Participatory processes in dike strenghtening projects

Bachelor Thesis Report Civil Engineering

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The figure on the prontpage is retrieved from (Koninklijk Nederlands Waternetwerk, 2019)

PREFACE

This report is written as part of my Bachelor Civil Engineering at the University of Twente. In this research five cases of current dike strengthening and water system improvement projects were used to obtain important criteria for effective and future-proof participatory processes, common problems and potential improvements.

I would like to thank everybody that helped me to complete this research. Especially in these times, where direct personal contact is not possible, I still felt supported. A special thanks goes to Bastiaan Du Pré, who not only provided helpful contacts within Infram and solid feedback on my report, but also new perspectives on writing reports and logical thinking. I would also like to thank Karina Vink for her guidance throughout the process, provision of helpful insights on scientific reasoning and helpful feedback for writing this thesis. Furthermore, I would like to thank all interviewees who committed some of their precious time for this thesis.

I hope you will enjoy reading this thesis. I certainly did enjoy working on it. If you have any questions, you can contact me through:

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ABSTRACT

The Netherlands faces a large task of revaluating all of its dikes, since new norms for water safety have been implemented in 2017. Mainly for this reason, there are currently 51 dike strengthening projects being conducted. And each one of these dike strengthening projects in the Netherlands is obliged to include stakeholder participation. Stakeholders should at least be informed and consulted about alternatives and solutions posed by the responsible organisation. On top of that, the upcoming Environment and Planning Act will set additional requirements. Moreover, since the projects can differ a lot from each other, a broad spectrum of participatory processes is implemented. Yet, general starting points and improvements regarding current processes can be posed. Taken this into account, Infram would like know how participatory processes should generally be approached and executed. Meaning, effective and future-proof participatory processes are sought after. For that reason, criteria, common difficulties and improvements were found through articles on participation, guides on the processes in HWBP and MIRT projects, legislation and nine semi-structured interviews with experts. Through the use of four cases of dike strengthening projects and one case of a pumping station and water system improvement project, these elements were found. Through literature research, eleven criteria were obtained. Additionally, through interviews, multiple criteria, problems and improvements were found. First of all, it was found that most of the criteria were valued by the projects. Nevertheless, interviewees also noted two additional criteria to be important for successful participatory processes. Secondly, it was found that the Environment and Planning Act proved to have little consequences for the way of working with participatory processes. However, it does provide a platform for showcasing successful and intensive participatory processes. Thirdly, common problems were identified. A lot of projects similar to the cases studied, follow the same structure and procedures, which were found to cause negative side-effects. These include, inconsistent communication and late involvement of stakeholders. Fourthly, views of the client (i.e. responsible party) were found to be very important. Conservative views may pose problems regarding certain criteria, while progressive views are found to be most important for committing to intensive and broad participatory processes. Potential improvements were also noted, of which the use of comprehensible animations and summaries is found to be useful for current projects. Besides that, through literature research, guides were found to not address high degrees of stakeholder involvement, which is proven to be of large value in certain contexts. And yet, high degrees of involvement pose certain risks that should be addressed to make them effective. Through the criteria, common problems and improvements found in this research, current and future projects can improve on participatory processes, by taking the most important criteria's as starting point, potential problems as something to reduce and avoid and improvements to implement.

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LIST OF ABBREVIATIONS

HWBP   =   High Water Protection Programme or 'Hoogwaterbeschermingsprogramma' in Dutch

KIJK   =   The project 'Krachtige IJsseldijken Krimpenerwaard'

MIRT   =   Multi-year programme for Infrastructure, Spatial Planning and Transport
                 or 'Meerjarenprogramma Infrastructuur, Ruimte en Transport' in Dutch

1 INTRODUCTION

1.1 CONTEXT

Currently, the Netherlands faces the large task to re-evaluate most of the dikes. Because of new norms for water safety set in the Water Act ('Waterwet') many dikes need to be heightened, strengthened or relocated (Deltacommissaris.nl, 2020). Therefore, a lot of dike strengthening projects are being started or realised at this moment. These projects are part of the ongoing Delta-programme. This programme describes plans for high water safety and fresh water demand. The goal is to make the water safety and fresh water provisions more robust and durable by 2050 (Rijkswaterstaat, 2017). Within this Delta-programme, the High Water Protection Programme ('Hoog Water Beschermings Programma' or HWBP) is an alliance between Rijkswaterstaat and Dutch Water Boards. HWBP is an integral programme which takes differentiating spatial chances and developments into account. If a multitude of opportunities to fulfil different functions, even those functions not related to high water safety, occur, multiple governmental bodies will be working together to obtain the best solution for the region. This calls for collaboration between lots of parties. The national government, water boards, municipalities, non-governmental organizations and civilians all have a say, or at least want to have a say, in the plans for reconsidering the Dutch system of dikes.

Additionally, a law that will be implemented in 2022 is the new Environment and Planning Act ('Omgevingswet'). This Act will combine a lot of existing laws and will provide additional requirements about an integral approach for most projects in the public space (Government of the Netherlands, 2020). Thus, this Act will have consequences for all dike strengthening projects. Together with the HWBP, it will most certainly mean that projects will become more multidisciplinary in the future. In order to take all perspectives of these multidisciplinary projects into account, well thought out participatory processes will need to be implemented. Furthermore, the Environment and Planning Act will likely change the way these processes are executed, since the Act carries certain requirements and principles about public participation (Aandeslagmetdeomgevingswet, 2020).

Participatory processes are integrated in all large infrastructural projects, however they differ from project to project (VNG & Ministerie van Binnenlandse zaken en Koninkrijkrelaties, 2019). Just like the projects themselves, the participatory processes seem to rely on the environment with its constraints and chances. Although the processes in dike strengthening projects must comply with the procedures of the Water Act and the rules of the HWBP, there is still quite a bit of room for customization and interpretation. Therefore, it is interesting to know how and why differences within the rules are observed. Through comparing different cases, and thus participatory processes, choices can be evaluated.

1.2 PROBLEM DESCRIPTION

Given the observations and developments mentioned in paragraph 1.1 , questions rise what the best practice for participatory processes regarding upcoming dike strengthening projects might be. There are a lot of guides available within companies and governmental organizations. However, project' participatory processes differ largely from one project to the other (VNG & Ministerie van Binnenlandse zaken en Koninkrijkrelaties, 2019). Therefore, Infram would like know why certain choices were made and why certain elements were disregarded or highlighted. Next to this, Infram would like to know what the best suitable practices should be according to literature and expert's opinions.

Additionally, the Environment and Planning Act will have an influence on future participatory processes. However, since this Act is not implemented yet, there are some unknowns concerning operationalizing, in this case, dike strengthening projects' participatory processes in the future.

Research has already been done about evaluating the practice of participatory processes and providing frameworks for these processes as a whole (e.g. (Krywkow, 2009) (Hassenforder, Smajgl, & Ward, 2015)). However, this research will use this information next to current and upcoming legislation to not only evaluate whether the process was effective, but also advise managers on certain problems and choices along the way.

1.3   RESEARCH AIM AND QUESTIONS

The aim of the research is to provide advice about participatory strategies to make them more effective and future-proof concerning the new Environment and Planning Act. Through obtaining criteria, common problems and improvements, this advice is given. In this case effectiveness means whether the strategies are complying with theory and whether strategies can be implemented in practice. Next to that, in order to establish if strategies are future-proof, the strategies were evaluated by checking whether these strategies comply with the new Environment and Planning Act.

First of all, in order to understand what makes participatory processes effective, important criteria were found. These criteria were found through multiple methods. First of all, relevant theories for participatory processes in water management were researched. This leads to the first question, which is answered in paragraph 4.1:

   1. *According to theory, which criteria are important for participatory processes?*

Next to the theory, a lot of guides are available within companies and organisations on what is best practice for participatory processes. However, these guides do not contain all information. In order to obtain that knowledge, experts were questioned on these criteria. Outcomes of these sources will answer the second question and can be found in paragraphs 4.1 & 4.2:

   2. *According to practice, which criteria are important for participatory processes?*

After answering the first two questions, criteria for current participatory processes were listed in Appendix D: Combined list of criteria. However, this research also looked into criteria and best suitable practices for future participatory processes. To do so, the Environment and Planning Act was studied. Therefore, the third question is, to which the answers are given in paragraph 4.3:

   3. *What must a participatory process include and achieve according to the Environment and Planning Act?*

After defining these criteria from the upcoming Act, all relevant criteria for current and upcoming participatory processes are known. This list of criteria was used to check whether current practices are in line with these criteria. Therefore, through multiple cases, current projects were evaluated on their practices. Choices within these projects were questioned. This leads to the fourth question,

   4. *What are current practices in dike strengthening projects and are they in line with the listed criteria?*

By answering question 4, differences between the listed criteria and the cases were found. These differences may be problematic or lead to inefficient processes. Therefore, differences were evaluated. This lead to fifth question:

5. *What are the possible problems in current participatory processes of dike strengthening projects regarding theory, practice and the Environment and Planning Act?*

After identifying the problems, which are stated in paragraph 4.4, advice is given on how these problems can be dealt with. Furthermore, next to the problems, it might be that the current projects miss out on possible improvements. This leads to the sixth question, which is answered in paragraph 4.5:

6. *In what way can participatory strategies for dike strengthening projects be improved concerning effectiveness and being future proof?*

Finally, it might be that the advice given for dike strengthening projects can be translated to projects from other disciplines as well. Therefore, an evaluation of this is made in paragraph 4.6, which answers the final research question:

7. *Can findings of this research translate into other projects?*

In the end, common difficulties are identified and additionally, criteria and improvements are listed which can help to better participatory processes for the future.

1.4 SCOPE

Case studies were done for evaluating current participatory processes within dike strengthening projects. Multiple cases were used that are well known under Infram's employees. This way, experts were contacted easily. Four out of the five cases considered are part of the HWBP. And one case, Alblasserwaard, follows a similar structure. Information on the projects were found through the interviews with experts. The cases used were:

- **HWBP Meanderende Maas**
  A 26 kilometres long dike trajectory between Lith and Ravenstein is not in compliance with the new safety norms. Therefore, this trajectory needs to be strengthened. Next to conventional strengthening, the river will be broadened and reshaped to its original meandering shape. This should lower water levels significantly and also provide about 500 acres more room for nature. And the excavation also provides extra ground for the dikes. This integral project aims to provide more water safety and to enhance the local economy. Furthermore, the project has a high urgency, since almost 260.000 people are living behind this dike trajectory. A unique feature of this project, is that not only the Water Authority is responsible for the execution of the project, but a combination of ten parties are. This is due to the integral nature of the project.
  The project has a broad an intensive participatory process. Stakeholders are involved up to co-creation/decision level.
  This project is currently in the plan development phase.
- **HWBP Noordelijke Maasvallei**
  Fifteen locations at the river Maas will be strengthened. These locations contain about 40 kilometres of dike in total. A lot of dikes were built in the 90's as emergency measures, as a reaction to the large floods of 1993 and 1995. However, these emergency dikes do not meet current norms for water safety. Furthermore, since the region mostly consists out of a natural river valley, dikes are not a normal sight in the region. Therefore, in a lot of locations dikes need to be built where no dikes are present now. Consequently, impacts on the region are high. An intensive and broad participatory process is therefore needed, with involvement levels going up to co-creation/decision level.

Additionally, the project combines strengthening of dikes with broadening of the river. In the locations where the river profile is altered, not only the Water Authority is responsible, but also the Ministry of Infrastructure and Water Management. Next to enhancing safety, other spatial problems and chances are taken into account such as preserving and creating spatial quality, sustainability, ecology in the area, cultural history, and recreation. The project affects 60.000 inhabitants and therefore a lot of effort is put in creating support for the alternatives. This project is divided in 15 sub-projects. Currently, one project is finished, eight are in the plan development phase, four projects are at the end of the exploration phase and two are at the start of the exploration phase.

- **Alblasserwaard**
  The Ablasserwaard has an old water system. Within this system a large section of quays were found to not comply with current norms. Additionally, the discharges of the system were also unsatisfactory, due to long drainage routes flowing against strong westerly winds. Better discharge and inflow was needed. By providing better discharges and water level control, the quay problems could be solved simultaneously. Current pumping stations are not able to this, so new ones are needed. Therefore, two sites are currently allocated for new pumping stations. The participatory process is going up to collaboration level.
  This project currently is in the exploration phase.

- **HWBP Krachtige IJsseldijken Krimpenerwaard (KIJK)**
  About 10 kilometres of dike between Gouderak, Ouderkerk aan den IJssel and Krimpen aan den IJssel are not complying with the new safety norms. The river is connected with the North Sea nearby and the dikes are very old. Due to settling soil, the dikes are descending with an increasing speed. Additionally, a lot of houses are built on or near the dike, adding complexity to the project. Furthermore, an important regional road is on top of the dike. Due to the close proximity of inhabitants on the dike, an intensive participatory process is being performed. The degree of involvement is going up to collaboration level.
  The project is currently in the plan development phase.

- **HWBP Arnhem Rijnkade versterking**
  In this project 1.2 kilometres of urban quay walls that ares not complying with the new safety norms will be strengthened. The aims of the project are to ensure water safety and making the quay climate adaptive and of high spatial quality. The monumental value of the quay should be taken into account, nevertheless the environment should be inviting and 'green'. The Water Authority is responsible for most of the project, including the participatory process. However, for parts of the additional spatial quality goals the Municipality of Arnhem is also responsible. Since this project is located in an urban area, a lot of disturbance will be caused for nearby inhabitants and companies. Therefore, an intensive participatory process is chosen for. The degree of involvement is going up to co-creation/decision level. The project is currently in the plan development phase.

Furthermore, mainly the exploration stage of participatory processes is evaluated. This has several reasons:

Firstly, the participation plans are made and implemented in this stage, this part of the process is key. Additionally, a foundation is being laid in this phase regarding stakeholder involvement. A stakeholder analysis and consultation will be performed in this phase making it crucial for the overall participatory process.

Secondly, the Environment and Planning Act defines participation as: "To involve stakeholders in an early stage of the process of decision-making about a project or activity", whereas it considers

stakeholders amongst others to be civilians, company representatives, professionals of civil organisations and members of governmental organizations (Aandeslagmetdeomgevingswet, 2020). This further highlights the importance of the early stages (or exploration phase) of such projects. Latter stages of projects focus more on keeping relations stable and informed. Whilst this is indisputably important for the projects themselves, less of interest for this research.

Lastly, all the cases chosen are either at the end of the exploration phase or beyond this phase. Therefore, only this phase can be compared, since some projects are not in the plan development phase yet.

2 THEORETICAL BACKGROUND

This chapter provides background information to the research and cases used. First of all, an introduction of participation is given. Secondly, the general structure of projects is shown and elaborated on. Lastly, an overview of the Environment and Planning Act is given.

2.1 PARTICIPATION

In this research participation will be defined as in (Reed, et al., 2017): "public or stakeholder individuals, groups and/or organisations are involved in making decisions that affect them, whether passively via consultation or actively via two-way engagement, where publics are defined as groups of people who are not affected by or able to affect decisions, but who engage with the issues to which decisions pertain through discussion and stakeholders as those who are affected by or can affect a decision".

Stakeholders can be involved in different degrees. Arnstein (1969) was the first to categorize these degrees. The ladder of participation had a large influence on further research regarding participation. In the decades after the release of this report, the ladder has been used and remodelled many times. In this research the five 'ladders' as argued in (Luyet, Schlaepfer, Parlange, & Buttler, 2012) are used. These are, from the lowest to highest level, shown below:

- Information: explanation of the project to the stakeholders.
- Consultation: presentation of the project to stakeholders, collection of their suggestions, and then decision making with or without taking into account stakeholders input.
- Collaboration: presentation of the project to stakeholders, collection of their suggestions, and then decision making, taking into account stakeholders input.
- Co-decision: cooperation with stakeholders towards an agreement for solution and implementation,
- Empowerment: delegation of decision-making over project development and implementation to the stakeholders.

In Arnstein (1969) it was already argued that the lower levels of this 'ladder' are not real participation. Higher degrees of participation should be used to enable stakeholders to truly participate. But why should participatory processes be used? Many advantages are linked to enabling participation of stakeholders. In (Luyet, Schlaepfer, Parlange, & Buttler, 2012) many of these advantages are listed. These are shown in Figure 1: Advantages public participation:

Advantages and risks of public participation.

Advantages of participation
- Better trust in decisions (Richards et al., 2004; OECD, 2001; Beirle, 2000)
- Improving project design using local knowledge (Irvin and Stansbury, 2004; Habron, 2003; Beierle and Cayford, 2002).
- Better understanding projects and issues (Duram and Brown, 1999)
- Integration of various interests and opinions (Griffin, 1999; Creighton, 1986)
- Optimizing implementation of plans and projects (Irvin and Stansbury, 2004; Konisky and Beierle, 2001).
- Public acceptance of the decisions (Reed, 2008; Junker et al., 2007).
- Fostering and developing social learning (Blackstock et al., 2007; Junker et al., 2007; Pahl-Wostl, 2002; Beierle and Cayford, 2002)

Figure 1: Advantages public participation

A lot of these listed advantages in Figure 1, are clearly linked to objectives the considered projects stated. One of which most important, is support for the decisions and design solutions. But, next to the advantages listed in literature, Dutch law also calls for participation. In the code for public participation (Rijksoverheid, 2014), some ground rules are stated. Additionally, the upcoming Environment and Planning Act will further define requirements for participation. These will be explained in paragraph 2.3.

But just as there are advantages, there are risks coupled to participation, especially considering higher levels of participation. Figure 2: Risks of participation shows a list of possible risks (Luyet, Schlaepfer, Parlange, & Buttler, 2012):

Risks of participation
- Expensive process (Mostert, 2003; Lawrence and Deangen, 2001; Vroom, 2000)
- Time consuming process (Luyet, 2005; Smith Korfmacher, 2001; Vroom, 2000)
- Potential stakeholder frustration (Reed, 2008; HarmoniCOP, 2005; Irvin and Stansbury, 2004; Germain et al., 2001)
- Identification of new conflicts (Kangas and Store, 2003; Germain et al., 2001; Cooke and Kothari, 2001)
- Involvement of stakeholders who are not representative (Reed, 2008; Junker et al., 2007; Smith Korfmacher, 2001)
- Empowerment of an already important stakeholder (Buttoud and Yunusova, 2002)

Figure 2: Risks of participation

These risks should be taken into account when participatory processes are designed and executed in the projects.

2.2   PROJECT STRUCTURE

As mentioned in paragraph 1.1, current dike strengthening projects are part of the Delta Programme. Within this programme, the projects are subjects of the High Water Protection Programme ('Hoogwaterbeschermingsprogramma' in Dutch or HWBP). This programme has its own procedures and methods. Most of these follow from an overall programme for spatial projects in the Netherlands, namely the MIRT which stands for 'Meerjarenprogramma Infrastructuur, Ruimte en Transport' that translates to Multi-year programme for Infrastructure, Spatial Planning and Transport (Programmabureau HWBP, 2014). Overall the MIRT-method divides the project in multiple phases (Rijkswaterstaat, 2017):

1. The initiative or research phase
2. The exploration phase
3. The plan development phase
4. The plan realisation phase

In this research the first two phases are considered. Especially the exploration phase is of interest, since the first participation plan and participatory methods are composed. These phases are elaborated below. The elaboration is derived from (Rijkswaterstaat, 2017).

The process starts with an initiative. At the start of the project the initiative should be defined in terms of the problem description and organization. This is done by composing a so called 'starting document', which describes an analysis of the surrounding area, stakeholders, goals, ambitions, chances and problems. And finally, the document describes the roles of the different responsible parties for the exploration phase. Through this document the 'starting decisions' can be made. These will register which spatial issues will be explored in the MIRT-exploration phase and which sustainability ambitions will be strived for.

The MIRT exploration phase normally takes around two years and can be divided in four stages (Rijkswaterstaat, 2017):

- Start-up stage (Start up and problem analysis)
- Analytical stage (Generating different solutions)
- Assessment stage (Assessing and selecting alternatives)
- Decision stage (Choosing a preferred alternative)

Firstly, during the start-up stage, the responsible governmental organisations compose a plan of action for the further exploration phase. Thereafter the public (inhabitants, companies and consultants) will be consulted for the problem description and scope. A first participation plan is composed in this stage. The participation plan describes how initiatives from the public are taken into account, how these are treated equally with government initiatives and how transparency of the participatory process is reached.

Secondly, the analytic stage starts, were a broad set of solutions will be generated. These will be globally judged on costs, feasibility and the ability to reach the goals set beforehand. This results in the first set of alternatives. A broad consultation about sub-solutions and alternatives should be done with stakeholders. The knowledge from stakeholders is input for selecting alternatives and the direction of the further process.

Thirdly, in the assessment phase the first set of alternatives are worked out further in order to reach a preferred alternative. In order to choose an alternative, a project group of specialists use instruments from the Environment Impact Report ('Milieueffectenrapport' in Dutch) and cost/benefit analyses. During the phase of assessing which alternative is preferred, another consultation with the public will take place. Here the presented effects, costs and benefits of the alternatives will be questioned by citizens, public organizations, companies and boards.

Finally, and the end of the exploration phase the preferred alternative is chosen by the responsible party. This phase of decision making has a strong political character where a broad support is crucial for a stable plan development phase. A management agreement will be composed where agreements about the processes and strategies will established. After this is done, the plan development phase can start, where the preferred alternative will be worked out further in detail.

The structure of HWBP projects is almost the same as MIRT projects in the initiative and exploration phase. Two elements are added in the HWBP in the exploration phase in comparison with the MIRT, namely a request for exploration and determination of exploration by HWBP (Programmadirectie HWBP, 2017). In the request for exploration, the project organisation has to provide a plan of action which is evaluated by the HWBP programme board. If this is evaluated positive, subsidy for the project can be given. The exploration phase is ended by the determination of the exploration by the HWBP programme board. This is based on a plan of action for the plan development phase. After this is completed and approved by the HWBP board, the plan development phase can start.

2.3 ENVIRONMENT AND PLANNING ACT

The Environment and Planning Act is likely to be implemented in January 2022. This Act will combine 26 laws, 60 general management measures and 75 ministerial rules in order to create a simplified and clearer law system (Minsterie van Binnenlandse Zaken en Koninkrijksrelaties, 2020b). The Act also adds new perspectives, procedures and measures. Most importantly for this research, initiators must now provide information about the participatory process. Through the environmental regulation (which is part of the Act), the initiator of a project must provide this information order to get a permit. Furthermore, the Environment-decision defines requirements connected to certain instruments to ensure participation with high quality. An overview of these requirements are stated below, and are derived from (Minsterie van Binnenlandse Zaken en Koninkrijksrelaties, 2020a):

Table 1: Requirements Environment and Planning Act

Instrument	Elaboration on the instrument	Requirements	Who is responsible?
Environmental vision ('Omgevingsvisie')	An instrument that is used by Municipalities, Provinces and National Government to set long term policy goals and ambitions for their respective area.	Duty to give reasons*	Relevant authority
Programme ('Programma')	An instrument used by Municipalities and Provinces. The programme describes measurers to tackle certain environmental problems addressed by National Government.	Duty to give reasons*	Relevant authority
Environmental Plan ('Omgevingsplan')	An instrument used by Municipalities. The plan defines all physical rules about the environment in the area of the respective Municipality.	The relevant authority elaborates on the participatory process, how is it shaped? + Duty to give reasons*	Relevant authority
Project decision ('Project besluit')	The project decision describes how the responsible authority will execute the project. It defines: - What the project will look like - Which measurers and facilities are used to realise the project - Which measurers will be taken to exclude or lower negative	The relevant authority notifies relevant actors about: - Who is involved in the project, in which parts and when - The role of the relevant authority and initiator - When more information will be provided and where - What the results of the exploration are	Relevant authority and initiator

	consequences of the project		
Environmental permit ('Omgevings-vergunning')	A permit which allows civilians, companies and governments to execute activities in the physical environment.	The initiator shows how participation is taken into account and elaborates on the first results of the participatory process thus far. Municipalities have the option to define cases where participation is obligated.	Initiator

* The relevant authority has to elaborate on how civilians, companies, public organizations and governmental organizations were involved in the preparations of the project and what the results were of this involvement.

What these requirements mean for the process overall, and how these might change the practice of participatory processes, is elaborated on in paragraph 4.3. Criteria following from the Act are used to determine whether current practises comply with the new Act.

3 METHODOLOGY

Multiple methods were used to obtain data and information, as shown by Figure 3: Research structure below. The objectives of the research questions (given by number) are linked to each other. Furthermore, the relevant methods used are also shown.
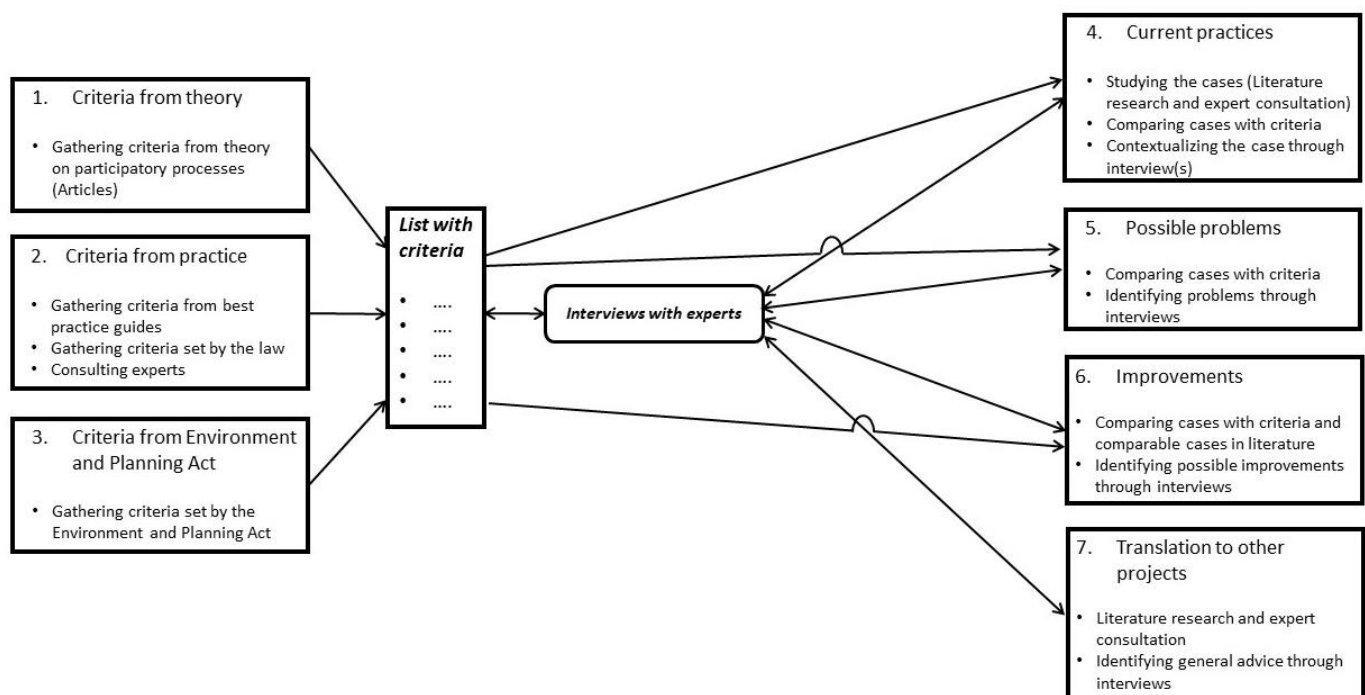

Figure 3: Research structure

The methods used follow from the research agenda as (Rower & Frewer, 2004) defined for evaluating participatory processes. The evaluation will be done through three steps:

- Defining the effectiveness of participatory processes
- Operationalizing the definition of effectiveness
- Conducting the evaluation and interpreting the results

First of all, in order to define effectiveness further than described in the aim of this research, relevant criteria for effectiveness were found (number 1 to 3 in Figure 3). Criteria from literature, practice and legislation were listed. This list with criteria in Figure 3 was used for comparing current dike strengthening projects on the participatory process. If a project did not meet certain criteria, problems might have occured and can therefore be defined. Furthermore, if certain criteria were insufficiently handled in the project, possible improvements could be discussed. This discussion might prove to be helpful for a multitude of spatial projects and therefore the outcome is evaluated for other fields as well (number 7 in Figure 3). In order to gather all needed information, three methodologies were used: i) literature research, ii) face to face interviews and iii) a comparative study of different cases.

Through literature research, theories on participation in water management were looked for. Criteria for effective participatory processes were obtained by articles that relate to this topic. Search engines like Google Scholar, Science Direct and Web of Science were used for this purpose. By using search terms like "Participation" , "Participatory processes" , "Water Management", and "Evaluation" relevant articles were found. Citations from these articles were also used for this research. Furthermore, four extensive guides of different organizations were used to obtain criteria or elaborate on common practices for participatory processes. Additionally, current legislation was evaluated for rules and laws for public participation. Lastly, literature about the chosen cases was used to define their context and common practice.

Step two was to operationalize the definition of effectiveness. In this context, it means to elaborate on processes or instruments used to measure whether the participation exercise was effective. Multiple methods were used for this purpose, and will be described below:

Like other research (Luyet, Schlaepfer, Parlange, & Buttler, 2012) (Rasche, Krywkow, Newig, & Hare, 2007) and (Rower & Frewer, 2004), Semi-structured, digital face to face interviews, e.g. with Skype and Zoom, were used in this research. Multiple experts from different organizations were confronted with the same questions in order to identify additional criteria, hence the connection between the list with criteria in Figure 3. Criteria and general practices following from their cases were obtained and compared (number 4 in Figure 3). Furthermore, possible problems (number 5), potential improvements (number 6) and wishes from the organizations were questioned in the interviews. These questions were defined by the list with criteria set up before the interviews, contexts of the projects, legislation and common questions used in other evaluations.

Mainly organizations that are responsible for the participatory process were contacted. Meaning, organizations that are within the project-group of a project. They are generally responsible for the project and the project-group normally consists out of people from Rijkswaterstaat, Water Boards, external consultants and engineering companies. Within this group, the manager of the surroundings ('Omgevingsmanager' in Dutch) oversees the whole participatory process and is therefore a clear candidate for interviewing. The manager of the surroundings should be aware of all perspectives within the project. Questions were asked about the different parties and their perspective on the matter. Although the manager of surroundings can probably answers these questions, multiple perspectives were sought. Therefore, stakeholders from differing organizations and/or positions were invited for an interview in order to gain more perspectives. These experts were found through networks within Infram. This way of selecting experts was done, since these experts all had experience in the exploration phase of the projects considered and were easy to contact. The latter was necessary, since meetings could only be done online and there was a limited time frame. In the end, all interviewees were part of the team of surroundings or project group. Eight of them were experts from 'external' companies. One interviewee was an employee of the organisation

responsible for executing the project (i.e. the client). All in all, nine interviews were conducted. Two experts for each project, which made comparison of multiple perspectives on the same process possible, except for the project Arnhem Rijnkade where only one person was interviewed due the fact that no other person was found. In this research the interviews are referred to as numbers, for example I4, where I4 is the second interview of the second project Noordelijke Maasvallei. The projects and their respective interviews are given below:

- Meanderende Maas, Interview 1 (I1, 2020) and Interview 2 (I2, 2020)
- Noordelijke Maasvallei, Interview 3 (I3, 2020) and Interview 4 (I4, 2020)
- Alblasserwaard, Interview 5 (I5, 2020) and Interview 6 (I6, 2020)
- Krachtige IJsseldijken Krimpenerwaard, Interview 7 (I7, 2020) and Interview 8 (I8, 2020)
- Arnhem Rijnkade versterking, Interview 9 (I9, 2020)

The questions asked to the nine interviewees, can be found in Appendix A: Interview Scheme. These questions were drafted to obtain knowledge about certain topics. These are shown as bold topics above the set of questions. The questions were depended on criteria and contextual factors found important in literature, guides and legislation. The interviews were recorded and minutes were made afterwards in Microsoft Word. These minutes were send to the interviewees, in order to make sure answers are interpreted rightfully. Due to privacy reasons, the minutes will only be available for the examination and will not be shared publicly.

Next to interviews, other methods are used in evaluation studies. Differing cases were used to seek general conclusions, like (Hurlbert & Gupta, 2015) and (Einsiedel, Jelsoe, & Breck, 2001). The context of the cases was defined by literature and experts opinions. Experts were consulted to obtain valuable insight in current practices. This was mostly done through questions in the interviews. The experts that were interviewed have a broad expertise in dike strengthening projects and participatory processes. Additionally, the interviewees assisted in obtaining the best suitable literature (e.g. guides and legislation).

Finally, the participatory processes were evaluated. In order to draw conclusions about answers given in the interviews, possible answers were categorized. Categorizations were made by listing possible criteria and criteria already found by literature research. Furthermore, answers from differing interviews were compared on keywords. This way common difficulties, criteria and improvements could be found. If these elements are taken into account, participatory processes can be bettered. Additionally, answers from interviewees that were in line with literature found earlier in this research were listed. This way, similarities between practice and literature could be found. These similarities further illustrate the importance of the elements which can prove to be helpful for current and future participatory processes.

4   RESEARCH RESULTS

Through answering the seven research questions using the methods used as described in chapter 3, the following paragraphs elaborate on the results found by the research. The structure of this chapter will be roughly like the sequence of the research questions in paragraph 1.3. First of all, relevant criteria found through literature research will be elaborated on. Secondly, changes through the Environment and Planning Act will described and evaluated. Thirdly, differences between practice and literature will sought after and elaborated on. After that, problems will be identified and possible improvements will be noted. Lastly, the findings will projected on projects outside of the scope and general advice will be given.

4.1 CRITERIA FOUND THROUGH LITERATURE, GUIDES AND LEGISLATION

First of all, criteria from literature were sought after. Multiple articles, guides and legal documents were used to determine important criteria for effective, successful and future-proof participatory processes. In total, eleven factors are listed in this research. An overview of these factors and their respective sources is given in Appendix B: Criteria from literature, guides and legislation. Furthermore, multiple criteria are connected and influence each other. An overview and elaboration of most important connections is given in Appendix E. In the paragraphs below criteria will be elaborated on.

4.1.1 Ability to reach objectives

Effectiveness can be defined differently throughout the stakeholders regarding the same process. However, if an objective perspective is taken, specific parties can agree upon the effectiveness of a participatory process (Rower & Frewer, 2004). Therefore, the objectives of the participatory process must be clearly defined, such that the effectiveness can be determined. Common objectives should be defined through dialogues between stakeholders. If this is done, outcomes will be more relevant to stakeholder needs and wishes and will keep them motivated throughout the process (Reed M. S., 2008). Thus, an effective participatory process is able to reach the objectives to highest extend possible.

4.1.2 Understanding local context

Outcomes of stakeholder involvement are affected by the context. In order to choose the right approaches, local context is important to take into account. Former participatory experiences are valuable to be aware of (Reed, et al., 2017), since they can influence the perspective of stakeholders towards the new process. Additionally, the stakeholder's perspective on the problem is important for choosing the right approach. A solid stakeholder analysis and consultation should therefore be the basis for the approach chosen.

4.1.3 Use of local knowledge

Next to understanding the local context, local knowledge is valuable for the project. This knowledge can add a lot value to the decision-making process, since the local stakeholders can contribute by providing multiple perspectives and possibilities which the responsible authority has not thought of. Therefore, these perspectives should be sought after actively, especially in the early phases of the project.

4.1.4 Trust

Throughout multiple articles and guides the word 'trust' keeps coming up as an important criterion for successful interaction between stakeholders. For instance, a clear link exists between trust levels and the quality of information flows (Hurlbert & Gupta, 2015). Furthermore, one of the objectives of participatory processes is to build broad support for the solutions to be implemented. With high trust levels, support can be created more easily. Therefore, high trust levels should sought after. However, trust in itself is quite hard to evaluate, however the factors that contribute to interactions with high levels of trust can be defined and evaluated. Multiple factors have been recalled to be important, an overview of these linkages is given in Appendix E: Criteria and their linkages.

4.1.5 Clear communication

Good communication is the foundation of successful interaction. In order to build a trustworthy relationship with the stakeholders, they should notice and know, you are doing what you are communicating (Programmadirectie HWBP, 2017). This can be reached by being honest about what can be achieved and what cannot, what is (un)known and what the boundary conditions are. Also

agreements and rules should be clear and kept in mind. This way, all parties know what they are up to, hopefully creating a clear picture of the problem for everybody. From this basis, more effective communication can be achieved, since there is less debate about the context of the problem.

4.1.6   Transparency

Transparency and trust-building are closely related (Abrams, Cross, Lesser, & Levin, 2003). Transparency is even called for by the law (Rijksoverheid, 2014). The context and decision-making process should be transparent. To achieve transparency, responsible actors should always be able to provide argumentation on their choices and how these will influence the project. In order to be ahead of possible questions, these responsible actors should provide information publicly. For this information it is important, that it is understandable for every stakeholder. Otherwise some might feel that the responsible party hides something behind their difficult language. Furthermore, the participatory process itself should also be transparent. Thus, the results of the participatory process should be elaborated on (e.g. outcomes of the stakeholder analysis, how stakeholders are involved).

4.1.7   Early involvement

Early involvement contributes on both sides of the participation spectrum; responsible actors can obtain local and specific knowledge early and stakeholders will feel they are able to influence the decisions made by the responsible actors. Also common goals can be determined, further solidifying the interests of all parties (Reed, et al., 2017).

Since projects are more flexible in the beginning regarding openness to new ideas and suggestions, involving stakeholders early is important (Programmadirectie HWBP, 2017). Stakeholders can greatly contribute to these ideas. This information is valuable, and obtaining this information as early as possible is crucial to make better decisions later in the process.

Additionally, if stakeholders are able to provide their views on the problems, they feel taken seriously (if treated well) and able to contribute to the decision-making process. If decisions are already made, and stakeholders are involved thereafter, stakeholders tend to become frozen in polarized positions and negotiation becomes difficult (Floke, Hahn, Olsson, & Norberg, 2005).

4.1.8   Reach (including and representing all stakeholders)

Just as mentioned in the paragraph Early involvement, obtaining local and specific knowledge can be beneficial. Therefore, all relevant stakeholders should be involved is some way. Involving all relevant parties also leads to better understanding. Furthermore, involvement can create acceptance, better informed decisions and better likelihood that decisions are implemented (Reed, et al., 2017). And the more stakeholders involved and contacted, the more create understanding and possible acceptance. Failing to include stakeholders may also lead to bias (Luyet, Schlaepfer, Parlange, & Buttler, 2012). Accordingly, during the stakeholder analysis it is of high importance to make sure all relevant parties are mapped and taken into account. And in order to keep stakeholders active and involved, information should be shared with them regularly at least. Participation methods of higher ladders are better, but not always necessary. Nevertheless, to make the participatory process inclusive, stakeholders should be able to take part in multiple degrees of participatory methods (Krywkow, 2009).

4.1.9   Match between methods, degree of involvement and objective

During the stakeholder analysis, stakeholders will be grouped and assigned a certain degree of involvement based on the objective the responsible authority has. This will determine how frequent the stakeholder will be involved in the process and which methods are relevant. Nevertheless, it is important, when choosing the methods, to keep the objective of the process and perspective of the

problem into account. As mentioned before in the split ladder of participation (Hurlbert & Gupta, 2015), different problems call for different approaches. If wrong methods are used, stakeholders may feel they are not involved enough, and thus feel not taken seriously, or stakeholders will be involved in methods were they are not useful or comfortable. For instance, if a certain stakeholder is confronted with highly technical issues and is expected to co-produce solutions, the stakeholder must have this technical knowledge available. If not, the stakeholder might not be able to produce solutions of high quality. Nevertheless, if this stakeholder has this knowledge prepared, but cannot address the issue since the setting of the method is not right, the stakeholder may feel uncomfortable and/or not taken seriously. Furthermore, the length of the process and thus frequencies and the timeline of the chosen methods needs to matched. If changes in deeply held values are necessary, it is likely more time is needed than if changes in preferences need to be made (Reed, et al., 2017). Hence, differences between values and preferences need to be made. These will also influence the choice of methods. Nevertheless, choosing methods relies on a broad scale of factors, and is an expert driven task (Luyet, Schlaepfer, Parlange, & Buttler, 2012). Generally these factors are important:

- Degree of involvement
- Type of stakeholders
- Local cultural and social norms
- Past events
- Intended timing
- Knowledge and experience of the project managers

Methods should be evaluated during the process to check whether they still provide the desired effect. As mentioned before, mismatches could lead to ineffective and undesirable effects.

4.1.10   Influence on decisions

Next to early involvement, and thus creating the possibility for influence on fundamental decisions, stakeholders should be able to make an impact on these decisions. Involving them in the process is only part of the participatory process if they can really contribute to solutions. Otherwise, the process is just designed to keep stakeholders under the impression that they are thought off. And if stakeholders feel they cannot influence the decisions, stakeholders will only get frustrated and conflicts may occur (Reed M. S., 2008). This problem is recognised by the Environmental and Planning Act and thus rules will implemented to tackle this. Responsible authorities will need to address all input given, no matter the initiator (Aandeslagmetdeomgevingswet, 2020). They will be obliged to provide feedback on ideas and initiatives towards the initiator. Furthermore, given input needs to be documented and the authority needs to define what is done with the input and why. This way, the relevant initiators will be able to know how their input is processed and used, creating a transparent decision-making process. This way a (more) level playing field is created, respecting all input given, which is also one of the principles of current laws concerning public participation (Rijksoverheid, 2014). And if it is not possible to create this level playing field, meaning stakeholders are not always able to influence decisions, the amount of influence they do have should be communicated to them (Rijkswaterstaat, 2011). Although they are not able to influence the decisions, the decision-making process will at least be transparent. Finally, a positive effect of allowing stakeholders to have influence on the outcomes, is that it is more likely that these outcomes are beneficial environmentally and socially (Reed, et al., 2017).

4.1.11   Facilitation of the participatory methods

Choosing the right methods is important, however the facilitation of these methods are just as important. Or as argued in (Reed M. S., 2008) even more important. Moderators need to make sure (possible) conflicts are dealt with nicely. Otherwise all work that has been conducted before can be lost in the process. Furthermore, moderators must be impartial, approachable and open to multiple perspectives. This is important to gain trust. And as mentioned before, high trust levels lead to higher quality of information. Next to skilled moderators, enough time and recourses must be available to reach the desired outcomes and high quality of participation. Stakeholders must be able to ventilate their thoughts, within reason off course, and should not feel rushed. Also if the method requires certain context, which the stakeholders may or may not know about, reliable and clear information must be provided. This way, stakeholders with inadequate knowledge beforehand can still contribute to the process.

4.2   CRITERIA FROM INTERVIEWS

As seen in Appendix A: Interview Scheme, in all nine interviews, most important criteria for effective and successful participatory processes were questioned. Next to obtaining these criteria by literally asking for them, a lot of interviewees mentioned important factors throughout the interviews. Factors and/or criteria that were mentioned by at least two different interviewees are shown in Appendix C: Additional criteria from interviews.

After comparing the criteria found through literature, guides and legislation with criteria recalled important in interviews, a lot of similarities were found. In the paragraphs below additional notions to the already found criteria are elaborated on and additional criteria are described. An overview of all criteria found in this research is given in Appendix D: Combined list of criteria.

4.2.1   Understanding local context

Just as found in literature, obtaining local perspectives is important. It was noted as a motive for the project organisation to think about wat is necessary or important and what is not (I3). It also makes understanding problems easier (I7). It also helps to divide subjective suggestions from objective ones, which is crucial in the decision making process (I8).

Former experiences are also good to be aware of, since these might influence the perspective of stakeholders on the current project. In the case of the project Alblasserwaard, bad experiences with former projects lead to distrust towards the current project organisation although they were not part of the former project organisation (I5). For this reason, it is important to know about these experiences to choose the right approach.

4.2.2   Use of local knowledge

Local knowledge was actively searched after in all projects. It was valued greatly because of multiple reasons. First of all, input from the stakeholders can lead to better alternatives and solutions. And although stakeholders might not be experts on the topic, some devote their time to finding better solutions and bring up really interesting ideas (I5). Secondly, the process also shows elements people find important in the project, some of which you might miss out on. This was clearly illustrated by the following quote: "You can try to figure out what is important from your office chair, but you won't ever be sure" (I9). Thirdly, enabling people to give input is appreciated widely (I8). People feel taken seriously and part of the process.

4.2.3   Clear communication

Determining if the communication was performed well depends on many factors. For participatory process some were mentioned more often than once during the interviews. Most importantly, people need to understand what the process and project is all about. Projects like these are very complex and take a long time and can therefore be hard to grasp. Furthermore, people experience a lot of uncertainty, since the process usually takes quite a long time and does not provide answers right away (I3). Therefore, it is important to provide perspective on the steps that will be taken. "Where will we be working towards?", "What is coming up?" are questions that need to be answered (I3). Although this might seem 'normal' for the organisation itself, for stakeholders it might not be that logical (I5).

Furthermore, next to providing information about the process itself, documents should be comprehensible as well. A lot of reports are written in highly technical or juristic language, and should therefore be made comprehensible for all stakeholders (I4).

4.2.4   Transparency

First of all, transparency and openness is being recalled as very important in all interviews. This was also stated as a goal in all projects. Transparency is said to be achieved in different ways. First all, a lot of documents are produced during the process. These should be made public to all stakeholders in order to provide transparency. It was also stated that this openness in documents can be helpful to obtain opinions and use those in further stages of the process (I8). This also makes the decision making process transparent, because these documents are basis for choices made. These choices can be unsatisfing for people, but openness is the way to go regarding dealing with these people (I6).

Secondly, in interview 3 it was mentioned that most information will be known after a while, so you might as well share it yourself. And if you are not able to share this information, you probably don't have your story right (I3). This further illustrates being transparent forces the project organisation to be thorough and make well thought out decisions, which should be best practice. And if documents are 'leaked' and not made available by the project organisation, people may feel they are hiding certain elements, which causes suspicion and distrust towards the organisation.

4.2.5   Early involvement

If stakeholders are involved in early stages, you provide more room and time for stakeholders to give input (I6). In this done actively, possible bottlenecks can be identified in time and can be taken into account for the preferred alternative (I8). Thus, sets of alternatives can be improved before working them out in detail, which saves time and might increase their support.

Not only civilians and companies should be involved early. Also governmental organisations should be involved is early stages, since if this is done, it stimulates solving more integral problems (Aandeslagmetdeomgevingswet, 2020). And if governmental organisations work together sooner, procedures in latter stages will run more smoothly (I8).

It was also said that early involvement increases trust: "Most definitely, the parties that are involved from the beginning, we build a trustworthy relationship with them" (I7).

4.2.6   Reach

As mentioned before, including all stakeholders in beneficial for the process. Furthermore, it was recalled to not only include all (or as much as possible) stakeholders, but also represent all views. Some stakeholders will naturally be more present in discussions, but more opinions and views are present. Therefore, it is important to give these other, more silent, stakeholders a voice (I3).

4.2.7   Match between methods, degree of involvement and objectives

Next to factors found to be important to choose the right methods in paragraph 4.1.9, the phase of where the project is in, is viewed as important. Different steps in the project call for different approaches. Starting in the exploration phase, a lot of information will be sought after, and methods to enable that should be used. After that, in the plan development phase, the alternative(s) will be worked out in detail. This calls for a different approach, which is recognized by all projects, since they all make participatory strategies per phase.

4.2.8   Translation participatory process to the responsible party

Participatory processes in all projects were very broad, required a lot of time and effort and involved a lot of people. Therefore, it is not hard to imagine that some outcomes of this process will be lost in translation when these are used in the decisions making process. Additionally, outcomes can be qualitative and subjective, therefore it is important to document these properly to make them useable for the decision making process(I2). "I can tell you participation went well and everybody is happy, but how do I use that in the decision making process?" (I2) is an notion that is very important in this case. For that reason, it is important to document the process well and take decision makers along in the process.

4.2.9   Mentality of the client

A factor which play a crucial role before the participatory process is even worked out, is the mentality of the client. The client or project organisation will determine what the process will look like, what is most important and how much time and effort will be spend. The decision to choose for an intensive and broad participatory process, depends on the view of the client (I2). If the client thinks it is an added value, than most probably an intensive process is chosen for (I1, I2). However, not all clients think this way, and sometimes these process are cut short without knowing all problems (I7).

4.3   ENVIRONMENT AND PLANNING ACT

In order to obtain information about the new Environment and Planning Act, the website from the Dutch Government (aandeslagmetdeomgevingswet.nl) about this matter was used. Multiple documents and web-lectures were used to find out what impact this Act will have on current and future dike strengthening projects. Furthermore, interviewees that had some experience with anticipating on this Act were asked about future changes. Combining these two sources, an overview of changes related to participatory processes in dike strengthening projects is given below.

First of all, it is important to note that the Act will not oblige certain methods in participatory processes, it will only set some requirements for these processes (VNG & Ministerie van Binnenlandse zaken en Koninkrijkrelaties, 2019). These requirements are as mentioned in Table 1 in paragraph 2.3. Most important are the requirements for the Project decision and Environmental permit, since the projects considered in this research will have to use these procedures. Parts that are new compared with current legislation are the formal notion to provide information to all stakeholders and civilians concerned, what the results of the exploration were, how participation is performed and how alternatives brought up by stakeholders are used or dismissed. In the interviews these aspects were also mentioned. These requirements can sure have effects on current and future projects.

Especially the latter factor, considering alternatives brought up by external parties or people, has consequences for the participatory process and organisation of the project. In some cases it will cause more work for clients, since stakeholders are now able to always provide alternatives. If this

done, the client is obliged to answer why this alternative is not considered (e.g. costs, laws, space) or how the client will look further into this alternative. This process will take additional time, but it will certainly contribute to shaping the best alternative. A good example is brought up in interviews I3 and I4, where a group of citizens living near the newly proposed dike suggested to not built the dike at all. This idea was considered by the client and in the end this piece of river valley was removed from the Water Act which meant is was no longer necessary by law to strengthen the dike. People in the area were satisfied, because no works needed to be done and their view of the river remained the same. Additionally, the client was satisfied, since citizens could be satisfied coupled with less costs and time spend. This example clearly illustrates that some 'out of the box' ideas can be found through the process required by the Environment and Planning Act. And although this process can be time consuming, it could safe costs and time in the end if good ideas are brought up.

However, the other factors seem less 'new'. The notion was made that not a lot will change, regarding the way or working with participatory processes (I5, I8). In most projects people were also kept up to date pretty well through a broad selection of communication methods (newspapers, website, social media, information sessions, one on one conversations and much more). The Act now only adds the fact that some information will need to be made public through a formal procedure. And for the fact that results of the exploration needs to be made public, this information was mostly shared already, although in parts, to the public to explain the process thus far and what is coming next.

Concluding, the Environment and Planning replaces current laws and does not change a lot considering the participatory process. This is also stressed in the communication around the Environment and Planning Act itself, since there is still a lot of room needed within the rules and laws to ensure every project can be executed corresponding to its context. (VNG & Ministerie van Binnenlandse zaken en Koninkrijkrelaties, 2019). Nevertheless, a lot of inspiration for 'successful' projects can be found on the website. These examples are working 'in the spirit' of the Environment and Planning Act, which means participation is embedded in the process and is considered as very important. So, although the law itself is not obliging higher ladders of participation as found in paragraph 2.1, the communication and the platform around the Act call for better, more intensive and effective participatory processes. At first glance, examples on the website are complying with criteria mentioned in this research, such as transparency, influence on decisions, early involvement and reach.

4.4   PROBLEMS AND/OR DIFFICULTIES

Due to the structure and procedures in the projects, some problems occured. First of all, a common problem is the timespan of these projects. During this long process, taking multiple years, interviewees mentioned that clients sometimes feel they do not have a lot of new information for the stakeholders (I4, I8). Therefore, the intensity of participation goes in waves. When information from the stakeholders is needed, a lot of effort and time is put in the participatory processes. The same goes for the times when large decisions are due to be made or are being made. However, during processes where the stakeholders are mostly not part of (e.g. the tender period), clients tend to remain silent, or less active towards stakeholders. When in fact, regular sharing of information is crucial to keep stakeholders active and involved as already recalled in paragraph 4.1.8. Failing to do so, can cause multiple problems. The project organisation can lose feeling with the stakeholders (I4), which can result in being unaware of changes during this quiet period. Furthermore, the project organisation can lose contact with certain stakeholders and/or trust (I9). Therefore, the flow of information should be continuous.

Another problem the structure and length of the project poses, is that early involvement might sometimes feel ineffective. Stakeholders sometimes have to deal with a lot of insecurities for quite a long time. This is due to the fact that most projects start with a broad exploration and after that start narrowing the solutions. However, this process takes quite some time and a lot of changes are made during the process. Due to this uncertain nature of the early stages, people will not get involved and wait till things become more specific (I3). This can result in people and/or stakeholders being involved too late in the process or not at all.

And a final problem identified due to the nature of the projects, is that due to great insecurities and large numbers of possible solutions stakeholders are not involved in time. In two projects (Alblasserwaard, Noordelijke Maasvallei) this problem became very apparent when a change in plans lead to involving certain stakeholders too late in the process. Consequently, in the project Alblasserwaard certain people desired more information and contact with the project organisation (I5). Additionally, due to this change in plans, time restrictions had become a problem in that certain area, making it hard to honour those desires. In the research (Luyet, Schlaepfer, Parlange, & Buttler, 2012), the problem of failing to include all stakeholders also became apparent. In that case all stakeholders were mapped, however potential ones were not. Although all stakeholders found by the project organisation were complying with the technical solutions, some of the potential stakeholders opposed to the project in the end.

One notable difference between what literature describes as best practice and what is observed in the interviews, is the difference in influence on the decision making process. In multiple articles (Floke, Hahn, Olsson, & Norberg, 2005), (Reed M. S., 2008), (Reed, et al., 2017) it is argued that influence from stakeholders on decisions should be made possible. This is enabled in the projects, however not at the level these articles advocate. Taking the five levels or 'ladders' or participation used in this research found under paragraph 2.1, two out of five projects considered went up to the level of collaboration, where three projects also incorporated co-decision. And by collaboration it is meant that input of stakeholders was considered and taken into account, however the project organisation was still in charge of translating this input to solutions and alternatives. This is clearly illustrated through experiences of the expert in interview 4 "I have worked a lot with Rijkswaterstaat, there the feeling was also to do it with the (local) stakeholders, however the amount of times we had contact with people, was less in my experience. The feeling was, after we retrieved the information, that we can continue with this information, and after we processes it, then we will come back". This is a clear example of collaboration, where stakeholders are consulted, ideas and suggestions are retrieved, but the client designs the alternatives on its own. And whether this 'extra step up the ladder' is needed, strongly depends on the context. However, in complex projects with high impact on the surroundings this step should be considered. As recalled in paragraph 4.1.10, a positive effect of allowing stakeholders to have influence on the outcomes is that it is more likely that these outcomes are beneficial environmentally and socially (Reed, et al., 2017). And since projects are stimulated to take along more chances outside the scope of just reinforcing dikes (Government of the Netherlands, 2020), these social and environmental gains should be sought after. Nevertheless, this step should only be considered if stakeholders can really add value and enough resources are available in the process to take outcomes of these methods into account, otherwise there is a risk of false expectations, which can lead to disappointment and resistance (I2).

As mentioned in the paragraph 4.2.9, the characteristics of the client or board are very important. This is also where initial problems or difficulties can occur regarding participatory processes. Since it is mostly up to these parties to decide how participation will take shape in the project, their views on participation are very important. In some of the projects where the participatory process was going

up to the co-decision level, the board and client were recalled as most important regarding the initialization of this process (I1, I2, I4). It seems logical since, under current legislation, such broad and thorough process as seen in these projects, is not required by law. Therefore, it is totally up to the client, how the process is performed. Multiple reasons are recalled in the interviews, as why the client would not perform such an intensive process:

- Uncertainties in outcome (I1, I6, I8)
- Lack of funds or resources (I4)
- Experience with participatory processes (I2, I4, I9)
- Relatively low impact on the surroundings (I4, I6, I7)

These reasons can all be justified. Nevertheless, as recalled before, the extra 'step up the ladder' three projects made should also be considered by other projects, where complexity and impact on the surroundings is high.

Although high levels of participation are advocated until now, this approach also has its own risks. As mentioned as some of the risks of intensive participation in paragraph 2.1, uncertainty in outcomes and loss of control are regarded as downsides of intensive participation. For instance, people can disagree with the nuances of certain reports, documents and outcomes. As mentioned in interview I8, these documents can fuel their disagreement and can possibly mobilize an opposition. Furthermore, if people were to choose freely which alternative they prefer, conflicts can occur between the client and these people, since the alternative most desired by the surroundings could not comply with the ambition, resources or goals of the client. If the client then would to choose the less preferred alternative, people may feel let down and not taken seriously. It would take way more convincing from the client to ensure their alternative is better.

Also, mentioned in interview I3, there is a constant balance between what can be told or confirmed by the organisation towards the stakeholders and what still is uncertain. If the balance is shifted towards one of the sides, problems can occur. For instance, as recalled in interview I9, if people are told certain preliminary results or alternatives, they might assume these are final. Therefore, if they are told in a later stage these results or alternatives were faulty, they might feel disappointed. Even though the new result or alternative may be better, their assumption is no longer right and it might take more time and effort to convince them of the 'better' solution. On the other hand though, if a lot of information is withheld with this reason in mind, transparency might be in danger. And if stakeholders find out they are being withheld from information, they feel the process is no longer fair.

4.5   POSSIBLE IMPROVEMENTS
In this chapter improvements or suggestions for mitigating the problems found in the former chapter are discussed. Additionally, general improvements noted in the interviews are elaborated on.

4.5.1   Suggestions for mitigating the problems found
The first problem found was the inconsistent information flow between the client and stakeholders. Quiet periods should be avoided as much as possible. In interview 4 the notion was made that the project discussed (Noordelijke Maasvallei) had a continuous flow of information. It was noted that there is always something to tell, contrarily to what was observed by certain experts. First of all, it has been said that updates about progress can always be given. This should however not be without a reason as mentioned in interview I9. Furthermore, it was said that "a lot of questions are coming in, making it important to keep into contact with stakeholders" (I4). During these relatively quiet times

there should be time to answer questions quickly. Additionally, it provides time to reflect on past decisions and set common goals for the next phase. Although, setting common goals together with stakeholders is not common practice. In all interviews it was said goals of the participatory process were set by the client. Which in the case of initial goals, made before the exploration phase, makes sense, since there are no stakeholders in the picture at this moment. Nevertheless, common goals can be set from plan development phase onwards, since most stakeholders will be involved by then. And as mentioned before, if common objectives are defined, outcomes will be more relevant to stakeholder needs and wishes and will keep them motivated throughout the process (Reed M. S., 2008).

Secondly, starting with a broad exploration and converging towards fewer possible alternatives, provides the problem that people might feel their early involvement seems not worth their time. This is hard problem to tackle, since, as touched upon earlier, the process of complex projects as these can be hard to understand. Therefore, people might not feel they can contribute to the project as is, (in early stages of the process) although they can. Because of this, people should be guided by the project organisation (Rijkswaterstaat, 2017). And in order to keep stakeholders active, adequate information and publicity is needed (Luyet, Schlaepfer, Parlange, & Buttler, 2012). Regular updates and reminders should be provided. Stakeholders should also obtain feedback to their suggestions, knowing they are taken seriously (I9).

Another problem found was the uncertainty in alternatives and solutions. Because of this stakeholders can be involved to late or not all. Due to the complexity of the projects it is hard to foresee large changes in preferred solutions. But, in order to mitigate the problems occurring when a totally unexpected solution comes to light, some precautions can be made. For instance, one of the main conclusions of the research of (Luyet, Schlaepfer, Parlange, & Buttler, 2012) was to not only map the stakeholders that are of importance considering the current solutions, but also potential ones. If a certain solution is becoming more apparent, potential stakeholders should be sought quickly to involve them as soon as possible. This might feel ineffective, thus mapping potential stakeholders should kept in bounds and only done when uncertainties in solutions are high or when new solutions might become apparent. And if stakeholders are involved too late, they should at least be aware of the problem and their situation. This transparency is also called for in the code for participation (Rijksoverheid, 2014) and hinted at in interview I8 and I9.

The problems regarding the levels of participation and views of the client are quite similar, in that they both are subject to the commitment and views of the project organisation. In order to convince decision makers to commit to more intensive participatory processes, good examples should be highlighted extensively. Positives coming from these processes as described in paragraph 2.1 should be shared. Luckily more and more projects are taking this approach, as raised in multiple interviews (I2, I4, I9). These projects could be used as examples, which in the case of the project of Meanderende Maas is already being done (I2). Furthermore, it became very apparent that the experts interviewed work in many different projects throughout their career. This gives them the possibility to make people aware of former experiences of intensive processes.

4.5.2   General suggestions to improve
In order to make difficult to understand documents and procedures comprehensible, a lot of effort should be put into providing easy summaries and/or videos. This way a lot of information can be condensed, while remaining comprehensible for all stakeholders. More costs are coupled to providing information in this way, however as brought up in interview I9, it is not possible to have a

fair and effective discussion if the stakeholders are not aware of the nuances and problems in the project. Therefore, animations, 3D sketches and comprehensible summaries could add a lot of value towards better understanding.

One of the criterions found through the interviews, was the translation of the participatory process to responsible party. As already touched upon, without a proper translation outcomes of the participatory process are difficult to use. Multiple ways to enhance the outcomes and perspectives found in the participatory process were recalled. First of all, in the project Meanderende Maas views of the stakeholders were documented per alternative and building block of these alternatives. Support for every building block was put in a clear overview, such that decision makers could easily see what the support for every part was. If the opinions about a certain part were divided it was also mentioned in the overview. Furthermore, in the project KIJK for example, not only the team of the surroundings was present during information sessions but also people from design, project management and other disciplines. This way the whole project organisation gets a feel for local problems, views and perspectives. This enhances the chance local suggestions and bottle-necks are taken into account regarding the design of the process and technical solutions. This also works the other way around, if the team of the surroundings only focusses on informing, consulting and collaborating with the stakeholders, the information is not brought up within the project organisation. The balance between 'going out' and discussing outcomes internally depends how much potential suggestions and solutions from stakeholders are taken into account regarding the final design (I7). Therefore, the both sides should be kept in mind.

During the stakeholder analysis or shortly after, degrees of involvements are identified for each stakeholder. This often based on feeling or experiences of the project leaders (Luyet, Schlaepfer, Parlange, & Buttler, 2012). Making this a subjective and non-standardized process. However, there are ways to make this process less subjective. There are systematic approaches to determine the specific degree of involvement for each stakeholder, like Vroom's model (Vroom, 2003). In this model, seven questions are asked sequentially. The answers allow for choosing the right degree of involvement. However, as recalled in (Luyet, Schlaepfer, Parlange, & Buttler, 2012) this method has its downsides: "One limitation to Vroom's method could be, in case of low trust, that stakeholders do not believe the agency-collated data on desired involvement levels.". In order to tackle this problem, other people that are familiar with the context, next to the project leader, should be included in deciding the degree of involvement, since attributing the degree of involvement is still an expert driven task.

4.6   PROJECTS OUTSIDE OF THE SCOPE

The five projects considered in this research all follow a similar structure, either the HWBP or MIRT structure as recalled in paragraph 2.2. A lot of projects in the Netherlands follow this same structure. Currently in 2020, there are 106 projects that fall under the MIRT programme (Minsterie van Infrastructuur en Waterstaat, 2020). Furthermore, the HWBP programme for 2020-2025 currently accounts for 73 projects of which 51 are in progress in 2020 (Hoogwaterberschimgsprogramma, 2020). Since these projects all follow similar structures, problems that were found because of this structure (e.g. duration and complexity of the projects) might also occur in these projects. And since participation is obligated, improvements that were touched upon earlier could also be helpful for these projects.

Next to that, all big infrastructural projects will fall under the regime of the Environment and Planning Act within 1,5 years. Consequently, no matter the context of the project, some parts of

participatory processes will be similar. Therefore, best practice could be shared quite effectively. The website for the Environmental and Planning Act already provides many good examples.

Furthermore, experts, from projects where the degree of involvement was high (co-decision), stated that in other projects and organisations levels of participation as co-decision was often not practiced (I2, I4, I9). This level of participation is certainly not always needed, since the context does play a big role in shaping participatory processes (I2). Projects with lower impact on the surroundings, like some highway projects, do not need such intensive stakeholder participation (I4, I7). Nevertheless, as referred to earlier in this research (paragraph 4.4) higher levels of participation should be sought after, but only if it adds value.

5 DISCUSSION

To provide advice on how to make participatory processes more effective and future-proof, a multitude of research questions were answered. In the end, through finding common difficulties, important criteria and improvements this advice is given. Through literature research and interviews these elements were obtained.

First of all, important criteria for participatory processes were obtained from literature. In general the criteria were recalled in most sources. This illustrates that factors stressed as important in theory are also represented in guides and legislation. However, when it comes to degree of involvement and influence on the decision making process, there seem to be differences. In (Krywkow, 2009) it is touched upon that, in order to make the process inclusive, stakeholders should be able to take part in multiple degrees of participatory processes. And as stressed before in paragraph 2.1, lower 'ladders' of participation do not enable true participation. Additionally, the guides for participatory processes considered in this research, mostly mention that input and suggestion from the surroundings should be gathered, through consultation of stakeholders. Higher 'ladders' of participation are not mentioned that clearly in the guides, although these levels of participation could prove to be very useful. Clear examples of the use and benefit of these levels of participation can be seen in the three projects that incorporate it (Meanderende Maas, Noordelijke Maasvallei, Arnhem Rijnkade versterking).

However, only four guides were used. And although being very excessive, two guides (Programmabureau HWBP, 2014), (Programmadirectie HWBP, 2017) elaborated on the whole process of the different phases of projects (e.g. the exploration phase), not just participatory processes. Therefore, it might be that more specific guides do offer information and suggestions for higher levels of participation. Nevertheless, if these documents or guides also do not incorporate this information, and this might be true since it was mentioned in multiple interviews (12, I4, I9) that these higher 'ladders' of participation are mostly considered as new, extra attention should be given to higher 'ladders' of participation in projects and guides, since they can be of great value.

After gathering important criteria from literature, interviews were used to obtain criteria from practice. An overview of these criteria is found in Appendix C: Additional criteria from interviews. Comparing both lists of criteria, the list obtained from literature and from interviews, a lot of similarities are found. A lot of factors found to be important in theory are clearly translated to practice. Still, through the interviews an additional two criteria (translation of the participatory process and mentality of the client) were found. The criteria have direct impact on the participatory process, while they are factors that influence the participatory methods externally as shown in Figure 4, Appendix E. Therefore, where most articles only considered the criteria that are important for the

participatory methods themselves, these 'external' factors are left out. All articles and papers state that the context is important, but a more in depth analysis about the two additional criteria found in the interviews is not given. Only in (Reed, et al., 2017), it was mentioned that effectiveness of engagement is also dependant on the way knowledge is constructed and considered valid by stakeholders (and thus also by the client).

Nonetheless, as addressed before, six articles and some of their references were used. Additional criteria found to be important, might be present in other articles which focus on more than criteria for the participatory methods themselves. When problems occur regarding the additional criteria found, other important factors will also suffer, making them explainable through the more limited criteria found in Appendix B: Criteria from literature, guides and legislation. Nevertheless, since these criteria were recalled as very important in multiple interviews, as shown in Appendix C: Additional criteria from interviews, they should be addressed individually. For example, a lot of criteria could not be met sufficiently, which might trace back to the initial views of the client. If an approach is chosen to find the root of the problem per criteria, it might take a long time to trace it back to the views of the client or poor translation of outcomes of the participatory process to decision makers. Whereas, involving these criteria from the start might help to identify and solve these problems quickly.

Through literature research and interviews, the projects were evaluated on whether they are future-proof, meaning they are complying with the upcoming Environment and Planning Act. Since the Act will not oblige certain participatory methods, it will have no consequences in this regard on future and current projects. Furthermore, most projects seem to work in the spirit of the new Act. People are able to provide input and feedback is given by the project organisation, which will be obliged by the new Act. The only part where (some) projects seem to be lacking regarding the new Act, are the formal notices towards stakeholders. Yet, the information provided in these notices are already provided in other methods. Therefore, implementation of these notices will likely pose no problems for the projects considered.

However, since the Environment and Planning Act will not be implemented till 2022, changes might occur in the meantime. These changes might pose more influential differences in the way of working with participatory processes. For that reason, changes should be followed closely in order to prevent surprises in the future.

In spite of the few changes expected, through the upcoming Act a platform for showcasing 'good' examples of participation is provided. On the website 'Aandeslagmetdeomgevingswet.nl' intensive and successful participatory processes are used to show how governmental organisations can successfully implement participatory processes. This offers an opportunity to showcase how participatory processes that have higher ambitions than just following the law can add a lot of value.

After obtaining criteria from literature, guides, legislation and practice through interviews, common problems could be identified, which are shown in paragraph 4.4. Respective improvements were also found and stated, as in paragraph 4.5.1.

Firstly, problems due to the structure of the projects were mentioned. Projects take multiple years and start off with a broad spectrum of alternatives and ideas. This creates a lot of uncertainties for stakeholders. This was found to pose multiple problems. These problems affect important factors like early involvement, reach and influence on the decision making process. And since all projects considered follow similar structures and procedures, as recalled in paragraph 2.2, these problems needs addressing. The guides from HWBP do not mention the importance of constant communication, however, the MIRT project guide of Rijkswaterstaat does (Rijkswaterstaat, 2017).

Still, this document does not describe how to deal with large changes in alternatives and late involvement of stakeholders. Though, as stated before, only four guides were used and more specific guides on participation might offer these answer. Yet, these problems were recalled multiple times in the interviews are therefore need addressing.

Secondly, another of the problems found was that clients tend to become more quiet in periods where they feel to have no relevant information for stakeholders, risking loosing feeling and contact with stakeholders. However, as recalled in (Luyet, Schlaepfer, Parlange, & Buttler, 2012), adequate information and publicity is needed to keep stakeholders active in the process. Furthermore, due to the unsecure nature in the beginning of projects, it was noted that some stakeholders do not participate even though they are able to and aware of the process (I3). Because of this, stakeholders are not involved in time. Additionally, due a broad set of alternatives in the beginning of the project, plans might change that much, that potential stakeholders might be affected that were not in the picture. Consequently, important stakeholders are involved too late or not at all. And since all projects considered follow similar structures and procedures, these problems needs addressing.

Thirdly, although high levels of participation are advocated, risks are involved with high degrees of involvement. This was recalled in interview I8 and in (Luyet, Schlaepfer, Parlange, & Buttler, 2012) for instance, where loss of control and uncertainty in outcomes can be risks that should be taken into account. In order to deal with this, (Rijkswaterstaat, 2017), (Programmadirectie HWBP, 2017), (Reed M. S., 2008), suggest clear communication about rules and how outcomes of the participatory methods influence the decision making process. This way, expectations of the stakeholders are managed beforehand, reducing disappointment and conflict afterwards (I2).

Additional improvements were recalled in the interviews. Transparency is recalled in literature, guides, legislation and the interviews. This also includes openness of documents. Still, a lot of documents are written in highly juristic or technical language. So, to make these comprehensible for all stakeholders, smart summaries and animations can be used. In two interviews this was directly recalled as possible improvement (I4, I9). This is also in line with literature (Reed M. S., 2008), (Programmadirectie HWBP, 2017), where making sure all stakeholders are able to understand and use the information is recalled as important. This process is very costly however, which was also noted in interview I9. But, in terms of effectivity, it can be a large improvement, because less debate will be occupied by discussion about the context or reasoning behind decisions if stakeholders are fully aware of these factors.

Problems and improvements were found through interviews. Nine experts were interviewed, of which eight from the same organisation. This might influence their views on participatory processes. Views of these experts might not be shared among all experts in this field. Therefore, it might be that problems were missed out on, since experts with roughly the same perspective might not value some potential elements as problematic. Additionally, although answers were categorized and compared using keywords, the interpretation of these results are not totally free of bias. Nuances in the answers could be lost in translation. Still, interviewees were asked to check the minutes, reducing possible misinterpretations.

Lastly, projects outside the scope were looked into. As referred to in paragraph 4.6, most projects that are similar to the five considered, follow the similar MIRT or HWBP structure. In total 51 HWBP and 106 MIRT projects are currently in progress. Therefore, it might be that the cases are not representative for the whole spectrum of projects. Nevertheless, problems due to the duration and structure of the projects can probably be found in a large multitude due to the similar procedures and processes. Furthermore, influence on the participation process, or the degree of involvement,

was still found to be lower in other projects. Experts, from projects where the degree of involvement was high (co-decision), stated that in other projects and organisations levels of participation as co-decision was often not practiced (I2, I4, I9). In highly technical projects this may well be enough (I4), however since projects are stimulated to take along a lot of additional problems to tackle (which the projects like Noordelijke Maasvallei and Meanderende Maas clearly illustrate), not all projects will just be highly technical.

6 CONCLUSION AND RECOMMENDATIONS

This research identified multiple criteria, common problems and improvements for participatory processes through literature research and interviews. First of all, important criteria were found (Appendix D: Combined list of criteria). In the cases these criteria were mostly valued and looked after. Still, differences between theory and practice were noted as well. Although three out of the five projects incorporated degrees of involvement towards co-decision, guides for the exploration phase of MIRT and HWBP projects and respective participatory processes did not address these high 'ladders' of participation. Projects that did incorporate these degrees of involvement should be exemplary for future guides on participation.

The interviews did also provide additional criteria however. The views of the client (the responsible party) were recalled especially important at the start of the process. It was noted that, conservative views of clients can cause problems, since some potentially valuable methods or processes are missed out on. On the other hand, clients with progressive views were recalled as most important for establishing intensive participatory processes. In literature and guides this aspect is not mentioned, probably since these documents only elaborate on the methods and procedures themselves, not the aspects influencing them from the outside. This also goes for the translation of outcomes of the participatory process towards the decision making process. If outcomes are not translated properly, even the best participatory methods cannot provide the desired results. Therefore, a lot of effort should not only be put into executing the participatory methods, but also in clearly documenting their outcomes. Decision makers and designers should also join these methods to ensure direct realization of perspectives and suggestions.

Consequences of the upcoming Environment and Planning Act were also evaluated. The way of working with participatory processes will not change that much. A few additional requirements and procedures are added. The Act does ensure all stakeholders are able to provide their input and obtain feedback on their suggestions, making more influence on the decisions possible. However, all cases in this research don't seem to require a lot changes in their current process to meet these new requirements. Nonetheless, the central website for the new Act provides a platform for successful examples of participation. Currently, the examples shown on the website generally comply with the findings of this research. Through these examples, potential clients could be made aware of the positives of intensive participation. More examples should be provided to raise awareness of the potential of intensive participatory processes.

Additional problems and/or difficulties were found through interviews. The structure and pace of the projects seemed to prove certain difficulties. And since many projects follow this structure, it is highly likely these occur in other projects as well. The problems observed were, communication between stakeholders and the client was inconsistent at times, some stakeholders were not participating due to the large insecurities in the exploration phase and due to these insecurities potential stakeholders were not in the picture and consequently involved too late. To reduce these problems, communication should be consistent in terms of frequency and content. Furthermore, in

highly complex projects, potential stakeholders could be identified as well, such that, in case of large changes, these stakeholders can be involved as quickly as possible. And when stakeholders are involved too late, their situation should be communicated as transparent as possible.

Besides the difficulties regarding the structure of the project, risks are also linked to the higher degrees of involvement advocated in this research. Uncertainties in outcome and loss of control are recalled as potential hazards from a project organisation perspective. To combat this, clear rules should be set from the outset and expectations should be managed.

Finally, an improvement that was noted, that does not directly links to the problems found, is the comprehensibility of documents and the process. Many documents are written in highly technical and/or juristic language. Additionally, most projects are complex and can be hard to fully grasp for all stakeholders. In order to make the documents and process comprehensible, animations and comprehensible summaries should be used.

Concluding, current projects and practices seem to be quite effective and future-proof. However, improvements can be made in the use and awareness of high degrees of involvement, use of consistent communication, identification of potential stakeholders and use of comprehensible animations and summaries.

7 RECOMMENDATIONS FOR FURTHER RESEARCH

In this research five cases were used, of which four are from the HWBP and one following the MIRT structure. Since these programmes have similar structures, other projects that are part of one of these programmes could be evaluated in the same manner as this research. Nevertheless, in this research only the exploration phase of the projects, thus not the whole process was considered. This was not possible and aimed for in this research, since the cases used were either in the exploration phase or at the start of the plan development phase. However, further research could be done, to identify problems and improvements for latter phases of HWBP and MIRT projects. Additionally, since only five cases were used, more projects could be questioned on the participatory process in order to obtain a broader perspective of criteria, problems and improvements.

The evaluation as in this research could also be used for projects that do not follow the HWBP or MIRT structure. Criteria found important for participation are largely universal and thus useable for all types of projects that incorporate participation. Be that as it may, in order to identify problems and improvements changes in questioning should be made to match the contextual factors. For instance, future-proof processes are stated as being in compliance with the upcoming Environment and Planning Act. However, questions on the Environment and Planning Act can only be relevant in the current Dutch context. Long after the implementation of the Act these questions might not be relevant, just as in the case of questioning this in other countries. Therefore, further research on future-proof participatory processes that follow the same approach as this one, are only relevant in the current Dutch context. For other contexts, additional research is needed to obtain criteria that determine how future-proof the processes are.

When looking at effectiveness, which is defined here as: "effectiveness means whether the strategies are complying with theory and whether strategies can be implemented in practice.", a broader set of contexts can be evaluated in the same manner as this research. Theory on participation is mostly detached from contexts. General important factors and requirements are found and used. Therefore, this theory is usable for many projects with differing contexts. Nevertheless, the latter statement about effectiveness, whether strategies can be implemented in practice, strongly depends on the

context. In order to determine whether this is possible, contextual factors that enable and restrict implementations of participatory methods should be known. This can be done through literature research and interviews, just as done in this research.

Next to the criteria found in literature, additional criteria were found through interviews. These factors were not addressed directly in the articles, but clearly recalled as important in multiple interviews. Therefore, more research could be conducted on how these factors influence the participatory process. For example, the influence of the views of the client and how these views might be receptive to changes, might be essential to know while shaping the participatory process.

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APPENDIX A: INTERVIEW SCHEME

Question that were asked during the interviews are shown below. Questions with a * were only asked to one of the interviewees per project, since answers to these questions could be found through online documentation. Therefore, they only needed to be confirmed. Because of privacy reasons, minutes of the interviews are only provided for the examination and will not be made public.

1. **Defining context of the project**
   - Who is the responsible party for the project and for the participatory process? *
   - What problem needs to be solved? *
   - In what phase is the project at this moment? *
   - Were there any demands from certain stakeholders regarding the participatory process?
2. **Knowing whether objectives are reached/reachable**
   - What are the main objectives of the project, besides the problem recalled before?
   - What are the objectives of the participatory process, as set by the project?
   - Are these participatory process objectives set by the responsible party or are these common goals set by multiple stakeholders? If so, who set these common goals?
   - Are the process objectives reached? If not already, will these objectives be reachable knowing what you know now? And the objectives regarding content?
   - What is your opinion about the objectives? (e.g. not ambitious enough, not reachable this way?)
3. **Defining the stakeholder context, meaning the stakeholders involved and when they were involved.**
   - Which parties where/are involved within the participatory process?
   - Were there parties added later in the process? If so, why?
   - Were there parties left out that should have been included in your opinion?
   - Are there parties that unified? (e.g. lobbies, interests groups?) Did this make communication more difficult or easier?
   - In what degree were the differing stakeholders involved in the process?
   - Did this degree of involvement comply with the degree stakeholders would have liked?
   - Were the changes of involvement throughout the participatory process? If so, why?
4. **Defining understanding and usage of local context**
   - Did participation with (local) stakeholders make the process easier or more difficult?
   - Did it also improve the process? If so in what way?
   - Were outcomes influenced by participation? And if so, were these important?
5. **Defining the participatory process. In this case, methods used, general communication and stakeholder perspectives on the process.**
   - How were the stakeholders informed? Which methods of communication? *
   - And which information was shared?
   - How frequently were stakeholders informed? (Regularly, or only when there was relevant news?)
   - Were there information available at all times? (e.g. a website, shared database) *
   - Did stakeholders feel they obtained enough information, or did they request more?
   - Were there room for input from stakeholders in the project? And what kind of input?
6. **Defining whether methods area used accordingly throughout the process**
   - Which participatory methods were used throughout the process and who were involved in these?

- Did these methods make influence on the decisions possible? If so, how?
- Were there in your opinion enough time and resources available to facilitate enough methods and of high quality? If not, wat were the restraints?

7. Defining trust levels and support for the project
- Did the communication and methods lead towards a trustworthy relationship between the project group/responsible party and the stakeholders?
- Were there objections towards the project? And how were these handled? Could these have be prevented?
- Were there conflicts between stakeholders and/or the responsible party?

8. Defining problems and improvements
- Were there a mid-term evaluation of the process? And what were problems and possible improvements?
- Could different methods have led to better outcomes?
- Are their improvements to be recalled in general?

9. Checking knowledge and perspective on the Environmental and Planning Act
- How much are you aware of the Environmental and Planning Act? Are you trained?
- What possible changes do you foresee regarding the Environmental and planning Act?
- Are these changes hard to implement?
- Does the Act lead to problems looking at the current projects?

10. Evaluating Criteria
- Looking back at the project so far, what was most important for a successful and effective participatory process?
- Did these criteria also come up as important in other projects you worked on?
- Are some of these criteria left out in projects? If so, why?
- If these criteria are taken into account beforehand, could that improve the process overall?

11. Obtaining advice for a broad scale of projects
- Did you encounter difficulties in this project that you also say in other projects?

12. Obtaining overall advice
- Do you have advice in general for my thesis?
- Are there any interesting points about participation that were not touched upon in this interview?

APPENDIX B: CRITERIA FROM LITERATURE, GUIDES AND LEGISLATION

This table elaborates on all criteria found through articles, guides and legislation.

Table 2: Criteria and their respective sources

Criteria	Elaboration	Based on
Ability to reach objectives	Extend to which the pre-set, common objectives are reached	Articles: (Rower & Frewer, 2004), (Luyet, Schlaepfer, Parlange, & Buttler, 2012), (Krywkow, 2009), (Reed M. S., 2008) Guides: (Rijkswaterstaat, 2011)
Degree of understanding of local context	Understanding of local perspectives	Articles: (Hurlbert & Gupta, 2015), (Reed, et al., 2017), (Rower & Frewer, 2004), (Luyet, Schlaepfer, Parlange, & Buttler, 2012), (Reed M. S., 2008) Guides: (Programmadirectie HWBP, 2017) Legislation: (Rijksoverheid, 2014), (Aandeslagmetdeomgevingswet, 2020)
Use of local knowledge	Usage of local knowledge throughout the project	Articles: (Hurlbert & Gupta, 2015), (Reed, et al., 2017), (Luyet, Schlaepfer, Parlange, & Buttler, 2012), (Krywkow, 2009), (Reed M. S., 2008) Guides: (Programmadirectie HWBP, 2017), (Rijkswaterstaat, 2017) Legislation: (Rijksoverheid, 2014)
Trust (General)	Trust levels between participants of the process and the responsible authority. Also support for the implementation of the project.	Articles: (Hurlbert & Gupta, 2015), (Luyet, Schlaepfer, Parlange, & Buttler, 2012), (Reed M. S., 2008) Guides: (Programmabureau HWBP, 2014), (Programmadirectie HWBP, 2017), (Rijkswaterstaat, 2011)
Clear communication	Way of communication, clear agreements and rules.	Guides: (Programmabureau HWBP, 2014), (Programmadirectie HWBP, 2017), (Rijkswaterstaat, 2011), (Rijkswaterstaat, 2017) Legislation: (Rijksoverheid, 2014)
Transparency	Degree of transparency. Information provision, transparency of choices and comprehensibility	Articles: (Hurlbert & Gupta, 2015), (Reed, et al., 2017), (Krywkow, 2009) Guides: (Programmabureau HWBP, 2014), (Programmadirectie HWBP, 2017), (Rijkswaterstaat, 2017) Legislation:

		(Rijksoverheid, 2014), (Aandeslagmetdeomgevingswet, 2020)
Early involvement	At what time relevant stakeholders were involved and notified about the project.	Articles: (Hurlbert & Gupta, 2015), (Reed, et al., 2017), (Luyet, Schlaepfer, Parlange, & Buttler, 2012), (Krywkow, 2009) Guides: (Programmabureau HWBP, 2014)**,** (Rijkswaterstaat, 2017) Legislation: (Rijksoverheid, 2014), (Aandeslagmetdeomgevingswet, 2020)
Reach (including all stakeholders)	Inclusion and representation of all stakeholders in the scope.	Articles: (Hurlbert & Gupta, 2015), (Reed, et al., 2017), (Luyet, Schlaepfer, Parlange, & Buttler, 2012), (Krywkow, 2009) Guides: (Programmabureau HWBP, 2014)**,** (Programmadirectie HWBP, 2017), (Rijkswaterstaat, 2017) Legislation: (Aandeslagmetdeomgevingswet, 2020)
Match between methods, degree of involvement and objective	The degree to which methods were used correct fully according to their objective and degree of involvement of the participants.	Articles: (Reed, et al., 2017), (Hurlbert & Gupta, 2015), (Luyet, Schlaepfer, Parlange, & Buttler, 2012), (Krywkow, 2009) , (Reed M. S., 2008) Guides: (Rijkswaterstaat, 2011), (Programmabureau HWBP, 2014)
Influence on the decision making process	Degree of influence stakeholders were allowed to have on decisions.	Articles: (Reed, et al., 2017), (Krywkow, 2009), (Reed M. S., 2008) Guides: (Rijkswaterstaat, 2011) Legislation: (Rijksoverheid, 2014), (Aandeslagmetdeomgevingswet, 2020)
Facilitation of the participatory methods	To which extend time, resources and skilled moderators were available to facilitate the participatory process	Articles: (Luyet, Schlaepfer, Parlange, & Buttler, 2012), (Krywkow, 2009), (Reed M. S., 2008) Legislation: (Rijksoverheid, 2014)

APPENDIX C: ADDITIONAL CRITERIA FROM INTERVIEWS

Below a table is shown with all criteria or factors mentioned during the interviews as important in the participatory process. Extra elaborations are added if the interviews provided it. Furthermore, the respective interviews where the criteria were mentioned are added. They are referred to as I1 or I8, respectively being Interview 1 and 8. If a block is coloured blue, the respective criterion is referred to as important for the process. The interviews that were conducted about the same project are grouped within the thick black lines. A total overview of which interview belongs to which project can be found in chapter 3.

Table 3: Criteria found through interviews

Criteria	(Extra) Elaboration	Based on interviews:								
		I1	I2	I3	I4	I5	I6	I7	I8	I9
Understanding local context	Understanding of local perspectives and former experiences.	■	■	■		■	■	■	■	
Use of local knowledge	Use of local knowledge throughout the project and room for (local) input.	■	■	■	■	■	■	■	■	■
Trust	Trust levels between participants of the process and the responsible authority. Also trust of participants in the process.		■		■			■		
Clear communication	Way of communication, clear agreements and rules. Providing perspective, a continuous information flow, comprehensibility and consistent communication.	■	■	■	■	■	■	■	■	■
Transparency	Degree of transparency. Comprehensible information provision, transparency of choices and documents.	■	■	■	■	■	■	■	■	■
Early involvement	At what time relevant stakeholders were involved and notified about the project.	■		■	■		■	■	■	■
Reach (including all stakeholders)	Inclusion and representation of all stakeholders in the scope.		■	■	■	■	■	■	■	■
Match between methods, degree of	The degree to which methods were used correct fully according to		■	■		■		■		■

involvement and objective	their objective and degree of involvement of the participants.
Influence on the decision making process	Degree of influence stakeholders were allowed to have on decisions.
Facilitation of the participatory methods	To which extend time, resources and skilled moderators were available to facilitate the participatory process.
Translation participatory process to the responsible party	Degree of which outcomes of the participatory process are translated and used in the decision making process.
Mentality of the client	Client's views on participatory processes.

APPENDIX D: COMBINED LIST OF CRITERIA

A final list of criteria important for participatory processes is shown below. This is based on literature, guides, legislation and interviews with experts.

Table 4: Combined list of criteria

Criteria	Elaboration	Based on
Ability to reach objectives	Extend to which the pre-set, common objectives are reached	Articles: (Rower & Frewer, 2004), (Luyet, Schlaepfer, Parlange, & Buttler, 2012), (Krywkow, 2009), (Reed M. S., 2008) Guides: (Rijkswaterstaat, 2011)
Understanding local context	Understanding of local perspectives and former experiences.	Articles: (Hurlbert & Gupta, 2015), (Reed, et al., 2017), (Rower & Frewer, 2004), (Luyet, Schlaepfer, Parlange, & Buttler, 2012), (Reed M. S., 2008) Guides: (Programmadirectie HWBP, 2017) Legislation: (Rijksoverheid, 2014), (Aandeslagmetdeomgevingswet, 2020) Interviews: I1, I2, I3, I5, I6, I7, I8
Use of local knowledge	Use of local knowledge throughout the project and room for (local) input.	Articles: (Hurlbert & Gupta, 2015), (Reed, et al., 2017), (Luyet, Schlaepfer, Parlange, & Buttler, 2012), (Krywkow, 2009), (Reed M. S., 2008) Guides: (Programmadirectie HWBP, 2017), (Rijkswaterstaat, 2017) Legislation: (Rijksoverheid, 2014) Interviews: I1 – I9 (All interviews)
Trust	Trust levels between participants of the process and the responsible authority. Also trust of participants in the process.	Articles: (Hurlbert & Gupta, 2015), (Luyet, Schlaepfer, Parlange, & Buttler, 2012), (Reed M. S., 2008) Guides: (Programmabureau HWBP, 2014), (Programmadirectie HWBP, 2017), (Rijkswaterstaat, 2011) Interviews: I2, I7, I9
Clear communication	Way of communication, clear agreements and rules. Providing	Guides: (Programmabureau HWBP, 2014), (Programmadirectie HWBP, 2017),

	perspective, a continuous information flow, comprehensibility and consistent communication.	(Rijkswaterstaat, 2011), (Rijkswaterstaat, 2017) Legislation: (Rijksoverheid, 2014) Interviews: I1 – I9 (All interviews)
Transparency	Degree of transparency. Comprehensible information provision, transparency of choices and documents.	Articles: (Hurlbert & Gupta, 2015), (Reed, et al., 2017), (Krywkow, 2009) Guides: (Programmabureau HWBP, 2014), (Programmadirectie HWBP, 2017), (Rijkswaterstaat, 2017) Legislation: (Rijksoverheid, 2014), (Aandeslagmetdeomgevingswet, 2020) Interviews: I1 – I9 (All interviews)
Early involvement	At what time relevant stakeholders were involved and notified about the project.	Articles: (Hurlbert & Gupta, 2015), (Reed, et al., 2017), (Luyet, Schlaepfer, Parlange, & Buttler, 2012), (Krywkow, 2009) Guides: (Programmabureau HWBP, 2014), (Rijkswaterstaat, 2017) Legislation: (Rijksoverheid, 2014), (Aandeslagmetdeomgevingswet, 2020) Interviews: I1, I3, I4, I6, I7, I8, I9
Reach (including all stakeholders)	Inclusion and representation of all stakeholders in the scope.	Articles: (Hurlbert & Gupta, 2015), (Reed, et al., 2017), (Luyet, Schlaepfer, Parlange, & Buttler, 2012), (Krywkow, 2009) Guides: (Programmabureau HWBP, 2014), (Programmadirectie HWBP, 2017), (Rijkswaterstaat, 2017) Legislation: (Aandeslagmetdeomgevingswet, 2020) Interviews: I2, I3, I4, I5, I6, I7, I8
Match between methods, degree of involvement and objective	The degree to which methods were used correct fully according to their objective and degree of involvement of the participants.	Articles: (Reed, et al., 2017), (Hurlbert & Gupta, 2015), (Luyet, Schlaepfer, Parlange, & Buttler, 2012), (Krywkow, 2009) , (Reed M. S., 2008) Guides: (Rijkswaterstaat, 2011), (Programmabureau HWBP, 2014) Interviews:

		I2, I3, I4, I7
Influence on the decision making process	Degree of influence stakeholders were allowed to have on decisions.	Articles: (Reed, et al., 2017), (Krywkow, 2009), (Reed M. S., 2008) Guides: (Rijkswaterstaat, 2011) Legislation: (Rijksoverheid, 2014), (Aandeslagmetdeomgevingswet, 2020) Interviews: I2, I4, I9
Facilitation of the participatory methods	To which extend time, resources and skilled moderators were available to facilitate the participatory process.	Articles: (Luyet, Schlaepfer, Parlange, & Buttler, 2012), (Krywkow, 2009), (Reed M. S., 2008) Legislation: (Rijksoverheid, 2014) Interviews: I2, I3, I4, I5, I6, I7, I8, I9
Translation participatory process to the responsible party	Degree of which outcomes of the participatory process are translated and used in the decision making process.	Interviews: I2, I6, I7
Mentality of the client	Client's views on participatory processes.	Interviews: I1, I2, I4, I5, I7

APPENDIX E: CRITERIA AND THEIR LINKAGES

In the figure below, the criteria found in paragraph 4.2 are shown. A lot of these criteria influence each other of may overlap. The most important linkages are elaborated on. It is important to note that not all linkages are shown and that these criteria might influence each other in more ways than elaborated.
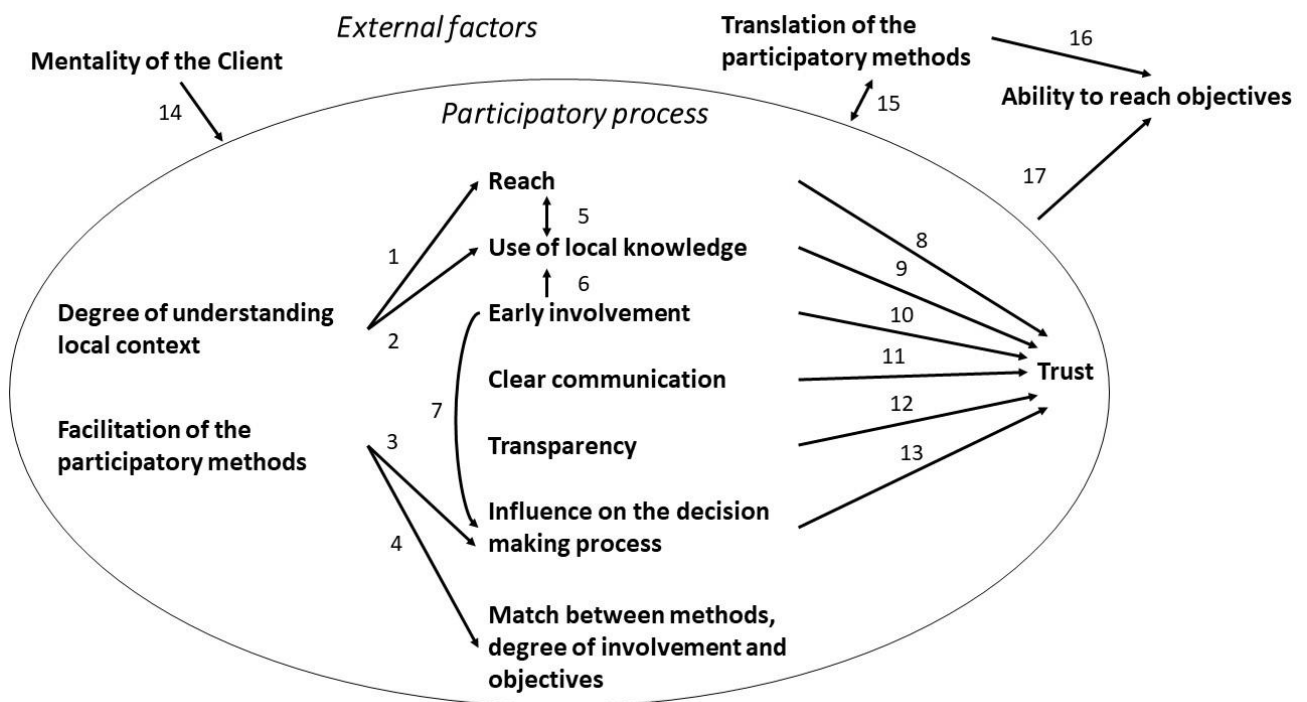

Figure 4: Criteria and their linkages

1 – Understanding local context – Reach

If the project is aware of local circumstances and thus aware about whom is important to include in the process, it will be easier to include all relevant stakeholders (thus having a great reach). Also certain perspectives or views might be over or underrepresented in 'normal' participatory methods (I3, I8) (e.g. information sessions) and it is therefore important to know all possible perspectives to represent all stakeholders.

2 – Understanding local context – Use of local knowledge

Just like the former link, high understanding of local context is a positive. If different views on the problem are known, knowledge can be put into perspective. This helps to separate the subjective knowledge from objective knowledge, which is an important part of the decision making process (I8). Furthermore, if the project is aware of former experiences, knowledge and experiences about these processes can be gathered to make sure the current project improves or maintains the level of the former project.

3 – Facilitation of methods – Influence on the decision making process

In order to make influence on the decision making process possible, stakeholders should have a platform to launch their ideas. Certain participatory methods can enable this. Furthermore, in order to gain positive and effective influence, stakeholders should be provided with all relevant

information and extra explanation if needed. This can only be achieved if enough time and effort is put in participatory methods that make this possible. Moderators should be able to set up an effective discussion. If this is not the case, the responsible party cannot or will not be open to listen to stakeholders. Therefore good facilitation is crucial.

4 – Facilitation of methods – Match between methods, involvement and objectives

A good match between methods, involvement and objectives is only possible if moderators or the responsible party is able to identify what stakeholders need and want to achieve. And choosing the right method is not enough, because when the method is right for the situation, but not executed well, objectives might not be reached as hoped for.

5- Reach – Use of local knowledge

This link works both ways. With a large reach, more local knowledge can be sought after and used. This is also mentioned in interview I7, "We always see new people throughout the process, since they are informed by people we reached earlier". And these new people can provide additional perspectives and information. This will also help to put knowledge in perspective and provide enough information to make well informed decisions.

Additionally, if local knowledge is sought after actively, more stakeholders will be identified. This is because the well-known 'Snowball effect'. If a stakeholder is found through the process of actively searching for knowledge, they might know other relevant stakeholders and so on.

6 – Early involvement – Use of local knowledge

The earlier people are involved, the more knowledge they are able to share. They can give input on multiple parts of the project. Furthermore, if people are aware what is coming in advance, is enables them to think along with the project (I9). Therefore, stakeholders are able to suggest ideas that take nuances of the project into account, making them more relative to the problem.

7 – Early involvement – Influence on the decision making process

Especially in at the start of the exploration phase information from stakeholders can be very valuable to shape alternatives, since at this moment the project is very open to suggestions (Programmadirectie HWBP, 2017). Therefore, in the projects where higher ladders of participation were used, methods making (almost) direct influence by stakeholders on decisions possible were performed in the exploration phase (I1, I2, I3, I4, I9). Nevertheless, in latter stages direct influence was also possible, although being for mostly for small detailed parts where single individuals were consulted.

8 – Reach – Trust

If a large part of the stakeholders is reached and involved, there is less room for bias (Luyet, Schlaepfer, Parlange, & Buttler, 2012). A large reach also depicts a thorough process, where everybody is considered. This can heighten the trust in the fairness of the process.

9 – Use of local knowledge – Trust

If local stakeholders are consulted in the process and their knowledge is shown to be appreciated, stakeholders might feel taken seriously. This will further enhance trust, knowing their local knowledge is considered and taken into account.

10 – Early involvement – Trust

If stakeholders are involved after major decisions are already made, stakeholders tend to become frozen in polarized positions and negotiation becomes difficult (Floke, Hahn, Olsson, & Norberg, 2005). Therefore, to build trust, stakeholders should be involved from the beginning. This was also touched upon in interview I7: "Definitely with the parties that were involved form the beginning, we build a trustworthy relationship" (I7).

11 – Clear communication – Trust

One of the parts of trust is in that stakeholders should trust the information you are giving (I9). Therefore, this information should be comprehensible to prevent stakeholders thinking you hide behind difficult language. Consistent communication is also key. People should be able to trust that you are saying the truth, and telling different stories throughout the process will make that difficult.

12 – Transparency – Trust

As already touched upon, transparency and trust-building are closely related (Abrams, Cross, Lesser, & Levin, 2003). Stakeholders should be able to understand and know how decisions are made. If not, stakeholders might feel the responsible party hides certain elements, which can cause distrust.

13 – Influence on the decision making process – Trust

Just like transparency and clear communication, if people are able to understand the decision making process they are more likely to trust it. Furthermore, if people are able to influence this process, they feel taken seriously and know that their problems are taken into account. This further enhances trust in the process.

14 – Mentality of the client – Participatory process

One of the important criterions recalled in the interview is the view of client. The client and/or project organisation shapes the participatory process and is therefore crucial. It is up to the client how much they value certain criteria mentioned in this research, and that will determine how much these criteria will be taken into account. It does not determine however, what a generally successful and effective participatory process is, since common goals should be leading for determining this, as (Rower & Frewer, 2004) already suggested. Therefore, this criterion is outside of the participatory process bubble in Figure 4.

15 – Translation of the participatory process – Participatory process

This connection works both ways. If the participatory process is not translated well into the decision making process, stakeholders might feel not taken seriously if their suggestions or ideas are not implemented in the design. Otherwise, if the participatory process is not conducted in the right way or certain criteria are not taken into account, outcomes might be biased and not useful for the decision makers.

16 – Translation of the participatory process – Ability to reach objectives

If outcomes of the participatory process are translated poorly, it might seem certain objectives are reached or not, when in reality it is the other way around. If for instance, the project organisation feels that people in the area happy and therefore assume a broad support is created, which is one of the most important objectives recalled in all interviews, the objective might feel reached. However, it could be this is interpreted in the wrong way and a lot of stakeholder might object the final solution. This was clearly illustrated in the research of (Luyet, Schlaepfer, Parlange, & Buttler, 2012), where all

stakeholders seemed to support the solution, however some potential stakeholders were not contacted and these stakeholders objected to the solution.

17 – Participatory process – Ability to reach objectives

If the all criteria are met in the participatory process, most objectives should be reached. However, if inadequate attention is put in certain areas, objectives might not be reached. Therefore, the participatory process should be designed in such a way, set objectives are reachable. The context also plays are crucial role is this. If the objective is to reach a large support for the final solution, but the stakeholders are very critical, the participatory process should be very intensive to convince stakeholders their problems are dealt with (Reed, et al., 2017).