

How public participation methods help overcome social barriers in the case of Amsterdam Rainproof.



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Amsterdam Rainproof

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Abstract

Due to climate change, there is a need for climate adaptation within cities, which can be seen as a wicked planning problem. In order to implement these climate adaptive measures, there is a need for public participation. This thesis researches the public participation methods used in the case of the climate adaptive programme Amsterdam Rainproof and how these methods help overcome social barriers. The proposed research question is: *What public participation methods are used in the programme Amsterdam Rainproof and how do these help overcome social barriers associated with the implementation of climate adaptive measures within the municipality of Amsterdam?* According to Biesbroek et al. (2009), in climate adaptive planning there are two main barriers that arise, social and material barriers. Social barriers can be categorized into actor specific and institutional barrier. For this thesis the focus is on social barriers. In terms of public participation methods, Dietz and Stern (2008) present three categories, information exchange, involvement and engagement. The categories can be linked to Arnstein's ladder of citizen participation.

In order to answer the research question, primary and secondary data are collected and analysed. The primary data used is in the form of semi-structured interviews with managers from the programme. The secondary data are academic articles and 222 projects from the website of Amsterdam rainproof. In the results the institutional barriers identified are categorized into actor specific and institutional barriers. The public participation methods identified are categorized into information exchange, involvement, and engagement. All three categories were represented in the project of Amsterdam Rainproof. Lastly, it is discussed how certain participation methods help overcome particular barriers.

It can be concluded that there are several social barriers that arise in the municipality of Amsterdam when implementing climate adaptive policies. The programme Amsterdam Rainproof uses a variety of different participation methods, these participation methods help overcome the barriers identified. However, the majority of the data does not indicate 'how' a public participation method helps overcome a certain barrier. Further research into the effectiveness of public participation methods by for example a comparative case study would be desirable.

1. Introduction

Natural disasters worldwide have been increasing over the years due to climate change, resulting in escalating human and economic losses. This poses a great risk for urban areas (Wamsler et al., 2013). According to Dai and others (2017) urban areas are the most vulnerable human habitats with regards to the consequences of climate change. Examples could be increasing heavy rainfall resulting in flooding or the urban heat effect resulting in discomfort. Considering that by 2050, 6 billion urban dwellers are expected worldwide, it is more relevant than ever to minimise the negative effects of climate change in urban areas (McCarthy et al., 2010). In order to minimise the negative climate change consequences in urban areas, climate adaptive planning is necessary (Tyler and Moench, 2012). According to Wamsler and others (2013), humanity is facing environmental challenges which are deeply intertwined with complex urbanization processes happening at a high rate and magnitude. This displays the complexity and the contradictions that could arise with climate adaptive planning within urban areas. Rittel and Webber (1973) introduced the term “wicked problems”. Accordingly, a wicked planning problem is highly complex, uncertain and non-linear. Considering the intertwined relationship of urban processes and climate change, climate adaptation can be considered as a wicked planning problem. One of the characteristics of a wicked problem is conflicting stakeholder groups, which makes climate adaptive planning difficult to implement (Perry, 2003). According to Ganeshu et al. (2023), due to conflicting stakeholder group interests, harmonisation between these groups is crucial for the successful implementation of climate adaptive measures. In an urban area, there are many different stakeholder groups. One of these stakeholder groups are the local residents. Harmonisation as argued by Ganeshu et al. (2023), between the local residents as a stakeholder group and other stakeholder groups is essential. According to this logic, a lack of harmonisation between the local residents and other stakeholder groups would complicate the implementation of climate adaptive measures. One could argue that local residents could be considered as a barrier to the successful and efficient implementation of climate adaptation measures. Thus, it is important to overcome this barrier.

Since the 1990s there has been growing acknowledgement of a need for greater public participation in decision making processes (Harman et al., 2014). Harman and others (2014) argue that for effective climate adaptation measures, local actors (such as residents) should be involved in the decision-making process, since climate change effects will most likely be experienced at a local scale. However, public participation is a broad concept and there are many different methods of participation.

This research is relevant due to the urgent need of climate adaptation, especially considering the increase and expected future increase of urban areas worldwide. However, adaptation to climate change is a process that ignites resistance and social activism (Brink et al., 2023). Therefore, it could be argued that some form of participation is necessary to successfully implement climate adaptive

policies. On the other hand, according to Wamsler et al. (2019), there is little empirical evidence regarding the value of citizen involvement in this field. This statement contradicts the previous one which means there is a research puzzle and simultaneously a research gap.

According to the sustainable city water index (2016), the Netherlands maintains a continuous investments programme in flood barriers, thus the Netherlands is considered the safest delta on earth. Furthermore, the sustainable city water index states that the municipality of Amsterdam is second place globally in the water resiliency index. The municipality of Amsterdam has launched a programme called Amsterdam Rainproof, this is a climate adaptation programme aiming to increase the ability of the city to deal with expected increase in rainfall by decreasing the existing grey infrastructure and increasing green infrastructure. The programme of Amsterdam Rainproof consists of multiple small-scaled cases, Amsterdam Rainproof (rainproof.nl). According to the website of Amsterdam Rainproof their goal is: “Amsterdam Rainproof, that is you, us, and all other citizens of Amsterdam”, suggesting the programme involves public participation. Considering Amsterdam is a frontrunner according to the water resilience index, it is interesting to research how this municipality approaches public participation and to research the barriers experienced how these can be overcome by public participation. Thus, the aim of this research is to identify what participation methods the municipality of Amsterdam uses in the programme Amsterdam Rainproof and how these methods enable the implementation of climate adaptation. This research could help to fill the research gap and solve the research puzzle whether public participation is beneficial for climate adaptive planning. The following research question is proposed:

What public participation methods are used in the programme Amsterdam Rainproof and how do these help overcome social barriers associated with the implementation of climate adaptive measures within the municipality of Amsterdam?

- *What barriers arise in the climate adaptive planning projects in the programme Amsterdam Rainproof?*
- *How do local residents participate in the climate adaptive planning projects in the case Amsterdam Rainproof?*
- *How do the public participation methods used in the cases of Amsterdam Rainproof help overcome the barriers identified?*

The thesis follows the following structure: The second chapter of this paper consists of the theoretical framework. Followed by the third chapter on the Data and Methods. The fourth chapter discusses the findings. This consists of a case study presentation, and the results. Finally, the fifth chapter consists of the conclusion and lastly, the discussion.

2. Theoretical framework

2.1. What barriers arise in climate adaptation?

The National Research Council defines adaptation in their book on climate change adapting as follows: “Adjustment in natural or human systems to a new or changing environment that exploits beneficial opportunities or moderates negative effects” (2010 p. 19). In the context of municipal climate adaptation the adjustments in human and natural systems aim to moderate the negative effects of climate change. The capacity of a city to adapt to climate change can differ. The ability of systems, institution, humans, and other organisms to adjust to possible damage or to take advantage of opportunities or to respond to consequences is called the adaptive capacity (IPCC, 2022). According to Shi et al. (2015), cities with a relatively high adaptive capacity can overcome barriers to climate adaptive planning due to more financial resources, stronger local leadership, and the ability to communicate climate information to others.

In summation, a municipality or city with a high adaptive capacity should be able to overcome barriers associated with climate adaptation relatively easier. In the following part, barriers associated with climate adaption is discussed. According to figure 1 from an article on barriers to climate adaptation by Biesbroek et al. (2009), the two main factors influencing climate adaptation are on the one hand material factors and on the other hand social factors. Social barriers can be described as the outcome of interactions of intentional actors. As this research focuses on public participation, social barriers will be the main focus of this chapter. As can be seen in figure 1, social factors are subdivided into institutional factors and actor specific factors. The paper of Biesbroek et al. explains that actor specific barriers are for example a person who does not want to include adaptation in their life due to this person perceiving climate changes as non-threatening. Institutional barriers have to do with regulations. This could, for example, be that due to regulations, an actor is not able to partake into climate adaption.

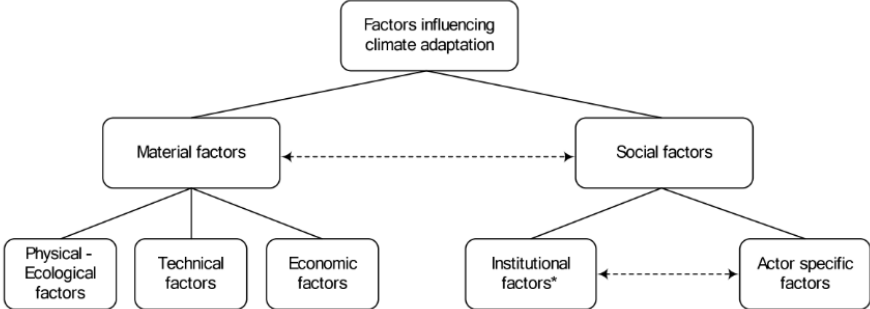


Figure 1 Variables influencing climate change adaptation (Biesbroek et al.,2009)

2.2 Public participation and categorization.

Increase in public involvement.

There has been a growing debate over the past few decades, about the role of the public in determining policies (Rowe and Frewer, 2000). The traditional view has always been that important decisions concerning technical matters should be left in the hand of experts. In spite of this, a growing interest in public involvement has risen. There are several reasons for the this. Rowe and Frewer (2000) argue there are two main reasons for the rising interest in public involvement. The first reason derives from the recognition for basic human rights with regards to democracy and thus policy involvement. The second reason is the fact that unpopular policy decisions could lead to protest and ultimately no trust in governmental bodies. According to Lane (2005), there is one main reason which summarizes the two reasons given by Rowe and Frewer (2000). He argues in his paper on the history of public participation, that there has been a shift from government to governance. He argues that the world has become too complex to rely on a political culture in which decision-making is done from above (top-down approach). Instead, there is an increase in relying on an network of decision-making across different scales (bottom-up approach). Consequently, governance implies the involvement of citizens and thus public participation.

Public participation categorization.

The definition of public participation is as follows: ‘Public participation encompasses a group of procedures designed to consult, involve, and inform the public to allow those affected by a decision to have an input into that decision’ (Smith 1983, as cited in Rowe and Frewer 2000 p, 4).

In 1969 Arnstein wrote an article, ‘A ladder of citizen participation’. In the article, Arnstein presents a ladder as seen in figure 2. This ladder represents different levels of citizen participation. Arnstein (1969) explains that the ladder juxtaposes the powerless citizen with the powerful citizen to highlight the differences between the two. The ladder is divided in three main groups: Non-participation, degrees of tokenism, and degrees of citizen power. At the top citizens are considered to have a high degree of power. A little underneath there is tokenism which Arnstein describes as a type of consultation, at the bottom of the ladder non-participation is shown, this means little to no power to citizens (Lane, 2005).

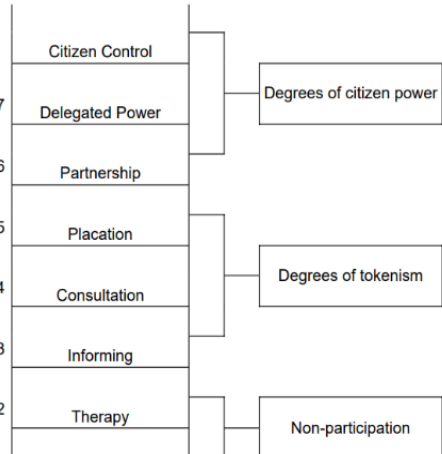


Figure 2 Arnstein's ladder of participation (Arnstein 1969)

According to Arnstein’s ladder of participation there are different levels of participation varying from very little participation of the public to a level of very high participation. Hence, literature reveals there is a variety of methods that come under the public participation categorization. This ranges from informing, input in the form of opinions to elicit judgements and decisions (Rowe and Frewer, 2000). According to Dietz and Stern (2008) in a book on

participation methods, many ways of organizing participatory processes exist. Dietz and Stern have come up with three broad classes of public participation formats. The three classes are; Information exchange, Involvement and Engagement.

1. Information exchange: This includes public hearings, focus groups, workshops etc. Used to both inform and consult the public.
2. Involvement: This includes citizen panels, polling, town meetings, study groups etc.
3. Engagement: This includes: Community partnerships, co-management of projects or programs, policy dialogues etc. Used both in collaborative action and decision making.

It could be argued that the level of participation in the three categories established by Dietz and Stern increase in level of participation in line with Arnstein’s ladder of participation. The lowest level of participation being information exchange and the highest level of participation engagement. The first category (information exchange) can be linked to the informing and consultation steps of Arnstein’s ladder. Secondly, involvement can be linked to the placation step of Arnstein’s ladder. In placation citizens begin to have a form of power. However, it still remains a form of tokenism, since the powerholders retain the right to make the final decision (Arnstein, 1969). This lines up with the public participation methods categorized under involvement. There is a form of citizen power but this is still limited. Lastly, the category engagement can be linked to the partnership step of the ladder. In this step of the ladder the power is redistributed through negotiation between citizens and power holders. There is an agreed form of planning and decision making responsibilities (Arnstein, 1969). This is in line with the engagement category since it includes partnerships, co-management and is about collaborative action and decision making.

Finally, it has to be determined if public participation methods are effective. In this thesis a public participation method is considered effective, if it helps overcome a social barrier. However, whether a participation method is effective is hard to determine. (Rowe and Frewer, 2000). Often public participation methods are performed because there is a need to involve the public somehow, meaning that the process of involvement of the public is an end itself rather than it being a means to an end.

2.3 Conceptual model

In figure 3, the conceptual model is shown, with public participation methods as the independent variable and overcoming social barrier as the dependent variable.



Figure 3 Conceptual model

3. Methodology

This research is a case study, it is an empirical study based on qualitative research. The case Amsterdam Rainproof is researched. This case is researched due to the municipality of Amsterdam scoring high on the sustainable city water index (2016) and due to the high priority this programme has with public participation, according to the website of Amsterdam Rainproof, which makes this case suitable to answer the research question. This case study consists both of primary data and secondary data. The unit of analysis is the programme Amsterdam Rainproof and within the programme 222 different projects. Research will be done into how the different participation methods enable the implementation of climate adaptive policies in the municipality of Amsterdam by overcoming social barriers. The primary data will be in the form of semi-structured in-depth interviews, the secondary data will be gathered by reviewing academic literature, projects from websites, and policy documents(units of observation). An overview of all data collected is visible in table 1.

Collected Data

Semi-structured interview with Programme manager #Interviewee 1 (primary data)
Semi-structured interview with Community manager #Interviewee 2 (primary data)
222 Projects of the Programme Amsterdam Rainproof in the form of web pages (secondary data)
Academic literature (secondary data)
The Amsterdam Rainproof Magazine (secondary data)

Table 1. Collected Data

Primary data collection:

The primary data is collected in the form of semi-structured interviews. Two interviews have been conducted with the programme manager and a community manager of Amsterdam Rainproof. The Amsterdam Rainproof website indicated the managing team that is in charge of the programme. This consists of a programme manager and several community managers. The programme manager is responsible for the programme in its entirety, community managers are responsible for certain communities, such as neighbourhoods within the municipality of Amsterdam. Considering the programme manager is responsible for the entire programme, and the community manager for certain neighbourhoods and residents, it is expected that the two interviewees can give useful insights with regards to public participation methods, barriers, and how these barriers can be overcome. The

interviews are semi-structured, meaning that an interview guide is made. However, there will be room to deviate from the predefined questions. This is the case since during the interviews, the interviewee could mention interesting insights that are not in line with the interview guide, but are worth asking follow-up questions on. The interviews are conducted in an online environment. Before each interview the interviewee was asked for permission to record the interview. Additionally, the interviewee was notified that participation in this thesis is voluntarily and the interviewee could withdraw from the research at any moment (see interview guide in appendix).

Secondary data collection:

The following secondary data is collected: After downloading the entire website of Amsterdam Rainproof to pdf, a total of 222 projects were found and have been researched. The 222 projects are all finished or still in progress. The aim of this is to identify the different participation methods used and social barriers. Furthermore, several academic articles have been examined that research the programme Amsterdam Rainproof.

Data analysis:

In order to analyse the collected data, both the interviews and secondary data are coded in ATLAS. The following coding is applied:

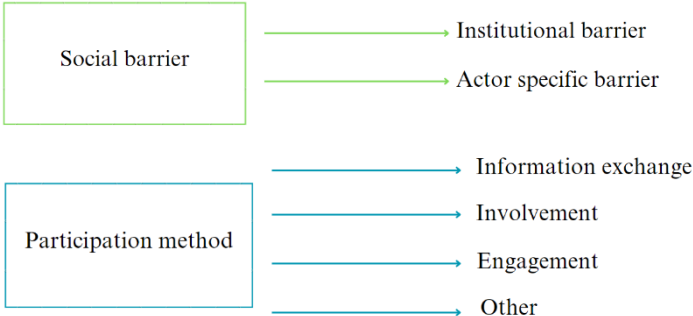


Figure 4. Coding tree

After all the collected data is coded, the data is analysed and put into tables to summarize the findings.

4. Findings

4.1 Case study presentation

Amsterdam Rainproof is a climate adaptive programme initiated by the local water authority Waternet and the municipality of Amsterdam in 2014. The aim of the programme is to absorb and capture rainwater by increasing green infrastructure and decreasing grey infrastructure. Amsterdam Rainproof makes use of the so-called network approach. The network approach is about analysing and assessing complex processes of problem solving in network systems. The starting point of the network approach is that all actors are mutually dependent to achieve their goals (Koppenjan and Klijn, 2004). According to Willems et al. (2022) by establishing a network and an identity that is not associated with Waternet or the municipality, it is expected to attract a larger variety of stakeholders within the municipality of Amsterdam. Thus, the aim of the programme is to trigger as many residents in the municipality as possible to participate in this programme. In addition to this, interviewee 1 states that the main aim of the programme is to increase the awareness of the consequences of increased heavy precipitation which was lacking in 2014. Amsterdam Rainproof is involved with many climate adaptive projects in the municipality. Examples of these projects are the implementation of green roofs, rain barrels, and creating gardens. Their approach is to link up with existing (small-scaled) projects often initiated by local residents.

4.2 Results

4.2.1 Barriers

As mentioned in the theoretical framework, barriers associated with climate change can be divided into social barriers and material barriers. As this research focusses on public participation and thus the local resident as an actor, social barriers will be looked at. The identified social barriers have been listed in table 2 (see below).

Institutional barriers:

The first institutional barrier identified is the fact that roughly 60 percent of space in the municipality of Amsterdam is private. According to a report on Amsterdam Rainproof by the Erasmus university Rotterdam (Willems et al., 2020), climate adaptive measures have to be implemented on private space. This is confirmed by interviewee 2: “The private space in the municipality of Amsterdam is very large. When adding up all roofs and backyards this is bigger than the sum of all streets and squares”. Additionally, the report by Willems and others (2020) mentions that local

residents often do not consult the municipality or take action regarding climate adaptation in their private space. This barrier is not necessarily institutional for the resident as an actor. However, it is an institutional barrier for the municipality, as the municipality of Amsterdam faces a legislative barrier when it comes to private space. A second institutional barrier that has been identified, is lack of resources to participate in climate adaptation, even though there is intrinsic motivation to act on this. Willems and others (2020) explain in a report on Amsterdam Rainproof that there is a part of the residents of the municipality that have a high intrinsic motivation but lack the institutional recourses to lift this to a higher level. This is an institutional barrier and not an actor specific barrier, since the actor is willing to act, due to intrinsic motivation. However, it is restricted to act on this, due to lacking institutional resources such as subsidies etc.

Actor specific barriers:

The first actor specific barrier identified is the lack of intrinsic motivation. In contrast to the previous barrier, there is a part of the residents of the municipality of Amsterdam that do not have intrinsic motivation to participate in climate adaptation (Willems and others, 2020). Interviewee 2 states that “Only a small part of the residents are triggered by climate adaptation, these are the intrinsic motivated people. People for example that are in social isolation do not get triggered by campaigns etc. You cannot reach all residents in the same way, finding the balance in this is very complicated.” Secondly, an actor specific barrier that occurs is simply the lack of knowledge on climate adaptation. Interviewee 2 states that the average resident does not know the meaning of the word climate adaptation. Residents sometimes participate because they like nature and greenery, the concept climate adaptation itself is unfamiliar. Furthermore, an actor specific barrier that has been identified has to do with the general dislike of government interference and top-down measure. Essentially, what is meant by this is that the local resident has trouble with the top-down nature climate adaptive policies can have. The authoritarian characteristics a municipality or other governmental bodies can have, sometimes cause a counterproductive effect when it comes to implementing climate adaptation measures. Interviewee 1 states that it is a barrier for residents to have to follow a governmental body, it can often come across as the municipality pointing their finger at the resident which makes residents reluctant to actually participate in climate adaptation. Lastly, an actor-specific barrier is the lack of knowledge on recourses. The lacking of institutional resources as mentioned in the previous part on institutional barriers, is an institutional barrier, due to the absence of the resources. However, when there are institutional resources present (subsidies etc) and the actor is not aware of this, it is an actor specific barrier.

Social barrier	Institutional barrier	Actor specific barrier
	Municipality of Amsterdam consists of 60 % private space	Lack of intrinsic motivation
	Lacking institutional resources	Lack of knowledge on climate change
		Dislike of government interference and top-down measures regarding climate adaptation
		Lack of knowledge on institutional resources (subsidies etc)

Table 2. Barriers identified

4.2.2 Public participation methods

As mentioned in the chapter 3, 222 projects from the Amsterdam Rainproof website have been coded in Atlas.ti. In order to find out the different participation methods that have been used in the Amsterdam Rainproof programme. The code participation method was applied and further categorised into information exchange, involvement, and engagement. This has been done according to the theoretical framework. Of all 222 coded projects, many have not been coded due to absence of the relevant data in said document. In total, 42 participation methods have been identified across 224 documents. In table 3, the participation methods found from the projects have been categorized. Additionally, examples of the participation methods found are listed.

Information exchange

First of all, in table 3, the participation methods identified have been summarized. As categorized by Dietz and Stern (2008), information exchange is about both consulting and informing the public linked to the informing and consultation step of Arnstein's ladder. Implying, there is dialogue with the local residents in the form of consult or information. Nonetheless, the local residents are not involved or engaged. In the case of Amsterdam Rainproof and according to the coded projects, many of the information exchange methods have an underlying focus of awareness raising. According to interviewee 1, an example of this would be a community of practice, in which several experts come together to consult and advice local residents which on the one hand would help raise awareness and on the other hand create perspective. Another method used with the goal of awareness raising (as indicated in the table), is campaigning. Examples of campaigning that are identified in the coded projects could be as simple as brochures, to clearly visible rainproof measures in a schoolyard to

trigger the environmental awareness of kids, or social media. According to interviewee 2, the main focus of campaigning is to trigger the public to get involved. Another type of information exchange that occurred multiple times in the coded projects was in the form of the consultation of ideas from the local residents. An example listed in the table is community design. Community design entails designing a project and making use of input and local knowledge of the residents (community). Furthermore, a method of information exchange is via door to door conversations, community evening and demo days. Lastly, the programme makes use of impact tools. The impact tools (as stated in the projects) is meant to find bottle neck areas in neighbourhoods or buildings. The impact tools are available to all local residents, to both inform and raise awareness.

Involvement

The second category Dietz and Stern (2008) recognize is involvement. In this category (linked to placation from Arnstein's ladder) there is more input and power for the resident. However, the final decision-making is not up to the residents. An example of such a participation method that has occurred is in the form of a district committee. Residents of a certain neighbourhood have the chance to choose between different project plans by voting. Similarly, an example is the co-decision on the budget used for certain projects. One of the coded project documents from Amsterdam Rainproof stated that local residents were able to vote on the budget, which according to Amsterdam Rainproof increased the trust between the municipality and the residents. Furthermore, sidewalk chalk sessions have been held. Local residents got the chance to envision their ideas on the neighbourhood by drawing them by chalk, which has been used as input by Amsterdam Rainproof. This is categorized as involvement and not engagement since the final decision on what project were to be implemented, was not in the power of the residents.

Engagement

The last public participation category Dietz and Stern propose in their book is engagement. In the engagement category the resident is actively engaged with the project. There is a shared decision-making process. This step is linked to the partnership step of Arnstein's ladder. This can be through co-management or co-design. An engagement participation method that has occurred is co-designing with the municipality. Local residents had the opportunity to be an active part of the design process. A similar example would be creative sessions that have been held with local residents, aiming at mutual decision-making. Both conducted interviews made clear that the programme Amsterdam Rainproof aims at linking up with existing initiatives trying to enable such initiatives. This would imply that many engagement public participation activities are not initiated by Amsterdam Rainproof.

<i>Participation class:</i>	Information exchange	Involvement	Engagement
<i>Step of Arnstein's ladder</i>	Informing and Consultation	Placation	Partnership
<i>Examples</i>	Impact tools exposing bottleneck areas.	District committee (chance to vote for project plans)	Co-designing with the municipality
	Door to door conversations with local residents.	Sidewalk chalk session	Creative sessions with local residents, aiming at mutual decision-making
	Campaigning to raise awareness (e.g. brochures, visible rainproof measures at a schoolyard)	Co-decision on budget (residents were asked to vote on the budget)	Building façade gardens (co effort of the municipality and local residents)
	Advice (e.g. a “green kiosk” residents can consult)	Co-decision on design proposals (residents were asked to vote on project designs)	
	Community evening and demo days		
	Community design (ideas and local knowledge from residents was consulted)		

Table 3. Public participation methods

4.2.3 Overcoming barriers

The question remains how the public participation methods used in the programme Amsterdam Rainproof help overcome the social barriers identified. As mentioned in the theoretical framework, it is hard to determine the effectiveness of participation methods. This is confirmed by both interviewees. Interviewee 2 states *“the programme does not measure effectivity as of yet. For example, it is noticeable that over the years the awareness amongst the residents of the municipality of Amsterdam has risen. However, it is extremely hard to trace this back to our programme, meaning the effectivity is hard to measure”*.

For several public participation methods it is indicated in the data (222 project documents and 2 interviews) how each method helps overcome a specific barrier. It is important to note, that the coded data mainly show barriers, or public participation methods. However, how specifically a certain public participation method helps overcome a certain barrier, is for most of the participation methods and barriers not indicated in the data. In summary, this means that for most of the public participation methods there is no validation on how these helps overcome a particular barrier and thus if it is effective. There are a few exceptions. These will be discussed in the following part and are summarized in table 4.

The first public participation method is the impact tool. According to one of the coded project documents from Amsterdam Rainproof, by giving each building a climate score, the vulnerability of a building will be known and accessible to local residents increasing the awareness and thus the knowledge on the effect of climate change. This implicates that the barrier on lack of knowledge of climate change is partially overcome, due to informing the residents with the impact tool. Secondly, is the co-decision on the budget for a project. According to one of the project documents from Amsterdam Rainproof, a project manager from the municipality of Amsterdam stated that transparency of budgeting and the chance to get involved in a project, resulted in more trust and a better bond with the local residents and the municipality. In this case the barrier of dislike of government interference and top-down measures regarding climate adaptation is overcome by creating more trust. Thirdly, according to interviewee 1, at community evenings one on one conversations on implementing green roofs are held with experts and local residents to increase awareness. Additionally, price indications and information on possible subsidies are given. On the one hand this decreases the barrier of lack of knowledge on institutional resources (information on subsidies). On the other hand, this partially tackles the lack of knowledge on climate change (information on green roofs). Finally, there is an example of a public participation method aiming to campaign to raise awareness. According to one of the coded project documents of Amsterdam Rainproof, by implementing water filters made out of shells in the shape of a water drop, there is an increase in awareness on precipitation. Thus, resulting in an expected increase in knowledge on climate change and a decrease in this barrier.

5. Conclusion and Discussion

5.1 Conclusion

In conclusion, there are several barriers identified in the climate adaptive projects of Amsterdam Rainproof. The barriers are identified as social barriers and can be categorized as institutional and actor specific barriers. The institutional barriers identified are the fact that the municipality of Amsterdam exists for 60 percent of private space and the presence of intrinsic motivation yet lacking recourses to act on this. The actor specific barriers identified, are the lack of intrinsic motivation, the lack of knowledge on climate change, and the dislike of government interference and top-down measures regarding climate adaptation.

It can be concluded that there are a variety of public participation methods used in the projects in the programme Amsterdam Rainproof. The public participation methods are categorized in information exchange, involvement, and engagement. All three categories are represented in the programme. The information exchange methods have an underlying focus on awareness rising. Examples are community evenings, campaigning and door-to-door conversations. The second category involvement exist of methods such as district committees, community design, and co-decision making by voting. Lastly, the category engagement consists of, for example, co designing with the municipality or creative sessions aiming at collaborative decision making and partnership between the resident and the municipality.

Lastly, the question remains how the public participation methods used in the case of Amsterdam Rainproof help overcome the barriers identified. Most of the data does not include how a certain public participation method helps overcome a particular barrier. There are a few exceptions. Firstly, by giving a building a climate score with the impact tool, the resident has an increased awareness and knowledge on climate change. Secondly, the co-decision on the budget of a project helped increase trust between the residents and the municipality. Thus, tackling the barrier of dislike of top-down government interference. Thirdly, one on one conversations at community evenings helped tackle both the barrier on lack of knowledge on climate change, and lack of knowledge on institutional resources. Lastly, by implementing water filters made out of shells in the shape of a water drop, there is an increase in awareness on precipitation, resulting in increased knowledge on climate change.

5.2 Discussion

The data analysed were primary and secondary data. The primary data existed of two in-depth interviews, ideally the number of interviews conducted would be higher. The fact that there are only two interviews makes the research less reliable in terms of making generalisations on the conclusion. The secondary data used are academic articles and the website of Amsterdam Rainproof with a focus

on 222 projects. Another complication which occurred while coding the projects is the fact that effectivity, or “how” a participation method can help overcome barriers, was hard to code since this is all from the website of Amsterdam Rainproof which could be biased. Adding to this, as mentioned in the results section, the data on how a participation method helps overcome a certain barrier was limited in the coded documents. Moreover, as mentioned in the results, the effectivity of the public participation methods used were not measured as of yet by the programme itself, this complicated the research slightly.

In the introduction it is mentioned that on the one hand it is argued that some form of participation is necessary for the successful implementation of climate adaptive policies (Brink et al., 2023). On the other hand Wamsler et al. (2019), argues there is little empirical evidence regarding the value of citizen involvement in this field. This thesis shows that the public participation methods help overcome social barriers, meaning that it would add to the research gap proposed by Wamsler et al. (2019). According to Lane (2005) as stated in the theoretical framework, the world has become too complex to rely in top-down implementation of climate adaptive policies. Instead, some form of public participation is necessary to successfully implement climate adaptive policies. This is confirmed by this thesis since the project documents, the interviews, and academic literature show that there are many barriers that arise during climate adaptive projects/policies. These barriers are overcome with the help of public participation methods, implying this is indeed necessary to successfully implement climate adaptive policies.

It is interesting to see what type of public participation methods have been used in the case of Amsterdam Rainproof. As the municipality of Amsterdam is one of the worldwide frontrunners on climate adaptation (with a focus on water), it could be argued that the implementation of climate adaptive measures is relatively efficient, which could mean the public participation methods used are efficient as well. Since this thesis shows that public participation methods help overcome social barriers, this could be the reason the municipality of Amsterdam is seen as a frontrunner worldwide. This suggests that similar programmes worldwide could learn from this, by looking at what type of participation methods have been implemented in this programme, and how each method helps overcome a specific barrier.

Follow-up research focussing on the effectivity of the public participation methods would be very valuable. Especially, since the programme itself does not have any tools to measure the effectivity as of yet. In order to do this, a model has to be generated determining the effectivity of public participation methods. This could be done, for example, by a comparative case study between municipalities that do not use many public participation methods and municipalities (such as Amsterdam) that make use of many public participation methods. Furthermore, research on how the public participation methods are perceived by the local residents themselves, could give interesting new insights on the public participation methods used in the programme. This could, for example, be

done by giving out surveys to residents that have participated in the methods used by the municipality of Amsterdam.

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Appendix:

Interview guide:

Introduction and ethical considerations:

- Introducing myself and clarifying the thesis subject and the reason to research Amsterdam Rainproof as a case study.

- Asking the interviewee permission to record the interview.
- Notifying the interviewee that participation is voluntary and that the interviewee can withdraw from the research at any moment.

1

- What is your function within the programme Amsterdam Rainproof and for how long have you worked here?
- On the website from Amsterdam Rainproof you mention you want to involve the residents. Why do you do this? What barriers would be overcome by doing this?
- How do you balance the need for public participation with the need for expert input and expertise in climate adaptive planning?

2

- What public participation methods are used in the programme Amsterdam Rainproof, could you give examples?
- How do you keep the community involved in the projects
- What are some of the challenges and limitations with public participation methods used in your programme?

3

- In what way do the public participation methods used in your programme help overcome social barriers?
- How do you measure the effectivity of the public participation methods used?
- According to you, what is the most effective public participation method?