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1st supervisor: Dr. Annika Jaansoo
2nd supervisor: Dr. Claudio Matera

The regulation of flood risk management of transboundary rivers in the Dutch-German border area

Cristine Johanna Kuiper
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Abstract

This bachelor thesis will provide an answer to the research question ‘’how do different institutional levels manage flooding of transboundary rivers in the Dutch-German border area?’’. The research question is answered via the analysis of policy documents of the EU Floods Directive, the Dutch Water Act and the German Federal Water Act. Together with several research rapports within the field of flood risk management a theoretical framework has been set up. Via the analysis the conclusion became that both Germany and the Netherlands work together within a multilevel system. On an international level, several commissions have been set up. The International Commission for the Protection of the Rhine and the International Meuse Commission ensure the flood risk management of the Rhine and the Meuse on an international level, and for the Ems, the Netherlands and Germany work closely together on national level. On regional level, the regulation of flood risk management of smaller river basins as Dinkel,Vecht, Berkel and Oude Ijsssel is getting regulated via the German-Dutch organisation Grensoverschrijdend Platform voor Regionaal Waterbeheer.

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1. Introduction

Nowadays the world is facing a big challenge, called climate change. As a consequence of global warming, the hydrological cycle of the earth is changing (Dankers & Feyen, 2008). As a result of this changing hydrological cycle, Europe faces an increase in extreme precipitation. Consequently, this increase leads to a higher risk of flooding of the rivers (Dankers & Feyen, 2008).

Multiple rivers are crossing the Dutch-German border. Because of climate change, these transboundary rivers come with an increased flood risk. This means that the increased flood risk needs to be managed by the different countries the rivers are crossing, and an example of this risk management is regulating the draining of the water (Knowledge for Climate, 2014). The draining of the water in the Dutch rivers is getting influenced via the water regulations of Germany. Rivers like Rhine, Meuse, Ems, Dinkel and the Vecht run through Germany before they enter the Netherlands. Thus, the regulation of the draining of those transboundary rivers in Germany have an influence on the draining in the Netherlands. The Netherlands therefore is responsible for managing the quality of the dikes, so that rivers wont flood (Knowledge for Climate, 2014). Because of this interdependence, cross-border risk management is necessary. So, several organisations and commission are ensuring that different countries are working together on the risk management of the transboundary rivers. These organizations are for example the GPRW (Grensoverschrijdend Platform voor Regionaal Waterbeheer), The International Commission for the Protection of the Rhine and the International Meuse Commission.

The German-Dutch organisation GPRW, fully called Grensoverschrijdend Platform voor Regionaal Waterbeheer, works on tackling climate change challenges. An example of the challenges they tackle is high water risk management in the zones of the transboundary rivers Vecht, Dinkel, Berkel and Oude Ijssel (GPRW, 2020).

To tackle the challenges transboundary rivers bring, countries have to work together. These collaborative governance projects are complex and act within multilevel systems that transform over time (Avoyan & Meijerink, 2020). External conditions such as, for example, policy and legal frameworks, politics and power relations, socioeconomic conditions and the history of conflicts play an important part in the multilevel systems of collaborative governance projects. So, to prevent the effects of climate change such as drought and flooding, cross border cooperation is necessary. This thesis discusses the cooperation on regional, national and international level for transboundary rivers at the German and Dutch border area.

This thesis has a high relevance as the cross-border cooperation for water management is one of the most accurate topics in the discussion over climate change. This is because weather behaviour is changing as a consequence of climate change, and this creates multiple water managemental challenges. Because of the transboundary nature of rivers, cooperation is necessary because data and

experiences needs to be shared to come to an optimal result to successfully adapt implementations for the risk management of the transboundary rivers (Price, 2006).

The flood risk management measures implemented in the Dutch-German border area will be analysed on different institutional levels. This will be done via analysing the different institutions and commissions who participate within the decision-making process of the flood risk management of the transboundary rivers. There are multiple publications that perform research within the field of different governmental perceptions in how to perform transnational water management. One of the publications explores the different views on participation of citizens and nature organizations within the river-management field (Katharina, P., et al., 2018). Also is stated that there are complexities within decision-making among countries due to cultural differences (Katharina, P., et al., 2018). There are also multiple key documents on flood risk management provided by the European Union, such as the EU Floods Directive and Flood Risk Management Plans of the Member States (European Commission, 2019). However, the publications that combine those two aspects are limited. This thesis will close this gap by answering the question ‘’How do different institutional levels manage flooding of transboundary rivers in the Dutch-German border area?’’.

After this short introduction the scientific relevance of this thesis will be discussed. Furthermore the research design and methodology will be explained, and a theoretical framework will be provided which will lead to the discussion and conclusion of this thesis.

2. Scientific relevance

The Dutch and German society could benefit from the research on cross-border flooding risk management. Flooding of the rivers can have consequences for the society, and therefore risk management is beneficial for the citizens living near the rivers. Drafting an analysis on how flood risk management gets managed between the Netherlands, Germany and the European Union can help contributing to a better overview of different implementations preventing this flooding risk, hence if necessary, other measures can be taken wherefrom the society could benefit which makes this thesis relevant.

3. Research Design and Methodology

3.1. Research questions

To address the research question, the EU Floods Directive, the Dutch Water Act, the German Federal Water Act, the Report on the International Cooperation under the Floods Directive from the European Commission and the rapport on Flood Risk Management Plans from the Member States from the European Commission will be analysed. So, this study analyses the risk managemental implementations that have been taken in the field of preventing the flooding of transboundary rivers. These measures are taken on different institutional levels, for example, European level and national level, which will both be analysed. A focus will be on Member States the Netherlands and Germany. While analysing the different measures the Netherlands and Germany take to prevent flooding of the transboundary rivers, various governmental perceptions on how to perform transboundary water management will be explained. Existing publications that combine flood risk management and different governmental perceptions on how to manage transboundary water management are limited. This thesis will close this gap by answering the question:

‘’How do different institutional levels manage flooding of transboundary rivers in the Dutch-German border area?’’

To be able to answer the research question, several sub-questions have been identified:

1: How does the European Union regulate flood risk management?
2: What are the main differences between the Dutch Water Act and the German Federal Water Act?
3: How do Germany and the Netherlands cooperate in the field of flood risk management?

3.2. Research design and sources

The primary sources of information that will be used for this thesis are policy documents from the European Union, the Netherlands and Germany. Examples of these policy documents are the EU Floods Directive, the Dutch Water Act, the German Federal Water Act, the rapport on International Cooperation under the Floods Directive from the European Commission and the rapport on Flood Risk Management Plans from the Member States from the European Commission. The EU Floods Directive aims for reducing the risks of flooding, and it requires the Member States to assess these flooding risks, the other policy documents show the implementations which the Member States took to meet the goals of the EU Floods Directive, with a focus on the Netherlands and Germany. Next to the official policy documents of the European Union and Member States the Netherlands and Germany, another

type of document will be used to construct a theoretical framework. This type of document will be different research reports, from several academically performed research and research committees. These reports have been found via the University of Twente library called LISA.

The mentioned policy documents and research reports will be analysed to make it possible to answer the sub-questions and to address the main research question. The documents will be analysed by careful readings and critically looking at the provided theories within the policy documents and research rapports. The analysis of the EU Floods Directive makes it possible to answer the first research question on how the European Union regulates flood risks. The analysis of the Dutch Water Act and the German Federal Water Act will provide information to be able to answer the second sub-question on the main differences between the Dutch Water Act and the German Federal Water Act. The analysis of the rapport on International Cooperation under the Floods Directive from the European Commission and rapport on Flood Risk Management Plans from the Member States from the European Commission will provide information about the German-Dutch cooperation under the EU Floods Directive, which will provide the information that is necessary to answer the third sub-question, how do Germany and the Netherlands cooperate in the field of flood risk management? The research rapports will help to create on overall insight within the field of flood risk management. The policy documents and research rapports will provide the theoretical background for answering the sub-questions. When the sub-questions are answered, the theoretical information to answer the main research question is provided.

4. Theoretical Framework

In this chapter several concepts will be explained, and different water risk management theories will be discussed. The information is provided by academic papers and directives from the European Commission.

4.1. Concepts

4.1.1. Flood management

The aim of transboundary flood management is to reduce flooding risks (Balint, Marsalek & Stancalie, 2006). The practise of reducing flooding risks comes with various measures, for example, jurisdictional measures as the EU Floods Directive and the Dutch Water Act, but also structural measures that include land drainage modifications, dykes and polders are necessary to reduce the flooding risks (Balint, Marsalek & Stancalie, 2006). Next to the different measures, flood management comes with another complexity, namely the transboundary nature of rivers. To get a clear overview into the framework of international flood management, the paper by Ronald K. Price (2006) was analysed. In his paper Roland K. Price discusses the importance of brining all different skills and stakeholders together in international and regional cooperation for managing international flood management (Price, 2006). Via this approach, different views and ideas can come together which can reduce the risks that come with floods. Flood management is transboundary by nature, since rivers can cross multiple borders before they reach the sea. This is why flood management has to be connected to different stakeholders, who have to work together to reduce the risks of flooding. Examples of stakeholders who should work together are scientists, policy-makers, decision-makers, national organizations and international organizations (Price, 2006). Because of the cooperation of different stakeholders, international and regional cooperation will follow. This is needed because data and experiences need to be shared to come to an optimal result in the prevention of flooding. Various fields of knowledge such as, for example, natural, scientific, economic, social, institutional and legal fields come together in the framework of flood management. These aspects can come together by monitoring, analysing and modelling all available data and activities. So to conclude, the field of flood management is very complex due its transboundary nature, which makes that various local, national and international stakeholders have to work together to prevent flooding risks. For getting a clear overview on how local, national and international stakeholders work together to prevent flooding risks, the measures taken by the European Union in the field of flood risk management will be analysed, with a focus on the Netherlands and Germany, and their cross-border cooperation.

4.1.2. Multilevel governance

Flood risk management is transboundary by nature, since rivers can cross multiple borders before they reach the sea. As mentioned before, this comes with different levels of government, namely international, national and regional levels. Within the cooperation of these different levels, tension can occur. National government usually has its own traditions and hierarchies, but the influence of the European Union can decentralize certain decision-making processes (Moss & Newig, 2010). So, the multiple levels of action needed within the field of water management can be seen as a challenge. One of these challenges are the changes of competences of political intervention. A shift is happening towards the national/supranational scale, towards the regional or local scale (Moss & Newig, 2010). For example, the EU Floods Directive is binding for the Member States. The directive requires Member States to assess water courses and coast lines that are in the risk of flooding. The Member States have to map the risk areas, and have to take measures to reduce the flooding risks (European Commission, 2019). Member States are legally bound to the directive, hence they have to implement the directive into their own national law. For the European Union it is important to include the management of floods into their framework, since floods can cause damage to the environment and the homes of citizens. When implementing policies, Member States are now required to consider the possible effects of the policy on flood risks and flood management (European Commission, 2019). So, flood risk management comes with a multilevel governance approach, because of its transboundary nature. Therefore, cooperation between different governance levels, such as international, national and regional levels, are necessary. Since the regulation is a directive, the Member States are allowed to be free in deciding how they want to achieve the results of the EU Floods Directive, but they do have to adopt measures to achieve this goal. Since the focus of this thesis is on the Netherlands and Germany, we will zoom into the adopted measures of implementing the directive into the national law of both countries, and the regional cooperation between both Member States.

4.1.3. Cross-border cooperation

This thesis will analyse the cross-border risk management of transboundary rivers, with a focus on cooperation between the Netherlands and Germany. Several rivers are crossing the Dutch-German border, such as the Rhine, the Meuse and the Ems. As mentioned before, the water regulation in Germany has an influence on the regulation in the Netherlands, and vice versa, since lots of rivers run through Germany before they enter the Netherlands. Therefore cooperation between both countries is necessary. The European Committee monitors the cross-border cooperation of Member States within the field of flood risk management. The rivers Rhine and Meuse are categorized by the European Commission as a type 1 basin. The Member States that have a river basin streaming within their state that is categorized as type 1 basin are obligated to set up an international coordinating body. This

international coordinating body has to ensure formal international agreements and an International Flood Risk Management Plan to regulate international flood risks within the transboundary river basin. So, the Rhine and Meuse should both have an international coordinating body. The Ems is categorized as type 2 basin, which states that the international river basin needs to have a formal international agreement and international coordinating body, but it does not need an International Flood Risk Management Plan such as is needed for the type 1 basins (International Cooperation under the Floods Directive, 2019). The Rhine River Basin is not only shared between Germany and the Netherlands, but also between France, Switzerland and for smaller parts in Austria, Italy, Luxembourg, Belgium and Liechtenstein. To ensure a good cooperation between all countries, an international commission has been set up, named The International Commission for the Protection of the Rhine. Within the commission a special 'Floods' working group has been set up, which helps implementing the EU Floods Directive measures (International Cooperation under the Floods Directive, 2019). The International Commission for the Protection of the Rhine made a flood action plan, that includes avoiding new unacceptable risks, reducing risks to an acceptable level, reducing adverse consequences during a flood, and after a flood. The Meuse River Basin is shared between France, Belgium, Germany, the Netherlands and Luxembourg. To ensure a well working cooperation between the states, the International Meuse Commission has been set up. The commission worked on an international Flood Risk Management Plan, and created a working group named 'Hydrology and Floods' that ensures the implementation of the Floods Directive (International Cooperation under the Floods Directive, 2019).The Ems River Basin is shared only between Germany and the Netherlands. There is no special international commission for the cooperation between both countries, but they agreed on Ministerial correspondence, which makes the Ministers responsible for the protection of the Elbe water basin (International Cooperation under the Floods Directive, 2019).

4.1.4. Sustainability

The European Union has an environmental focus while practising flood risk management. The EU wants to achieve better environmental options by reducing human casualties (European Commission, 2019). The focus lays on green infrastructure measures, so that nature's own absorbing capacity can help reducing the flood risks in the European Union. So, the EU has a focus on sustainable water management, that works with nature instead of against it. The focus on sustainable water management and measures is also put into force via a directive, namely the Environmental Impact Assessment and Strategic Environmental Assessment Directive. The goal of this directive is aiming for balance between the human needs and protecting the environment, with an overall view of sustainable water management (European Commission, 2019). This sustainable water management is also called natural flood management. So, the core of natural flood management is the balance between nature and humans, and to create the most effective flood risk solutions that are in balance with nature, but still

work effectively. Examples of these solutions are building dikes which change with the river flow and solving drought by altering the natural flow of the river (European Commission, 2019). So, Natural Flood Management takes the hydrological process of a river into account while implementing measures to prevent flooding risks, and therefore the European Union has a focus on sustainability while performing flood risk management.

4.2. Regulations of flood risk management

This thesis will focus on the transboundary water risk management between the Netherlands and Germany. The Netherlands and Germany have several transboundary rivers, which cross the Dutch-German border. This comes with transboundary river management, that brings current and future challenges. The core of transboundary water management is to manage all the users of the water with social, environmental and economic objectives. For turning these goals into practise, several challenges occur. The challenge that is the most interesting for this thesis is the challenge of reconciling political borders and basin boundaries. When rivers cross international borders, geopolitical stakes come up (Zeitoun et al., 2013). Often, states see water management as a part of national security. Therefore, cooperation between the states is necessary and joint data sharing and treaties get implemented as a sign of good relations between the states (Zeitoun et al., 2013). In the transboundary risk management the different views between all different actor groups should be clear to one another, to make cooperation between different stakeholders possible (Panten et al., 2018). One of the most important factors within making cooperation possible is trust. Therefore, creating a dialogue wherein all the motivations of the stakeholders become transparent is important. Transparency is needed to prevent unequal goals and to prevent disillusionment, and to stimulate social learning (Panten et al., 2018).

The European Union regulates flood risk management on European level. So, within the multilevel system, this can be seen as the international level, since the regulation applies to all Member States. This European approach is necessary to ensure a well-established flood risk management in every Member State (Priest et al., 2016). The measures and policies are not equal in every Member State, but the regulation of the European Union does ensure that the goals of the flood risk policies are met within every Member State, so therefore the Member States still are independent in how they apply measures to ensure the EU goals, but they do have to meet these goals. One of these goals is to ensure transboundary flood risk management, instead of every state acting on its own. Furthermore, an important goal is taking sustainability into account within the field of the economy, the environment and human health (Priest et al., 2016). To be able to manage the flood risks on European level, a legal framework had to turned into force. This legislative and policy action had to ensure a good working transboundary cooperation (Priest et al., 2016). When countries are a Member State of the European Union, the EU can enforce laws. There are different types of laws. Not every

law has to be binding for the Member States. Guidelines, recommendations, declarations and opinions are not binding, they just have a statement function, and therefore no legal obligation (European Commission, 2020). In contrast to the non-legally binding acts, treaties, regulations, directives and decisions are legally-binding. In the field of floods risk management the European Union implemented the legally binding EU Floods Directive, which entered into force in November 2007. Within this thesis, the European legislative approach will be analysed.

4.3. The regulation of flood risk management by the European Union

This chapter will address the first sub-question ‘’how does the European Union regulate flooding risk management?’’ by analysing the EU Floods Directive.

Regulating flooding risk management is transboundary by nature, and therefore an important theme of the European Union. But how exactly does the EU execute this flooding risk-management? Water legislation is a very broad theme. From legislation of fish waters, to the quality of drinking water, all is included in the European Water Policy. Several directives got implemented to protect water related issues, like the Urban Waste Water Treatment Directive, the Nitrates Directive, and, to protect the European Union from floods, the EU Floods Directive (European Commission, 2019). The focus of this thesis lays within flooding risk management. For that reason, an analysis of the EU Floods Directive will be made to answer the question, how does the European Union regulate flooding risk-management?

In November 2007, the EU Floods Directive entered into force. The purpose of the directive is to reduce and manage the risks that floods bring. The main goals of flood risk management are prevention, protection, preparedness, emergency response and recovery, these goals are in the field of human health, the environment, cultural heritage and economic activity (European Commission, 2019). Because of the directive, Member States are required to adopt measures that help achieve the goals of the EU Floods Directive. These measures get constructed by identifying the river basins and the coastal areas which are at risk of flooding (European Commission, 2019). So, the EU Floods Directive is the EU Action programme on flood risk management. The EU Floods Directive entered into force after consideration of several stakeholders, including the Member States, the European Commission, EU Water Directors, and the public. After the consultation of the stakeholders, the Commission adopted the proposal for the EU Floods Directive.

Since the EU Floods Directive requires Member States to implement measures within the national law to ensure the goals of the EU Floods Directive, the EU requires the Member States to approach the flood risk management in a process of three stages (European Commission, 2019). Firstly, Member States were required to undertake a preliminary flood risk assessment of their river basins and coastal zones, for the reason that potential flood risk areas could get identified. Secondly, the areas where real potential flood risks exist, need to be mapped in flood hazard maps and flood risk

maps. Within these maps, the potential citizens in danger, the environmental damage, and the economic damage should be visible. Thirdly, flood risk management plans should be developed for the risk zones. Measures reducing flood risks and the consequences should be included, from preventing, protecting, to preparing. All stages get reviewed every six years, to ensure that the measures are up to date with the situations.

To ensure an as effective as possible enforcement of the EU Floods Directive, the Common Implementation Strategy has been set up (European Commission, 2019). This strategy facilitates the information exchange between all stakeholders that participate within the EU Floods Directive. Via this information exchange, all stakeholders can learn from each other since experiences get shared. The specific working group that has been set up as a part of the Common implementation Strategy is named Working Group on Floods. This working group supports the implementation of measures that ensure the goals of the EU Floods Directive, and also gives a platform to exchange experiences.

To be able to compare the Dutch and German ways of implementing measures which will help achieving the goals of the EU Floods Directive, the details of the EU Floods Directive will be analysed. Within the directive, the different levels of the multilevel system occur. For example, the Committee of the Regions got informed, and agreed on analysing and approaching flood risk management, flood prevention, protection and mitigation at community level. The community is allowed to adopt necessary measures within the field of flood risk management as well, because this would be more effective than only letting the national level of the Member States adopt measures. This is possible because of the principles of proportionality and subsidiarity, which are attached to the directive. According to the directive, the Member States should always consider the impacts of newly implemented policies on flood risks. So, this means that the EU Floods Directive takes the national level into account. The management of flood risks is not determined by the EU, but by the Member States themselves. They should manage the damage caused by floods themselves, and this should be based on local and regional circumstances since the type of floods differs for every region. This makes that within this aspect of the directive, national, regional and local level come together. On the other hand, the Council approved that effective flood prevention and mitigation needs cooperation with countries who are not a member of the EU, also called third countries, next to cooperation between Member States. A very important principle within the EU Floods Directive is the principle of solidarity. This means that Member States should not implement measures that increases the flooding risks in other Member States, unless this is agreed on from both countries. Member States should act responsible and with the common benefit as priority. On European level, the Member States should all implement measures who are necessary to be implemented to meet the goals of the EU Floods Directive. Therefore can be stated that the EU Floods Directive focusses on a multilevel approach to achieve the goals of the EU Floods Directive.

The EU Floods Directive consists out of nineteen articles that together create the legislative framework for managing flooding risks in the European Union. The directive aims for Member States

to identify their coastal areas and river basins, and to assign them to the according level of flooding risks. This should be done via a Flood Risk Assessment, which tests the flooding mechanisms and can therefore provide an advise about the actions that have to be taken during a flood, or for flood prevention. The Member States should at least include maps of the river basins, descriptions of floods that happened in the past, and about floods which had an impact on human health, the environment, cultural heritage and economic activity, and for which it could be possible to happen again in the future. Also, Member States should asses the consequences of future floods that may happen, and they should identify the areas where there is a significant potential for flood risk. The so called flood hazard maps include three different scenarios of floods, namely the floods with a low probability, a medium probability and a high probability. The flood risk maps should include the number of citizens that could be affected by a flood, and the economic activity that could be affected. When an area that belongs to an international river is at risk of flooding, the Member State where the area belongs to has to coordinate the flooding situation with the other Member States with whom the river basin is shared with. Rivers are transboundary by nature, which makes information exchange a priority, since implementing a measure in the river basin area of one Member State can have an effect on a river basin area of another Member State. Solidarity is very important within the directive, indicating that Member States are not allowed to implement measures that have a negative effect on the basins of other Member States.

After completing the flood hazard maps, Member States should create their own flood risk management plans. The management plans of the Member States have to focus on preventing floods, and on minimizing the consequences when a flood does occur. The management plans should thereby focus on prevention, protection and preparedness (European Commission, 2007). For transboundary rivers, an international flood risk management plan should be created by the Member States on an international level. So, for an international river basin Member States have to work together and formulate a flood risk management plan. The EU Floods Directive gets coordinated by the European Commission. The flood hazard maps and flood risk management plans of the Member States are getting reviewed every six years in a cycle coordinated and synchronised with the Water Framework Directive implementation cycle (European Commission, 2019). The flood hazard maps and flood risk management plans get reviewed to ensure that the measures taken and implemented are still fitting for the current situation, and so that the impact of climate change can be taken into account. Member States should implement certain measures if needed to meet the goals of the EU Floods Directive, and when they adopt these measures, a reference to the Directive has to be made. Also, when the Member States do adopt a certain measure within the field of the Directive, this has to be communicated to the Commission. The Member States are allowed to be free in deciding how they want to achieve the results of the EU Floods Directive, but they do must adopt measures to achieve this goal. Since the focus of this thesis is on the Netherlands and Germany, we will zoom into the adopted measures of implementing the directive into the national law of both countries.

4.4. The regulation of flood risk management by the Dutch Water Act

This chapter will address the second sub-question ‘’what are the main differences between the Dutch Water Act and the German Federal Water Act?’’ by analysing the regulation of flood risk management of the Netherlands.

As a Member State of the European Union, the Netherlands has to adopt measures to be able to implement the EU Floods Directive. The Netherlands did apply measures, via the so called Overstromingsrisico en waterbeheer in Nederland (Flood Risk and Water management in the Netherlands, 2012). Within the rapport, the Dutch Ministry of Infrastructure and the Environment integrates adoptive changes in organizational, legal and financial tools and institutions (Flood Risk and Water Management, 2012). The rapport furthermore describes the context of the flood risk management of the Netherlands and the institutions that manage this task. The Netherlands favours protection methods in the field of flood risk management, and therefore focus on repairing and constructing flood defences (Flood Risk and Water Management, 2012).

Figure 1

Source: European Commission

4.4.1. National State and the National Water Authority

The rapport Flood Risk and Water Management in the Netherlands describes the context of flood risk management in the Netherlands and the protection standards for preventing flood disasters, but it also explains how European legislation influences the Dutch flood risk management strategy. In the Netherlands, a multilevel system is responsible for the prevention of flooding risks. The national level, the provincial level and the municipality work together in this system. Within the field of water

management on national level, the Ministry of Infrastructure and Environment is responsible for the flood protection (Flood risk and water management in the Netherlands, 2012). Another institution acting on national level is called the National Water Authority, which is responsible for the flood risk management of the North Sea, large lakes, Estuaries and the major rivers.

4.4.2. The provinces

The provinces have a responsibility within the field of spatial planning, since they can determine the destination plan of an area, which can be for industrial reasons or rather for nature. Also, the provinces are responsible for setting the standards of secondary dike systems, which gives them a larger role within the field of flood risk management.

4.4.3. The municipalities and the Regional Water Authorities

On a lower level, the municipality is responsible for more local destination plans. This certainly has to do with the flood risk management field, since the EU Floods Directive states that all measures implemented have to be considered about the possible effects of the policy on flood risks and flood management. Another institution acting on the same level as the municipality are the Regional Water Authorities. This institution has as core goal water management and flood protection, and is therefore important in the regional water risk management.

4.4.4. The safety regions

To be able to handle disaster management, 25 safety regions have been set up in the Netherlands. These safety regions contain the emergency services and public health authorities, and have the mayor of the most important municipality is the head of the safety region. When a disaster happens in more than one municipality of the safety region, the head of the safety region gets responsible for the coordination of the emergency services and public health authorities of the safety region (Flood risk and water management in the Netherlands, 2012). To clarify the current situation of institutions that cover flood risk management in the Netherlands, a visualisation of the system can be found below.

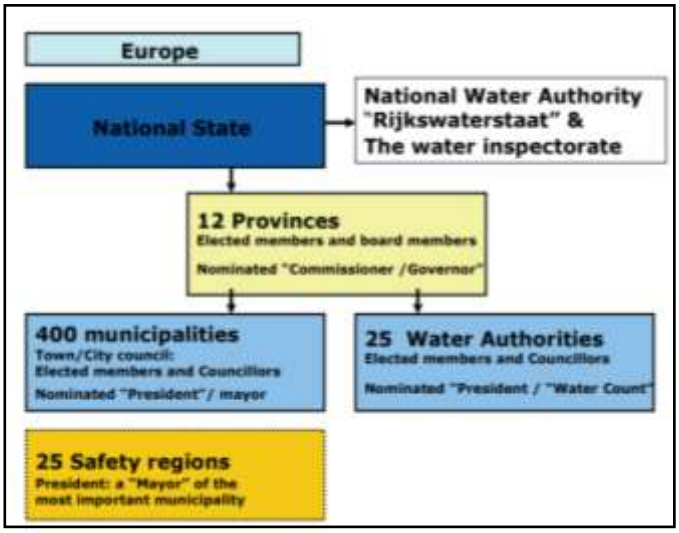

Figure 2

Source: Flood risk and water management in the Netherlands

4.4.5. Flood risk management

Within the field of flood management, the Netherlands have experience, since their flood risk policy changed a lot over the years because of the influence of past disasters (Flood risk and water management in the Netherlands, 2012). Before the entering into force of the EU Floods Directive in 2007, the Netherlands already applied a Flood Risk Assessment in 1960. Member States have to undertake a Flood Risk Assessment of their river basins and coastal areas (European Commission, 2019). This Flood Risk Assessment is part of the EU Floods Directive to be able to clarify the risks of floods in certain areas. The Netherlands applied such an assessment to include formal safety standards on national scale to ensure the safety of the citizens, and to determine which level of flooding risk is acceptable in an area, and therefore to determine which areas should receive more protection (Flood risk and water management in the Netherlands, 2012). The levels of flooding risks are determined on the basis of return periods. This means that, for example, the agglomeration in the Netherlands named the Randstad has a return period of flood risk of 1/10000 per year. This means one flood in 10000 years. For less populated areas a lower return period is seen as acceptable, areas of the Northern and South Western coast have a return period of flood risk of 1/4000, so one flood in 4000 years (Flood risk and water management in the Netherlands, 2012). The lowest return period in the Netherlands in 1/250, this is the along the Meuse river where 20000 people live behind dike rings that offer their protection (Flood risk and water management in the Netherlands, 2012). The whole Flood Risk Assessment, the process of formalizing the safety standards resulted in the implementing of the Act on Flood Defences, which ensures protection of areas in risk of flooding, and which ensures that all flood defences, like dike rings and barrier dams, have to be assessed every five years. So every five years a new assessment gets applied. This is not only helpful for achieving the best protection possible, but

also the effect of climate change can be taken into account, and therefore measures can be taken if necessary. The Netherlands focusses on sustainability with applying new design manuals that take into account climate change. One of the projects that got introduced within this field is the project Room for the River, were rivers got redesigned to be able to adapt to future climate change (Flood risk and water management in the Netherlands, 2012).

The Dutch Water Act also takes the EU Floods Directive into account. The Netherlands produced the flood risk and hazard maps, but they did not carry out the Flood Risk Assessment, since they already did this for the Act on Flood Defence, and this identified the hazard zones and potential damages already. In the rapport created for the EU, the Dutch identified the main flood risk management policy characteristics and the main objectives they want to focus on, to create a clear view of their water risk management. The focus on objectives have been split into three themes, namely protection against floods, prevention of the consequences and crisis management (First Flood Risk Management Plans - Member State: The Netherlands, 2019). To be able to achieve these objectives, several measures are planned. There are 28 measures which focus on being prepared for floods, 12 measures which focus on the prevention of floods, 68 measures which focus on the protection against floods and eight measures which focus on the recovery and review after a flood (First Flood Risk Management Plans - Member State: The Netherlands, 2019). The Dutch were already experienced in flood risk management, but to meet the goals of the EU Floods Directive new legislation had to enter into force (Flood risk and water management in the Netherlands, 2012). One of the new laws is the new integrated spatial planning act (Flood risk and water management in the Netherlands, 2012). The new act combines the Water Act and the Spatial Planning Act into one. Another new law is the Nature Conservation Law, to protect natural habitat and birds. The Nature Conservation Law combines the protection of natural habitat and birds with the EU Floods Directive, since no negative effects on the environment may occur when measures against flooding risks are taken.

The EU Floods Directive had a minimum impact on the flood risk policies of the Netherlands, since the Netherlands already has a long history of flood defence, with a focus on flood risk management (Flood risk and water management in the Netherlands, 2012). Within the multilevel system of the Netherlands no major changes were applied because of the directive, but within the field of sustainability the Nature Conservation Law has been implemented. The directive had an influence on the cross-border cooperation, since the directive stresses the importance of solidarity between the Member States, which can be found in the international commissions for, for example the Rhine and the Meuse, which work on one international flood risk management plan for each river basin. Also, Member States are not allowed to implement measures that can have a negative influence on the river basin within another Member State. So, the Netherlands and its neighbouring countries had to anticipate its water policies on each other, and this results in cooperation, for example, Rhine Action

Plans have been set up. Further in this thesis the cooperation between the Netherlands and Germany will be analysed.

4.5. The regulation of flood risk management by the German Federal Water Act

This chapter will address the second sub-question ‘’what are the main differences between the Dutch Water Act and the German Federal Water Act?’’ by analysing the regulation of flood risk management of Germany.

Germany, as well as the Netherlands, is a Member State of the European Union, which makes that they have to adopt measures according to the EU Floods Directive. Germany constructed the Wasserhaushaltsgesetz, also called the Federal Water Act, in 1957. The Federal Water Act already existed in Germany before the EU Floods Directive got implemented, and had a strong focus on water pollution control (Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, 2020). As a response to the EU Floods Directive, Germany included a legal framework to adopt the EU Floods Directive. The new federal legislation now has a focus on the managemental aspect of water legislation, and coordinates ten river basin districts in Germany. The federal states of Germany, also called Länder, are now obliged to coordinate the management of the water bodies in the river basin districts (Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, 2020).

4.5.1. National State

As mentioned before, as a Member State Germany had to implement the EU Floods Directive into the federal legislation. This implementation was done via the Federal Water Act. Section six of the Federal Water Act describes the legislation within the field of flood protection. According to the Federal Water Act, flooding risk areas contain the combination of the probability of the occurrence of a flood that can have an impact on human health, the environment, cultural heritage and economic activities (Bundesministerium für Umwelt Naturschutz und nukleare Sicherheit, 2009).

4.5.2. Federal States

The Federal Republic of Germany has multiple Federal States. These Federal States may implement the flood risk management measures into their legislation themselves, but they do have to meet the goals set by the EU Floods Directive (Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, 2020). While implementing these flood risk prevention measures, the impact of climate change should be taken into account (Bundesministerium für Umwelt Naturschutz und nukleare Sicherheit, 2009).

4.5.3. Coordination Committees

Also, Germany set up coordination committees in relevant river basins, to be able to cooperate on a less formalised basis (Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, 2020). Within the field of communication, Germany addresses the importance of sharing all necessary information between the Federal States, but also between the Member States of the European Union. This meets the goal of the EU Floods Directive of solidarity, since the EU Floods Directive aims for international river basin management, and therefore for solidarity between Member States (European Commission, 2019).

4.5.4. Flood risk management

Germany produced the flood risk and hazard maps that were obligated by the EU Floods Directive. The German flood risk maps contain areas that are at risk of flooding once in between 200 and 100 years, or more often (Bundesministerium für Umwelt Naturschutz und nukleare Sicherheit, 2009). The flood risk maps also include the extent of flooding, the water depth, the water level, and the risk of draining the water when necessary (Bundesministerium für Umwelt Naturschutz und nukleare Sicherheit, 2009). The German hazard maps include the consequences of floods and potential damage (Bundesministerium für Umwelt Naturschutz und nukleare Sicherheit, 2009). The flood risk maps and hazard maps get assessed every six years, to make sure that taken measures are still accurate for the situation.

To be able to create well established River Basin Management Plans, Germany divided its river basins into different districts. Ten districts have been set up, namely Danube, Rhine, Ems, Weser, Elbe, Odra, Meuse, Eider, Schlei/Trave and Warnow/Peene (European Commission, 2019). To be able to meet the principle of solidarity[1], the countries sharing the same River Basin District have been identified by Germany. To be able to have coordination between the Federal States, also called Länder, a common inter-Länder plan has been set up for the districts of the Danube and the Rhine (European Commission, 2019). In Germany, all different river basin districts created their own flood risk management plans, so there is no common national flood risk management plan in Germany. On national level the ‘’ Working Group of the Federal States on Water Issues‘’ also named ‘’Länderarbeitsgruppe Wasser’’ was setup to be able to create some kind of coordination between the different Länder, and some Länder even worked together very closely to be able to create a river basin management plan, but also some Länder worked very individually.

[1] The principle of solidarity means that Member States should not implement measures that increases the flooding risks in other Member States, unless this is agreed on from both countries. Member States should act responsible and with the common benefit as priority.

On municipality level in Germany are municipalities allowed to adopt certain binding measures within their specific area of sovereignty, for example, raising cost-recovery fees and public water supply (Arle, J., et al, 2018).

Figure 3

Source: European Commission

For analysing German flood risk management plans, the choice has been made to analyse the flood risk management plan of Nordrhein-Westfalen, since this Federal State covers all main river basins that cross the Dutch-German border, namely Ems, Rhine and Meuse. Nordrhein-Westfalen created a flood risk map and a flood hazard map for all mentioned rivers, and based the measures implemented on these maps. All measures taken are implemented to prevent new flooding risks and to minimize existing risks and to minimize negative consequences during and after floods (Hochwasserrisikomanagement in Nordrhein-Westfalen, 2015).

The measures taken cover at least one of the aspects of preventing new flooding risks, minimizing existing risks or minimizing negative consequences during or after floods, for example, in the field of preventing new flooding risks measures against new erosion risks are taken, in the field of minimizing existing risks measures to improve natural water retention are taken, in the field of minimizing negative consequences during floods measures are taken to improve the reaction time of responsible organisations and authorities, and in the field of minimizing negative consequences after a flood measures are taken to improve the possibilities of aftercare for the citizens, environment and economy (Ministerium für Umwelt, Landwirtschaft, Natur- und Verbraucherschutz des landes Nordrhein-Westfalen, 2015). To clarify the current situation of institutions that cover flood risk management in the Germany, a visualisation of the system can be found below.

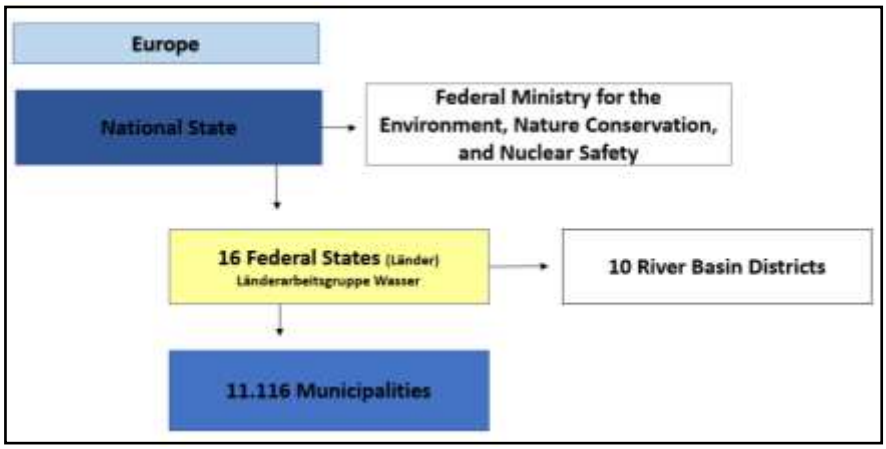

Figure 4

Source: German Environment Agency

The EU Floods Directive had an impact on the flood risk policies of Germany. Germany had a strong focus on water quality before the entering into force of the EU Floods Directive, and therefore had to create additional water policy that implemented the directive. This legislation was implemented within the already existing Federal Water Act. The implementation changed the multilevel system, because ten river basin districts were identified. Coordination committees entered the system as well to regulate the information about the river basin districts on the Federal State level. Within the field of sustainability no major changes were applied, and within the field of cross-border cooperation international flood risk management plan for type 1 river basins were obliged, which led to more cooperation. Also, the directive stressed the importance of solidarity, and Member States are not allowed to implement measures that can have a negative influence on the river basin within another Member State. So, cross-border cooperation is necessary to ensure the principle of solidarity. Furthermore in this thesis the cooperation between Germany and the Netherlands for the shared river basins will be analysed.

4.6. German-Dutch Cooperation under the Floods Directive

This chapter will address the third sub-question ‘’how do Germany and the Netherlands cooperate in the field of flood risk management?’’ by analysing several international coordinating bodies and cross-border cooperation’s.

Several rivers are crossing the Dutch-German border, such as the Rhine, the Meuse and the Ems. The water regulation in Germany has an influence on the regulation in the Netherlands, and vice versa, since lots of rivers run through Germany before they enter the Netherlands. Thus, the regulation of the draining of those transboundary rivers in Germany have an influence on the draining in the Netherlands. Therefore cooperation between both countries is necessary. The European Commission monitors the cross-border cooperation of Member States within the field of floods risk management.

For the Dutch-German case the Rhine, The Meuse and the Ems are crossing the Dutch-German border. The rivers Rhine and Meuse are categorized by the European Committee as a type 1 basin, which makes that the Member States of the Rhine and Meuse river basins have to set up and international coordinating body which ensures formal international agreements and an International Flood Risk Management Plan. The Ems is categorized as type 2 basin, which states that the international river basin needs to have a formal international agreement and international coordinating body, but it does not need an International Flood Risk Management Plan such as is needed for the type 1 basins (International Cooperation under the Floods Directive, 2019).

4.6.1. The International Commission for the Protection of the Rhine

The Rhine River Basin is not only shared between Germany and the Netherlands, but also between France, Switzerland and for smaller parts Austria, Italy, Luxembourg, Belgium and Liechtenstein. To ensure a good cooperation between all countries, an international commission has been set up, named The International Commission for the Protection of the Rhine. Within the commission a special 'Floods' working group has been set up, which helps implementing the Floods Directive measures (International Cooperation under the Floods Directive, 2019). The International Commission for the Protection of the Rhine made a floods action plan, that includes avoiding new unacceptable risks, reducing risks to an acceptable level, reducing adverse consequences during a flood, and after a flood. Specific measures to achieve the mentioned objectives are reducing damage risks by 25 per cent, extreme flood stages downstream the impounded sections have to be reduced by 70 cm, the citizens who are living near the Rhine have to be made aware of the risks of floods and periods of flood forecasting are getting prolonged, to avoid potential damage from floods (International Commission for the Protection of the Rhine, 2020). All plans of flood risk management for the Rhine are drafted in the Flood Risk Management Plan for the international Rhine river basin. The Flood Risk Management Plan describes the management of flood risks of all the states within the Rhine river basin. The management plans to prevent flood risks are based on a preliminary flood risk assessment, that has been coordinated on an international level. The preliminary flood risk assessment provides a map that includes all areas which have a potential significant risk of flooding.

The Member States in the river basin of the Rhine also agreed on several approaches to plan and implement measures to meet the goals of the EU Floods Directive. These contain the following approaches. Firstly, regional and local measures that do not have a transboundary effect can me planned and implemented on regional and local level. In case, regional or local measures do have a transboundary effect, there should be information exchange between all sides. Secondly, when the measures cause in addition to the regional effects also supra-regional effects, the transboundary effects get coordinated by the river basin district. Thirdly, next to transboundary effects, the effect of climate change has been taken into account as well. The impacts from climate change of the measures of flood

risk management for the Rhine basin have been assessed, and a strategy to adapt to climate change has been made. For example, agreements have been made to give more room to the river and to keep floodplains free of all uses (International Cooperation under the Floods Directive, 2019). Therefore, the International Commission for the Protection of the Rhine focusses on better environmental options while protecting humanity against floods, and therefore acts in a sustainable way.

4.6.2. International Meuse Commission

The Meuse River Basin is shared between France, Belgium, Germany, the Netherlands and Luxembourg. To ensure a well working cooperation between these states, the International Meuse Commission has been set up. The commission worked on an international Flood Risk Management Plan, and created a working group named 'Hydrology and Floods' that ensures the implementation of the Floods Directive (International Cooperation under the Floods Directive, 2019). The international Flood Risk Management Plan for the Meuse contains information on how measures need to be coordinated and on the needed information exchange between Member States on international level (International Cooperation under the Floods Directive, 2019). The International Meuse Commission coordinated a preliminary flood risk assessment on international level, all Member States that share the Meuse River Basin developed a risk assessment, and border areas coordinated their risk assessments together (International Cooperation under the Floods Directive, 2019). Based on the preliminary flood risk assessment, flood hazard and flood risks maps were created, to be able to receive insight in the probabilities of flooding and the consequences. All details of the flood hazard and flood risk maps got included in the Flood Risk Management plan of the Meuse River Basin. Within this Flood Risk Management Plan, several objectives were set up as well to be able to manage flood risks at international level. These objectives mainly focus on the aspect of solidarity. The Member States should act on an appropriate level within the multilevel system, and they should show solidarity in the case of flooding (International Cooperation under the Floods Directive, 2019). Also, international coordination should take place when measures contain transboundary effects. Within the field of sustainability, the International Meuse Commission focusses on ecological balances between the environment and flood protection while implementing measures against flood risks (De Internationale Maas Commissie, 2015).

4.6.3. Cooperation in the Ems River Basin

The Ems River Basin is shared only between Germany and the Netherlands. There is no special international commission for the cooperation between both countries, but they agreed on Ministerial correspondence, which makes the Ministers responsible for the protection of the Elbe water basin (International Cooperation under the Floods Directive, 2019). This Ministerial correspondence

happens within the International Steering Group Ems. On the other hand, several experts work together in the International Coordination Groups Ems, to implement the decisions of the International Steering Group Ems. Since the Ems is categorized as type 2 river basin, the international coordinating body, which is the International Steering Group Ems, does not need to have an International Flood Risk Management Plan. Germany and The Netherlands both have different policies regarding flood risk management, and both countries did set up flood risk and flood hazard maps themselves. And accordingly to the principle of solidarity, Germany and the Netherlands shared their information and combined their knowledge, which led to a flood risk and flood hazard map that combines the knowledge of both countries, and contain several flood scenarios and water depths (De Eems, 2020). The hazard maps include the potential damage floods can do, and contain information about the number of inhabitants and negative consequences for the economy and the environment.

4.6.4. Regional cross-border cooperation

The river basins of Rhine, Meuse and Ems are the larger river basins that cross the German-Dutch border, but also several other small rivers cross this border, examples are Dinkel, Vecht, Berkel and Oude Ijsssel. To ensure the water risk management of these small river basins, the German-Dutch organisation Grensoverschrijdend Platform voor Regionaal Waterbeheer has been set up. The organisation ensures the management of flood risks and water quality (Grensoverschrijdend Platform voor Regionaal Waterbeheer, 2020). The organisation is a cooperation between the German Landkreis Grafschaft Bentheim, Kreis Steinfurt and Kreis Borken, and the Dutch water authorities Vechtstromen and Rijn & Ijssel. The organisation regulates meetings and information exchange between all parties, to ensure good regional cooperation in flood risk situations (Grensoverschrijdend Platform voor Regionaal Waterbeheer, 2020). This cooperation has led to several transboundary projects, for example, creating the German-Dutch border meander. The meander streams on the German-Dutch border, and is therefore a good example of solidarity between both countries. The meander is part of regional flood risk management and plays a role within the environment, since it should be an environment that has to attract new animal species, so therefore Grensoverschrijdend Platform voor Regionaal Waterbeheer also takes sustainability into account. So, German-Dutch cooperation under the EU Floods Directive is taking place on international, national and regional level. On international level several countries of one river basin as the Rhine or the Meuse are working together on regulating flood risk management, on national level Germany and the Netherlands work on creating flood risk management for the Ems basin, and on regional level Germany and the Netherlands work together by regulating flood risk management of Dinkel, Vecht, Berkel and Oude Ijsssel.

5. Discussion

To answer the main research question of this thesis ‘’How do different institutional levels manage flooding of transboundary rivers in the Dutch-German border area?’’ three sub-questions have been set up:

1: How does the European Union regulate flooding risk-management?
2: What are the main differences between the Dutch Water Act and the German Federal Water Act?
3: How do Germany and the Netherlands cooperate in the field of flood risk-management?

To be able to answer these sub-questions several policy documents have been analysed. Firstly, the EU Floods Directive has been analysed. This analysis led to answering the first sub-question ‘’how does the European Union regulate flood risk management?’’. The European Union regulates flooding risk-management via the EU Floods Directive. The EU Floods Directive ensures that the Member States implement measures within their national law to meet the main elements of the EU Floods Directive, which are prevention, protection, preparedness, emergency responses and recovery in the field of human health, the environment, cultural heritage and economic activity. To achieve these goals, the Member States had to undertake flood risk assessments of their river basins and coastal zones. Therefore, potential risk areas could get identified in flood hazard maps and flood risk maps. When the risk areas where identified, the Member States had to develop flood risk management plans, that should reduce the flooding risks of the identified areas. The Floods Directive is coordinated by the European Commission. The flood hazard maps and flood risk management plans of the Member States are getting reviewed every six years in a cycle coordinated and synchronised with the Water Framework Directive implementation cycle, which ensures that the measures of the Member States stay up to date. To answer the first sub-question ‘’how does the European Union regulate flooding risk management?’’, the European Union implemented the EU Floods Directive to be able to regulate flooding risks in a multilevel, sustainable way within a legislative framework.

Secondly, the Dutch and German approach to meet the goals of the EU Floods Directive were analysed, to be able to compare their differences and therefore answer the second sub-question ‘’What are the main differences between the Dutch Water Act and the German Federal Water Act?’’. The Dutch Water act represents a multilevel system that handles the prevention of flooding risks. On national level, the National Water Authority is responsible for flood risk management. The provinces are responsible for regional spatial planning, and the municipalities are responsible for local destination plans. All the measures implemented have to be considered about the possible effects of the policy on flood risks and flood management, and therefore the provinces and municipalities have an effect on the implementation of the EU Floods Directive via regional and local planning. Also, on

municipality level another institution plays a role within the flood risk management field. In the Netherlands, 25 safety regions have been set up that handle the coordination of the emergency services and public health authorities when a disaster, like a flood, occurs. So, the Netherlands approaches flood risk management via a multilevel system with a focus on regional management. To meet the obligations of the EU Floods Directive, the Netherlands undertook a Flood Risk Assessment, and implemented on the basis of the results of the Flood Risk Assessment the Act on Flood Defences, which ensures the protection of areas in risk of flooding. The flood defences in the Netherlands, like dikes rings and barrier dams, get assessed every five years to ensure that the right measures are taken within the right situation, and to adapt to climate change. Therefore, the Netherlands applied the EU Floods Directive into national law via a multilevel system, that take sustainability into account. Germany updated the national legislation on water management, named Wasserhaushaltsgesetz, to meet the goals of the EU Floods Directive within the national legislation. Within this update, Germany divided the country in ten different River Basin Districts. The federal states of Germany, also called the Länder, are responsible for the coordination of the water management of the River Basin Districts. Therefore, Germany represents a multilevel system that handles the prevention of flooding risks. Also, Germany created flood risk maps and flood hazard maps, to be able to implement measures within the areas at risk of flooding. The maps get assessed every six years to make sure that the taken measures are still up to date, and to be able to adapt to climate change. To make sure that the Federal States, Länder, can rely on each other, and that they can share their information, the ‘’Länderarbeitsguppe Wasser’’ was set up. The group ensures coordination between the Federal States when necessary, but it is up to the Federal States themselves if they want to work individually or more close with other Federal States. The Dutch and German water acts have several similarities. Both acts stimulate sustainability by revising the flood risk maps and flood hazard maps every five or six years, which ensures that both countries have the possibility to adapt to climate change. Also, both countries manage flooding risks in a multilevel system. For the Netherlands, this multilevel system includes the National State, the National Water Authority, twelve provinces, 400 municipalities, 25 water authorities and 25 safety regions. This multilevel system does differ from the German multilevel system, which is much more focussed on the Federal States themselves. The multilevel system in Germany includes the Federal State, the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, 16 Länder, ten River Basin Districts and the 11.116 municipalities. This makes that the difference between the Netherlands and Germany mostly lies within the power of the local governance. In the Netherlands, the municipalities and safety regions play a part within the field of flood risk management, and in Germany the Federal States mostly fulfil this part, which is less local than in the Netherlands. Both the Netherlands and Germany created flood risk maps and flood hazard maps to identify the areas at risk of flooding, and to identify the consequences when a flood would occur. The Netherlands created this map on national level, and in Germany the maps where created by the Federal States. The Netherlands focusses on preparing on a flood happening, prevention of

flooding risks, protection against floods and recovery and review after a flood in the implemented measures. Nordrhein-Westfalen focusses on preventing new flooding risks, minimizing existing risks and minimizing negative consequences during and after floods. So, both the Netherlands and Germany focus on implementing the EU Floods Directive via national legislation, but both apply this via a different multilevel system. Both the Netherlands and Germany focus on several parts of flood risk management such as prevention, protection and recovery.

Thirdly, the Dutch-German Cooperation under the EU Floods Directive got analysed. The EU Floods Directive stresses the importance of solidarity between the Member States. Therefore, Member States should not implement measures that have negative consequences for the water risk management of another Member State. Also, they are obligated to share important information about shared river basins when necessary. The Netherlands and Germany share several transboundary rivers, such as Rhine, Meuse and Ems. To be able to regulate these river basins, international commissions have been set up, which are the International Commission for the Protection of the Rhine and the International Meuse Commission. For the Ems the International Steering Group Ems has been set up, that only includes Germany and The Netherlands, since only Germany and the Netherlands are within the river basin of the Ems. The International Steering Group Ems regulates the correspondence between The Netherlands and Germany about the Ems river basin. The Rhine, Meuse and Ems are large river basins, but also small rivers like Dinkel, Vecht, Berkel and Oude Ijsssel are crossing the German-Dutch border. The regulation of these smaller river basins is organized via the German-Dutch organisation Grensoverschrijdend Platform voor Regionaal Waterbeheer. The organisation works on water risk management and ensuring good water quality. So, Germany and the Netherlands are working together on several levels to ensure water risk management. On an international level they are working together in the Commission of the Protection of the Rhine, and within the International Meuse Commission. On national level the water risk management of the Ems gets regulated, and on regional level the water risk management of Dinkel, Vecht, Berkel and Oude Ijsssel gets regulated.

After the analysis of the European, Dutch and German flood risk management some improvements can be stated. The European Union is clear about the aim of the EU Floods Directive, namely reducing and managing the risks that come with floods. The directive ensures that the Member States have to adopt measures to meet the goals, and the European Commission makes sure that the Member States meet these goals by reviewing the taken measures every six years. But when these regulations come into practise on national level, the regulations get less coordinated. Every Member State can implement the measures that they assume are necessary, but there is no overall European plan. The Member States should find out themselves, how and which measures are fitting for their situations. This means that the flood risk management regulations differ from state to state, as can be seen between the Netherlands and Germany. This does not have to mean that the EU Floods Directive won't be able to achieve the original goals, but is does mean that there is no coherency. The approach of the Netherlands is more national with regional implementation, were Germany has a strong focus

on less local implementation but more on the Federal States level. This makes it hard to compare the regulations of different Member States, and therefore it would be hard to see if the Member States are meeting the goals of the EU Floods Directive.

6. Conclusion

To address the main research question ‘’how do different institutional levels manage flooding of transboundary rivers in the Dutch-German border area?’’ a theoretical framework has been set up via several research rapports and the analysis of the primary sources of this thesis the EU Floods Directive, the Dutch Water Act and the German Federal Water Act.

The analyzation of the EU Floods Directive, the Dutch Water Act, the German Federal Water Act and international cooperation’s that regulate the transboundary river management led to an answer to the main research question of this thesis ‘’how do different institutional levels manage flooding of transboundary rivers in the Dutch-German border area?’’ To be able to answer the main research question, three sub-questions have been answered. After analysing the EU Floods Directive, the first sub-question ‘’how does the European Union regulate flooding risk management?’’ could get answered. The European Union implemented the EU Floods Directive to be able to regulate flooding risks in a multilevel, sustainable way within a legislative framework. After comparing the Dutch and German ways of managing flooding risks the second sub-question ‘’what are the main differences between the Dutch Water Act and the German Federal Water Act?’’ could get answered. Several differences and similarities occurred. The Netherlands and Germany both have a multilevel system to implement national legislation within the field of flood risk management. Both countries adapted their national water legislation to meet the goals of the EU Floods Directive. The Netherlands mostly implemented measures on national level, where Germany mostly implemented measures on the level of the Federal States, also named the Länder. The EU Floods Directive focusses on solidarity between the Member States, and therefore the Netherlands and Germany where expected to share information about their shared river basins. For answering the third sub-question ‘’how do Germany and the Netherlands cooperate in the field of flood risk-management?’’ several transboundary cooperation’s have been analysed. On an international level, several commissions have been set up. The International Commission for the Protection of the Rhine and the International Meuse Commission ensure the flood risk management of the Rhine and the Meuse on an international level, and for the Ems, the Netherlands and Germany work closely together on national level. On regional level, the regulation of flood risk management of smaller river basins of Dinkel, Vecht, Berkel and Oude Ijsssel is getting regulated via the German-Dutch organisation Grensoverschrijdend Platform voor Regionaal Waterbeheer.

To answer the main research question ‘’how do different institutional levels manage flooding of transboundary rivers in the Dutch-German border area?’’, the different institutional levels manage the flooding of transboundary rivers in the Dutch-German border area through solidarity. The principle of solidarity that is included in the EU Flood Directive makes clear that Member States should not implement measures that will have negative consequences for the flood risk management of another

Member State. To ensure this solidarity and good cooperation between the Member States, several commissions have been set up. Member States who have River Basins that are categorized as type one basins, such as the Rhine and the Meuse, have to ensure international commissions to regulate flood risk management. Germany and the Netherlands are working together on international level within the Commission of the Protection of the Rhine and the International Meuse Commission. On national level, cooperation occurs for the flood risk management of the Ems via the International Steering Group Ems. On regional level cooperation occurs for the smaller transboundary rivers Dinkel, Vecht, Berkel and Oude Ijsssel via the German-Dutch organisation Grensoverschrijdend Platform voor Regionaal Waterbeheer.

There were some limitations to this research. The Dutch Water Act and the German Federal Water Act were sometimes hard to compare, because of the difference in implementation. The Netherlands mostly implemented the flood risk management measures on national level, therefore the measures were clear to find. Germany therefore mostly implemented measures on the level of the Federal States. This means that all Federal States are free to implement measures, as long as they are meeting the goals of the German Federal Water Act, but therefore the measures differed per Federal State. Within the scope of this thesis it was not possible to compare different implementations of different Federal States, and therefore only the implementations of the Federal State Nordrhein-Westfalen has been analysed, because all three larger transboundary River Basins, Rhine, Meuse, Ems, stream through this Federal State. For further research, my suggestion would be to compare more Federal States of Germany, to be able to create a fuller understanding of the water risk management of Germany, and to therefore create a fuller analysis of the German-Dutch border cooperation within the field of flood risk management.

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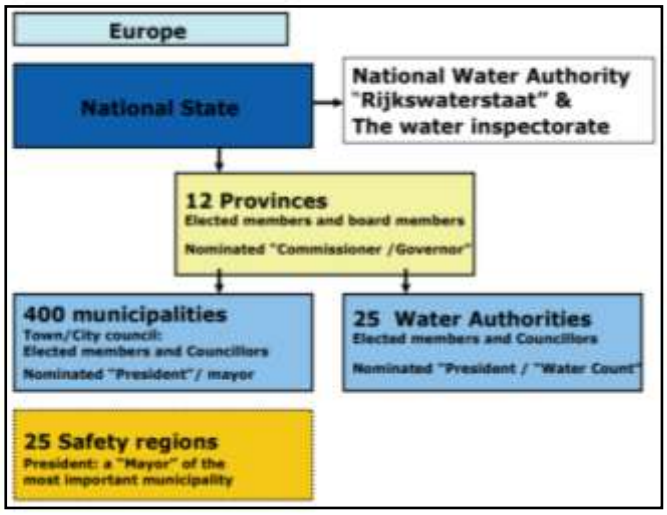
8. Appendices

Figure 1

Source: European Commission

Figure 2

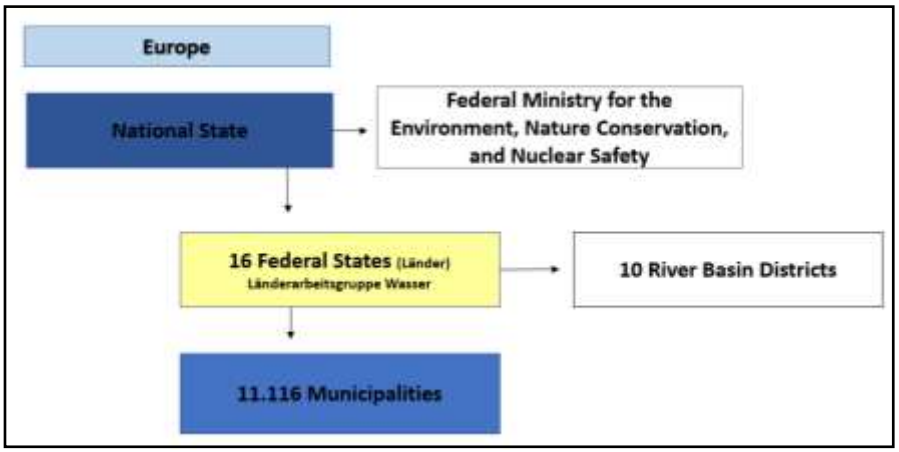


Source: Flood risk and water management in the Netherlands

Figure 3

Source: European Commission

Figure 4



Source: German Environment Agency