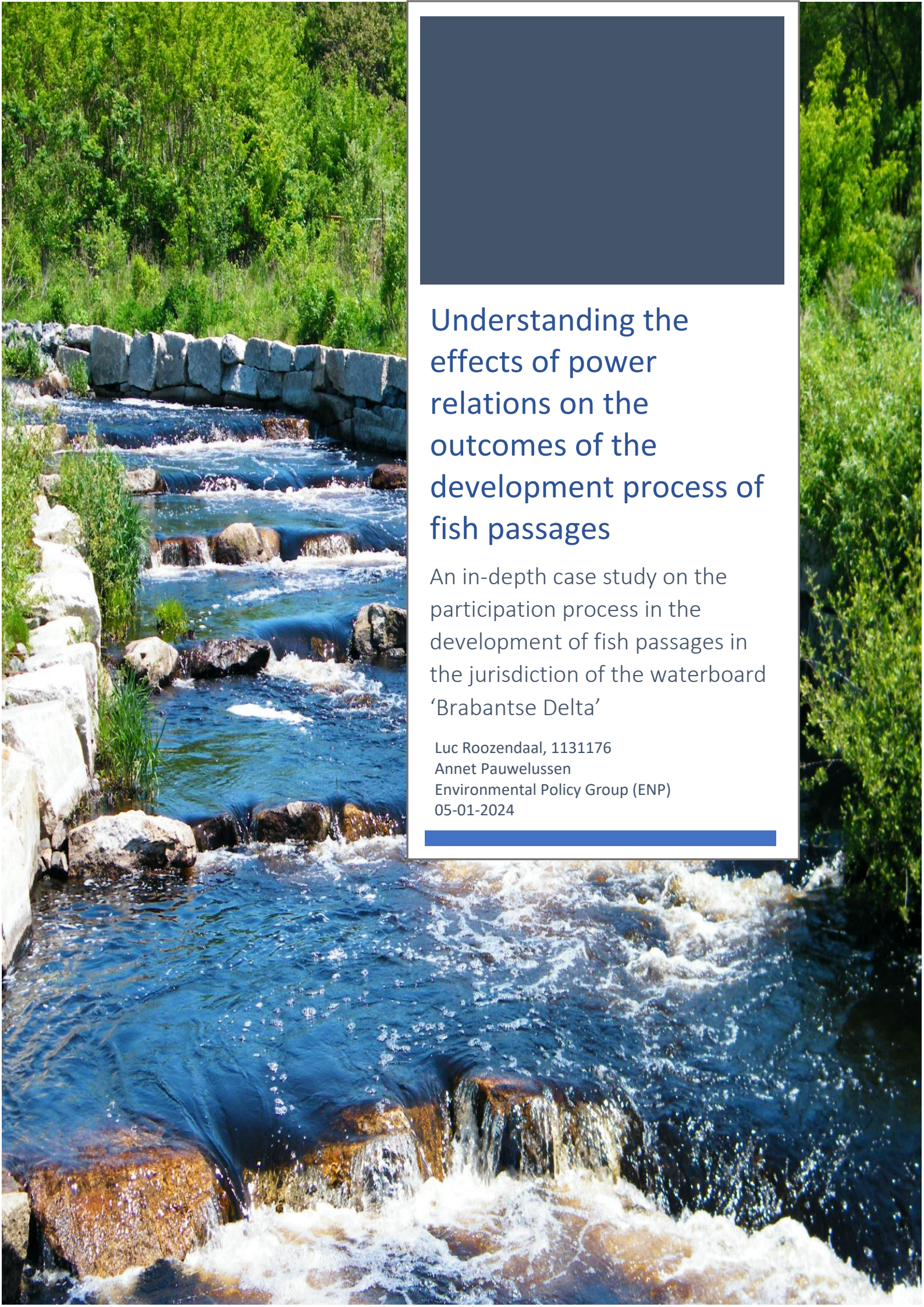

Understanding the effects of power relations on the outcomes of the development process of fish passages

An in-depth case study on the participation process in the development of fish passages in the jurisdiction of the waterboard ‘Brabantse Delta’

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Acknowledgments

The thesis lying before you is the result of an intense learning process, as part of my Master's program, which allowed me to put all my theoretical knowledge about performing qualitative research into practice. Moreover, it allowed me to gain a deeper understanding of topics like fish migration, multi-stakeholder processes, participation, development processes, water management, and waterboards.

As part of this learning process, I was able to gather data and perform fieldwork about the development of fish passages in the jurisdiction of the waterboard 'Brabantse Delta'. For this reason, I want to thank waterboard 'Brabantse Delta' for opening its doors to me and allowing me to perform my thesis. Marco Beers of waterboard 'Brabantse Delta' played a large role in making this possible and also helped me to get in contact with different actors that are involved in the development process of fish passages, for which I am grateful. Moreover, I want to thank all the different interviewees that contributed to my study, by making time for an interview in their busy schedules. I hope that the outcomes of this study are regarded as useful. Additionally, this study is part of a PhD-project on fish migration in The Netherlands, performed by Panos Panagiotopolous, who I want to thank for showing continued interest in the developments of this study, the fun times during the field days, and offering help and emotional support if needed. Furthermore, I want to thank Tom Buijse for allowing me to be part of this PhD-project. I also want to thank Hilde Toonen for providing me with valuable feedback on my thesis proposal and being my second reader. Furthermore, I want to thank Annet Pauwelussen, who has presented herself as a formidable supervisor. Her feedback and guidance during this whole process helped me significantly in writing this thesis. She always tried to deliver her best, which added to my learning process towards becoming an academic researcher in social sciences. Lastly, I want to thank anyone who reads this thesis. Hopefully, this thesis provides insights that can be of use in your field of work.

Abstract

Fish passages are increasingly being developed in The Netherlands to improve the connectivity of waterbodies to enhance fish migration, as part of the implementation of the Water Framework Directive. Participation is deemed highly important in these development processes. However, organizing a participation process is complex, and the power relations in these processes can have a significant effect on its outcomes. As social factors are often overlooked in fish passage development, the effects of power relations in the development process of fish passages remain unclear. Therefore, this study aims to increase understanding of how power relations in the organization of actor participation in fish passage development affect the outcomes of such restoration interventions, by using the waterboard 'Brabantse Delta' in The Netherlands as a case study. By using the Policy Arrangement Approach (PAA) as an analytical tool, this study presents an analysis of the actors that are involved in the different phases of fish passage development in the 'Brabantse Delta', their interests, and how their participation in the different development phases are embedded in power relations. It is shown that there are two main interests amongst actors, which are 1) retaining water in the waterbodies, and 2) increasing fish migration. These interests are conflicting, as increasing fish migration implies a (partial) removal of barriers that enable the retainment of water. The research shows that the waterboard organizes participation based on the requirements of each development phase. The waterboard, as the authority to organize the participation of employees of the waterboard itself, and actors outside of the waterboard, shapes the conditions of participation, which determines the influence the abovementioned actors can have on the different development phases of fish passages. In these phases, power imbalances have been found that can be traced back to the value given to actors with expert knowledge, skills, and land in the development process of fish passages. Actors that did not possess these resources are deemed less important and are constrained in their position where they cannot influence the development process, to advocate for their interests. The current power relations in the development process shape the choice for technical type of fish passages over natural type of fish passages, which seems to be a clear reflection of the two conflicting interests in the jurisdiction of the waterboard 'Brabantse Delta'. The power relations in the development process also influence the fish passages by resulting in a loss of their functioning over time. It appeared that this can be attributed to a lack of attention to organizing participation after the construction of a fish passage and large shifts in power relations that are not taken into account when organizing participation.

1. Introduction

1.1. Context of study

Rivers in Europe have been of importance for human development by providing transport routes, energy through hydroelectric power production, drinking water, intensive agriculture, and the expansion of settlements (Schmutz & Sendzimir, 2018). At the same time, rivers are important ecosystems that are home to a large variety of aquatic biodiversity (Tockner et al., 2009). However, river ecosystems have increasingly suffered because of water abstraction, river channelization, pollution, and damming to allow human development (Schmutz & Sendzimir, 2018). Europe, and especially The Netherlands, has one of the highest numbers of barriers in water bodies in the world (Belletti et al., 2020). They offer protection against flooding and enable effective water management to mitigate droughts and retain water (van den Born et al., 2019). Although they have an important function, their presence is the main reason for the decline in freshwater fish and biodiversity in the Netherlands (Moria, 2008). Especially diadromous fish (i.e., fish that migrate from or to the sea to complete their life cycle), like eels and salmon, and potamodromous fish (i.e., fish that migrate in the riverine system itself), like barbel and chub, are affected (Gough et al., 2012; Breve et al., 2014).

Currently, there is a growing societal call for ecological restoration (van den Born et al., 2019). This societal call is also represented in the implementation of the Water Framework Directive (WFD). The WFD is a legislation issued by the EU towards all the member states, that places great emphasis on restoring fish habitats and seeks to achieve 'good environmental status' for all freshwater and coastal waters between 2015 and 2027 (European Commission, 2022; Breve et al., 2014). This also involves the improvement of the connectivity of water bodies to bring back and restore vulnerable migratory fish stocks. This connectivity is currently being hampered by the large number of barriers in the water bodies of The Netherlands. Therefore, restoration of longitudinal connectivity involves the removal, or circumvention of these barriers, to allow fish migration (Breve et al., 2014). Under the WFD, a total of 2664 priority barriers have been identified that inhibit fish migration and need to be removed by 2027 (Kroes et al., 2018). In the Netherlands, the implementation of the WFD, and therefore the removal of the 2664 priority barriers, is the responsibility of the twenty-one waterboards. These are independent governmental organizations, each responsible for the management of the water bodies in their jurisdictional area (Kroes et al., 2018; Unie van Waterschappen, 2022). A common measure of these waterboards for to restore connectivity is by developing fish passages. Examples of a fish passage can be a side channel, a fish-friendly pump, sluice management that is adjusted to the migration of fish, or the removal of a dam (Breve et al., 2014).

1.2. Importance and evolution of participation in water resource management in The Netherlands

Bennet, (2016) mentions that participation is highly important in environmental restoration efforts, like the development of a fish passage. It has the potential to improve the quality of decision-making by increasing the legitimacy of decisions (Michels, 2016). Participation can also lead to greater cooperation and facilitate problem-solving by introducing different perspectives and constraints, which can stimulate creative and new solutions (Phalen, 2009). The guidance document on public participation in the implementation of the WFD agrees with that. It states that the formal authorities of member states must inform and consult actors that have an interest in or are affected by, the measures resulting from the WFD. Moreover, this document encourages the active participation of actors as it could lead to a higher acceptability towards policy outcomes by increasing ownership over policy decisions (European Communities, 2003).

The Netherlands has a long history of participation of actors in water resource management, which evolved since the 1970s with the rise of an environmental movement (Brouwer, 2015). This is illustrated by the widescale protests and political debates regarding the potential ecological effects of the planned closure of the Eastern Scheldt estuary in 1974, to ensure water safety by preventing floodings. These protests resulted in a change of construction plans that involved moveable panels to retain the natural tidal variations and the ecological values of the estuary, instead of a full closure of the Eastern Scheldt (Brouwer, 2015; Verkerk & van Buuren, 2013). According to Brouwer (2015), this was the start of a more integral and participatory method of water resource management in The Netherlands. From the 1990s, democratization further expanded in water resource management, which resulted in an increase in more ad-hoc forms of participatory processes, that were often framed as 'multi-stakeholder participation', or 'joint-fact finding'. These processes aimed to create a better understanding of the local situation, and an implementation process that was more legitimate in the eyes of the actors that were directly affected (Roth et al., 2017). Nowadays, water resource management in The Netherlands is highly decentralized and takes place in close collaboration with many different governance levels and actors (Brouwer, 2015). This gradual evolution and the increase of participatory processes regarding water resource management is described in the literature as a process of political modernisation (Arts & Van Tatenhove, 2006).

1.3. Complexity of participation in river restoration projects

Participation is especially important in policy arrangements of river restoration projects, as there is a large number of actors present, whose uses of the water system are often conflicting (Juarez-Bourke & Blackstock, 2021; Hommes, 2008). A policy arrangement is defined as the temporary stabilisation of the content and organisation of a particular policy domain (Liefferink, 2006), like for instance river restoration, or more specifically fish passage development. The actors in these policy arrangements have different interests and they value certain social, environmental, and economic outcomes differently (Juarez-Bourke & Blackstock, 2021). Therefore, on the one hand, involving more actors in a project may improve the legitimacy of projects and widespread support for its outcomes. On the other hand, it makes the decision-making process in these projects complex, as more interests need to be taken into account.

To add to the complexity, the development process of fish passages usually consists of different phases (Coenen et al., 2013). Uittenbroek et al, (2019) mention that the input of actors in different project phases may vary, as they can take up different roles like providing ideas, implementing ideas, or contributing to the eventual maintenance or operation. Therefore, initiators of a participatory process, often governmental bodies, scientists, or large NGOs (Turnhout et al., 2020), need to decide who, when, and how actors are allowed to participate (Uittenbroek et al., 2019). Moreover, the initiators often hold privileged positions, shaping the scope of participation, and defining which interests are legitimate. They often possess resources in the form of specialistic knowledge and skills. As a consequence, these actors are enabled to have a large influence on the participation process, so that it serves their interests. Actors with interests, knowledge, and skills that are deemed less legitimate, are only able to influence the process to a lesser extent. As a result, these power relations can have a significant influence on the outcomes of a development process, and they are less likely to reflect the interests of the actors with less influence (Turnhout et al., 2020).

1.4. Problem statement

Currently, the increase in the development of fish passages is paired with an increase in studies regarding the effectiveness of fish passages, which describe a substantial amount of fish passages that do not sufficiently improve fish migration (Bunt et al., 2011; Noonan et al., 2011). The section above described that differences in interests and existing power relations between actors have the potential

to significantly influence the outcomes of the development process of fish passages. However, the current studies on the effectiveness of fish passages only focus on technical and ecological factors. They attribute fish passage failure to mistakes in the technical design (Katopodis & Williams, 2016), or inadequate operation (van Leeuwen et al., 2016) and maintenance (Santos et al., 2012). This focus on technical and ecological factors disregards social factors, like issues with power relations between actors in the development process, that have the potential to affect the development and functioning of fish passages. Because of this, Moore & Rutherford, (2017) stress the importance of taking a social science approach to issues in the management of river restoration projects, like the development of fish passages. Therefore, this study wishes to add to the literature in social sciences on issues with power relations between actors in the development process of river restoration, and fish passage projects. To achieve this, there is a need to understand how power relations in the organisation of actor participation in fish passage development in the 'Brabantse Delta' affect the outcomes of the development process of fish passages.

1.5. Research objective and research questions

1.5.1. Research objective

This study aims to explore how the power relations in the organisation of actor participation in fish passage development in the 'Brabantse Delta' affect the outcomes of the development process of fish passages. The Policy Arrangement Approach (PAA) is used in this study as an analytical tool that enables studying power relations in relation to participation. The insights of this study can enhance understanding of power relations in participatory processes in river restoration and fish migration projects, and how these affect the outcomes of the different phases of the development process. This enhanced understanding can be used by policymakers and waterboards to improve participatory processes in fish passage and river restoration projects.

1.5.2. Research questions

To reach the abovementioned objective, the following main research question has been formulated:

How do the power relations in the organisation of participation in fish passage development in the 'Brabantse Delta' affect the outcomes of the development process of fish passages?

four sub-questions are formulated to break down the main research question into more specific questions. Sub-question one is used to identify the actors and their interests involved in the development process of fish passages. Sub-question two is used to get a general understanding of how participation is organised throughout the development process of fish passages. Sub-question three is used to create an understanding of how the participation of actors is embedded in power relations. Sub-question four is used to understand the effects of the power relations present in the organisation of participation on the outcomes of the development process of fish passages.

1. Who are the actors and what are their interests in fish passage development in the ‘Brabantse Delta’?
2. How is participation organised in fish passage development in the ‘Brabantse Delta’?
3. How is the participation of actors in the development process of fish passages in the 'Brabantse Delta' embedded in power relations?
4. What effects do the power relations have on the outcomes of the development process of fish passages in the ‘Brabantse Delta’?

1.6. Outline of the report

Chapter two describes the theoretical framework and discusses the theory of political modernisation, participation in relation to power relations, the analytical tool (PAA), a definition of power, and the conceptual model. Chapter three describes the methodology by going into the general scientific approach, the case study approach, the different data-gathering methods, the external and internal validity, the data-analysis methods, challenges and adjustments, ethical concerns, and possible bias. Chapter four describes the results, by first describing the different actors and their interests. This is followed by a general description of how participation is organised. Moreover, a description of how the participation of actors is embedded in power relation, is given per development phase. Lastly, the two main effects of the power relations in the development process are described. Chapter five offers a reflection on the results of this study on political modernisation, and participation in relation to power relations. Lastly, I discuss the limitations of this study. The last chapter gives the conclusions that answer the main question, after which recommendations are given.

2. Theoretical Framework

In this chapter, I will describe the debate on power relations in participation processes, and how these can be understood and critically analysed. I will do this in the context of the political modernisation theory, as participation plays a central role in the governance processes described in this theory. From this follows the analytical tool, which is the PAA, a commonly used tool in the political modernisation theory. This tool enables the analysis of the policy arrangement of fish passage development in the 'Brabantse Delta'. Moreover, it enables me to highlight the power relations in the development process. Lastly, how the theory and the different concepts of this study come together is graphically depicted in a conceptual model.

2.1. Political modernisation

Over the last decades, there has been a shift in Western societies regarding what 'good governance' is. This is also the case in The Netherlands concerning river restoration, as it appears to have undergone a process of political modernisation, from state-centred interventions towards decentralisation and increased participation of non-state actors. For example, in The Netherlands, up till 1974 most of the decisions regarding river restoration were made by the state (Brouwer, 2015), followed by an increase in participatory processes in the 1990s (Roth et al., 2017). Presently, it is the norm that river restoration is highly decentralized, and takes place in close collaboration with many different governance levels and actors (Brouwer, 2015).

According to the political modernisation theory, Western nations went through similar phases with regard to what is seen as 'good governance' in environmental policy. Arts & van Tatenhove, (2006) have referred to these phases as early- anti- and late political modernisation. Early modernisation is characterised by optimistic views on government steering. In this phase, it is perceived that it is the responsibility of the state to pursue good policies (Arts et al., 2006). Anti-modernisation is characterised by public mistrust towards the government. This phase can be identified by claims for more participatory politics. Late modernisation assumes an increase of interwovenness of the market, civil society, and state, which leads to more cooperation and participation of actors from the market, civil society, and state. Arts & Leroy, 2006 describe the shift towards late modernisation as the shift from 'government' to 'governance'. Governance refers to the fact that steering is no longer the privilege of the government, but is the shared responsibility of a variety of actors from state, market, and civil society (Arts & Leroy, 2006). Most commonly, the different political modernisation phases follow each other consecutively. However, different phases of political modernisation can also exist at the same time in Western nations (van Tatenhove & Leroy, 2003). Due to these shifts in phases, political modernisation is defined by Arts & van Tatenhove, 2006 as:

'*The shifting relationships between the market, civil society and state in political domains of societies, implying new conceptions and structures of governance*'

The political domain of society can be defined as the arrangement in which actors from civil society, the market, and the state are organised in terms of the distribution of resources, what their values and interests are, and in what ways they can interact (Arts & van Tatenhove, 2006). The phase of political modernisation and how these arrangements are organised can provide a lens to explain power relations in participatory processes in a political domain, like fish passage development in the 'Brabantse Delta'.

2.2. Participation

The last section explained the gradually evolving character of what society sees as 'good governance' in river restoration and environmental policy as a result of political modernisation. As part of this 'good governance' in the late political modernisation phase, it is desired that different actors from the market, civil society, and state increasingly cooperate and participate. For this reason, this study bases its definition of participation on the definition of van Tatenhove & Leroy, 2003, which is as follows:

'Participation is the involvement of actors and their interests, such as citizens, market parties, or non-governmental organisations in politics and the process of 'government'

Although participation plays a prominent role in the political modernisation theory, I noticed that it does not go deep into why exactly an increase in participation is beneficial in political domains of society, but just describes that these shifts happen in what is regarded as 'good governance' in political domains. Therefore, by making use of literature regarding participation in decision-making processes, I will go deeper into the debate on why participation nowadays is deemed so important in these policy domains, the complexity of organising participation in decision-making processes, and the possible implications for the development of fish passages. However, first I will provide a typology to get a general idea of the different forms of participation that exist.

Forms of participation

Participation can be used in many different contexts and can take different forms (Carter, 2006). In grey literature, Davidson (1998) developed a typology to describe different forms of participation in the so-called 'Wheel of participation' (*Figure 1*). In this typology, four main forms of participation are described, which are 'information', 'consultation', 'participation', and 'empowerment'. Each form is not necessarily better than others, but the appropriateness of each form is dependent on the context of the participation process (Carter, 2006). Reed (2008) mentions that the wheel of participation is an appropriate metaphor to describe participation. However, without a rigorous theoretical basis, it has seen limited use. Nevertheless, this typology allows me to interpret and reflect on the different forms of participation observed in this case study.

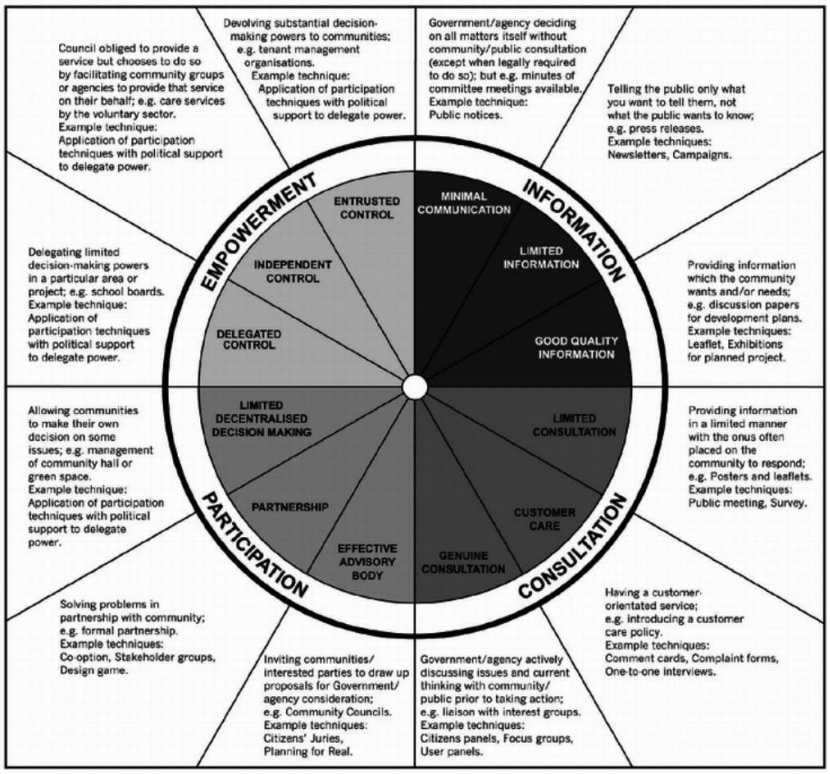

Figure 1: Wheel of participation (Davidson, 1998)

Why is participation important?

Akerboom & Craig, 2022 argue that participation is essential for good environmental governance, based on the large array of interests and information needed in environmental decision-making. Moreover, they write that involving actors in decision-making helps initiators of participatory

processes to make better decisions, by taking important impacts into account, or to become aware of unintended consequences. Moreover, Newig & Fritsch, 2009 argue that participation usually increases acceptance of decisions during a development process. The term that conveys this is legitimacy in multi-actor processes and comes in two-fold. *Input legitimacy* entails the adequate representation of actors, transparency, and accountability. Adequate representation can mean full inclusion of all actors, or actors that represent all the interests (Uittenbroek et al., 2019). Transparency means that other actors who do not make the final decisions have access to information regarding actions and decisions made by the actor in the position to make decisions (Harrison & Savogo, 2014). Accountability is facilitated by transparency, which means that decision-makers have to justify their actions and decisions to the actors that are affected (Bäckstrand, 2006). *Output legitimacy* is concerned with the problem-solving capacity and effectiveness of the actors present in the participation process to reach its intended goals (Bäckstrand, 2006). However, it also increases the acceptance of decisions by actors, as they are involved in the decision-making process (Hogl et al., 2012). A lack of legitimacy may lead to non-compliance of actors and little support for the outcomes of decision-making processes (Rohe et al., 2017).

Complexity of participation

In theory, participation has many benefits and is essential for good environmental decision-making. However, in practice, organising a participation process is quite complex and there are different ideas in literature on what an adequate representation is. Firstly, increasing the number of actors has been shown to complicate participation processes, as actors have different interests and values regarding social, environmental, and economic outcomes (Juarez-Bourke & Blackstock, 2021). This means that actors can perceive the goal of the participation process differently because of their interests. Irvin & Stansbury, 2004 mention that involving more actors and their interests in a participatory process takes more time. Furthermore, involving more actors in a participation process requires more financial resources than when decisions are made by a single actor. Irvin & Stansbury, (2004) mention that this reduces the financial resources available for on-ground results. Moreover, the initiator of the participation process needs to make a decision on which actors are allowed to participate (Uittenbroek et al., 2019). Meaning, that some actors are excluded and some are included in the participation process, which already shows the difference in influence between the initiators of a participation process, and the actors that are invited to participate.

That brings us to my second point, the representation of actors in a participation process reflects existing power relations (Uittenbroek et al., 2019; Reed et al., 2017). Actors like the government, scientists, or large NGOs often initiate these processes, define the scope of participation, and have certain resources in the form of specialistic knowledge and skills. By having access to these resources, and being in a position to use them, the initiators of a participatory process are enabled to have a large influence on the outcomes of a participation process. Actors who are invited to participate might have other interests, knowledge, and skills that are not deemed relevant or legitimate. Moreover, they might not be in a position that enables them to influence the participatory process (Turnhout et al., 2020). This can reproduce or exacerbate existing inequalities, or power relations between actors. This can subsequently affect the usefulness, quality, and legitimacy of the policy outcomes, as they are less likely to result in policy outcomes that reflect the interests of the actors with less influence (Turnhout et al., 2020).

Reed et al., (2017) argue that the design of a participation process needs to be implemented in a way that ensures that power dynamics are effectively managed so that the interests of all the actors are recognised and everyone is given equal opportunities to contribute. However, giving all the actors equal opportunities to contribute could be a risk, as Juarez-Bourke & Blackstock, (2021) mention that

actors give value to different social, environmental, and economic outcomes. Meaning, sharing the authority to make decisions might lead to outcomes that are not favoured by the initiators of the participation process. To add to the complexity, development projects often consist of different phases, and actors can have different roles in all these different phases (Reed, 2008). Van Ast & Gerrits (2017) confirm that this happens, as actors can shift from an active to a more passive role during different phases. However, there are barely any studies that look at the effects of shifting roles in different phases of a participation process, so the effects of this remain unclear.

Implications for fish passage development

Although participation can make decision-making processes more complex, it is still considered essential in environmental policy for incorporating different kinds of knowledge to make better decisions and enhance input and output legitimacy. This is shown by a large number of fish passages that do not sufficiently improve fish migration (Bunt et al., 2011; Noonan et al., 2011). Partly, this can be attributed to mistakes in the technical design (Katopodis & Williams, 2016), or inadequate operation (van Leeuwen et al., 2016) and maintenance (Santos et al., 2012). However, these mistakes can also be attributed to how participation is organised, and the power relations between actors in the development process, as their design, maintenance, and operation require the cooperation of different actors (Coenen et al., 2015; Moore & Rutherford, 2017). Due to the complexity of organising participation and managing power relations, a mistake seems to easily be made, as Akerboom & Craig, 2022, mention that initiators of participatory processes continue to fail to match the form of participation to the decision under question.

2.3. Policy Arrangement Approach (PAA)

The section above described the complexity of organising a participation process in a policy arrangement. The development of fish passages in the 'Brabantse Delta' is also considered a policy arrangement. Analysing this policy arrangement, through the PAA, makes it possible to create a deeper understanding of the complexity of power relations in the organisation of participation in the development process of fish passages in the 'Brabantse Delta'.

A policy arrangement is defined as *'the temporary stabilisation of the content and organisation of a particular policy domain'* (Liefferink, 2006). A political domain, like fish passage development in the 'Brabantse Delta', can be defined as the arrangement in which actors from civil society, market, and state are organised in terms of the distribution of resources, what their interests are, and what ways they can interact (Arts & van Tatenhove, 2006). Overtime, recurring patterns can form in these arrangements, and these patterns tend to stabilise (Arts et al., 2006). Meaning, in the policy arrangement of fish passage development in the 'Brabantse Delta', patterns can recur in the power relations. These power relations conditions the participation of actors in the development process of fish passages.

The Policy Arrangement Approach (PAA) is an analytical tool that enables the analysis of these recurring patterns in policy arrangements by analysing four dimensions. The different dimensions are actors, discourses, resources, and rules of the game (Liefferink, 2006), and are defined later in this section. The PAA draws its inspiration from network theory and includes elements of discourse analysis. The main difference is that the four dimensions are intrinsically interrelated and do not just sum up to define a policy arrangement (Liefferink 2006), which means that a change in one dimension almost always influences the other dimensions (Arts et al., 2006). This is useful in this study, as Arts & van Tatenhove, (2004) mention that power relations between actors can be reshaped when resources are added or withdrawn from a policy arrangement.

Liefferink (2006) constructed a schematic overview of the PAA, called a tetrahedron (*Figure 2*). The flexible nature of the PAA allows the tetrahedron to be entered from each dimension, depending on the analytical angle of the research. For research questions that focus on the roles and positions in a certain policy arrangement, it makes sense to enter the tetrahedron from the 'actors' dimension (Liefferink, 2006). Next to that, entering from the actor dimension fits the focus on multi-actor participation best. Therefore, I chose to enter the tetrahedron from the angle of the actor dimension in the policy arrangement of fish passage development in the 'Brabantse Delta'. Liefferink, (2006) mentions that many policy studies follow the same angle. These studies first determine who the actors are, and what interest they have. This is mostly followed by an analysis of the power relations and the context in which they operate, or rather participate.

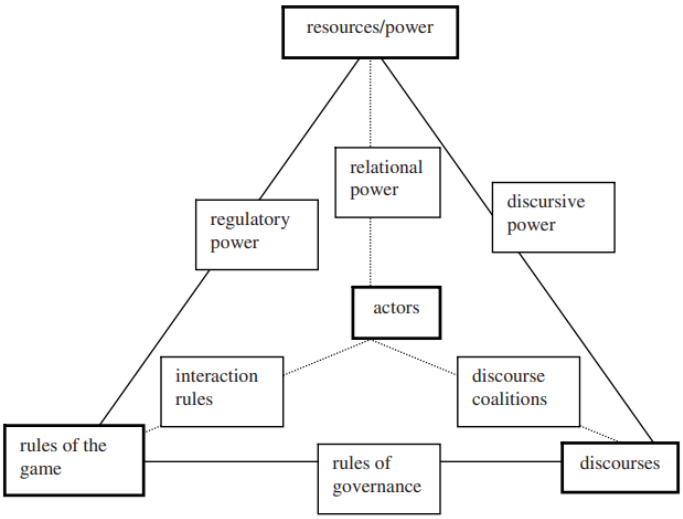

Figure 2: Schematic view of the PAA (Liefferink, 2006)

Entering the PAA from the 'actors' dimension allows me to identify which actors from civil society, market, and state are involved in the different development phases of fish passages in the Brabantse Delta. In this study, actors are defined as private companies, NGOs, governmental organisations, departments in organisations, and even individuals (Liefferink, 2006). Each actor can have different perceptions and interests, which refer to the way the actor observes, understands, interprets, and evaluates a referent object, action, experience, individual, policy, or outcome (Bennett, 2016). These perceptions and interests are based on frames, which function as a filter (Hommes, 2008). This means that different actors can look at the same policy issue, but perceive something different (Bennett, 2016). Most importantly, these perceptions and frames shape the discourses that actors have and use (Kusmanoff, 2019). The concept of discourses is used in many different disciplines and can have different meanings. In this study, discourse is defined as *a shared meaning of a phenomenon. This phenomenon may be small or large, and the understanding of it may be shared by a small or a large group on a local, national, international, or global level*' (Adger et al., 2001). The actors in the policy arrangement may give input in the different phases of the development process so that it serves the discourses that they represent.

Each actor with corresponding discourse can have different resources in the development process of fish passages in the 'Brabantse Delta'. The division and access of these resources can lead to differences in the influence of actors on the outcomes of the development process. Resources in this study can be, but are not limited to financial resources, knowledge and expertise (Liefferink, 2006), the responsibility of actors (Talberg, 2010), and the time they have to participate in the development process (Juárez-Bourke, A., & Blackstock, 2022). In these policy arrangements, there are mutually agreed rules between actors too. These rules take the form of formal procedures and informal routines that influence how the actors in the development process of fish passages (Liefferink, 2006).

2.4. Relational power

The section above describes the different dimensions of the PAA, and how they are connected. How these dimensions are connected is often embedded in unequal power relations, that can take different forms. The three-layer model of power from Arts & van Tatenhove, (2004) allows me to distinguish

three forms of power relations in policy arrangements, which are '*relational power*', '*dispositional power*', and '*structural power*', and are explained below:

'*Relational power*' refers to actors who are capable of achieving certain outcomes through interactions. A distinction is made by Arts & Tatenhove, (2004) between transitive and intransitive power. The former refers to actors achieving outcomes against the will of others (Arts & Tatenhove, 2004). In the context of fish passage development, we can understand this as actors that have the authority to make decisions in the development process so that it serves their interests and not others. Intransitive power encompasses the ensemble of relationships that together form a group of actors as a community (Arts & Tatenhove, 2004). In the context of fish passage development, we can understand this as developing a fish passage that is benefitting the actor community as a whole.

The second layer of the model is '*dispositional power*', which shapes the actor's capacity to act. Through this type of power, actors are positioned in organisations vis-`a-vis each other. These positions co-determine what actors may achieve in terms of relational power. Organisational rules determine and legitimise what position the actors occupy in the development process of fish passages. The division of resources determines the relative dependency and autonomy of an actor in its position (Arts & Tatenhove, 2004).

The third layer of the model is '*structural power*', which refers to signification, legitimisation, and domination. Signification refers to overarching discourses on governance, legitimisation refers to the 'right way' of doing politics, and domination refers to the structured uneven division of resources. These three factors are materialised in discourses and in political institutions like a waterboard, which actors use to give meaning to their social world. The structural power in a policy arrangement determines what moves and thinking of actors are legitimate, and which are not. It also enables or hampers the mobilisation of resources to achieve certain policy outcomes (Arts & Tatenhove, 2004).

By defining the three forms of power relations described above, I am enabled to identify different forms of power relations in the development process of fish passages. This allows me to analyse and reflect on how the power relations in the organisation of participation in the development process of fish passages affect the outcomes of the development process.

2.5. Conceptual model

The conceptual model (*Figure 3*) below is constructed to graphically depict how the different components of the theoretical framework are connected. From a political modernisation theory perspective, the political domain of the 'development process of fish passages' is studied by operationalising the key concept of participation by entering the PAA through the 'actors' dimension. The arrow from the 'actor' dimension towards 'relational power' signifies the specific focus on the power relations between actors in this study.

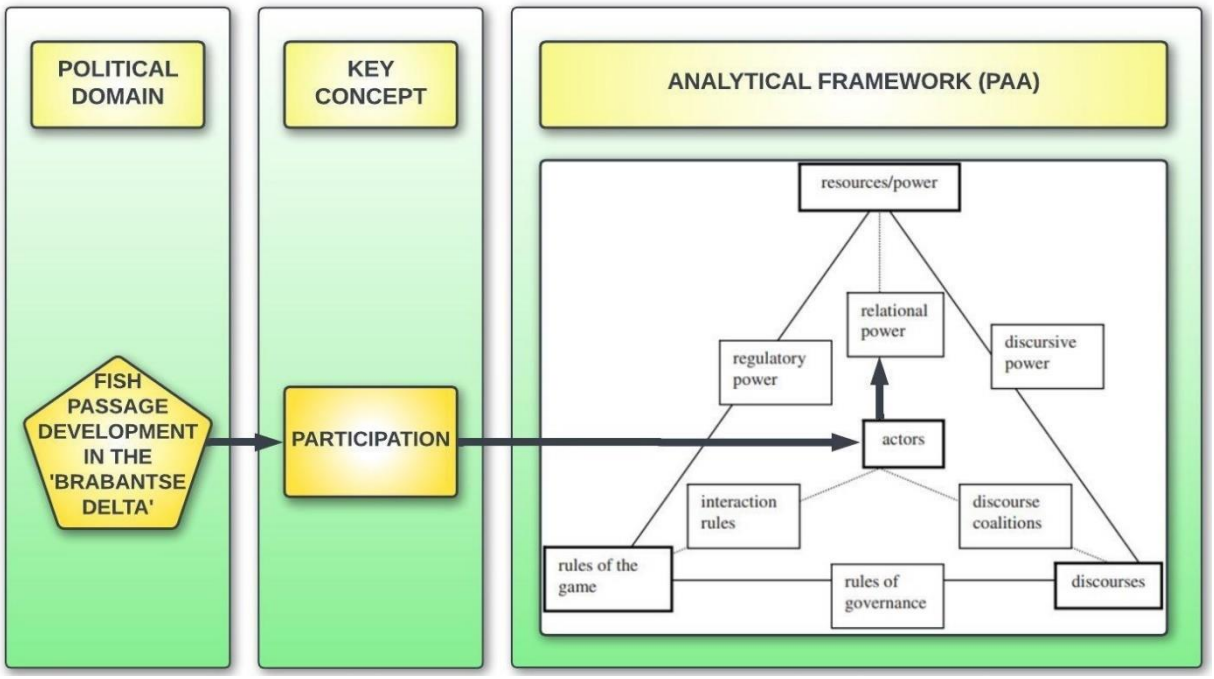

Figure 3: Conceptual model that graphically depicts the political domain, the key concept of participation, the analytical framework with the different policy dimensions, and a specific focus on relational power.

3. Methodology

This study has a qualitative approach as it focuses on practices, meanings, and different perspectives of actors on the power relations in the development process of fish passages in the 'Brabantse Delta'. Moreover, the data derived in this study is used to further develop the concept of participation as part of a better understanding of social processes (Mohajan, 2018). In addition, this study takes a descriptive approach as it aims to describe social phenomena and their characteristics (Nassaji, 2015).

3.1. Case study approach

Using a case study approach can help to add onto the theoretical debate on participation by exploring what happens in practice with power relations in participatory processes (Choy, 2014).

Specifically, I chose the waterboard 'Brabantse Delta' (*Figure 4*) as a case to use in this study. The waterboard 'Brabantse Delta' is a suitable case study for several reasons. First, the old secretary-director of the waterboard called this area 'The Netherlands in small', as the area is built out of almost all the different types of soils, elevation levels, large water bodies, and utilities like agriculture, nature, industry, and urban areas (Jochemsen, 2006). This also means there are many actors present in the jurisdiction of the waterboard with a variety of interests in fish passage development. Actors involved in this jurisdiction are the European Union, river commissions, regional departments of the Ministry of Transport, Public Works and Water Management, national government, provincial authorities, municipal authorities, other water boards, citizens, industry, farmers, environmental groups, research institutes, and the mass media (Witter, 2006). The large variety of actors and interests increases the opportunities for conflicting interests in the development of fish passages in the 'Brabantse Delta'. This increases the likelihood of acquiring a rich dataset that enables exploring how these actors and their interests are involved in fish passage development.

Figure 4: Jurisdictional area of waterboard 'Brabantse Delta' (Waterschap Brabantse Delta, 2022a).

A second reason to choose waterboard ‘Brabantse Delta’ as a case study, is because this waterboard has developed many fish passages before (Waterschap Brabantse Delta, 2022b). This increases the chances that recurring patterns have formed in how participation is organised, which can be analysed through the PAA.

The third reason is practical; the research was carried out in collaboration with a PhD-project on fish migration in The Netherlands. The PhD researcher had already established good contacts with the waterboard 'Brabantse Delta' for other parts of his PhD-project. This provided easy access to relevant people to interview, and documents to study for the thesis.

3.2. Methods for data collection

Three different data-gathering methods were used to answer the research questions. The main method for gathering data were semi-structured interviews. The data derived from the semi-structured interviews was complemented by literature from the website of the waterboard 'Brabantse

Delta', scientific papers and policy documents used in the development process of fish passages in the 'Brabantse Delta', and observations in the field.

3.2.1. Semi-structured interviews

General method

All sub-questions were mostly addressed by the data gathered in the semi-structured interviews. In this type of interview, the interviewer constructs a topic list with guiding questions, that broadly guide the interview, and ensure that all topics that are needed to answer the research questions are addressed (Kallio et al., 2016). The different topics and how they address the research questions are shown later in this section. The full interview protocol with guiding questions is shown in *Appendix 2.* A large advantage of using semi-structured interviews is that it is both flexible and versatile and that it allows for reciprocity between the interviewer and interviewee. This enables the interviewer to improvise and ask follow-up questions based on the response of the interviewee. This allows the interviewer to gain a thorough understanding of the subject under investigation (Kallio et al., 2016).

At the beginning of the interview, I introduced myself to the interviewee and the interviewee also introduced him/herself, after which I explained the goal of the study. For ethical reasons, I asked if it was allowed for the interview to be recorded, and I mentioned that the interviewee remains anonymous in the final report. The interview started after these formalities. In the interviews, to answer sub-question one, I aimed to gain an understanding of the interests of the different actors and how they perceive participation. I asked the interviewees about what their organisation represented, their drive, and their responsibilities in the development process. To answer sub-question two, I tried to gain an understanding of how participation is organised. I asked the interviewees about the different development phases, how participation is organised in these phases, and what their involvement is. To answer sub-question three, I asked the interviewees about their resources in the form of financial resources, time, knowledge, skills, formal authority, and responsibilities, but also on the influence of themselves and other actors in the development process. To answer sub-question four, I asked if the interviewees were satisfied with the outcomes of the development process, and the influence of themselves, and other actors, on the outcomes of the development process of fish passages.

Sampling methods

Two different sample methods, called purposeful and snowball sampling, were used to get into contact with a sufficient number and diversity of actors, to ensure the data needed to answer the research questions became saturated. A one-size-fits-all approach to reaching data saturation does not exist, but it is generally agreed in literature that data saturation is reached when no new data, themes, and coding are found during the data-gathering phase (Fusch & Ness, 2015). This means that when I noticed that my data became saturated, I stopped asking interviewees for contact details during interviews as part of the snowball sampling technique, and I also stopped searching for new interviewees as part of the purposeful sampling technique.

With purposeful sampling, the researcher selects interviewees according to the needs of the study. The interviewer first selects actors who have broad knowledge on the development process of fish passages in the 'Brabantse Delta', or who have typical experiences with it. When the study progresses and the researcher acquires more knowledge, participants are sought deliberately to acquire specific information and to ensure that the phenomenon under investigation is fully understood (Morse, 1990).

Snowball sampling is a common method used in convenience sampling, and is often applied in empirical studies like this one (Kirchherr & Charles, 2018). This method starts with one or more interviewees who are embedded in the topic of interest (Kirchherr & Charles, 2018), found through purposeful sampling. The first well-situated interviewees mention other possible relevant interviewees

(Naderifar et al., 2017; Kircher & Charles, 2018; Noy, 2008). Then, the second round of interviewees mention other potentially interesting interviewees for a possible third round of interviews (Naderifar et al, 2017; Noy, 2008). Potentially interesting interviewees were mentioned in the interview by the interviewees without specifically asking for it. However, after the interview, I also asked the interviewees if they knew other interesting interviewees. Contact details of new interesting interviewees were always asked after the interview was finished.

Approaching interviewees

By using the purposeful sampling method, the ecologist of the waterboard 'Brabantse Delta', who is well embedded in the development of fish passages in the 'Brabantse Delta', was the first interviewee who was asked to participate in this study. This interviewee functioned as a key informant, as there was an existing relationship between him and the PhD researcher of the project in which this study took place. Key informants are usually identified as they hold 'expert or special knowledge' on a topic, which in this case is the development of fish passages in the 'Brabantse Delta'. Moreover, a key informant enables the researcher to gain access to certain communities and helps identify other interviewees (Lokot, 2021). This is what the ecologist did by pointing out relevant employees of each department of the waterboard, and brought me in contact with them by sending an e-mail with a short introduction of this project, and a request for an interview. All the contacted employees of the waterboard responded to this request and were eventually interviewed. The good relationship with the ecologist and the willingness to provide contacts and help with contacting the different employees of the waterboard contributed to the success of this study.

For interviewees outside of the waterboard, a list was created with potentially relevant interviewees for this study. This list was shown to the ecologist of the waterboard for contact details, and to receive feedback on the relevance of the interviewees on the list, or if some were missing. The different interviewees were approached through LinkedIn, email, or by phone in which the scope of the study was explained, and if they wanted to participate in this study by doing an interview. After agreeing, an appointment was made with the interviewees to do an interview. The interviews were either performed face-to-face or through Microsoft Teams. However, most interviews were performed through the latter due to the little available finances in this project reserved for gathering data. It was costly to go to the jurisdiction of the waterboard for each interview.

Participating actors

Actors that participated in this study are landowning nature organisations, local and provincial NGOs, Belgium water manager, citizens, construction companies, farmer organisations, private fish migration company, consultancy companies, local, regional, provincial, and state governmental organisations, sport fisheries organisations, and employees of the waterboard, which are: environment managers, internal client, technical manager, participation expert, ecologist, hydrologist, maintenance employees, project manager, regional manager, and water managers. The interviews with all these interviewees formed a strong foundation for addressing the research questions. A list of the different interviewees and corresponding reference numbers is given in *Appendix 1.*

As mentioned in the theoretical framework, actors in this study are considered private companies, NGOs, governmental organisations, departments in organisations, and even individuals (Liefferink, 2006). This definition allows me to consider the waterboard in the form of an organisation as a governmental actor. However, the definition above also allows me to distinguish employees of the waterboard as individual actors. This complicates the methodology, as individual actors of the waterboard are interviewed to gain insights into the interests of the waterboard as a governmental actor. However, by interviewing different employees inside the waterboard, it is also possible to find interests that are specific to an individual actor inside the waterboard. In the results, a clear distinction

is made between the interests of the waterboard as a governmental actor and the interests that are more specific for individual actors inside of the waterboard.

3.2.2. Literature study

In the literature study, three different kinds of literature were used as a secondary method of data collection. Firstly, information from literature in this study comes from primary sources and scientific articles and reports. A source is considered reliable when it is peer-reviewed and/or the author is connected to a reliable institute. This study limited itself to only using sources that are in Dutch or English. The scientific articles were sparsely used in the results section to complement the data from the semi-structured interviews. However, these scientific articles were more prominently used in the discussion section. Keywords used to search for scientific articles in Google Scholar to complement the data in the results from the semi-structured interviews are: 'fish passage development', 'waterboard', and 'water resource management'. Keywords used to search for scientific articles in google scholar to write the discussion are: 'participation', 'fish passages' 'river restoration', 'actors', 'power relations' 'political modernisation'.

Secondly, information from literature in this study comes from policy documents that are related to the development process of fish passages. For example, these were contracts or guiding documents on how to clean a fish passage that were provided by the interviewees themselves. Some of these documents have been used in the results section to verify certain points that interviewees made in the semi-structured interviews. Moreover, data derived from the policy documents have been used to formulate follow-up questions in the semi-structured interviews.

Thirdly, information from literature comes from the website of the waterboard 'Brabantse Delta'. This information was used to verify or strengthen certain points that interviewees made in the semi-structured interviews. Moreover, data from the website was used to formulate follow-up questions in the semi-structured interviews.

3.2.3. Observations

During the interviews, I asked interviewees thorough questions about participation in the development of fish passages in the 'Brabantse Delta'. Moreover, I read numerous policy documents regarding this topic. However, I found that it is not only important to hear what the actors were saying, but also to see what was happening in practice on what is mentioned in interviews. Therefore, I organised three field trips, visiting a total of twenty-six fish passages throughout the jurisdiction of the waterboard 'Brabantse Delta' in many different contexts, to get a more complete image of the state of the previously constructed fish passages. Examples of different contexts are fishways in the middle of the city, on the land of citizens, farmers, or landowning nature organizations, in large water bodies, or small streams. To document observations, I took pictures from each fish passage and made a voice recording that described the situation surrounding the fish passage.

Next to observing the fish passage itself, citizens, maintenance personnel of the waterboard, sport fishers, personnel of landowning nature organisations, and farmers were asked about their experiences with these fish passages, and what they think of it. They complimented the data from the semi-structured interviews and policy documents. Some confirmed what was said in interviews, but also added new insights. The observations and the informal interviews mostly added information with regards to showing what is lacking in the effectiveness of fish passages, which gave new insights, or strengthened certain insights that I already had with regards to the participation process of the development of fish passages in the 'Brabantse Delta'. The results from the observations and informal interviews are documented in an observation report. Each fish passage is documented by its name and location. The pictures, the text from the voice recordings, and the relevant information about the

actors from the small interviews were added under the heading of the fish passage where the data was derived.

3.3. Data storage

The data derived from the (small) interviews was stored in two places. Firstly, it was stored on my laptop. Secondly, it was stored in Microsoft Teams in a Teams channel that is only accessible by me and the PhD researcher, to ensure privacy of the interviewees. To further ensure the privacy of the interviewees, the interviews on my laptop were stored in an encrypted folder that can only be accessed with a password.

3.4. External and internal validity

Using the waterboard 'Brabantse Delta' as a case study provides the opportunity to study how power relations in actor participation in the development process of fish passages affect the outcomes of the development process of fish passages. It enables asking empirical questions, and as a result, captures what actors say about and do in daily practice, in the development process of fish passages in the 'Brabantse Delta'. However, the conclusions that can be drawn from this particular case may not be generalizable to the other twenty waterboards and fish passage development in general (Choy, 2014). Therefore, this study has a low external validity.

Nevertheless, this study has some external validity, as it offers analytical generalization, which focuses on generalization with regard to empirical observations into theory. To achieve this, I presented the reasons why I selected this case study and its context. Moreover, in the discussion, I identified patterns in the theory that allow generalization of the empirical results obtained (Quintão et al., 2020). Next to that, empirical insights on what happens in practice may generate questions that others can ask in case studies on participation in fish passage development in The Netherlands, but also other countries. If more cases are studied in detail, it is possible to compare them. and analyse how a certain context and approach to participation leads to different outcomes.

The low external validity of this study is not necessarily an issue, as it does not seek to have a high generalizability. This study rather tries to add to the theoretical debate regarding the concept of participation, by studying to see what happens in practice concerning power relations in actors' participation in the development process of fish passages in the 'Brabantse Delta'. Crowe et al., (2011) suggest that a case study approach is fit for this, as it has the potential to obtain an in-depth understanding of a phenomenon in its natural real-life context.

To create a strong foundation for the results and conclusions and increase internal validity, different ways of data collection were used as a form of triangulation. Thereby, insights from semi-structured interviews were complemented by those from literature and observations during field visits. Not only did these methods allow for triangulation to increase internal validity and come to deeper insights. The data derived from the semi-structured interviews and policy documents also guided me in what to look for when visiting the fish passages. Moreover, the results from the field trips and policy documents allowed me to confront interviewees by questioning them about pieces of text described in a policy document, or observations I made in the field. Furthermore, I tried to reduce bias and also enhance internal validity by making the observations together with the PhD researcher and discussing the results of the interviews with each other. Furthermore, by doing interviews with actors from the same actor group, I cross-checked if they said the same thing, which deepened the analysis of the results.

3.5. Data analysis

The analysis of the transcriptions was performed as follows: Firstly, all transcriptions were read thoroughly to get an overview of the data. Then, the data was analysed by assigning codes to fragments of text, which briefly explained what the fragment is about in Atlas.ti 22. Each code was assigned to a category that was used to answer the research question. This study used a hybrid deductive and inductive method of coding. For the deductive coding method, a starting list of overarching themes, categories, and codes was constructed (*Appendix 3*), as it was expected that certain themes were in the data provided by the interviewees. For inductive coding, it is necessary to read all the transcripts carefully and assign new codes to interesting fragments of text that do not necessarily fit in the categories or codes thought of upfront, but appear relevant for answering the research questions (Azungah, 2018).

3.5.1. Sub-question one

To answer sub-question one, the interests of the actors in the development of fish passage development in the 'Brabantse Delta' needed to become clear. Pieces of text that described the interests were added into folders in Atlas.ti 22. Each actor has a folder that includes separate folders, that include folders called perceptions and interests

3.5.2. Sub-question two

To answer sub-question two, how actor participation is organised in the development of fish passages on paper needed to become clear. A folder was assigned to each development phase. Pieces of text that described the steps and requirements in these phases, were added in these folders. Moreover, a folder on the formal way of organising participation was added in the different phases. Pieces of text that explained how participation is organised were added to these folders.

3.5.3. Sub-question three

To answer sub-question three, how the participation of actors is embedded in power relations needed to become clear. Separate folders on the resources, participation, and rules of the game related to a specific actor were added to the actor folder. The resources folder included the following categories: Financial resources, time, responsibility, knowledge, skills, land, and authority to make decisions. The participation folder included the following categories: actual participation and perceptions of participation. The rules of the game folder included the following categories: formal rules, and informal rules specific to the actor. Moreover, another general folder regarding the rules of the game was added that is not actor-specific, but still broadly shapes how actors can participate. This folder included the following categories: Contracts, laws, meeting groups, and permits.

3.5.4. Sub-question four

To answer sub-question four, the effects of the power relations on the outcomes of the development process of fish passages in the 'Brabantse Delta' needed to become clear. The codes from the folders in the previous sub-questions were linked by assigning these codes to code groups in Atlas.ti 22.
These code groups were linked to each other to describe the main effects.

3.6. Challenges and adjustments

3.6.1. Challenges

Getting into contact with actors

During the data-gathering period, it became clear that it was vital to this study to interview maintenance personnel and water managers of the waterboard. In the initial contact round, the ecologist did not want to give contact details to maintenance personnel and water managers. However, I stressed the importance of getting these contacts to the ecologist, and eventually, the

contact details were provided. It was a bit more difficult to get an interview with maintenance employees and water managers, as they refused to do an interview about fish passage development. Fortunately, waterboard 'Brabantse Delta' is a large organisation and other maintenance employees and water managers were willing to do an interview.

Number of interviews

In hindsight, I conducted more interviews than I could physically handle to transcribe. It eventually led to the development of pain in both hands, which resulted in putting the thesis temporarily on hold for eight months. The whole experience of getting pain and recovering from it was a learning experience on a personal level that taught me that not doing everything perfectly is also fine. Through this experience, I learned about the importance of being selective in the selection of interviewees, and to think more critically about the information that is missing to write a good thesis or report.

3.6.2. Adjustments

Increasing the quality of semi-structured interviews

During interviews, I noticed that after the actual interview, some interviewees continued to talk about more topics that were interesting and not mentioned before. For that reason, a last question was added that was always asked at the end of the interview, namely: *Is there anything that you would like to add that we haven't spoken about in this interview, that could be interesting for my study?* This question always seemed to give interesting data. Next to that, the quality of the interviews improved overtime as I became more skillful in conducting interviews. In the beginning, I was nervous to do the interviews. Overtime, I became more confident in my interview skills, which led to the improvement of the quality of the interviews. Next to that, after more information became available through the three different data-gathering methods, different questions were asked in the semi-structured interviews than in the beginning of the data-gathering phase. The gradual process of becoming a more competent interviewer and gaining more knowledge about the development of fish passages in the 'Brabantse Delta' had a positive effect on the questions that I asked, which improved the results.

Sending back transcriptions

The decision to send back the transcriptions eventually caused problems, as different actors started to change what they said in the interview, or they added various comments that they wished to see changed in the eventual transcription. There was confusion about what exactly would be added to the report. For this reason, the interviewees were very serious about checking the transcripts and changing sensitive things they said, which influenced the quality of the data. Therefore, in deliberation with the supervisor, the transcripts were not sent back to the actors anymore.

3.7. Ethical concerns and positionality

This study primarily uses semi-structured interviews and it is considered highly important that there is consent from the interviewees to perform this study. I was fully transparent regarding the purpose of the study, and informed the interviewees on the topic of this study when contacting them for the first time, and again before the start of the interview. In this study, I also found it important that the interviewees have the right to privacy. To ensure this, the interviewees remain anonymous in the final report. Moreover, everything an interviewee mentioned in an interview will remain confidential and will not be shared with other parties without the consent of the interviewees. Next to that, I found it important to reflect the vision of the interviewees as much as possible in the results section, without interpreting the data too much myself. Sending back the transcriptions to the interviewees was related to this ethical concern. However, this was changed in the duration of this study, as mentioned above.

During the observations, it was sometimes difficult to reach the fish passage, as it was on the land of a private landowner. Permission to enter the land was always asked beforehand, and this usually was

no problem. Moreover, the different people whom I met in the surroundings of the fish passages, that I interviewed, were always informed about the purpose of the study as well. Moreover, I ensured that they understood that everything they said could be used as data in this study.

Lastly, I find the restoration of migratory fish species highly important. Therefore, it could be possible that the way I gathered data and wrote the results is slightly biased towards restoring fish migration. Moreover, due to my academic training and personal beliefs, I am a supporter of participation in decision-making processes, which could also have led to bias in this study. However, as an aspiring scientist, I will always try to be as objective as possible during the gathering of data and writing this thesis.

4. Results

This chapter will address the four sub-questions formulated that are used to break down the main questions. First, the different actors and their corresponding interests are described. This is followed by a description of how participation is formally organised. After this, a description of how the participation of actors is embedded in power relations is given. Lastly, two effects of the power relations on the outcomes of the development process of fish passages in the 'Brabantse Delta' are described.

4.1. Actors and corresponding interests

This section identifies the different actors and their corresponding interests in the development of fish passages in the 'Brabantse Delta', to address sub-question one. First, the governmental actors are described, which shape the development of fish passages in the 'Brabantse Delta'. This is followed by an inventory of the individual actors inside the waterboard, and actors outside of the waterboard, with their corresponding interests.

4.1.1. Setting the scene

Governmental actors

The main governmental actors that shape the development of fish passages in the 'Brabantse Delta' are the European Commision (EC) and the Province of Noord-Brabant. The EC has issued the WFD, which shows its interest in the natural restoration of the water bodies. The EC has given the task to the different member states to implement the WFD and reach a 'good environmental status' for all freshwater and coastal waters between 2015 and 2027 (European Commission, 2022; Breve et al., 2014). Reaching the goal of the WFD is outsourced to the different provinces. This increases the importance of the natural restoration of water bodies within the Province of Noord-Brabant. However, the Province also has interests in conserving and retaining water to battle droughts, and to prevent floodings in lower parts of the river catchment (35). The Province of Noord-Brabant passes the responsibility of identifying and implementing the measures for reaching the goals of the WFD onto the waterboard Brabantse Delta'. Being responsible for the implementation of the WFD transfers the interests of the EC to restore the natural values of their waterbodies onto the waterboard 'Brabantse Delta'.

The waterboard as a governmental actor

The board of the waterboard is the highest governing body in this organisation. In total, this board consists of thirty members, of which twenty-six represent different political parties that are chosen by the public in elections (Waterschap Brabantse Delta, 2023a). To understand the main interests of the board, it is important to understand the history of how waterboards came into existence.

Historically, the Dutch have battled with water, and from the ninth century onwards, peat areas were drained to make agriculture possible. Drainage ditches were dug that allowed the peat to decompose and shrink, which resulted in the subsidence of land. This created more drainage problems. At first, the drainage of water was managed locally. However, in the eleventh century, local water management was no longer sufficient, as land increased to subside, and the flooding and drainage issues increased. Therefore, waterboards were established to oversee water management on a regional level. Overtime, more land was drained, which was essential for developing the agricultural economy of The Netherlands, and the waterboards played a large role in this (Mostert, 2023). In recent history, the water system was still adjusted to fit the needs of agriculture, which means that water is drained as fast as possible with heavy rains and can be conserved if there are droughts.

However, a change is happening, as nature restoration is increasingly becoming more important in society (4), and the implementation of the WFD is a reflection of that. This change is also reflected in the goals of the waterboard 'Brabantse Delta', which added water quality as one of their core goals, next to water safety and water quantity (13). A waterboard employee sees that the board also directs more attention to nature-oriented tasks nowadays, but there are still many traditional board members who find water quality less important (7). In an interview, another employee mentioned that the waterboard 'Brabantse Delta' is still a very traditional organisation (3). Moreover, it is perceived by landowning nature organisations that interests of agriculture are still favoured over nature-oriented goals (16, 18), as an interest representative of a landowning nature organisation explained: *'Yes, always the farmers are favoured, but this is changing' (10-11-2022).* The recent elections in the waterboard, with a historically high turnout, also illustrate this, as the 'Boer Burger Beweging', a highly agricultural-oriented political party, acquired the largest amount of representatives in the board of all political parties (Waterschap Brabantse Delta, 2023b). Nevertheless, the agreements made in the WFD and the deadline in 2027 contribute to the importance of nature-oriented goals in the waterboard and are putting water quality higher on the political agenda (5, 6, 10).

Sub-section conclusion

This sub-section indicates that the European Commission broadly shapes the interests of the Province of Noord-Brabant and the waterboard 'Brabantse Delta', by passing the responsibility to implement the WFD on these actors. However, the Province of Noord-Brabant, and especially the waterboard 'Brabantse Delta' have other interests as well. As the waterboard currently and historically has a strong connection with agriculture, it appears as if the interest of reaching a 'good environmental status' for their waterbodies is deemed less important. This might be an indicator that fish passages are developed by an organisation, in which the majority of the board is not necessarily interested in increasing fish migration.

4.1.2. Individual actors inside the waterboard

Now that it is clear what interests there are present in the governmental organisation that shapes the development process of fish passages, I will venture deeper into the interests of the individual actors inside the waterboard that are involved in the development process of fish passages. In total, individual actors from five different departments of the waterboard are involved in the development of fish passages, which are called '*proces programmeren & monitoren*', '*proces bouwen*', '*proces bedienen*', '*proces onderhoud*' and '*proces waterbeleid & plannen*'. The overarching tasks of the different departments and the interests of the individual actors in their roles are described per department.

Proces monitoren & programmeren

'*Proces monitoren & programmeren*' (Department of monitoring & programming) as a whole translates the long-term goals of the waterboard into concrete activities. (Waterschap Brabantse Delta, 2023c). Three individual actors from this department are involved in the development process of fish passages in the 'Brabantse Delta'. They work in two different teams, which are called '*team programmeren*' (team programming) and '*team kennis*'. (team knowledge). The first team harbours the internal client. The task in this role is to keep an oversight of all the fish migration projects and to ensure that these projects are programmed and executed. The internal client's main interests lie in restoring fish migration and reaching the goals of the WFD in 2027, by removing all the barriers that are necessary for reaching this goal (3). The internal client describes its drive as follows: *'For me, it stimulates to be ahead. I know on other parts of the KRW measures, that we are behind schedule, but on fish migration, we are ahead of schedule. So we will be ready well before 2027 with the planned fish passages that we had in mind' (31-10-2022)*

Individual actors from '*team kennis*' who are involved in the development process of fish passages are hydrologists and ecologists. The interests of the hydrologist lay in developing a fish passage as good as possible so that fish can migrate throughout the waterbodies of the 'Brabantse Delta'. The ecologist is highly interested in fish migration, and perceives the restoration of migratory fish species as highly important (6, 39), as is described below: *'On one hand, it is part of my job and task in the organization. On the other hand, I have been fascinated by fish from an early age, so there is also a personal motivation' (10-10-2022)*

Proces bouwen

'*Proces bouwen*' (Department of construction) as a whole works on projects as agreed in the programming of the waterboard (Waterschap Brabantse Delta, 2023c). In this department, an 'Integral Project Management-team' (IPM-team) is formed for each specific fish migration project, whose task is to develop the fish passages (1, 7). The main interest of the IPM-team as a whole is to have a good project process and deliver a good fish passage (1, 4). This team consists of a project manager, environment manager, contract manager, technical manager, and project controller.

Proces bedienen

'*Proces bedienen*' (department of operation) as a whole takes care of the day-to-day management of water levels in the jurisdiction of the waterboard, by operating installations in the flood defences and waterways (Waterschap Brabantse Delta, 2023c). One individual actor in this department is involved in the development of fish passages in the 'Brabantse Delta', which is the water manager. It is the task of this individual actor to maintain the water levels in the waterbodies (14, 15). In this task, the interest in managing the water levels for agriculture-oriented goals is always deemed more important than managing the water levels to allow fish migration (14). The water manager describes fish passages as their least interest (15): *'I'm not going to tell the ecologists that I'm not going to do it, but I'm going to make it clear that it's the least priority for me to do' (30-11-2022)*

Proces onderhoud

'*Proces onderhoud*' (department of maintenance) as a whole is responsible for ensuring that installations in the waterways and dikes in the jurisdiction of the waterboard continue to function (Waterschap Brabantse Delta, 2023c). One individual actor of this department is involved in the development of fish passages in the 'Brabantse Delta', which is the maintenance employee. It is the task of this individual actor to maintain the fish passages. However, the interest in fish passages is not widespread amongst maintenance employees (8). For them, an eventual fish passage must be easy to maintain and reach (9), as a maintenance employee describes: *'Ideally, I could drive past it by car to check the fish passage' (22-11-2022)*

Proces waterbeleid & plannen

'*Proces waterbeleid & plannen*' (Department of water policy & planning) as a whole is responsible for thinking about how to make the jurisdiction of the waterboard climate resistant and work together with municipalities, companies, and organisations to achieve this (Waterschap Brabantse Delta, 2023c). One individual actor is involved in the development process of fish passages in the 'Brabantse Delta', which is the areal advisor. The main task of this individual actor is to set up cooperation processes with actors outside of the waterboard. It is the interest of this employee to have a good relationship with the different organisations in the jurisdiction of the waterboard.

Sub-section conclusion

Although the individual actors work in the same governmental organisation, it appears their tasks serve different interests. The internal client, ecologist, hydrologist, IPM-team, and areal advisor work towards an increase in fish migration. However, the reasons for their interest in increasing fish

migration differ. The differences in interests to increase fish migration can potentially lead to conflicts in the development process. In contrast, the maintenance employees, and especially the water managers, do not have an interest in increasing fish migration. The presence of actors in the development process that are not interested in increasing fish migration is perceived as a risk. This is because they can have a negative influence when they acquire positions where they can have a large influence on the outcomes of the development process.

4.1.3. External actors

There is a large variety of external actors with an interest in the development of fish passages in the jurisdiction of the waterboard 'Brabantse Delta'. In this study, external actors are distinguished into two groups, which are affected and interested external actors. This distinction is based on the results from the interviews. The main characterization of external affected actors is that they are directly affected by the development of fish passages. The main characterization of external interested actors is that they are not directly affected by the development of fish passages, but have an interest to be involved in the development process of fish passages. The different actor groups with corresponding interests are discussed below:

External affected actors

The interviews show that the main identified external actors are landowning nature organisations, Rijkswaterstaat, municipalities, farmers, and citizens. The main interest of landowning nature organisations is retaining water in the waterbodies in the proximity of their nature areas, as these areas have been succumbed to droughts (16, 18). The landowning nature organisations describe their large interest in retaining water as follows: *'Water conservation is the most important thing, without water, everything is dying and drying up' (10-11-2022).* Rijkswaterstaat is interested in a fish migration project if the fish passage connects the waters in the jurisdiction of the waterboard with the national waters under the jurisdiction of Rijkswaterstaat (45). Both the waterboard and Rijkswaterstaat, as governmental organisations, are responsible for reaching the goals of the WFD. The municipalities are in general willing to allow the construction of a fish passage on their land (7, 38), as protecting and enhancing biodiversity are goals of the municipality (36), which an ecologist of a municipality describes: *'Protecting biodiversity and enhancing biodiversity are goals of our municipality. Fish passages play an important role in this (20-10-2022)*

The farmer's main interest is to retain water (26) and to ensure that the water levels next to their land remain the same (28). Generally, they do not have an interest in fish passages (27, 28, 29, 30). However, fish passages are mostly constructed on the land, or in the waterway next to the land of farmers (1, 23). Land is very important for a farmer and they rather not lose it (31), as a result of the space needed for the development of a fish passage. Moreover, they want to be able to drive straight lines with their machinery (25, 26). Therefore, it is complicated to get land from farmers (36), and they are currently less willing to cooperate and make land available because of the nitrogen crisis (13, 25). The citizens generally support fish migration and want to have a good natural environment (44, 49, 50, 51). Their main interest is that the fish passage does not negatively impact their property (1).

External interested actors

The interviews show that the main external interested actors are interest groups like local NGOs and sport fisheries associations, and private companies like consultancy companies, construction companies, and a company called '*Vislift.*'

The local NGO's main interests are to improve natural values in their areas, and therefore find restoring fish migration important. They are also interested in receiving updates on the effects of the fish passages on the fish populations (19). The local NGO describes their interest as follows: *'Our interest*

is already quite large because we think that the blue-green vein between nature reserves is very important' (16-10-2022). The sport fisheries associations and fishers have mixed interests concerning the development of fish passages. Some are not happy with the fish passages, as they allow the distribution of exotic fish species (8). Moreover, some fishers mention that their favourite sport fish disappeared after the development of a fish passage (42). However, in general, sport fisheries associations and fishers perceive that restoring fish migration and migratory fish stocks is good, as it allows them to catch migratory fish species (39, 43, 44). A fisher next to a fish passage described their interest as follows: *'Fish passages are good so that fish can migrate and I can catch them upstream' (15-11-2022).* Moreover, they are also interested in conserving water, but by naturally restoring the river systems and not by implementing more barriers in the river systems (39, 40). Next to that, they are interested in being informed about developments in a fish passage project (41).

The consultancy companies are driven to make contributions to an increase in the natural health of the water bodies. They wish to achieve this by minimizing the impact of barriers that are in the water bodies (33, 34). Next to that, they want to deliver good work, whilst making a profit (32, 33). The construction companies are contracted by the waterboard to construct the actual fish passage. The interest of construction companies is to build a fish passage that is economically favourable for them, whilst fitting the requirements of the contract that they have with the waterboard (23). A project manager of a construction company describes their interest as follows: *'If we have to make a fish passage, then our main interest is to make one that meets the requirements and, if possible, is also the most economically advantageous solution' (13-10-2022).* Moreover, it is important for construction companies to construct a fish passage that makes the customer see that it is good to work with this particular construction company. In this way, the customer could choose the construction company more often to construct other projects (24).

'*Vislift*' is a private company that is driven to improve fish migration in The Netherlands and the EU (31). They wish to achieve this by developing fish passages as effectively as possible (31). The co-owner of '*Vislift*' explains the drive of the employees who work at '*Vislift*' as follows: *'At one point, you will come to a stage in your life where you want to do something that matters. There are several people at Vislift who do not come from the world of fish or ecology, but do want to do something that matters to make the earth better for our children' (28-09-2022)*. To make fish passages as effective as possible, they have developed a fish passage, called a '*Vislift*' (*Figure 5)*, which they mention is constantly monitored (31), is easy to maintain (31), operate (15, 31) and construct (24), which therefore saves time (24, 31), can be adjusted for the optimum flow for different fish species (31) and wet and dry periods (16, 18, 31), needs little space (31), and is considered to be cheap (38).

Figure 5: A 'Vislift' in the jurisdiction of the waterboard 'Brabantse Delta,' next to the land of a landowning nature organisation (Observation report)

4.1.4. Section conclusion

As is shown, there are large differences and overlaps in the interests of the governmental actors, the individual actors inside the waterboard, and the external interested and affected actors in the development process of fish passages.

It became clear that the interests of different governmental actors overlap strongly in wanting to reach the goal of the WFD. However, there are different visions amongst actors on how this goal should be reached. For instance, the waterboard and the Province of Noord-Brabant are also interested in water quantity and water safety. Especially, water quantity appears to be an important interest in the Province of Noord-Brabant, and in the jurisdiction of the waterboard, as the area has been succumbed to droughts. This interest in water quantity is shared by landowning nature organisations and farmers. The landowning nature organisations need enough water to battle the droughts in their nature areas, and farmers need enough water to irrigate their crops. Although they both want to conserve water, landowning nature organisation have far more interest in fish migration than farmers, who are not interested in fish migration at all. The lack of interest in fish migration is shared by the water managers, who for the most part serve the interest of the farmers. Next to that, the interests of the majority of the board are also skewed towards agricultural goals.

Nevertheless, there are also strong interests present in the jurisdiction of the waterboard 'Brabantse Delta that favor increasing fish migration. This is shown by the interests of the ecologist, hydrologist, local NGOs, fisheries associations, citizens, and municipalities to increase fish migration and biodiversity, and to restore the natural river systems. These interests are however directly conflicting with the interests of retaining water, as increasing fish migration and restoring the natural river systems implies a (partial) removal of barriers that enable the regulation of water levels to battle the droughts and manage the water levels for agricultural goals. This means that fish passages in the jurisdiction of the waterboard 'Brabantse Delta' are developed in an area where there are conflicting views on how the available water should be used. How these conflicting views influence the development process of fish passages, and reaching the goal of the WFD, will become clear later in this chapter.

4.2. How participation is formally organised

The influence of actors with corresponding interests is partially determined by how participation is organised. This section describes how participation is formally organised in the development process of fish passages, by the waterboard 'Brabantse Delta' as a governmental actor. This is described by following the different phases in the development process of fish passages. These phases are based on the steps described in a policy document called '*Handreiking vispassages in Noord-Brabant*', which is used by the waterboard 'Brabantse Delta' for the development of fish passages (Coenen et al., 2013). The steps are also based on what is mentioned in interviews by actors. The different phases in the development process are the '*vision*', '*choice*', '*design*' '*construction*', '*operation and maintenance*', and '*monitoring*' phase.

4.2.1. How participation is formally organised to determine the policy of the waterboard

The waterboards are the oldest democratic institutions in The Netherlands (Ietswaard, 2006). Citizens in the jurisdiction of the waterboard 'Brabantse Delta' can participate, and have a voice in the policy of the waterboard, by voting on the political party that they wish to be represented by. In the waterboard, a main distinction can be made between the board of the waterboard, who can formally make decisions on the policy of the waterboard (2), and the civil servants of the waterboard, who need to implement the policy, as decided on by the board. The policy of the board of the waterboard is

legitimized by the fact that the representatives are chosen by the citizens in the jurisdiction of the waterboard (van Buuren, 2012).

4.2.2. How participation is formally organised in different development phases

As the waterboard is responsible for developing fish passages (35), they are also responsible for organising participation in the development process. Each development phase has different requirements and the waterboard adjusts participation to ensure that these requirements are met. The responsibility of the waterboard to organise participation already shows that they attain a dominant position in the development process.

In the *vision phase*, it is required that the right choices are made on the most important fish migration routes, and the barriers to remove in the waterbodies to reach the goal of the WFD. This is mostly determined by the waterboard itself (6). After the choice for the fish migration routes and barrier removals is already made, affected and interested external actors are consulted to revise the proposed plans of the waterboard (6, 19). The waterboard retains the authority to make the final decisions. This shows again the dominant position of the waterboard and the limited influence of external actors in this phase.

In the *choice phase*, it is required to choose the type of fish passage to be developed. To make this choice, individual actors inside the waterboard and affected external actors are consulted by the IPM-team (6). Based on this input, the IPM-team decides on the type of fish passage. It shows again that the waterboard retains the authority to make decisions.

In the *design phase*, it is required to develop a preliminary, definite, and execution design (4). Specialistic knowledge, that is not present in the waterboard itself, is needed to develop these designs. Therefore, the waterboard invites private companies to participate in developing these designs. The individual actors inside the waterboard participate by giving feedback on the different designs (2, 6). The external affected actors continue to be informed and are allowed once to revise the definite design. The IPM-team retains the authority to make decisions on the progress of the development process.

In the *construction phase*, it is required to construct the fish passage as previously designed. Specialistic skills, that are not present in the waterboard itself, are needed to construct the fish passage. Therefore, the waterboard invites private companies to construct the fish passage. The private companies and waterboard organise external participation together, by informing individual actors inside the waterboard and external affected actors on the development of the construction phase.

In the *operation & maintenance phase*, it is required to operate and maintain the fish passage so that it keeps functioning overtime. Individual actors inside the waterboard, who have the experience and skills to operate and maintain the fish passages ensure that the requirements of this phase are met. No external participation is organised.

In the *monitoring phase*, it is required to monitor the fish passage to ensure that it functions and remains functioning overtime. The waterboard invites private companies, who have the skills necessary to properly monitor a fish passage. Next to that, the waterboard does not organise external participation.

4.2.3. Section conclusion

It was found that the waterboard is responsible for organising participation in the development process of fish passages. It became clear that how participation is organised is highly dependent on

the phase of the development process. In each phase, the waterboard determines the conditions for participation. Based on the requirements of each development phase, the waterboard adjusts participation to involve the actors that have the knowledge or skills to ensure the success of each development phase.

By reflecting on the typologies of participation described in the 'Wheel of participation', it appears that the participation of affected actors is mostly typified as 'information' and 'consultation' forms. The participation of external actors ranges from no participation towards forms that are typified as 'participation'. It appears that forms of participation typified as 'empowerment' do not appear to occur in the organisation of participation in the development process of fish passages in the 'Brabantse Delta'. This is because, forms of participation, typified as 'empowerment', require the waterboard to share the authority to make decisions with external actors, which currently does not happen. These power dynamics are described in detail in the next chapter, per development phase.

4.3. How participation of actors is embedded in power relations

How participation is formally organised as described above, and the dominant interests described in *section 4.1*. conditions to what extent the individual actors inside the waterboard and external actors are enabled to influence the policy outcomes of the development process. This section describes the participation of employees of the waterboard and external actors in the different development phases, as a result of the power relations present in the development process of fish passages.

4.3.1. Vision phase

Delegating the vision of the European Commission

The vision of the European Commission (EC) is to achieve a 'good environmental status' for all freshwater and coastal waters between 2015 and 2027, which shapes this phase. The EC has given the task to each member state to implement its vision (European Commission, 2022; Breve et al., 2014). The issuing of the WFD results in action of the member states by implementing measures, like fish passages, to reach the vision of the EC, which signifies its influential role in this phase of the development process of fish passages (16). The state government of The Netherlands has outsourced the implementation of the WFD to the provinces. This position makes the Province of Noord-Brabant an influential governmental actor in the development process of fish passages (35). However, they will not implement these measures, but outsource the responsibility of identifying what measures to take, and implementing these measures to waterboard 'Brabantse Delta' (35). This makes the waterboard an influential governmental actor when it comes to determining how the vision of the EC is going to be reached.

Incorporating the vision of the European Commission into the vision of the waterboard

For identifying measures to reach the vision of the EC, the waterboard 'Brabantse Delta' executed an 'ecohydrological water system analysis' on the different water bodies in its jurisdictional area (35, 6). Based on the results of the analysis, improving connectivity by removing barriers might be an aspect that is needed to reach the vision of the EC. After this, an advisory note with regards to the proposed barriers to remove is sent to the board of the waterboard. The position of the board allows them to make decisions on the amount of financial resources reserved for removing obstacles in their water bodies. Based on this position, and the available resources, they make the final decision on which obstacles are going to be removed (6). However, the interviews show that the structural powers in the board with regards to what interests are legitimate are not in favour of the development of fish passages, as the former project manager of fish passage projects in the waterboard explained: '*These kinds of objectives are sometimes neglected. For example, water safety is often a bit higher on the agenda than fish passages' (19-10-2022).* In addition, a representative of a landowning nature

organisation mentioned that programming a large amount of financial resources for nature-oriented goals is not favoured in the waterboard (16). This shows that, although the EC and its vision are influential, the board also has its own vision, and appears to value other objectives like water safety higher. This influences the amount of financial resources available for developing fish passages, to reach the vision of the EC. It also shows that the board can steer the vision of the EC so that it fits their vision.

The former project manager of fish passage projects in the waterboard mentioned that the board is only willing to implement more expensive fish passages when there is co-financing of other governmental actors, else they are not interested (12). Therefore, co-financing frequently occurs with other governmental actors who share the vision of the EC. For example, the Province of Noord-Brabant shares the costs fifty/fifty for all the projects related to the WFD, and Rijkswaterstaat co-finances fish passages when developed in the border of their jurisdiction (45). Moreover, the waterboard is regarded to make use of subsidies from the EC as much as possible, so that it costs the waterboard and Province of Noord-Brabant as little as possible financial resources (35). As a result, Rijkswaterstaat, the EC, and the Province of Noord-Brabant are enabled to have an influence to promote their vision and steer phases in the development process, and how subsidies are used for that.

Mandatory participation of the WFD

After an agreement is reached with the board on the finances, the removal of these barriers needs to be programmed and executed, which is the responsibility of the internal client. This position in the development process allows the internal client to decide when the barriers are going to be removed. Eventually, the programmed fish passages are documented in a report, called the 'Waterbeheerplan' (WBP), in which the waterboard describes all their goals and vision for the coming six years. Amongst many other topics, the WBP includes the important fish migration routes and the barriers on these routes that the waterboard plans to remove in the coming six years (6).

The WBP entails the mandatory external participation as described in the WFD. Although the document on public participation of the WFD encourages active forms of participation, the waterboard is free to choose any form of participation. With regards to the WBP, the waterboard allows external actors to inspect the WBP, and officially respond by giving remarks on its contents. The position of the waterboard as the highest authority enables them to decide if they wish to incorporate these remarks in the final version of the WBP. Therefore, external actors are in a dependent position concerning the final decision on the WBP. *Box 1* shows an example of the leading role of the waterboard and its authority to make decisions, and the dependent role of external actors to influence the vision of the waterboard to reach the goal of the WFD.

Box 1: Participation in WBP

With regards to the proposed barrier removals in the last WBP, the waterboard received 'one' official response from a local NGO on the choice for a certain fish migration route (6). Based on the physical presence of the local NGO in its local area, they gained knowledge on the different barriers and fish migration routes in their area. From this position, the local NGO was able to officially respond on a specific fish migration route, and a planned barrier removal described in the WBP. The local NGO proposed to remove the barrier for fish migration in a different location. In the previous WBP, the proposed location by the local NGO was pinpointed by the waterboard as the right place for developing a fish passage. However, the waterboard changed this waterbody to a channel type in the most recent WBP, which in the WFD has lower quality demands. The ecologist as the expert on fish migration in the waterboard was responsible to explain to the local NGO why the waterboard made that decision. However, the local NGO was not convinced and has never seen a substantiated report, with in their eyes valid reasons for changing the waterbody type, and location for the fish passage. The local NGO thinks that the waterbody type has been changed due to the perceived costs of removing the barrier in this specific place (19). The opinion of the local NGO regarding the current choice for the removal of the barrier is as follows: *'Now they choose the easy way, the cheap way, and develop a fish passage at the pumping station with some sort of lift system' (16-10-2022)*

Section conclusion

The European Commission shapes this phase, as they delegate their vision to the member states, and eventually waterboard 'Brabantse Delta'. This positions the board of the waterboard to determine the

structural powers in this phase of the development process, with regards to what the most legitimate way is to reach the vision of the EC. The most legitimate way appears to incorporate the vision of the EC into the vision and objectives of the waterboard. Nevertheless, Financial resources reserved for objectives seems to be unfavourably distributed toward objectives related to reaching the vision of the EC, like developing fish passages. Next to that, the waterboard is positioned to shape the influence of external actors on their vision to reach the goal of the WFD. Participation appears to take the forms of 'information' and 'consultation', as typified in the 'Wheel of participation'. This places external actors in a position where they are more or less incapable of influencing the vision of the waterboard to reach the goal of the WFD. Therefore, it is not certain if the vision of the waterboard is shared by external actors.

4.3.2. Choice phase

Different roles of individual actors inside the waterboard

After it is decided when and where a barrier is going to be removed by way of developing a fish passage, the internal client is in a position to assign a fish passage project to '*Proces bouwen*'. This department forms an IPM-team, which consists of a project manager, environment manager, contract manager, technical manager, and project controller. Based on their position and responsibility of their formal role in the IPM-team, they are enabled to influence the development process. The project manager is responsible for managing all the different members of the IPM-team. Moreover, this employee can make the final decisions about the progress of the fish passage project (6, 7). The project manager is enabled to make these decisions based on being positioned as the link between all the different departments of the waterboard and external actors involved in the development process. The environment manager is responsible for organising the participation of external actors (1). The environment manager can influence the development process by deciding which external actors are allowed to participate in the development process and how (2, 6). The contract manager is responsible for putting the eventual design of the fish passage on the market in the right way and is the focal point of communication with external companies in the market (4). The technical manager is responsible for organising the participation of internal advisors. These internal advisors consist of the hydrologist, ecologist, water manager, and maintenance employees. The technical manager forms the link between the IPM-team and the internal advisors (1, 4). The project controller is responsible for the planning of the project and the budgets (4).

Participation of internal advisors

The IPM-team starts the choice phase by initiating a variant study to determine what type of fish passage would fit best in the local context. The technical manager invites the internal advisors to participate to gather information that contributes to making the right choice for the type of fish passage. For this reason, the technical manager involves the ecologist, who is the expert on fish migration in the waterboard. In the position of the ecologist, it is possible to advise on the technical requirements, like the maximum flow rate, and maximum decay per chamber in the fish passage (6). The IPM-team values the input of the ecologist, as the expert on fish migration, in the development process of a fish passage highly. Therefore, the ecologist can steer the choice of the type of fish passage and eventual design (2, 3, 4, 6, 7). Moreover, it is required in this step of the development process to know the differences in water level, and how the water system works in the area where the fish passages will be developed. Therefore, the technical manager asks the hydrologist to give input on these hydrological requirements, which brings the hydrologist in a position to influence the choice for the type of fish passage (7).

When the fish passage is constructed, it needs to be maintained and operated. Therefore, this step also requires the input of maintenance employees and water managers. The maintenance employees

are therefore positioned to give input that makes it easy for them to maintain the fish passage (9). The water managers are also asked to give input that enables them to operate the fish passage and manage the water levels easily. In the development process, the input of maintenance personnel, and especially water managers, is valued highly, as they eventually need to maintain and operate the fish passages (4, 14, 15). Although all input from the different employees is considered important, the IPM-team values the input of the ecologist and water manager the highest in the development process. However, the hydrologist mentions that their input is often contra dictionary: *'You can see that there is a conflict between our water managers who want to keep high water levels and our ecologists who want to ensure that fish migration can take place' (14-10-2022).*

Although making the right choice requires the input of all the internal advisors described above, the extent to which they influence this choice is also based on their interests and willingness to be involved in the development of fish passages. For example, the ecologist takes a prominent role in this process out of personal interest in fish migration. This strengthens the position of the ecologist in the development, which enables a strong position in this phase (1). The water manager and maintenance employees deliberately limit their influence in the development process, as fish passages are not in their main interest (4, 8, 15). Moreover, they mention that they do not have the time to be intensively involved, which limits their influence (8, 9, 10, 15).

Perception of individual actors inside the waterboard on the participation of external actors

The paragraphs above describe the high value that the IPM-team gives to the input of the internal advisors for choosing the type of fish passage. On the contrary, individual actors inside the waterboard perceive that external participation is not important for the success of a fish passage (2, 6, 7). Reasons that are given are that external actors do not care about fish passages (2, 3, 6), they do not have the required knowledge due to the technical nature of the fish passage (2, 6), and involving many different external actors takes more time, and can delay the development process (2, 3). As a result, there is a policy in the waterboard to build the fish passages as much as possible on its land and waterways. This policy is stated in the plan of action that is formulated at the beginning of each fish passage project (2). In this way, little external participation is needed (3).

However, one of the most important requirements for choosing the type of fish passages is the available land. Therefore, individual actors inside the waterboard mention that external participation only becomes important when land is needed of external actors to develop a fish passage (3, 6), or to access the land for construction (1, 2, 6). Therefore, land is a resource that places external actors in a strong position in the development process of fish passages to have an influence on the choice for the type of fish passage.

Participation of external actors

The environment manager, whose responsibility is to organise external participation, creates a strategy for external participation based on the location of the fish passage project. This strategy involves the decision on which external actors are allowed to participate, and the level of influence they can have (1, 2). The environment manager usually only involves the external affected actors. The interviews show that these actors are usually landowning nature organisations, farmers, municipalities, and citizens surrounding the fish passage. This decision of the environment manager weakens the position of external interested actors that are not directly affected. They are placed in a position where they are not able to have any influence on the choice of the type of fish passages. The environment manager gives the following reason for not involving these interest groups: *'The project has a positive effect on the possibilities for fish migration, so the nature and fishing associations benefit from this, but they are not directly affected by the adjustments we make' (26-10-2022)*

The environment manager visits the affected actors personally without a set plan, but more with a first line of thought on the direction of the project (1,2). During this visit, the different wishes and demands of these external actors are documented in an official document called the 'Klanteneis specificatie' (1). The wishes and demands of external actors, who own land, can potentially have a large influence on the eventual choice for the type of fish passage. The landowning nature organisations, whose main interest is to conserve water, are enabled by owning land to advocate for a fish passage that allows the migration of fish, but also the retainment of water (16). The observations confirmed this, as a fish passage on the land of landowning nature organisations is usually a '*Vislift*'. This type of fish passage allows fish migration, whilst having the ability to retain water (Observation report).

The farmers are usually not willing to make land available for fish passages (31). The position they hold by owning land enables them to influence the development process by advocating for a fish passage that does not require a lot of space. This is confirmed by the observations, as fourteen out of fifteen fish passages surrounded by land of farmers are built in the waterway of the waterboard itself (Observation report). Moreover, they are enabled to advocate for a fish passage that is able to regulate the water levels next to their land. This is confirmed in the observations, as eleven out of the fifteen fish passages surrounded by land of farmers were technical fish passages that are easily closed to regulate the water levels (Observation report). An example is shown in *Figure 6.*

Figure 6: A technical 'De Wit' fish passage that does not take up a lot of space, next to the land of a farmer (Observation

Municipalities, whose interests are to protect and enhance biodiversity (36), are strongly positioned in the development process by their ownership of land. They influence the development process by advocating for natural types of fish passages (36, 37). This is confirmed by the observations as four out of five fish passages on the land of municipalities are natural fish passages (Observation report). Depending on the location and visibility of a fish passage project, citizens' influence on the type of fish passage ranges from no influence to a large influence. The former project manager of the waterboard mentions that when a fish passage is developed in the middle of a field, a small number of citizens are involved, as no one can see the fish passage (12). However, for instance, in the middle of the city of Roosendaal, a fish passage was developed in full sight of a large apartment complex (1, 4), see *Figure 7*. Therefore, the environment manager decided to organise an information meeting where the

Figure 7: A natural type of fish passage on the land of the municipality of Roosendaal, next to a large apartment complex (Observation report).

inhabitants of the apartment complex can give input on their wishes and demands (1). The observations show that fish passages look more aesthetically pleasing when they are in sight of a large number of citizens, which could be a direct influence of the citizens living next to it (Observation report).

Section conclusion

It became apparent that the IPM-team has full authority over the decision on how to organise participation and project progress in the choice phase. This enables the members of the IPM-team to shape the structural power on what input and which forms of participation are legitimate. It appears that they value the input of employees of the waterboard higher than the input of external actors. This increases the dispositional power of the ecologist, hydrologist, maintenance employee, and water manager. From these strong positions, they can steer the choice for the type of fish passages. The hydrologist, and especially the ecologist, fully utilise this strong position to influence the choice for the type of fish passage. However, the maintenance employees and water managers do not fully utilise their positions out of a lack of interest and limited resources, which limits their influence. The low value given to the input of external actors by individual actors in the waterboard reduces their dispositional power. External interested actors are placed in a position where they are unable to influence the choice of the type of fish passage. However, external affected actors may acquire a dominant position in this phase when they own land. It appears that owning land enables the external affected actors to influence the choice for the type of fish passage so that the choice for the type of fish passage is in line with their interests.

4.3.3. Design phase

Designing a fish passage requires specialistic knowledge and skills on designing and constructing a fish passage. This specialistic knowledge and skills are not present in the waterboard itself. Therefore, the IPM-team invites consultancy and construction companies to participate in this phase. The IPM-team values the specialistic knowledge and skills of these external private actors highly, which places them in a strong position in this phase of the development process. There are three main forms of organising participation of external private actors, which are described below:

The most common work form

In the most common work form, the design is developed by a consultancy company alone, and a construction company is invited to participate by constructing this design (6). This work form implies a strong position for the consultancy company in this phase. For organising the participation of consultancy companies, waterboard 'Brabantse Delta' works with a '*Raamovereenkomst Integraal Technische Advisering*', which is an agreement that is made with an X-number of consultancy companies. This agreement makes it easy for the waterboard to find consultancy companies who are willing to execute its assignments. These companies need to write a proposal on how they propose to execute the assignment. The waterboard chooses the company, that wrote the proposal that fits the assignment best, to execute it (32).

Preliminary design

When the proposal of a consultancy company is accepted, the IPM-team sends all the available information, gathered in the choice phase, to the consultancy company. Based on this information, the consultancy company develops a preliminary design (6). The preliminary design is shared by the IPM-team with the internal advisors and affected external actors (7, 15). Both the hydrologist and ecologist test if the preliminary design fits the hydrological and ecological requirements that were formulated in the choice phase. They give remarks on the preliminary design to ensure that these requirements are met (6, 7). This places the hydrologist, and especially the ecologist, in a position where they can affect the design. The ecologist perceives that the IPM-team often makes decisions too fast without

incorporating all the remarks of the internal advisors. This is especially perceived by the ecologist when deadlines need to be reached that are related to subsidies from the EC (6). This shows that the EC, through their subsidies, can steer this phase of the development process.

The technical manager also asks the water manager and maintenance employees to asses if the preliminary design fits their demands given in the choice phase. However, they choose not to be involved at this point (14, 15), which limits their influence.

Definite design

Based on the remarks of the internal advisors, the consultancy company redefines the preliminary design to a definite design. Again, the definite design is tested by the ecologist and hydrologist to test if the definite design fits the hydrological and ecological requirements (6). The maintenance employees and water managers still choose to only be limitedly involved. At this point, the external affected actors get one official chance to influence the definite design. They can do this by reviewing the definite design, as part of a law called the '*Projectplan Waterwet*' (2, 32). The remarks given in this procedure are taken very seriously by members of the IPM-team. Most of the time, this procedure gives few new remarks, as the external affected actors have continuously been informed about developments of the design (1). However, sometimes it does give new remarks, like in a fish passage project in Roosendaal (*Box 2*). The example in *Box 2* shows that the '*Projectplan Waterwet*' places citizens, that live next to a fish passage, in a position where they can have a notable influence on the design of the fish passage.

Box 2: Roosendaal

In one particular location in Roosendaal, three citizens thought the fish passage came too close to their properties, and they were concerned that four trees would die, as they were located close to where the fish passage needs to be constructed. Therefore, the waterboard contacted an external party to test the effects on the trees, and the conclusion was that the trees would not survive, which meant that the trees needed to be cut down. After which, the project manager communicated to the consultancy company that the trees are going to be removed, so that they could change the design and make a design where the fish passage is further away from the properties of the citizens. The consultancy company made a new design, which included eight newly planted threes. This was communicated with the municipality and the citizens, who now agreed with the new design. After that, there was another citizen who did not agree with cutting the trees and took his protest up to the councillor of the municipality, who eventually decided that the trees can be cut down, but only after the breeding season of birds (1).

Execution design

After the final revision, an execution design is developed by the consultancy company. This design includes a detailed description of the specifications of the fish passage, which is called a '*bestek*' (4, 32). The assignment for constructing the execution design is placed publicly as a tender on websites like '*Tendernet*'. Through this website, construction companies can respond to the assignment of the IPM-team by making an offer to construct the fish passage (23). The construction company with the best offer is chosen by the IPM-team to construct the fish passage. A project leader of a construction company criticizes this work form, as it does not give the construction company the freedom to make adjustments to be able to construct it (24). This shows that the construction company, in this work form, is limited to influence the design phase. The project leader of a construction company explains the perception regarding this work form underneath: *'You can design something fantastic on paper and do research, but in the end, it must also be possible to make it and preferably in the shortest possible time' (11-10-2022)*

Inefficiency of the most common work form

Although this work form limits the influence of construction companies, the IPM-team values the input and expertise of the construction company highly. The value given by the IPM-team to the construction company brings them in a position where they are still able to influence the execution design. For example, based on the practical knowledge on construction, the construction company found that different fish passage projects were not possible to construct with the current execution design. The

construction company gave recommendations to the IPM-team on how to change the design so that it was possible to construct the fish passage. The IPM-team incorporated the remarks of the construction company in the design. The environment manager mentions that several fish passages were eventually designed completely different due to the input of the construction company. These changes in the design are incorporated after the final execution design is agreed upon with the internal advisors and external affected actors. This causes quite some inefficiencies in the project, as the internal advisors and affected actors need to agree on the new execution design again (1). The willingness of the IPM-team to go through all this extra effort to change the design, based on the remarks of the construction company, shows that the construction company gains a strong position in the design phase after being contracted.

Design & construct work form

The second work form in the design phase is through a design & construct contract. A tender will be placed on 'Tendernet' in the form of a functional design for a construction company to respond to, and make an offer. A functional design means that there are certain requirements that the fish passage needs to comply with. However, a decision on the type of fish passage is not made yet. This gives freedom to the construction company to choose the type of fish passage, as long as it fits the functional requirements (32). Therefore, this type of contract places the construction company in a position where they can steer the design phase. This is considered a risk by a project leader of a construction company. This is because, construction companies prefer to make an offer for the tender as cheaply as possible, due to their interest in making a profit. Moreover, a construction company can make a design that fits the functional requirements, but it can still be a design that is not desired by the ecologist (23). In this study, one case in the '*Westelijke Langstraat*' was found that is designed by using a design & construct contract (*Box 3*). This case shows how a construction company can steer the design phase in this work form. Moreover, it shows how '*Vislift*' strengthens its position in the design phase, by providing a type of fish passage that makes it easy for a construction company to fit the functional requirements of the design & construct contract.

Box 3: Westelijke Langstraat

The construction company had to adhere to the functional design of the contract and eventually made a conscious decision to construct three 'Visliften'. The reasons that they chose this type of fish passage is because it is easier and faster for them, as they do not have to hire someone to design a fish passage with all the different specifications, which costs a lot of time. When choosing to construct a 'Vislift', you do not have to get into the specifics and they could start constructing right away. Another reason to choose for a 'Vislift' is because it is widely applicable, which makes it easy for the construction company to comply with the functional design. The project manager mentioned that in this case they chose the easy way out by choosing for a 'Vislift'. (24).

'Bouwteam' work form

The third work form in the design phase is a new work form called a '*bouwteam*'. In this work form, the IPM-team constructs a team that involves a construction and consultancy company and the internal advisors at the beginning of the choice phase. In this way, they choose the type of fish passage and the eventual design together (1,24). A project leader of a construction company mentions that this work form can reduce the inefficiencies in the most common work by bringing in the expertise of the construction companies earlier in the process (23). During this study, waterboard 'Brabantse Delta' has put its first tender in the '*bouwteam*' work form on the market, so they do not have experience with this work form yet. However, the environment manager mentions that the construction company is getting a more prominent position with regard to thinking about solutions to remove a barrier, which increases their influence in this phase. The consultancy will be placed in a more subordinate position (1), which limits their influence in the design phase. This again shows the value that the IPM-team places on the expertise of the construction companies.

Sub-section conclusion

It became apparent that the IPM-team is in a position to shape the structural powers in the design phase. This shapes what thinking and moves of actors are more legitimate than others. The IPM-team places a high value on the expertise of consultancy companies to design fish passages. Therefore, consultancy companies have a strong position in the design phase, which allows them to steer the design. However, their dispositional power has recently been weakened, as the IPM-team has realised that the leading position of the consultancy company in the design phase, often leads to inefficiencies. On the contrary, the IPM-team appears to have realised that increasing the influence of construction companies in the design phase can lead to more efficiency. Therefore, the construction companies seem to take advantage of the weaker position of consultancy companies and gain a stronger position in this phase, which increases their influence. However, the influence of the consultancy and construction companies is not unlimited, as they are bound to the requirements of the fish passage formulated in the choice phase. As a result, the hydrologist, and especially the ecologist, gain a strong position in the design phase, as they need to test the designs on these requirements. This position allows them to influence the design by ensuring it fits the requirements. However, their influence is also limited by the influence of deadlines, that come with subsidies of the EC. Although the IPM-team values the input of water managers and maintenance employees highly, the influence of the water managers and maintenance employees in the design phase remains low, as they deliberately choose to limit their involvement. Lastly, the IPM-team seems to value the input of external actors less than the input of internal advisors and the consultancy and construction companies. However, the '*Projectplan Waterwet*' ensures that external affected actors can still influence the design.

4.3.4. Construction phase

The construction phase requires the construction of the fish passage, and this allows the construction company to gain an even more prominent position. Their prominent position stems from their contract with the waterboard, which requires they are responsible for everything that has to do with the construction of the fish passage (23). This includes applying for permits that allow them to construct the fish passage (1). Moreover, through the contract and their physical presence on the construction site, they become partly responsible for the role of the environment manager. For example, it is now the shared responsibility, together with the environment manager, to get access to the land of the private landowners for the construction activities, and inform the surroundings of developments in the project (23). Next to that, the ecologist retains its strong position in this phase by controlling if the construction company constructs what is agreed upon in earlier phases. The ecologist does so by visiting the construction site once a week (6, 7). Though, the influence of the ecologist is limited as this internal advisor cannot continuously be present at the construction site.

When the construction is finished, the IPM-team and internal advisors assess if the fish passage meets the contract demands and the requirements formulated in the choice and design phase. At this point, maintenance employees and the water manager come with questions and remarks regarding the design. This leads to frustration amongst different employees of the waterboard, who think that maintenance employees and water managers should increase their involvement in earlier phases and bring in their remarks there (2, 4, 6). Both the water manager and maintenance employees have a strong position here, as they need to operate and maintain the fish passage after the construction phase. Therefore, the IPM-team will incorporate their remarks, even after finishing the construction. Although the IPM-team prefers not to make changes anymore, they know it is essential to incorporate the remarks and keep the water manager and maintenance employees happy, as they need to operate and maintain the fish passage after this phase. The technical manager has a clear personal opinion about the late remarks, as is described below:

'Personally, I think that if we all approve a design together and we construct the design, then the people of water management and maintenance will get the fish passage as we designed it. If they are not satisfied, they will fix it themselves after the project. When we start working in that way, I'm sure they'll provide more input in the beginning because they now have to solve it themselves at the end' (15-10-2022)

Although the participation of internal advisors is valued higher than the participation of external affected actors (2, 7), employees of the waterboard do see the importance of raising awareness to increase the support of fish passages and fish migration in general (6, 7). Depending on the visibility and location of the project, the IPM-team may decide to organise a festive opening to inform the broader surroundings about the opening of the fish passage (1). However, when a fish passage is constructed out of sight of the public, the IPM-team may decide to open the fish passage without informing anybody (3).

Section conclusion

Although the IPM-team continues to shape the structural powers in the construction phase by their formal authority to make decisions in the development process. It seems that the requirements of the construction phase, increases the dispositional power of the construction company towards the most influential position. They have the expertise to construct a fish passage that is required in the construction phase. Moreover, they are physically present in the construction phase, which makes it easy for the construction company to partly perform the task of the environment manager. However, the influence of the construction company is not unlimited, as the ecologist controls their activities, and ensures that the fish passage is constructed as agreed upon in earlier phases. The water manager and maintenance employees gain a strong position, as the full responsibility over the fish passage almost shifts to them after the construction phase. Therefore, they get away with being limitedly involved in the choice and design phase, as the fish passage will still be adjusted to their needs, even after the construction is officially finalized.

4.3.5. Operation and maintenance

After completion of the construction phase, the fish passage project is finalized on paper. As a result, the IPM-team leaves the development process in this phase. This also means that the environment- and technical manager are no longer able to organise participation, which signifies the official end of the participation process. This weakens the position of the external affected actors, who were involved in the development process by the environment manager. Moreover, it limits the position of the hydrologist, and especially the ecologist. This phase does also not require specialistic knowledge of the consultancy and construction companies. Therefore, they are not involved in this phase either, which disables their ability to have an influence in this phase. In other words, the actors that had the strongest positions in previous phases, have lost their capacity to influence the development process. This causes a large shift in relational power, as the full responsibility to maintain and operate the fish passage is transferred onto the water managers and maintenance employees (6). This section will first describe the operation of the fish passages, followed by a description of the maintenance of the fish passages.

Operation of fish passages

This phase requires the continued dedication of the water manager. However, in the total amount of work that they are required to do, managing the water levels is their highest priority, and operating fish passages is their lowest priority (15). There are two types of water bodies that require different approaches to the management of the water level. Firstly, there is *'Peilbeheerst gebied*', which are

areas where the law obliges that a certain water level is maintained. Secondly, there is '*Vrijafwaterend gebied*', which are areas with targets for the desired water levels in the water bodies (6).

In '*Peilbeheerst gebied*', it is the main interest of the water manager to maintain that particular water level. A water manager is held accountable when the water is not at the level obliged by the law' (15). In '*Vrijafwaterend gebied*', the water manager can be more flexible in managing the water levels. Currently, droughts are more frequently occurring in the jurisdiction of the waterboard 'Brabantse Delta'. The main interest of the water manager in '*Vrijafwaterend gebied*' is to ensure that farmers surrounding the waterbody are enabled to irrigate their land as long as possible, and allow fish migration at the same time (14). This can be done by raising the heights of the weirs in the waterbody early in spring to retain as much water as possible. When the droughts intensify, and there is less water available, more water will eventually flow through the fish passage, than over the weir. This is the moment that the water manager closes the fish passage to retain water for agricultural uses. The water managers choose to close the fish passage, as they value the importance of irrigation of the land of the farmers, over fish migration (14). It is difficult for the water manager to explain to the farmers that fish have a higher priority than the livelihood of the farmers themselves (14). The water manager emphasises its reason to close a fish passage as follows: *It is nice that these fish can migrate to Belgium and that thing needs to be open if possible, but allowing farmers to irrigate is priority number one for me (30-11-2022)*

Officially, closing a fish passage should be communicated with the '*Verkeerstoren*', which is a central point in the waterboard that keeps track of all the water levels in the jurisdiction of the waterboard. Based on these water levels, the '*Verkeerstoren*' gives the official order to open or close a fish passage. In practice, the water manager closes the fish passages before they have received the official order to close them. For example, last year, the fish passages were already closed three weeks before the '*Verkeerstoren*' gave the official order (14). Although a water manager should communicate when they close a fish passage, they often do not report it. Eventually, the '*Verkeerstoren*', or the ecologist finds out that a fish passage is closed without reporting it. Therefore, they ask questions to the water manager about how it is possible that the fish passages are already closed (14). *Figure 8* shows a fish passage that is observed without a clear reason.

Figure 8: Stagnant water in a 'De Wit' fish passage because it is closed, whilst there is no apparent reason for closing it as there is a lot of water flowing over the weir next to it (Observation report).

It is in the interest of the ecologist to keep the fish passage open as long as possible. Each year when the droughts intensify, there is a struggle between the water managers and the ecologists with regards to keeping the fish passage open as long as possible and the interest of conserving water for agricultural purposes (14). However, the ecologist is not in a position to have a large influence on the

operation of the fish passages, as it requires a lot of time to observe all fish passages regularly. Moreover, it is not the task of the ecologist to observe if all the fish passages are open or closed (3).

Next to that, for a water manager, it feels as if the ecologists force the responsibility of operating the fish passages on them, whilst they have no interest, or time for it (15). For example, before a meeting with water managers and ecologists, the water manager got a call up-front from another employee of the waterboard to warn the water manager that the ecologists were going to try to make them operate additional fish passages. The information provided in the phone call was correct. However, the water manager did not go into the proposition of the ecologists during that particular meeting (15). The perception of the water manager regarding the operation of additional fish passage is described as follows: *It's the ecologist's hobby, so they do it themselves (30-11-2022)*

The unwillingness of the water managers to operate fish passages feeds into '*Vislift*' gaining a stronger position in the development process of fish passages. This is because '*Vislift*' only uses one button that can be operated from the office of the water manager. The water manager mentions that they favour the newly constructed '*Visliften*' in the jurisdiction of waterboard 'Brabantse Delta', as it costs little time to operate (15).

Maintenance of fish passages

This phase also requires the continued dedication of maintenance employees. They are required to maintain the fish passages and keep them functioning overtime (4, 6, 9, 17). In early spring, maintenance employees will maintain the fish passages thoroughly. This is a point that is fixed in the agenda of the maintenance employees (9). How to maintain a fish passage is described in a document called '*Basisdocument Groenelementen en Randvoorzieningen*'. The maintenance employees use the instructions in this document to maintain the fish passages (9). According to this document, they only have to maintain the fish passages once a year in spring (Team Kennis, 2022), which seems to be little. Next to ecological elements, there are numerous other elements in the waterbodies of the waterboard 'Brabantse Delta' that they are required to maintain (3). Overall, a senior maintenance employee perceives that there are too many elements in the waterbodies to maintain. Due to time pressure, they cannot understand all elements in the waterbodies deeply, and maintain all these elements thoroughly. Moreover, the water manager mentioned that the time pressure results in not performing tasks that are not in their main interest (15), like maintaining and operating fish passages.

During a field visit, I observed a maintenance employee maintaining a fish passage, which reinforced the perception that fish passages are not the main interest of maintenance employees. This employee mentioned that he never had any instructions on how to maintain the fish passage and that he just took out some debris. Most of the debris was in the actual fish passage itself, which was left behind in the fish passage (*figure 9*). I asked why the maintenance employee did not clean the inside of the fish passage. The response of the maintenance employee was as follows: *'Somebody else can do the debris that is clogging the passage inside the vertical slots. I am not going to do that now' (21-10-2022)*

Figure 9: A technical 'Vertical Slots' fish passage with debris stuck in one of the slots that the maintenance employee did not want to clean (Observation report).

To combat the time pressure, '*proces onderhouden*' contracts external maintenance personnel. One external contractor explains that there is a lot of uncertainty and unclear about the maintenance of fish passages. Moreover, they have little time for the assignment they were contracted to do (52). Furthermore, they lack knowledge on fish passages. For example, the senior maintenance employee mentions that an external contractor did not mow the vegetation surrounding a fish passage, because the external contractor said there were rocks underneath the vegetation. However, this was the actual fish passage, which shows their lack of knowledge on fish passages. These external contractors will also not signal if something is wrong with the fish passage to other employees in the waterboard (9).

Another issue is that no one controls whether the maintenance employees are performing their tasks sufficiently to keep the fish passages functioning. The only control that happens is when the ecologist visits a fish passage as part of a field visit, which not happens regularly. The ecologist signals to maintenance employees to maintain a fish passage when an abnormality is observed in a fish passage that inhibits fish migration (6). During the field visits, I signalled malfunctions myself related to lagging maintenance in different fish passages to the ecologist. The ecologist asked maintenance employees to repair or maintain these fish passages. This shows that a control function in the field can work very efficiently to ensure that fish passages are continuously maintained. However, there is no one in a position to fulfil this function, except the maintenance employees themselves.

The field visits confirmed that lagging maintenance has a large influence on the functioning of fish passages. In total, a total of twenty-six fish passages were visited. At first sight, fourteen of these fish passages were observed to be functioning properly. Another seven of these fish passages seemed to be working only limitedly. The main reason for this was that fish passages were not properly maintained. For example, the floating beam that should prevent debris from entering the fish passage was not floating anymore in several fish passages. Therefore, the floating beam lost its function to prevent clogging in the fish passage (*Figure 10*). This results in clogged openings of these fish passages, which inhibit fish migration. The opinion of the internal client regarding the lagging maintenance is described below: *'That maintenance doesn't maintain them is frustrating, but of course they have to do that. Somebody has to tell them: You didn't do your work properly' (31-10-2022)*

Figure 10: The wooden beam in front of a technical fish passage that lost its function of preventing debris from entering the fish passage, which resulted in a clogging at the entrance of the fish passage, inhibiting fish migration (Observation report).

Section conclusion

The operation & maintenance phase requires the continued dedication of maintenance employees and water managers to maintain and operate the fish passages to ensure fish migration. All the actors that were able to steer previous development phases, have lost their dispositional power, and are not

able to have an influence anymore. Therefore, the structural powers concerning what thinking and moves are considered legitimate shifts toward the water managers and maintenance employees. Because of this shift in structural power, the interests of retaining water for agricultural purposes have become the most legitimate way of thinking, and not increasing fish migration. Next to that, the sole responsibility of maintenance employees to maintain fish passages results in a very strong position in this phase of the development process. From this position, they can influence this phase by choosing how often and thoroughly they maintain the fish passages. The influence of the water manager and maintenance employees seems to be without limits, as there is no actor present in this phase that has the capacity to have a structural controlling function and hold them accountable. It appears as if the large shift in power relations towards maintenance employees and water managers negatively influences the goal of increasing fish migration

4.3.6. Monitoring phase

The monitoring phase requires that the fish passage is monitored to assess if it allows the target species to migrate. Actor participation is organised by the department of the ecologist called '*proces programmeren en monitoren*'. The ecologist has a prominent position in this phase as the expert on fish migration in the waterboard. This position allows the ecologist to decide which fish passages are going to be monitored, as not all fish passages are monitored (6). It is the perception of the hydrologist that too few fish passages have been monitored in the recent past (7). Often, there is no money reserved by the board in the project budget to monitor the fish passages (6). Therefore, from their position to reserve financial resources for a fish passage project, they influence the monitoring phase by not reserving sufficient financial resources to monitor all fish passages.

This phase requires specialistic knowledge concerning monitoring a fish passage. For this reason, the department '*proces programmeren en monitoren*' values the expertise of consultancy companies highly, as they possess this specialistic knowledge. They are invited by '*proces programmeren en monitoren*' to participate. This happens in the same manner as in the design phase by writing a proposal on how to approach the assignment of the waterboard. The consultancy company gains an important position in this phase, as it is their responsibility to monitor the fish passage. The assignment of the consultancy company is finished when it is proven that the fish passage functions properly (34). However, if the fish passage is proven not to function, it needs to be adjusted, so that it allows fish migration. However, the internal client mentions that it is not easy to adjust the fish passage after the construction phase is finished. This is because it takes additional financial resources, which the board has not reserved for adjusting previously constructed fish passages. Moreover, it has to be programmed again by the internal client, which takes a long time (3).

Next to the involvement of the consultancy company, there is no external participation organised by '*proces programmeren en monitoren*' in the monitoring phase. However, there is an interest amongst external interested actors, and to a lesser extent of affected actors, to be involved in the monitoring phase, by receiving the monitoring data of the fish passages. For example, the local NGO has an interest in receiving monitoring data. However, the local NGO has not been allowed to participate throughout the whole development process (19). The local NGO expresses its exact reason for receiving the monitoring data below: *'Then, of course, we would very much like to know what comes out of the monitoring process. What were the fish stocks before and what is the development after that' (16-10-2022)*. Moreover, a regional sport fisheries association expressed their interest in receiving the monitoring data, as they are interested in fish migration in the areas that they represent. However, it rarely happens that the regional sport fisheries association receives monitoring data from the waterboard 'Brabantse Delta' (40). The consultancy companies are also interested in receiving monitoring data of the fish passage they designed. If the consultancy company receives this monitoring

data, they can assess if their design is working and learn from mistakes in the design. The ecologist of a consultancy company also sees it as an advantage to the waterboard, when a consultancy company learns from past mistakes in developing a design, if the waterboard wants to contract the consultancy company again for developing a design (34).

Furthermore, citizens who live next to a fish passage are interested to know what fish migrate through the fish passage, whilst other citizens do not even know that they are looking at a fish passage when they are looking at one (47, 48). Another case on the land of a private landowner described in (*Box 4*) shows the importance of sharing data and having continued contact with the external affected actors after the construction phase. When the project is finished, having continued contact with the region is the responsibility of the areal advisor, but the areal advisor mentions that there is a capacity problem amongst areal advisors (13). Another advantage of sharing monitoring data, or involving interest groups in the development process, is that the local fishing club is willing to have a signalling function in the field (40). Moreover, the local NGO has a lot of contact with citizens who live in the same area as the fish passages (20). These citizens might also be open to having a signalling function if involved.

Box 4: Private landowner

The Province and the municipality of Breda wanted to restore the natural flow of a stream that was on the land of a private landowner. The private landowner liked this idea and her land was depreciated from agricultural to nature land, which she was compensated for. As her land is now considered nature land, she needs to ensure that there is a certain variety of flowers on her land and they come to check if there are enough flowers. However, maintenance comes two times a year to dredge the fish passage, driving over these flowers with their excavator, which is not right in her eyes. Moreover, they take a lot of fish out of the fish passage in the process of dredging, killing a lot of fish, which she feels is very conflicting with the goal of the fish passage. Next to that, she needs to put in a lot of effort to ensure that they take the material that came out of the fish passage with them, as it causes different undesired plants when they leave it on the bank. She called the waterboard many times asking why it happens in the way it does and they say that they follow protocol. Her perspective is that they hire the cheapest contractor, who dredges it. At first, she liked the fish passage, but it is getting less and less. Moreover, she did not even know if the fish passage worked and what actually migrated through it. Eventually, I provided the landowner with the data on the fish that migrated through the fish passage. This was received well and enthusiastic and it seemed there was a large interest to know more about it (51).

Section conclusion

In the monitoring phase, the structural powers shift towards the ecologist and '*proces programmeren en monitoren*'. Like the IPM-team in the earlier phases, this department also values the specialistic expertise of consultancy companies highly. Therefore, the consultancy company that has this specialistic knowledge gains a strong position in the monitoring phase. However, in this position, they cannot affect the development process as a whole, as they only monitor the fish passage. It appears that '*proces programmeren en monitoren*' values the participation of other external actors very low, as there is no external participation organised. Therefore, the dispositional power of external interested and affected actors is also very low. For this reason, they are not able to steer this phase at all. Next to that, it appears that the board, in the position to make budget decisions, negatively influences the usefulness of this phase. This is because they prefer to reserve their money on topics that are more in their line of interest. Therefore, not all fish passages can be monitored, and the fish passages that appear not to function can barely be adjusted.

4.4. Effects of power relations on the outcomes of the development process of fish passages

The section above describes the participation of actors in the different development phases, and how this is embedded in different kinds of power relations. This section connects the results from the different phases, to analyse two main effects of the different kinds of power relations on the outcomes of the development process of fish passages. The first effect is that technical types of fish passages are often chosen over natural types of fish passages in the development process of fish passages. The second effect is that the power relations in the organisation of actor participation often lead to fish passages that lose their functioning overtime.

4.4.1. Technical over natural fish passages

The results show that the current power relations determine the participation of individual actors inside the waterboard and external actors. As a result of the structural power relations, the participation of actors in the different phases of the development process often leads to the development of technical types of fish passages, over natural types of fish passages.

Characteristics of technical and natural types of fish passages

The three most common types of technical fish passages observed during the field visits were '*de wit*', '*Vislift*', and '*vertical slots*' type of fish passages. These technical types of fish passages have the following characteristics: Easy to manage water levels, relatively cheap, uses little space, low water current to attract migrating fish, low landscape value, low aesthetic value, and provide little to no additional habitat for migrating fish (Coenen et al., 2013). The two most common types of natural type of fish passages observed during field visits were a bypass next to the main stream or gradual steps in the main stream itself. These natural types of fish passages have the following characteristics: Difficult to impossible to manage water levels, high landscape value, contribute to the recovery of natural streams, requires a large amount of space, suitable for a large variety of migratory fish and macrofauna, needs intensive maintenance, and has a draining effect of water on the direct environment (Coenen et al., 2013). The characteristics of the natural type of fish passages appear to be more desired for reaching environmental goals, like increasing fish migration. Nevertheless, the choice for a technical type over a natural type of fish passage is made more often in the development process of fish passages in the 'Brabantse Delta'. The next paragraphs will give insights into the power relations that leads to making this choice.

Power relations leading to a technical type of fish passages

In the vision phase, the vision of the EC to reach a 'good environmental status' for all waterbodies is leading. However, delegating the responsibility to implement the vision of the EC to waterboard 'Brabantse Delta', allows this governmental actor to steer how to reach this vision. The board inside the waterboard has the most influential position in steering this vision. Although the natural type of fish passages are more inclined to reach the vision of the EC, the interests of the board in agriculture are more in line with the characteristics of the technical type of fish passages. By using 'information' and 'consultation' forms of participation in this phase, the board only limitedly allows external actors to steer its vision. Therefore, external actors, which might prefer the natural type of fish passages, barely have any influence on the policy and budget decisions, whilst the board retains full authority to make decisions. Meaning, that these forms of participation do not enable a change in the structural power relations in this phase of the development process. For this reason, the preference of the board for the technical type of fish passages remains dominant, and the vision of the EC appears to dilute due to the vision of the board. As the board members are democratically chosen by citizens in the jurisdiction of the waterboard 'Brabantse Delta', the preference for the technical type of fish passages is also an indirect preference of these citizens. Based on the above, it appears that the structural powers in the policy arrangement of fish passage development in the 'Brabantse Delta' are stabilised on the interests of the agriculture sector, which leads to technical type of fish passages.

In the choice phase, it became clear that the structural powers shifted from the board towards the members of the IPM-team and the internal client. For choosing the type of fish passage, the IPM-team decides to limit participation to external affected actors, which takes the forms of 'information' and 'consultation', as typified in the 'Wheel of participation'. Although these forms of participation normally do not lead to a change in power relations, external affected actors that own land in the location of the fish passage gain a strong position to steer the choice for the type of fish passage. Currently, the fish passages are mostly developed on, or next to the land of external affected actors,

whose interests match with the characteristics of technical type of fish passages. In addition, the IPM-team tries to limit the influence of the external affected actors by developing fish passages as much as possible in the waterways, and land, of the waterboard itself. In this way, limited external participation is needed.

The decision of the IPM-team to not allow external interested actors to participate, whose interests match with characteristics of natural type of fish passages, further increases the likelihood of choosing a technical fish passage. This is because, the external interested actors are not enabled to advocate for natural solutions, as they are placed in a position where they cannot have an influence. Therefore, how external participation is organised, as a result of the power relations, contributes to the choice of technical fish passages over natural fish passages.

Next to the participation of external affected actors, internal advisors are also in a position to influence the choice of the type of fish passage. Firstly, the demands of the water manager to be able to manage the water levels are regarded as very important in the development process (4, 14, 15). It is generally easier to manage the water levels with a technical type of fish passage. Therefore, the choice for this type of fish passage is often made. The ecologist and hydrologist appear to favour the natural restoration of waterbodies. However, they do not have access to resources, like land, or financial resources, that are most important for steering the choice for a natural type of fish passage. Nevertheless, they can still have an influence, but only on which kind of technical or natural fish passage suits the location best, when the decision between a natural or technical fish passage is already made.

Lastly, the strong position of the board of the waterboard, and the Province of Noord-Brabant, and their desire to use subsidies from the EC as much as possible, results in time pressure in the development process (6). This time pressure reduces the time to search for available land to develop a natural type of fish passage (6). Therefore, the EC influences the development process by indirectly stimulating the choice for technical fish passages, as these types of fish passages can be developed faster. The technical fish passages may help achieve the 'good environmental status' of the waterbodies of the EU in 2027, but do not appear to contribute to the actual natural restoration of water bodies.

Section conclusion

Overall, it appears that the structural power relations in the policy arrangement of fish passage development in the ‘Brabantse Delta' are not in favour of increasing fish migration. Nevertheless, the deadline of the WFD ensures that fish passages are developed, which mostly are technical fish passages. Therefore, the uneven development of technical fish passages over natural types of fish passages can be considered a compromise, between the vision of the EC, and the interests of the most influential actors in the policy arrangement of fish passage development in the 'Brabantse Delta’. This compromise allows fish migration, and also enables the retainment of water in the waterbodies in the jurisdiction of waterboard ‘Brabantse Delta’. However, it is unclear to what extent this compromise actually serves the goal of restoring fish migration, and truly reaching a ‘good environmental status’ for the waterbodies in the ‘Brabantse Delta’ in 2027.

4.4.2. Not properly functioning fish passages

During the field visits, it became clear that at first sight, twelve out of twenty-six fish observed were reduced in their functionality. Five of these fish passages did not function at all, as there was no water flowing through these fish passages. Next to that, seven fish passages were limitedly functioning and showed issues related to operation and maintenance. This section will describe why this reduced

functionality can be seen as an effect of the power relations in the organisation of actor participation in the development process of fish passages in the 'Brabantse Delta'.

Power relations leading to a loss of functionality of fish passages overtime

In the vision phase, the dominant actors that shape the development process of fish passages have a high interest in reaching the goals of the WFD. They are positioned to pursue this interest by stimulating the development of fish passages as a measure to reach those goals. In the choice, design, and construction phase, the IPM-team is in a position to shape the structural powers in the development process. The IPM-team is interested in delivering a good fish passage process and project and organises the participation of individual actors inside the waterboard and external actors to make this possible. However, the power relations in the development process make a substantial shift in the operation & maintenance phase. The requirements of this phase, and how the development process is structured, make the involvement of previously influential actors unnecessary. Therefore, they leave the development process and lose their strong positions. This also means that their influence to pursue their interests that favour doing a good fish passage project stops.

The responsibility for the ongoing functioning of the fish passage is transferred to the maintenance personnel and water managers. Therefore, the structural powers, that shape what thinking and moves are legitimate, shift towards the maintenance employees and water managers. Based on the results and observations, it can be concluded that this shift in power relations in the operation & maintenance phase development contributes to the reduced functionality of seven out of twenty-six fish passages observed.

The ongoing functioning of fish passages requires ongoing maintenance and operation. However, the results show that this is often not seen as a priority. Nevertheless, according to the document that maintenance employees use as a manual to maintain fish passages, they only have to maintain the fish passage once a year, in early spring. The senior maintenance employee mentions that they exactly do that once a year (9). Although I am not a fish migration expert, I wonder if maintaining a fish passage once a year is enough. The results show that maintenance employees will only maintain a fish passage outside of the yearly planned maintenance round when they are signalled. However, no one controls the fish passages regularly to signal maintenance employees to maintain the fish passages. The results also show that the activities of the water managers are not controlled in any way. Based on the results, I argue that this is a direct effect of the fact that there is no participation organised in this phase of the development process, which leads to very low accountability.

In the jurisdiction of the waterboard 'Brabantse Delta', the external interested actors are not allowed to participate by the waterboard in the development process of fish passages. This shows a power imbalance between the waterboard and the external interested actors in the policy arrangement of fish passage development in the 'Brabantse Delta'. Nevertheless, the involvement of these external interested actors could have a positive influence on the ongoing functionality of the fish passages, as they might be open to having a signalling function in the field and increase accountability of the activities of water managers and maintenance employees. Therefore, allowing external interested actors to participate could balance the power relations in the policy arrangement toward favouring an increase in fish migration. This is because external interested actors could increase the number of times that maintenance employees are signalled to maintain the fish passage. However, as of now, actor participation is organised in a way that does not allow a strong position in the policy arrangement for this actor group. Therefore, they are not able to influence this phase by having a signalling function or contributing in any other way that is beneficial for the continued functioning of the fish passages.

Section conclusion

The policy of the waterboard to limit external participation in the choice and design phase to only external affected actors leads to sufficient input to develop a functioning fish passage. Therefore, this approach speeds up the development process. This leads to reaching the goals of the WFD faster, which is desired. However, it is the question if the decision to not allow external interested actors to participate continuously ensures fish migration overtime, and contributes to a 'good environment status' in the future over and over again, even after the deadline of the WFD in 2027. This is unclear, as the waterboard does not structurally monitor all the fish passages, which shows a lack of attention and priority for the monitoring phase. Therefore, the development of fish passages by the waterboard appears more like a box-ticking exercise, instead of sustaining an improvement of fish migration overtime. For this reason, based on the results discussed above, it appears that the current power relations in the policy arrangement of fish passages in the jurisdiction of waterboard 'Brabantse Delta', are more inclined to not ensure fish migration overtime, or limitedly, rather than ensuring fish migration.

5. Discussion

The research insights provided a detailed description of the different interests of actors in the development process of fish passages in the 'Brabantse Delta'. It also details how participation is formally organised, and in practice, and how the participation of actors is embedded in power relations. Based on these results, I discuss the usefulness of the political modernisation theory in this study and provide a critical reflection on the political modernisation theory. I will also reflect on my findings regarding power relations in participation in the development process of fish passages, and compare my findings with literature. From this reflection, I propose a new perspective on participation in fish passage and river restoration projects that take shifting power relations into account. Finally, I will discuss the limitations of this study.

5.1. Political modernisation theory

Usefulness of political modernisation theory

In this study, political modernisation, through the use of the PAA as an analytical tool, enabled the analysis of the policy domain of fish passage development in the 'Brabantse Delta'. It allowed me to write a detailed description of the policy arrangement, in which actors from civil society, market, and state are organised in terms of the distribution of resources, what their interests are, and in what ways they can interact (Arts & van Tatenhove, 2006). By linking the different dimensions of the PAA to the participation of actors in the different development phases, the political modernisation theory allowed for the description of the participation of actors per development phase. This allowed for an analysis of the changes in power relations throughout the different phases of the development process. Moreover, it enabled me to analyse how the power relations in the development phases affect the outcomes of the development process of fish passages. Therefore, based on the ability to perform this study with the political modernisation theory, I argue that political modernisation, in combination with the PAA, is useful to understand how participation is organised in development processes.

Criticism on political modernisation theory

Although this theory is useful to operationalise this study, the results of this study were not fully in line with the early-, anti-, and late political modernisation phases, as described in the political modernisation theory. This is because it appears that the policy arrangement of fish passage development in the 'Brabantse Delta' includes characteristics of different phases of political modernisation.

For example, in the vision phase, the substantive discourse was imposed by the state by way of issuing and delegating the implementation of the WFD to member states, provinces, and waterboards. Although the EU promoted public participation in the WFD, it is more participation on paper, than participation in practice. For example, it rarely happens that the fish migration routes were deliberated with other actors than the state itself. The participation organised as part of the WFD is neglectable and does not seem to influence the eventual decisions of the waterboard. Therefore, this phase in the development process has characteristics that fit more in the early modernisation phase. In the choice, design, and construction phase, external actors from the market (construction and consultancy companies) and civil society (farmers, citizens) are allowed to participate. From this position, they can influence the choice of the type of fish passage, and its design. This is more characteristic of the late political modernisation phase. However, the fact is that the waterboard retains its position to make the final decisions. This means that the actual diffusion of political power is still low, and not spread amongst actors from civil society, and the market.

The presence of characteristics of early and late political modernisation in the results of this study makes me wonder if these clear distinctions between political modernisation phases exist. Arts &

Leroy, (2006) also found several empirical examples of policy arrangements that showed characteristics of both early and late political modernisation, which they call hybrid structures. They concluded that characteristics of late modernisation are mostly found in the dominant view with regards to what is perceived to be 'good governance'. However, they found that the existence of late modernisation is less clearly present in the actual relationships between actors from the state, market, and civil society. This is also observed in this study. For example, the dominant view on 'good governance' is shaped by the EU which promotes 'active participation' in the implementation of the WFD, and the waterboard as an organisation tries to promote participation in all their tasks. However, in the relationships between the state (waterboard), market (consultancy and construction companies), and civil society (citizens, farmers) in the development process of fish passages, the waterboard retains its position to make the final decisions. They also retain the ability to organise participation, which takes forms of 'information', 'consultation', and 'participation' forms of participation, as typified in the ''Wheel of participation', if they involve external actors at all. This shows that forms of participation, that are not necessarily in line with the dominant view on ‘good governance’ in late modernisation, can exist at the same time in a policy arrangement.

Arts & Leroy (2006) do emphasize that they observe small subtle shifts towards late modernisation in policy domains in environmental policy. However, these subtle shifts do not imply a large decrease in the political power of the state and a large increase in the political power of the civil society and market. Therefore, Arts & Leroy (2006), conclude that the prominent shift from 'government' towards 'governance' described in literature cannot be validated in the environmental domain. Small subtle shifts towards late modernisation are also observed in this study, as the waterboard tries to experiment with a new work form called the '*Bouwteam*'. This increases the influence of consultancy and construction companies. However, the waterboard still retains its position to make the final decision. Therefore, based on the discussion above, the empirical findings from this study complement the findings of Arts & Leroy (2006), as the shift from 'government' to 'governance' cannot be validated in the policy arrangement of fish passage development in the 'Brabantse Delta’ either.

When the theory of political modernisation was developed, Arts et al., (2006) recognised that it was too early to evaluate what the late modernisation phase in environmental policy means. Now seventeen years later, the results of this study complement the same findings as Arts & Leroy, (2006), which show a hybrid structure of different phases of political modernisation in 'one' policy arrangement. Therefore, the shift from 'government' to 'governance' is yet again not validated in a policy domain regarding environmental policy. Nevertheless, this study complements the political modernisation theory when it comes to confirming that the dominant view on 'good governance' shows strong links to late modernisation. However, in practice, the results of this study show that the political modernisation theory needs to be supplemented with theory on participation in relation to power relations, that typifies different forms of participation. This further enables an understanding of the hybridity of the phases of political modernisation in environmental policy, which can be used to further understand how policy arrangements can stabilise or change.

5.2. Participation and power relations

Reflection on participation of external actors

The results show that the waterboard 'Brabantse Delta' mostly limited the participation of external actors to ‘information’ and ‘consultation’ forms. With these forms of participation, the waterboard fulfils the mandatory participation, as described in the WFD. However, they do retain their authority to make the final decisions and are not obliged to take the input of external actors into account (Hansen & Mäenpää, 2008). Van der Heiden & ten Heuvelhof, (2012); Raadgever et al., (2011), and van den Born et al., (2019) share the same findings and mention that participation in the

implementation of the WFD in The Netherlands is often in the abovementioned forms of participation. A famous quote from Arnstein, 1969 (p. 216) regarding these forms of participation is as follows: '*Participation without redistribution of power is an empty and frustrating process for the powerless*'. This quote shows that these forms of participation mostly reproduce the existing power relations between the initiator of the participatory process and the participants. Hassenforder et al., (2019) mention that structural actor participation, like in the WFD, can be detrimental, as it can lead to box-ticking approaches, whereby participation is only carried out to comply with legal frameworks. In these approaches, participation is often limited to what is required. Therefore, the benefits of participation to reach the goal of the project will also be limited. The findings of this study confirm this. For example, in the vision phase, a local NGO revised the proposed place of a barrier removal, as part of the mandatory participation of the WFD. Although the local NGO received an explanation, their revision did not lead to any changes in the proposed plans of the waterboard. This shows that the local NGO does not have much influence on the decisions of the waterboard. Moreover, neither the waterboard nor the local NGO gained any benefits from their interaction.

Next to limiting participation to consulting and informing external actors, the results show that the waterboard tries to limit the number of actors in the development process as much as possible. The results indicate that this is the result of the low value given by the waterboard to the interests and knowledge of interested external actors. Mitchell & Ejderyan, (2020) describe the situation in which the public is given no voice to express disagreement as 'post-politics'. They further describe that participatory processes are archetypal of post-politics for their ability to silence opposing interests or input. However, with regards to input legitimacy, involving local interest groups and citizens is regarded as important, as a failure of a river restoration project may be attributed to the opposition of local residents. Sufficiently involving and empowering local interest groups and citizens in the participation process, can increase the acceptance and effectiveness of these river restoration projects (Carré et al., 2021). Therefore, it is important that these local interest groups and citizens are allowed to participate, and that their input is also taken seriously (van den Born et al., 2021). However, the results show that the opposite is happening in this case study. This negatively affects the output legitimacy, which is shown by the number of fish passages that lose their functionality overtime.

Critique on the strong position of experts

Although input legitimacy is deemed so important in the literature regarding river restoration, the findings of this study show that input legitimacy is mostly limited. This is because the expertise of internal advisors, consultancy, and construction companies, is valued higher than other external actors in the development of fish passages in the 'Brabantse Delta'. Van Ast & Gerrits, (2017) and Germaine et al., (2021) confirm that experts in waterboards or private organizations often hold privileged positions in participatory processes of water management projects. Van Ast & Gerrits, (2017) mention that experts hold these privileged positions, as they possess the knowledge that is needed to assess the possible consequences of decisions, which allows them to answer questions about the feasibility of certain ideas. Moreover, the experts are in control over the information, and formal and hierarchical rules (Germaine et al., 2021), which is also observed in this study. This strengthens the position of experts in river restoration projects. Therefore, participation in river restoration projects generally involves large imbalances in power relations between experts, citizens, and local interest groups (Germaine et al., 2021), which the findings in this study also confirm. These participatory processes in river restoration projects, where the voice of the public is limited, and experts hold privileged positions have received critique (Cottet et al., 2021). This is because, only the experts with technical knowledge are recognised as legitimate participants (Mitchell & Ejderyan, 2020). The results of this study are in line with the critique on the current form of participation in river restoration projects. This is because the current form of participation leads to fish passages that lose their functioning overtime.

To add to the critique from the literature, I found that, placing certain experts, like maintenance employees and water managers, in prominent positions, and limiting external participation in the development process of fish passages is a risk. This is because, there is an assumption that these experts perceive the goal of the development of fish passages as a topic they are interested in, or support. However, this study shows that the experts in the development process of fish passages might not always have an interest in the goal of the river restoration project. This does not form significant issues when the structural powers favour doing a good fish passage or river restoration project, as shown in the choice, design, and construction phase. However, the results show that this forms an issue when the structural power shifts to experts who do not have an interest in fish migration, like in the operation & maintenance phase.

Lack of attention on shifting power relations

Although it is already known that power relations have the potential to steer river restoration projects, little attention is given in literature on the power relations that shift from one phase to another, as a result of how participation is organised. This study shows that the lack of attention to shifting power relations, throughout the different development phases, can be a main contributor to the failure to continue to reach the desired environmental outcomes overtime of fish passage, and river restoration projects. The significant shift in structural powers toward water managers and maintenance employees is made possible because participation is organised with the perception that a fish passage project is finished after construction, and that the experts that gain a dominant position after the construction phase will perfectly execute their tasks. Skinner & Bruce-Burgess, (2005) share these findings and mention that the end of a project in river restoration is often signified by finalizing the construction phase. However, they suggest that the end of the construction phase is only the beginning of the long-term future management, and is one of the most important project phases. Moore & Rutherfurd, (2017) also confirm that how river restoration projects are managed and maintained in the long-term is just as important to its success, as how they are designed and constructed. Although this is known in the literature, the structural powers relations in the policy arrangement of fish passage development in the 'Brabantse Delta' do not show a high priority to the development phases after finalizing the construction of the restoration project. Moreover, external interested actors are not allowed to participate in these phases, leading to significant power imbalances, and undesired environmental outcomes. Therefore, a different perspective is needed in the policy arrangement of fish passage development regarding what participation in river restoration and fish migration projects exactly entails.

New perspective on participation in river restoration and fish passage projects

Firstly, as described by Skinnen & Bruce-Burgess, (2005) and Moore & Rutherfurd, (2017), participation in fish passage and river restoration projects is better seen as a never-ending participation process, instead of a process that ends after construction. In this never-ending process, it is required that more value is given to the input of external interested actors. The proposition to increase the value of the input of local actors is not new in literature regarding river restoration projects (Cottet et al., 2021; Buletti et al., 2021), as it is a logical result of the extensive critique on the persisting form of participation in which experts hold privileged positions. Therefore, the findings of this study are in line with the latest developments in the theory of participation in river restoration projects, as it found that the strong position of experts can lead to a loss of functionality of fish passages overtime. In literature, increasing the value of external interested actors is mostly proposed to increase acceptance of the decisions made in the development process (Buletti et al., 2021; Carré et al., 2021). Whilst increasing acceptance of decisions is important, this study found another reason why external interested actors need to be valued higher in river restoration projects. As the results show, some development phases are dominated by experts who do not have an interest in the goal of the

development process. By involving local interest groups and citizens, and increasing the value given to these actors, it could balance the power relations in the policy arrangement to ensure desired environmental outcomes overtime.

This new perspective on participation in fish passage and river restoration projects requires a different approach to organising participation. It requires not only analysing which actors are affected and involve them to create acceptance for decisions. It also requires to carefully analyse which external actors might be useful for balancing the power relations in phases of the development process, where the power relations do not favour increasing fish migration, like the operation & maintenance phase. For example, Moore & Rutherfurd (2017), mention that the maintenance phase in river restoration projects often lacks transparency and most importantly, the absence of oversight of external actors. Without accountability, the best management arrangements cannot ensure that river restoration projects are maintained effectively (Moore & Rutherfurd, 2017), which is exactly what the findings of this study also show. Therefore, to increase the likelihood of reaching desired environmental outcomes, it would be favoured to include external interested actors, and the development phases after finalizing construction, in the participation process. This could destabilise the power relations in the operation & maintenance phase by holding the activities of the experts accountable.

Difficulty in destabilising the policy arrangement

The above described that it is possible to change the outcomes of the development of fish passages by destabilising power relations. However, this is difficult, as the development process of fish passages takes shape in a policy arrangement that is stabilised by actors who value the interests of agriculture higher than increasing fish migration. Changing the structural power relations in the development process of fish passages requires a transformation or destabilisation of the policy arrangement of fish passage development in the 'Brabantse Delta', to centre it around the interests of fish, and environmental values in general. However, a destabilisation of the policy arrangement seems unlikely at the moment and is probably not favoured by the waterboard, who currently determine the structural powers in the policy arrangement. This is because, a destabilization could mean using 'participation' and 'empowerment' forms of participation, where the waterboard needs to share the authority to make decisions with external interested actors, and include more interests in decision-making processes that are not in line with their interests, and reserve extra financial resources for nature-oriented goals. Moreover, the members of the board are democratically chosen. Therefore, a change in power relations in this phase should mean a shift in the dominant interests of the citizens in the jurisdiction of the waterboard 'Brabantse Delta' towards environmental interests. Based on the results of the most recent elections, this shift appears to be unrealistic, as the interests of the citizens are moving even more towards agriculture. Therefore, it is likely that the structural power relations in the policy arrangement of fish passage development in the 'Brabantse Delta' remain stable in the foreseeable future. This also means that the current outcomes of the development process of fish passages will most likely remain the same.

5.3. Limitations of this study

This study made use of three different data-gathering methods to triangulate the findings of this study and achieve a high internal validity. This was attempted by performing interviews with a broad variety of different interviewees who have an interest in, or are involved in the development process of fish passages in the 'Brabantse Delta'. By doing thirty-eight interviews, I covered almost all the different actors in the policy arrangement of fish passage development in the 'Brabantse Delta'. This ensured a rich data-set which enabled me to address the research questions. Nevertheless, in hindsight, I would have liked to interview board members of different political parties as well, because these shape the structural powers in the policy arrangement. I still acquired information on the democratic process

inside the waterboard through interviews with other interviewees inside the waterboard, but the information on this topic could have been more comprehensive.

Although I tried to triangulate the data from the interviews with literature, there was not much literature available that was specific on the different phases of fish passage development in The Netherlands, or even worldwide. On one hand, it shows the novelty of this study. On the other hand, it was difficult to triangulate the information from interviews with literature, which poses a limitation in this study.

Fortunately, the observations allowed me to cross-check the most important findings in this study. Nevertheless, The timing of the data-gathering period offered a limitation on the observations made in this study. All three field trips were organised in fall, a season when maintenance employees usually do not focus on maintaining fish passages. In addition, the timing of the field visits prevented a thorough assessment of the activities of water managers concerning closing the fish passages, as there was no shortage of water during the field visits. This hindered a thorough understanding of how freely water managers are in their activities with regard to operating a fish passage. Nevertheless, the interviews with water managers indicated that they possess freedom when it comes to operating the fish passages.

Another limitation is the actual description of the organisation of actor participation, as there are numerous possibilities on how actors can participate in the development process. This study did not describe all these different variations in actor participation. However, the most common recurring patterns in how participation is organised in the development process of fish passages in the 'Brabantse Delta' are covered in this study.

5.4. Further research

Considering the discussion, I recommend that future research focuses on the following two points:

1) This study shows that shifting power relations can negatively influence the outcomes of river restoration and fish passage projects. Nevertheless, there is limited literature that describes shifting power relations in development processes of restoration projects in environmental policy. Therefore, it is recommended that more studies are conducted that explore shifts in power relations in development processes of restoration projects in environmental policy, to further understand the effects of shifting power relations in development processes on reaching desired environmental outcomes.

2) Although external validity was not the goal of this study, it is recommended that case studies are conducted with other waterboards on participation in development processes of measures to reach the goal of the WFD. This could strengthen or weaken the findings of this study, by showing differences and/or overlaps in case studies on other waterboards.

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6. conclusions & recommendations

6.1. Conclusions

This study aimed to enhance understanding of how the power relations in the organisation of actor participation in fish passage development in the 'Brabantse Delta' affect the outcomes of the development process of fish passages. A total of four sub-questions have been formulated to answer the main question.

The first sub-question focussed on the different actors, and their interests, that are present in the development process of fish passages. It became clear there are two interests present among the actors that are most important to understanding the power relations in the development process of fish passages. The first important interest is to increase fish migration, and the second important interest is to retain water in the jurisdiction of the waterboard 'Brabantse Delta'. It became clear that these interests are conflicting, as increasing fish migration can mean the (partial) removal of barriers that enable the regulation of water levels, and the retainment of water in the waterbodies of waterboard 'Brabantse Delta'. Meaning, that fish passages are developed in an area where there are conflicting views about how the available water should be used.

The second sub-question focussed on how actor participation is organised in the development process of fish passages. It was found that the waterboard as an organisation is responsible for organising participation in the development process of fish passages and determining its conditions. The results show that how participation is organised changes with the phase of the development process. Based on the requirements of each development phase, participation is adjusted to involve the actors that have the knowledge or skills, to make it possible to ensure the success of each development phase. On paper, this results in the effective development of fish passages, that ensure continued functioning of fish passages overtime.

The third sub-question focussed on how participation of actors in the development process of fish passages in the 'Brabantse Delta' is embedded in power relations. It became clear that the waterboard, responsible for the development of fish passages, has the full authority to decide which actors can participate. Expert knowledge is valued highly in the development process of fish passages. The results show that this creates power imbalances between actors who possess expert knowledge and actors who do not. The results show that this largely determines how actors can participate, and the extent to which they can have an influence. Another important factor that determines the participation of an actor is the ownership of land that is needed to develop a fish passage. A clear relation is observed between the choice for the type of fish passage and the input of actors who own land, that is needed to develop a fish passage. Lastly, it became clear that the requirements of the different development phases largely determine the participation of actors and the influence they can have. As a result of the different requirements, the power relations between the actors shift throughout the different development phases.

The fourth sub-question focussed on the effects of the power relations on the outcomes of the development process of fish passages in the 'Brabantse Delta'. Two main effects on the outcomes of the development process were found. Firstly, it became clear that the structural power relations in the policy arrangement of fish passage development in the 'Brabantse Delta' are not in favour of increasing fish migration. Nevertheless, the deadline of the WFD ensures that fish passages are developed, which mostly are technical fish passages. The development of technical fish passages over natural types of fish passages can be considered a compromise, between the vision of the EC, and the interests of the most influential actors in the policy arrangement of fish passage development in the 'Brabantse Delta'.

This is because, technical fish passages allow fish migration, and also enable the retainment of water in the waterbodies in the jurisdiction of waterboard 'Brabantse Delta'.

Secondly, it was found that the power relations in the development process favour doing a good fish passage project, or improving fish migration up until the operation & maintenance phase. In this phase, the structural power in the policy arrangement makes a substantial shift towards the actors that are not interested in improving fish migration. As a result of how participation is organised, the actors that favour doing a good fish passage project, or improving fish migration, are placed in a position where they do not, or only limitedly, have an influence. This creates a situation where there is limited control over the actors who are not interested in improving fish migration in the operation & maintenance phase. As a result, these shifting power relations in the different phases lead to the deterioration of previously constructed fish passages that lose their function overtime.

Based on the two effects of the power relations described above, it became clear that the current power relations in the organisation of participation negatively affect the development process of fish passages in the 'Brabantse Delta' to increase fish migration. This implies that the current way of organising actor participation in the development process of fish passage is more inclined to not ensure fish migration overtime, or limitedly, rather than ensuring fish migration overtime. This may contribute to only reaching the goals of the WFD in the waterbodies of waterboard 'Brabantse Delta' on paper, and not actually reaching a 'good environment status' in 2027, and thereafter.

6.2. Recommendations

Based on the results and the conclusions described above, I will make recommendations that can be used by waterboards in The Netherlands to improve or adjust participation processes in river restoration and fish migration projects in The Netherlands. The recommendations are as follows:

1) River restoration and fish passage projects need to be seen as a development process that never ends. Participation should be organised for the duration of the life expectancy of the fish passage, or river restoration project.

2) Reserve financial resources in the project budget for the monitoring and operation & maintenance phase to give more attention to these important, yet, neglected phases of the development process.

3) Hire permanent maintenance personnel with an interest in ecology, instead of external contractors, who are not interested in ecology, to relieve work pressure on regular maintenance employees.

4) Expand the participation process to include external interested actors. Invite these actors to participate at the beginning of the choice phase, keep them engaged, and promote ownership throughout the different phases of the development process.

5) Empower external interested actors to have a signalling function in the field to increase accountability of the maintenance employees and water managers in the operation & maintenance phase. Hereby, the external interested actors must have a permanent contact in the waterboard.

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8. Appendix

Appendix 1: Reference list semi-structured interviews and small interviews in the field

Reference number	Type of actor	Function/role/occupation
1	Waterboard	Environment manager 1
2	Waterboard	Environment manager 2
3	Waterboard	Internal client
4	Waterboard	Technical manager
5	Waterboard	Participation expert
6	Waterboard	Ecologist
7	Waterboard	Hydrologist
8	Waterboard	Former maintenance team leader
9	Waterboard	Senior maintenance employee
10	Waterboard	Maintenance employee in the field
11	Waterboard	Employee with link to schools
12	Waterboard	Former project manager
13	Waterboard	Areal advisor
14	Waterboard	Water manager 1
15	Waterboard	Water manager 2
16	Landowning nature organisation 1	Interest representative
17	Landowning nature organisation 1	Employee in the field
18	Landowning nature organisation 2	Interest representative
19	Local NGO 1	Board member
20	Local NGO 2	Secretary
21	Provincial NGO	Deputy director
22	Belgium water manager	Water manager province of Antwerp
23	Construction company 1	Project leader
24	Construction company 2	Project leader
25	Farmer organisation 1	Chairman
26	Farmer organisation 2	Interest representative
27	Citizen 1	Farmer 1
28	Citizen 2	Farmer 2
29	Citizen 3	Farmer 3
30	Citizen 4	Farmer 4
31	Private fish migration company	Co-owner
32	Consultancy company 1	Engineer
33	Consultancy company 2	Owner
34	Consultancy company 3	Ecologist
35	Province of Noord-Brabant	WFD-coordinator
36	Municipality 1	Ecologist
37	Municipality 2	Ecologist
38	Municipality 3	Senior project manager
39	National sport fisheries organisation	Fish migration expert
40	Regional sport fisheries organisation	Advisor fish stock management
41	Local sport fisheries organisation	Chair
42	Citizen 5	Fisher 1
43	Citizen 6	Fisher 2
44	Citizen 7	Fisher 3

45	Rijkswaterstaat	Senior advisor water management
46	Citizen 8	Resident 1
47	Citizen 9	Resident 2
48	Citizen 10	Resident 3
49	Citizen 11	Recreationist 1
50	Citizen 12	Recreationist 2
51	Citizen 13	Citizen with fish passage on land
52	Contracted maintenance employee	Tractor driver

Appendix 2: Interview protocol

Background information

This study is performed by Luc Roozendaal, who is performing his Master thesis for the study Aquaculture and Marine Resource Management. He is collaborating with Panos Panagiotopolous, who is performing a PhD-project on fish migration in the Netherlands. The aim of this study is to gain a better understanding of power relations in the organisation of actor participation in the policy arrangement of fish passage development in the 'Brabantse Delta'. We are particularly interested in the different actors and their interests and how they use their resources and power so that the policy outcomes favour their interests. This improved insight can be used in the Netherlands to improve actor participation in the development process of fish migration and river restoration projects.

Research name: PhD-project/Master Thesis Understanding power relations in the participatory process of the development of fish passages.
Interviewer: Luc Roozendaal.
Interviewee:
Type interview: Semi-structured interview.

Important matters for the interview

- The interview will last approximately 60 minutes.
- It is favourable for us to audio record the interview.
- The summarized transcription of the interview will be send back to check if the recording is correctly transcribed. The transcription will be adjusted if necessary.
- The following interview questions serve as a guide, there is a possibility that follow-up questions are asked that are not in this document.
- The interviewees remain anonymous in the final report.

Topic list for interview

1. What do you and/or your organisation represent?
2. How would you describe the development process of fish passages?
3. What is your involvement in the development process of fish passages?
4. What are your interests on being involved in the development process of fish passages?
   - What is your perspectives on the development of fish passages?
5. Do you see yourself as a participant in the development process of fish passages and why?
6. To what extent can you influence the development process of fish passages and why?
   - What resources do you have to participate in a development process
   - What knowledge could you bring into a development process
   - How are the outcomes of the development process shared with you?
   - How does the waterboard decide who can participate in a development process?
   - Do you see any power differences in the development process?
7. Are you satisfied with the outcomes of the development process of fish passages and why?
8. Could you tell me about the different policies and decision-making process regarding the development of fish passages?
9. How do you think the WFD impacted the development of fish passages?
10. WFD participation question
11. Do you think the success of a fish passage is related to cooperation with other stakeholders and why?

Post-interview

The interview is processed by using a natural transcription method. This allows the us to document the main message and leave parts out. These parts could entail misspeaks, repetition or parts that are of topic and do not relate to the study. This allows the transcription to be more focussed on the main messages that the interviewee is trying to convey. The summarised transcription is send back to the interviewee to check if they agree with the contents of the transcription. Corrections are made when an interviewee did not agree with the contents.

Appendix 3: Overarching themes, categories and codes

List with RQs, overarching themes, categories and codes		
Overarching themes	**Categories**	**Codes**
The different internal and external actors	**Power/resources**	Formal power, responsibility, time, knowledge, money, land decision-making power,
	Discourses	Interests, perceptions
	Rules of the game (actor specific)	Contracts, meeting groups, informal/formal communication, policy documents, legislations.
	Actor participation	When, how, why
Actor participation	**All the different phases**	Steps, rules of the game
	Actors	When, how, why they are participating, how they use their resources