that most of the laws and plans regulating disaster management structures in the four countries have all been updated over the last decade, which strengthens the resilience of these countries against today’s disaster vulnerabilities through up-to-date plans and procedures. The Luxembourgish rescue system is currently under reform, and a new law is set to be introduced once it passes parliament this year; further studies will be needed to analyse the effect of this legislation change in the Grand-Duchy.

The systems in the four countries also differ in multiple aspects. Belgium, France and the Netherlands all use ascending management systems with multiple levels of coordination. The systems of Belgium and France are comparable, as they both start at the lowest administrative level, the municipality, and are upgraded to superior structures according to need and severity of the disaster. The Dutch system also uses an ascending phase system, but differs in the number and type of management structures. With more severe incidents, the number of coordinating bodies increases and it could be difficult for foreign stakeholders to understand which structure is responsible for what. Even though the Belgian and French system use multiple levels as well, only one central coordinating entity is in charge in per level. The Luxembourgish system stands in contrast to the multi-phase systems, as in case of a disaster, only one central coordination cell exists, which is
characterized by a differencing chairperson and composition according to severity and incident type. This simple structure could be seen as a consequence of the size of the country and government administration, where multiple levels are, in contrast to the bigger neighbours, not necessary. All systems are in line with scientific recommendations (Carter, 2008; WHO 2007) on disaster management structures. As recommended by the WHO (2007), extensive national emergency-preparedness plans exist in all countries. Moreover, preparedness and response measures are clearly defined in policy and arrangements on different government levels, as recommended by Carter (2008).

Cross-Border Cooperation
In most border regions, cross-border cooperation exists in some form in the field of this study. As recommended by Carter (2008), all countries have agreements in place on national level and in different forms on regional level. At the Dutch-Belgian border, regional agreements exist between all Belgian provinces and Dutch “Veiligheidsregios”. While agreements often differ in form and content, a positive effort was made by EMRIC in 2013, in which the Dutch “Veiligheidsregios Zuid-Limburg, Limburg-Noord and Brabant Zuid-Oost” and the Belgian provinces of Limburg and Liège have signed standardized agreements for disaster management. This agreement was not noted down by the “Veiligheidsregio Limburg Noord” in the Benelux questionnaire. The reasons for this are not known as it is not clear who filled out the questionnaire and if this agreement is actually not known in this institution. A similar effort of standardization is currently being undertaken in the “Veiligheidsregio Zeeland”, where the three existing agreements with neighbouring provinces are being translated into one single agreement. A standardization of regional agreements all along the borders of the study region would be a positive development, which would facilitate the work of rescue forces and reduce insecurities concerning responsibilities and content of the different agreements.

Cooperation appears to be most developed in the Euregio Meuse-Rhine, with an institution, EMRIC, facilitating cooperation through its unique mission on cross-border emergency care. Nevertheless, all along the border, structured cooperation including meetings and exercises take place. The recommendation of regular multi-national exercises formulated by Carter (2008), is taken into account in agreements, but is not always executed in practice. In two regions, the Euregio Meuse-Rhine and between the “Veiligheidsregio Midden- en West Brabant” and the province of Antwerp, multi-year exercise cycles, focussing on all levels of cooperation, have been put in place and introduce a certain structure to exercises. These initiatives bring structure into the planning of exercises and make sure that all involved layers of disaster management practice and evaluate existing agreements. Multiple interviewees, especially in Belgium, mentioned constraints in time and resources for the organization of cross-border exercises. Governments should make
sure that the responsible authorities have the financial and human resources, required for the planning and execution of exercises, available. Joint exercises are essential for the well-functioning of multi-national disaster management.

The cooperation at the Belgian-French border is currently developing into a positive direction, with a major Interreg project aiming to improve and formalize cooperation all along the border. This project could be compared to the former EMRIC and EMRIC+ projects that took place in the Euregio Meuse-Rhine in the past. Cooperation between the Belgian province of Luxembourg and the Grand-Duchy of Luxembourg is close to non-existent, which is explained by a low need for cooperation. This finding confirms the cooperation's cycle assumption that if there is no need, the willingness and ability to cooperate are not present nor required. In many interviews it was confirmed, that if there is an actual need and dependence for cooperation, the willingness to cooperate is established and difficulties arising from the ability to cooperate are consequently eliminated. Furthermore, the statement by Ramakers (personal communication, May 24th, 2017) that if no need is present, starting a cooperation would only lead to additional problems and questions, affirms that first a need has to be present, before further steps should be taken. The creation of a new framework agreement on national level is nevertheless a positive initiative from the Luxembourgish and Belgian government. If a need would arise on regional level, the foundation for further cooperation initiatives is consequently already present.

In the interviews, the factors of density of population, risk areas and geography were identified as additional factors influencing the cooperation need. These factors could be added to the cooperation circle to better illustrate cooperation needs. In order to emphasize the importance of the factor need in the cooperation circle, the example of the French-Luxembourgish border, where a need is perceived and further collaboration agreements are currently being drawn, shows that need and its preceding factors play a major role in the cooperation circle. The application of the cooperation circle to different regions and fields in cross-border cooperation could be tested in further studies.

**Obstacles**

This study has identified a number of obstacles that negatively influence cross-border cooperation. In line with earlier research by Benelux (2011), the insufficient knowledge on reciprocal systems, lack of structure in cross-border agreements, lack of concrete operational cross-border plans, lack of joint exercises and communication problems have been identified by this study. As the same obstacles have been mentioned six years after the creation of the Benelux inventory, this study suggests that governments and Benelux should investigate what has been done to tackle these difficulties. Moreover, it is advised to evaluate the measures and work towards eliminating these barriers.
The obstacles identified in this study, are also in line with the experience of the EMRIC cooperation in challenges for disaster management and daily cooperation (Ramakers, personal communication, July 18\textsuperscript{th}, 2017). Despite this confirmation, a complete generalizability to all regions is to be avoided, as differences exist due to specific characteristics of border regions, as for example the language situation. The latter did not apply to the French-Belgian border region, as the same language is spoken. Surprisingly, this issue was raised between the Netherlands and the Belgian Flanders region, where Dutch is spoken on both sides of the border. In spite of this similarity, an interviewee stated that the same language is indeed spoken, but problems of comprehension still arise in this region, which is to be explained by the Flemish dialect. This unexpected finding shows that one has to be cautious with generalizing obstacles; attention is always to be given to regional characteristics.

Another notable obstacle is the lack of knowledge on both foreign administrative and disaster management structures. On both sides of the border, interviewees expressed difficulties on understanding the systems of the neighbouring country. Especially the complexity of Belgium’s administrative structure was raised by both Belgian officials and Dutch counterparts. The same feeling was also expressed by Belgian interviewees, noting that the neighbouring administrative structures are complex to understand as well. Based on the findings of this study, it would be beneficial if governments would strive for a simplification of administrative structures and processes, in order to improve procedures and cross-border cooperation. Moreover, this study suggests that responsible government institutions provide simplified contact details and responsibilities to their neighbouring colleagues. This could help to improve the understanding of the different administrative structures and work processes and improve cross-border collaboration.

Additionally, uncertainties were expressed concerning existing agreements, its contents and the functioning of the different disaster management systems in general. This uncertainty could be explained by the high number of different regional agreements and a missing priority for cross-border cooperation, also identified as an obstacle during interviews. These findings confirm the need for projects such as IKIC, planned in the Euregio Meuse-Rhine. After a successful implementation and evaluation of this initiative, a further application of this project to other border regions should be considered, as a need for knowledge across borders is given. Moreover, the importance of knowledge management in a cross-border setting, described by Worseling (2016) is affirmed by this study.

\textit{Future of Cooperation}

The findings of this study indicate that cross-border cooperation will always exist if a need is present, with or without a EU or Benelux (Ramakers, personal communication, May 24\textsuperscript{th},
However, most interviewees stated that in case of less EU involvement, they’d expect to be confronted with more difficulties. Interviewees see both the EU and Benelux as facilitators for their work, be it through Benelux framework agreements or EU Interreg funding. Another role for the EU or Benelux would be as a platform for knowledge exchange and best practices. A need for more exchange and getting to know colleagues and working methods in the different countries was expressed in multiple interviews. Moreover, a focus on small and practical solutions, namely less bureaucratic processes was mentioned as a good way to deal with cross-border cooperation. It is not only the EU and Benelux, but also national governments who should strive towards simpler administrative processes leading to a smaller bureaucratic burden. Regions should be able to work flexibly within a legal frame, set by national governments or supra-national institutions. Additionally, the accomplishments and current projects of national and supra-national institutions should be better communicated to partners on regional level, as frustration concerning lengthy and complicated processes was mentioned. This study suggests that further involvement of the EU, Benelux and national governments should be in the form of facilitators for networking, practice and knowledge exchange.

Considering the current political climate, major changes in the orientation of the EU seem less probable than four months ago. Only one of the five strategies on the future of the EU, namely strategy number two, with its focus on the single market, was estimated to have negative consequences on disaster management cooperation, as the European initiatives Interreg and ERCC could potentially be abolished. Strategy one and three essentially describe the current state of cooperation in the study region and would subsequently not change anything on the current cooperation. This goes hand in hand with the different characteristics and needs in the border regions of the Benelux and can further be recognized in the cooperation circle. Finally, the fifth strategy, doing much more together, is an idealistic scenario, which most of the interviewees described as being potentially beneficial to their work, especially if systems and professions would be harmonized.

**Strengths and Limitations**

The first limitation of this study is the restricted time frame in which this study had to be conducted. Even though interviews were conducted in all border regions, this time constraint has lead to scheduling issues with interviewees. In an ideal scenario, interviews would not have been only conducted on one side of the border, but on both sides. This fact can lead to biased view points, as only one viewpoint of the border region is provided. A second limitation is that even though most of the interviews have been done in a face-to-face setting, which can be considered a strength, three of the interviews were conducted via e-mail. Although this has allowed the author to collect data from experts
that were otherwise not accessible, it would still have been preferable to do these interviews in person. Further studies could try to cover the complete region by including experts on both sides of the border and attempt to do all interviews in person.

A third limitation is that interviewees only had two weeks to reply to the member check e-mails. As this happened during a holiday period, not all interviewees replied to the member check and thus did not verify their quotes in the context of this study. For further research in this field, the study should be scheduled outside of holiday periods.

A strength of this study is the language flexibility of the author. Interviews could be conducted in English, French, German and if wished by interviewees with the help of a translator in Dutch. The author speaks Dutch on an A2 level, but understands Dutch on a higher level. Even though interviewees were offered to conduct interviews in Dutch, Dutch-speaking interviewees chose to do the interviews in German or English. This might have led in some cases to difficulties of expression, but was compensated with the help of explanations in Dutch.

Finally, future studies should attempt to collect data in the Flanders region of Belgium, the Dutch “Veiligheidsregio Limburg Noord”, as this study was not able to collect data in those areas.

6. Conclusion and Recommendations

This study has established that cross-border cooperation in disaster management exists under different forms in an unstructured fashion in the study region. Even though efforts exist to standardize agreements and cooperation forms, every region has their own approach to cooperation. These differences are due to specific characteristics (population density, risk areas) of each region and the factors influencing the willingness and ability to cooperate. Moreover, differences in cooperation agreements and approaches, but also differences in the disaster management systems lead to insecurities and lack of knowledge among responsible staff and rescue personnel. In addition to this, this study has identified a lack of knowledge and comprehension on the administrative functioning of neighbouring state structures as a major obstacle to cooperation. Furthermore, this study confirms the newly created cooperation circle and underlines its assumption that first willingness to cooperate has to be established, before factors of the ability of cooperate are being approached.

Stakeholders interviewed in the scope of this study recognize the role of the EU and Benelux as facilitators for the elimination of legal obstacles to facilitate cooperation on regional level, while not getting involved in the practical organization of regional matters. Additionally, experts expressed the wish that national states, the EU and Benelux would get more involved in a role of facilitator for networking, knowledge and best practice exchange between the regions in this study region.
Based on the findings of this study, the following recommendations for policy makers have been formulated. First, governments should create a complete inventory of existing agreements on all levels to get a complete overview of the current situation. Second, each state should provide a simplified depiction of missions, contacts and responsibilities of their institutions to their neighbouring counterparts. This would resolve misunderstandings between stakeholders and improve cooperation. Third, governments should facilitate the work of their institutions to support cross-border cooperation. This could be achieved through an appropriate provision of resources or support for the realization of meetings, joint exercises and work necessary for a well-functioning cross-border collaboration. Lastly, the EU and Benelux should continue and increase their work as facilitators for cross-border cooperation, be it through the creation and negotiation of framework agreements or as a platform for exchange of knowledge and best practice. It is essential that those affected by organizing and executing cross-border cooperation know each other and have the right conditions to improve cooperation in the field of disaster management.
References


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