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# **Sustainability and Trust in the Waterboards**

**To what extent does attitude towards sustainability affect trust in the water boards?**



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# Abstract

Environmental disasters, such as floods are increasing making climate change more prominent in our daily lives. This has made attitudes towards sustainability and combating climate change a disputed political topic. This raises the question if attitude towards sustainability has any influence on trust in governmental bodies. This research aims to find out if the attitude towards sustainability affects trust in the waterboards. This will be done by asking the question: To what extent do attitudes towards sustainability and demographic characteristics influence flood protection trust in the water boards? This research analyses primary quantitative data collected in the municipality of Heerenveen. The 81 participants are all residents of the municipality of Heerenveen and are all 18 years or older. The analysis uses multiple linear regression, and all the assumptions for the regression analysis are met. The dependent variable is trust in the water boards on a scale from 0 to 10. The independent variables (willingness to become sustainable, meat-eating, driving, domestic heating and showering) measure the attitude towards sustainability. The regression analysis found that no variables indicate that attitudes towards sustainability are significant for predicting trust in the water boards. This means that the findings in this research do not support the expectation that an attitude towards sustainability increases trust in flood protection of the waterboards.

# Structure of the Thesis

- Abstract ..... 1
- Structure of the Thesis ..... 2
- Introduction ..... 3
- Theoretical Framework..... 4
  - Hypotheses/Expectations..... 7
- Methodology ..... 7
- Results ..... 12
- Conclusion..... 14
- References ..... 15
- Appendices ..... 18
  - Appendix A ..... 18
  - Appendix B ..... 20
  - Appendix C ..... 21

## Introduction

Climate change is the long-term shift in temperatures and weather patterns (United Nations, 2020). Since the 1800s, the main source of climate change has been human activity (Masson-Delmotte *et al.*, 2021). The shift in temperature and weather patterns will affect people in diverse ways. Some people will be displaced by prolonged droughts, while others will be threatened by floods (2020). The number of people displaced by weather-related events is expected to rise. The Netherlands will also have to adapt to climate change (Unie van Waterschappen, 2021). In spring, autumn and winter the Netherlands will experience more precipitation and increased chances of floods (2021). But in the Summer the Netherlands will have to adapt to heatwaves that can cause droughts (2021). The Netherlands has multiple scales of government responsible for climate adaptive planning (van Dijk *et al.*, 2019). The water boards are governmental bodies that hold the responsibility of water management at the regional level (2019). This governmental body is independent of other administrative governmental bodies (2019). The water boards levy taxes and work together on climate policies and sustainability policies with other Dutch governmental bodies (Ministerie van Algemene Zaken, 2021). However, sustainable policies are not supported unanimously (Fairbrother *et al.*, 2019). Worse still, some climate sceptics completely deny human-induced climate change and its impacts (2019). Furthermore, climate denial leads to negative attitudes towards sustainable policies, which has been associated with a decrease in political trust (Klenert *et al.*, 2018).

While it is well known public trust in governmental institutions is under pressure, little is known about the trust in the water boards (Voogd *et al.*, 2021). That being said, the water boards are actively lobbying for the importance of water management in the EU (Onderwater, 2024). Generally speaking, lobbying in governmental bodies negatively affects political trust in them (Christians, 2016). Lobbying can legally influence politics. However, the lack of transparency of lobbyists results in people losing trust in the fairness of tax policies and the passing of laws (2016). The discontent resulting from lobbying may result in less trust in the water boards. Considering, designing and implementing sustainable water management is largely dependent on whether the organisation responsible is regarded as trustworthy and legitimate (Stern and Coleman, 2015). Furthermore, trust in the governmental bodies is crucial for the success of a learning process and the collective achievement of solutions and insights. (De Vries *et al.*, 2017). Therefore, the trust in the water boards should be researched. Research studying the trust in the water boards did not research the effect of political orientation in depth. This research will focus on the effect that attitude towards sustainability has on trust in the water boards.

Previous research has stated that behaviour supporting communal causes increases political trust (Lim and Moon, 2020). One might wonder if attitude towards sustainability is also associated with political trust. That is, do people who behave more sustainably also have more trust in the water boards? This research will add to the literature on trust in governmental bodies by researching if the attitude towards sustainability affects political trust. This is done by answering the following research question: To what extent do attitudes towards sustainability and demographic characteristics influence flood protection trust in the water boards?

This will be answered using primary quantitative data collected in the municipality of Friesland. This data will then be analysed using a multiple linear regression. The aim of this research is to find out how attitude towards sustainability affects trust in the water boards.

The remainder of this research is organised as follows: The theoretical framework section explains the existing knowledge and explores the relevance to my research of each finding. This is followed by the methodology, detailing the empirical study's approach. Next, the results, show and analyse the data through the lens of theory. Finally, the conclusion discusses the main findings.

## Theoretical Framework

Unfortunately, current political climates in English-speaking countries have become more polarised around the topic of climate change (Smith and Mayer, 2019). Research has found that political identity is a strong predictor for denying the existence of human-induced climate change (2019). The research explains that people are likely to adopt the beliefs of the political group they associate with instead of thinking critically for themselves. This polarization is worsened by organizations leveraging considerable resources to spread denial of climate change among conservatives, according to Bugden (2022). Different research suggests that lower trust of conservatives in science could explain this difference (Unsworth and Fielding, 2014). Nevertheless, this increased denial of climate change will also lead to less support for sustainable policies (Unsworth and Fielding, 2014; Bugden, 2022). The difference in attitude towards sustainability might affect political trust as well seeing that this relationship has been extensively researched with varying results (Rafaty, 2018; Fairbrother, 2019; Fairbrother et al., 2019; Lim and Moon, 2022).

According to Rafaty (2018), the effect environmental policy has on political trust depends on people's attitudes towards sustainability. The research states that in countries where sustainability is perceived as important, a lack of sustainable policy is seen as corruption (2018). However, in countries where sustainability is not perceived as important, there may be reluctance to pass effective climate policies out of fear of losing trust or political support (2018). This means that the effect attitude towards sustainability has on political trust depends on whether the policy is sustainable or not (2018). Therefore, political trust can result from the effective allocation of resources for the public good such as sustainability (Rudolph and Evans, 2005). However, the ineffective allocation of resources into a transition towards sustainability will also result in lower political trust in people with more positive attitudes towards sustainability. For example, European countries that tend to have lower support for carbon tax also have low trust in politics, despite the majority believing in the existence of human-induced climate change (Fairbrother et al., 2019). Contrary to those findings, people can also become more distrustful of the government when environmental taxes are increased (Fairbrother, 2019). When introducing an environmental tax a different tax has to be lowered (2019). Otherwise, people will be led to believe the true motivation for the additional taxes was not environmentally friendly but increasing tax revenue instead (2019). These articles show how the relationship between attitudes towards sustainability and political trust is often researched. The articles, state that people's political trust changes with the introduction of effective green policies depending on their attitudes towards sustainability (Rudolph and Evans, 2005; Rafaty, 2018; Fairbrother et al., 2019). However, I will not be using these findings for my research. Seeing that nitrogen levels have not been effectively reduced (Squintani et al., 2017) and the theory from the articles works on the assumption that the green policy of a governmental body is effective (Rudolph and Evans, 2005; Rafaty, 2018; Fairbrother et al., 2019).

Attitude towards sustainability is not just measured by asking the opinion people have on certain green policies. It is also about everyday behaviour and the willingness to make sacrifices for the sake of sustainability (De Silva and Pownall, 2012). This links to the concept of 'civic morality' (Lim and Moon, 2020). 'Civic morality' is the willingness to abide by social roles to support communal causes (2020). The writers found that people who scored higher in civic morality also had higher levels of political trust (2020). In a different article, they found similar results. They further explain that adherence to ethical principles and social obligations can enhance an individual's trust in the government because they believe in upholding the public good (Lim and Moon, 2022). This research will add to this literature by researching if, attitudes towards sustainability.

It is important to note that the literature states that the relationship between political trust and attitude towards sustainability could very well be circular (Rafaty, 2018; Fairbrother, 2019; Fairbrother et al., 2019). This means that higher political trust can also make attitudes towards sustainability more positive, as people have higher trust that their efforts will be effective in combating climate change (Rafaty, 2018; Fairbrother, 2019; Fairbrother et al., 2019; Lim and Moon, 2020; Lim and Moon, 2022).

Seeing that political trust is a strong predictor for trust in the water board, one might wonder if sustainability affects trust in the water boards similarly to political trust (Voogd et al., 2021). But before discussing if the attitude towards sustainability affects trust in the water boards, it is worthwhile to elaborate on the meaning of trust in this research. Trust is a psychological state of positive expectations, that the organization has the competences and goodwill to manage issues the trusters risk facing (Stern and Coleman, 2015). For the theoretical framework, literature about trust in the water boards will be compared to literature about political trust, because very little is written about trust in the water boards (Voogd et al., 2021). The literature also makes a distinction between task-specific trust and general trust in the water boards (2021). Task-specific trust relates to competences such as maintaining biodiversity, managing the quality of water and mitigating drought (2021). The task-specific trust in this research pertains to the trust residents have in the waterboards' ability to protect them against floods. Specifically floods from minor rivers and channels (Ministerie van Algemene Zaken, 2017). The level of trust in the flood protection of the waterboards is high. They score 7.6 on a scale from 0 to 10 (Voogd et al., 2021). This high trust opposes literature about governmental bodies and lobbying, as lobbying in governmental bodies results in lower trust in that governmental body (Christians, 2016). The exact cause of this difference is not certain, however, it could be due to the history of Dutch water management which is perceived as successful (Mostert, 2017).

Important determinants of trust in the water boards and politics include gender, risk perception, knowledge about the water boards, political orientation, flood risk, general political trust and occupation (Dalton 2005; Sturgis et al., 2010; Schoon and Cheng, 2011; Borgonovi, 2012; Hooghe et al., 2012; Irwin et al., 2015; Vollaard *et al.*, 2021; Voogd et al., 2021; McDermott and Jones, 2022). For some of these determinants, a clear correlation was found with trust in the water boards. Other determinants are much more uncertain. An example of a clear correlation is political trust (Voogd et al., 2021). They also found that people living in flood-risk areas tend to have lower trust in the waterboards' flood protection due to higher risk perception (2021). This finding will provide a geographic element to the research. Higher political trust also had higher trust in the waterboards (2021). People with more knowledge about the water boards also had more trust in them (Vollaard et al., 2021).

When considering other possible causes of differences in trust in the water boards, gender plays an important role. However, the role gender plays is one of the determinants that are unclear. Women tend to have lower trust in the water boards than men (Voogd, et al., 2021). This might be due to a difference in risk perception of climate change, which is found to be higher in women than in men (Irwin et al., 2015). This could be due to their stronger reactions to risk and higher sensitivity to trust-related information (2015). Evolutionary biology may explain the root of this difference (2015). Mainly the greater investments in child-rearing and critical mate selection which leads to more responsiveness to fear incentives in social interaction (2015). This could be why women are less trusting of the water boards' attempts to adapt to climate change. Despite this, women do have more trust in the national government than men (Schoon and Cheng, 2011). This might be attributed to women's higher participation rate in societal activities like membership in organizations and voting (2011). McDermott and Jones (2022) criticize previous studies for using gender and biological sex interchangeably when researching trust in politics. While biological sex is something you are born with, gender is socially constructed (2022). They find that not biological sex but gender, specifically communal personality traits that are more common in women results in higher levels of political trust (2022). This theory of communal personality closely relates to the concept of civil morality from Lim and Moon (2020) will help explain the results in this research. However, this for the purposes of this research the meaning of biological sex will be used for the concept of gender just like in previous studies discussing trust in the water boards (Vollaard *et al.*, 2021; Voogd et al., 2021). However, the effect gender has on the trust in the water boards is the opposite of what is found when discussing

political trust. This could be due to women being more concerned about environmental problems than men (Irwin et al., 2015).

Income is not significant in determining the trust in the water boards (Vollaard *et al.*, 2021; Voogd et al., 2021). However, people from low-income households might have fewer education opportunities to develop themselves (Schoon and Cheng, 2011). These people will have more trouble finding a job and climbing the occupational ladder (2011). Persisting experiences of disadvantages leads to distrust in governmental bodies as they should create opportunities for changing their lives. This distrust extends to governmental bodies that are not responsible for income inequality (Kettl, 2018). Therefore it is still a valuable control variable just like previous studies studying trust in the water boards boards (Vollaard *et al.*, 2021; Voogd et al., 2021). On an international level, higher levels of income inequality are also associated with decreased political trust. Supporting the idea that income affects political trust systematically and on an individual level (2018). However, income inequality measured by a Gini index is not the only way the relationship between income inequality and political trust has been studied (Bobzien, 2023). It is the perception of inequality that matters. If there is a difference between the income they prefer and the income they receive (2023). In short, lower-income and higher-income inequality results in decreased political trust. However, this cannot be found when researching trust in the water boards. Despite distrust originating from income inequality extending to governmental bodies that are not responsible for income inequality (Kettl, 2018). This could be due to the water board's responsibility and functioning to protect everyone from floods equally (Ministerie van Algemene Zaken, 2017).

As mentioned above, the level of education can lead to lower income, which can result in negative experiences which decrease political trust (Schoon and Cheng). Nevertheless, people with higher education levels have more trust in the water boards even when taking income into account (Vollaard *et al.*, 2021). This could be explained by a better understanding of the importance and functioning of the water boards (2021). Because people with a higher education level had higher tested knowledge than people of a lower education level (2021). There is also a line of research supporting higher education levels are also associated with increased political trust (Borgonovi, 2012; Hooghe et al., 2012). This difference in political trust could be explained by a difference in intelligence (Hooghe et al., 2012). Intelligence can increase the ability to assess the motivations and interests of other actors (2012). It can also help make sense of signs of untrustworthy behaviour, allowing a more accurate distinction of who should and should not be trusted (Sturgis et al., 2010). In summary, the level of education is a significant determiner of trust in the water boards as it is associated with a better understanding of the water boards. This lines up with the literature about political trust, which has found that higher levels of education are associated with higher levels of political trust. The articles differ in their explanations. While the article from Vollaard et al., (2021) argues trust is higher due to more knowledge. The other articles explain that differences in trust originate from different abilities to process knowledge (Sturgis et al., 2010; Borgonovi, 2012; Hooghe et al., 2012).

Age is also a disputed determinant for trust in the water boards. Older age groups do not have significantly more trust in the waterboards' flood protection than younger age groups (Vollaard *et al.*, 2021; Voogd et al., 2021). However, older age groups do measure higher in tested water board knowledge and place attachment (Vollaard et al., 2021). Furthermore, both place attachment and tested waterboard knowledge are associated with higher trust in the waterboards (2021). The results in the literature about age and political trust are just as elusive. The age of an individual might affect political trust, however, the difference in political events and economic success are hard to disentangle (Schoon and Cheng, 2011). (Schoon and Cheng, 2011) Therefore, people might research how certain periods have shaped trust in politics instead of the effect that age has on trust in politics. Dalton (2005) supports the idea that the effect of age on political trust is hard to disentangle from other factors. However, he contrasts Schoon and Cheng (2011) by stating it is not the failures or successes of a government that shape trust. It is the expectations groups of different age cohorts have of the government (2005). For example, the rise in participatory governance (2005). This showed a more critical view of governing being solely in the hands of the government (2005). While age is disputed when discussing trust, it is still important to look into it because age is associated with higher trust in

maintaining surface water quality (Voogd et al., 2021). Furthermore, age was also researched in previous research trying to find determinants for trust in the water board groups (Vollaard *et al.*, 2021; Voogd et al., 2021).

The main variables from the theoretical framework for predicting trust in the water boards are income, age, gender, education and flood risk. These are the variables that will be used in this research. It should be acknowledged these are not the only determinants for trust in the water boards. Still, the abovementioned variables are the ones that will be used in my research.

The most relevant literature is visualised in Figure 1. Trust in the waterboards is shown on the right. On the left attitude towards sustainability is measured in two key ways. At the bottom control variables which are not the focus of the research but also are likely to influence trust in the water boards.

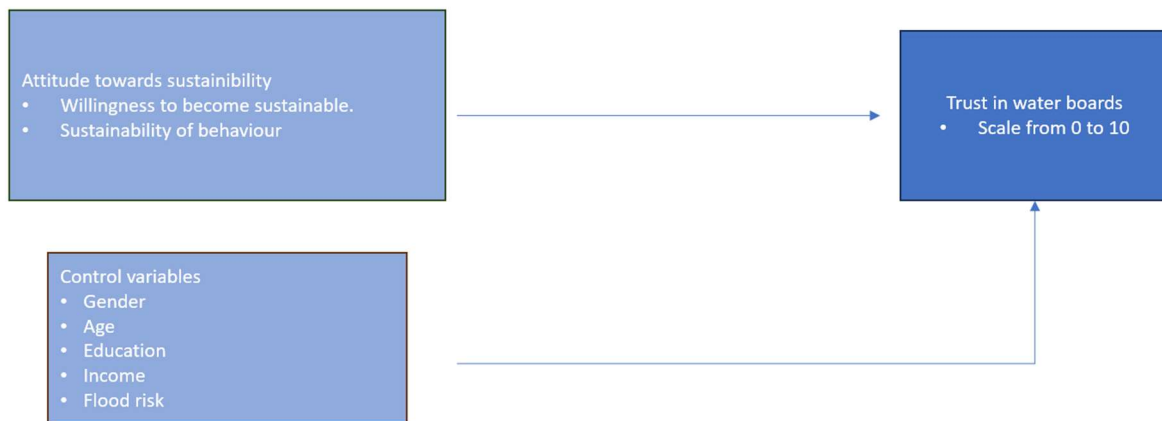


Figure 1: Conceptual model

Hypotheses/Expectations.

H 1 A more supportive attitude towards sustainability increases the trust in the water board’s flood protection.

This hypothesis is from combining the findings from multiple articles. The first two articles found that civic morality was related to political trust (Lim and Moon, 2020; Lim and moon 2022). Civic morality is the willingness to abide by social norms for communal causes like combating climate change (Lim and Moon, 2020; Lim and moon 2022). When researching trust in the waterboards this civic morality will be measured in two ways. First, the willingness to sacrifice things for the sake of sustainability, based on research from de Silva and Pownall (2012). Second, asking more specifically if their behaviour is sustainable based on research from (CBS, 2021).

## Methodology

This research attempts to determine if there is a causal relationship between attitude towards sustainability and trust in the flood protection of the water boards. In this explanatory research, primary quantitative data will be analysed using multiple linear regression. The data in this study has been collected using a survey made for this study in the municipality of Heerenveen. This municipality is part of the water board ‘Wetterskip Fryslan’. Participants have to be residents of the municipality of



Heerenveen, as residency is required for the right to vote for the regional water board. Contrary to previous studies which used data from all the water boards of the Netherlands (Vollaard et al., 2021; Voogd et al., 2021). The questions of this survey can be found in the Appendix A. As shown in Figure 2, approximately half of this municipality is at risk of flooding because the land is below sea level. A minimum age of 18 was required for participation like a previous study about trust in the water boards, which is the youngest age people are allowed to vote for the water boards (Vollaard *et al.*, 2021). The sampling methods used were random sampling and snowball sampling. Random point sampling was done by surveying passersby in Akkrum, Heerenveen and Nieuwehorne. Snowball sampling was done by sending the survey to close friends and families and asking them to send the survey to anyone living in the municipality of Heerenveen.

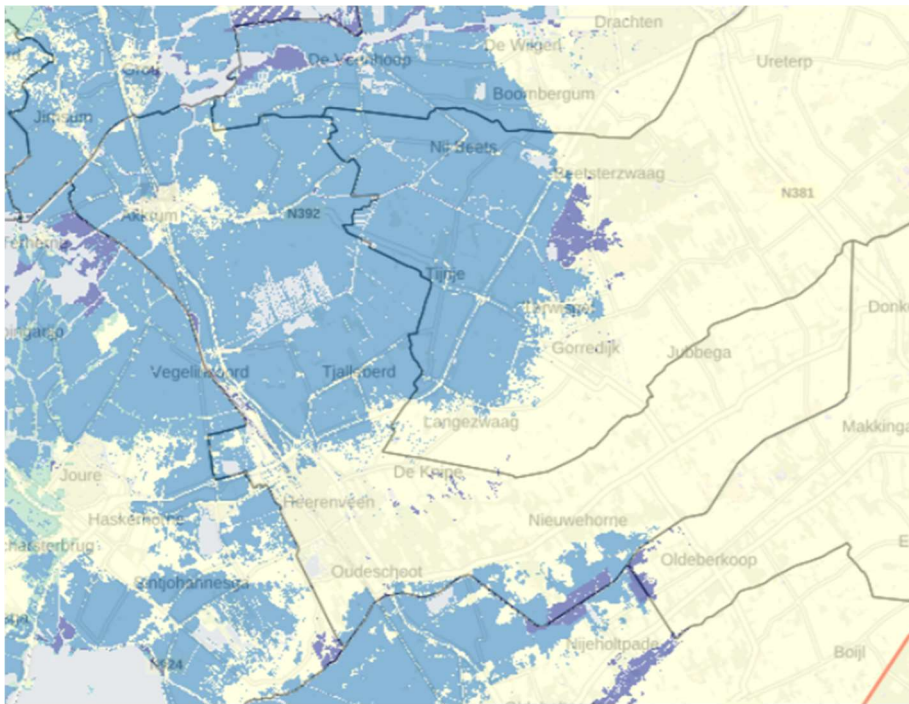


Figure 2: Flood risk map (Atlas Leefomgeving, 2022)

The variable ‘trust in the water board’s flood protection is studied as the dependent variable. The variable is based on a Likert scale previously used in a study about trust in the water boards (Voogd et al., 2021). This number is based on participants rating their trust in the water boards on a scale from 0 (meaning the absence of trust in the water boards) to 10 (meaning complete trust in the water boards). The variable is treated as a quantitative, continuous variable. Although it could be argued the variable has characteristics of a categorical value, it is a common approach to trust in the waterboard research boards (Voogd et al., 2021). Table 1 shows the descriptive statistics of the data collected. The mean of the trust in the waterboard’s flood protection, is around 7,51 which is similar to the 7.6 mean measured. The standard deviation is a little bit lower in my dataset being 1.147 and being 1.42 in the study from Voogd et al., (2021). This means there is a smaller variance in my data set which means my data is more centralised to the mean than previous research. Table 2. Shows the summary statistics of this variable.

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Trust in the water board's flood protection on a scale from 0 (none) to 10 (full) Dependent variable	81	6.00	4.00	10	7.51	1.147
Willingness to sacrifice things in your life for the sake of sustainability on a scale from 0 (none) to 10 (full)	81	9.00	0.00	9.00	6.12	1.855

Table 1: Descriptive statistics

	Frequency	Percentage	Cumulative Percentage
0.00	0	0	0
1.00	0	0	0
2.00	0	0	0
3.00	0	0	0
4.00	1	1.2	1.2
5.00	4	4.9	6.2
6.00	6	7.4	13.6
7.00	29	35.8	49.4
8.00	26	32.1	81.5
9.00	13	16.0	97.5
10.00	2	2.5	100
Total	81	100	100

Table 2: Summary Statistic Trust in the Water Board's Flood Protection (dependent variable)

The features that will measure the independent variable's attitude towards sustainability are willingness to sacrifice, Meat eating, domestic heating, showering, driving, importance of durability. Table 3 shows the frequency of these variables. The willingness to sacrifice things for a communal cause such as combating climate change.

Variable	Category	Frequency	Valid Percentage	Cumulative Percentage
Willingness to become Sustainable	0.00	2	2.4	2.4
	1.00	1	1.2	3.7
	2.00	0	1.2	4.9
	3.00	4	4.9	9.8
	4.00	3	3.7	13.4
	5.00	11	13.4	26.8
	6.00	21	25.6	52.4
	7.00	21	25.6	78.0
	8.00	15	18.3	96.3
	9.00	3	3.7	100.0
Meat eating	10.00	0	0	100.0
	Total	81	100.0	
Meat eating	7 days per week	14	18.3	18.3

	5 to 6 days per week	39	47.6	65.9
	1 to 4 days per week	22	26.8	92.7
	Never	6	7.3	100.0
	Total	81	100.0	
Domestic Heating	Increase domestic heating	23	28.0	28.0
	Putting on warm clothes	58	72.0	100.0
	Total	81	100	
Showering	5 minutes or longer	49	59.8	59.8
	Less than 5 minutes	33	40.2	100.0
	Total	81	100.0	
Driving	Drives short distances often	35	43.8	43.8
	Rarely drives short distances	26	32.5	66.3
	Does not drive	19	24.4	100.0
	Missing	1		
	Total valid	80	100.0	100.0
Importance of durability	Not Important	75	8.5	8.5
	Important	7	91.5	100.0
	Total	81	100	

Table 3: Frequency table independent variables

In the dataset ‘Willingness to sacrifice ’ means the ‘willingness to sacrifice things in your life for the sake of sustainability on a scale from 0 (no willingness) to 10 (complete willingness)’. This variable for the concept of attitude towards sustainability has been used before (De Silva and Pownall, 2012). This measurement gives people room to interpret their attitude towards sustainability (2012). The mean for ‘willingness to sacrifice’ was similar to the results from De Silva and Pownall (2012). Table 1 shows the mean in my data set is 6.12, and the mean in previous research is 6.047 (2012). This means my sample is marginally more willing to sacrifice things for the sake of sustainability.

The variables from Table 3: Meat eating, domestic heating, showering, driving and importance of durability are all variables based on a survey from CBS (2021). This measurement gives people less room to interpret their attitude towards sustainability. In these variables, their attitude towards sustainability is measured by how sustainable their behaviour is.

For example, eating meat is considered unsustainable behaviour (2021). The more it is done by an individual the less sustainable their behaviour is (2021). For the multiple linear regression, this variable has to be transformed into a dummy variable. The categories ‘7 days per week’ and ‘5 to 6 days per week’ will be combined into the category ‘eats meat more often’. Categories ‘1 to 4 days per week’ and ‘never’ will be combined into the category ‘eats meat less often’. These two categories will be combined into dummy variables. A summary of the coding of all the variables can be found in Appendix B. In the survey from CBS (2021) increasing domestic heating instead of putting on warm clothes is considered unsustainable behaviour. This is true assuming this is not done by green energy sources or climate-neutral technologies (2021). Because this variable is binary no dummy variable has to be created. Showering uses clean and often warm water, which makes showering longer durations less sustainable (2021). Driving emits carbon emissions, and driving short distances is therefore a choice which is more unsustainable than cycling and walking (2021). Therefore participants were

asked how often they drove distances that were shorter than 5 km. People who drove short distances more than once a week were categorised as ‘drives short distances often’. People who drove short distances once or less a week were categorised as ‘rarely drive short distances’. For the multiple linear regression, this variable has to be transformed into a dummy variable. ‘drives short distances often’ will become ‘commutes unsustainably often’. The categories ‘rarely drives short distances’ and ‘does not drive’ will be combined into the category ‘commutes sustainably often’. The durability of products reduces the need for frequent replacements and reduces waste (2021). This variable is measured by asking if people find durability in clothing important. Only 7 people did not find the durability of clothing important. Because of this low number of people that answered ‘not important’ I have decided to remove this variable from the regression.

The variables gender, income, education level, age and flood risk are all the control variables in the data set Table 4 describes the frequency of these variables. Two models will be run in this research. Model 1 will just have independent factors and the control variables will be added in Model 2. For the research, the variable gender is divided between men and women, just like in previous studies about trust in the waterboards (Vollaard *et al.*, 2021; Voogd *et al.*, 2021). It has to be acknowledged that gender is a social construct and should not be mistaken for biological sex (McDermott and Jones, 2022). Nevertheless, this research measures gender as a binary since gendered personality is highly associated with biological sex (2022). Furthermore, biological sex does affect risk perception and therefore trust in the waterboard’s flood protection (Irwin *et al.*, 2015; Voogd *et al.*, 2021). ‘Income in euros’ is measured on an ordinal scale based on 3 categories. Each answer represents annual net income levels of standardised annual income that are approximately 33% of the working Dutch people (CBS, 2023). ‘Age’ is measured by the years people have been alive. A more extensive version of the frequency table can be found in Appendix B. The variable age is heavily skewed towards younger ages, as Table 4 shows that 35.8% of the participants are 18 to 21 years old. This, however, should not influence the results of the research because age is not a predictor variable and will be accounted for in the regression. Education levels are measured by the Dutch education level that has been achieved most recently. Vollaard *et al.*, (2021) stated that people with a higher education level could have higher trust in the waterboards due to their higher tested knowledge. Therefore, ‘HBO/ WO’ will be compared with the other categories which will be transformed into one variable called lower education. Flood risk is also associated with trust in the waterboards, the variable measures if someone lives in a flood-risk area or not using the map in Figure 2. My dataset only contains 5 cases of people living in flood-risk areas. This variable will still be used in model 2 because contrary to the variable ‘importance durability’ it does not measure a concept central to the aim of the research.

Variable	Category	Frequency	Valid Percentage	Cumulative Percentage
Gender	Man	32	39.5	39.5
	Woman	49	60.5	100.0
Total		81	100.0	
Income in euros	Less than 24 000	36	49.3	49.3
	24 000 to 36 000	21	28.0	77.3
	More than 36 000	17	22.7	100
	Does not know or missing	7	0.0	
	Total (valid)	74		
Age	18 to 21 years old	29	35.8	35.8

	22 to 50 years old	30	38.3	74.1
	51 to 77 years old	22	25.9	100
Total		81	100.0	
Education level	VMBO/ Practical education	2	2.5	2.5
	HAVO/ VWO	27	33.3	35.8
	MBO	23	28.4	64.2
	HBO/ WO	29	35.8	100.0
	Total	81	100.0	
Flood risk	Yes	5	6.5	6.5
	No	72	93.5	100.0
	Does not know	4		
	Total (valid)	77	100.0	

Table 4: Frequency table control variable

There are no ethical issues related to privacy since the survey does not enable the identification of participants. The survey will ask for the participant's consent with a consent form. This consent form can be found in the appendix at the start of the survey. The data will be stored on the UG network. The only people who have access to this data are me and my supervisor. This data will be deleted after completion of the thesis.

## Results

The assumptions for the multiple linear regression have been met. The tables that test for non-multicollinearity and homoscedasticity are in Appendix C. The threshold of 10.0 VIF has not been passed so no multi-collinearity has been found. Neither model 1 nor model 2 passed the z residual or z predicted value of minimum -3 and maximum 3.

Studying the determinants of trust in the water board's flood protection before adding control variables, 7.8% of the data can be explained by the set of independent variables as shown in Table 5. Table 5 also shows that model 2 can explain 13.8% of the data using the independent and control variables. This is expected as the R-squared value does not account for the diminishing returns of adding more variables to the model. However, the Adjusted R squared value is also higher in model 2 than in the model 1. Therefore model 2 is better than model 1 at explaining trust in trust in the water board's flood protection. The regression model from Voogd et al., (2021) had a higher adjusted R-squared value of 0.187. Model 1 uses a total of 80 cases, Model 2 uses a total of 77 while the model from Voogd et al., (2021) used a total of 2041 cases. The higher random sampling error of the dataset in this research could explain the difference in the adjusted R-squared value.

Table 6 and Table 7 show which of the independent variables are significant. It is important to understand that the dependent variable, 'trust in water board's flood protection', is a value from 0 to 10. A positive t-value means that a more positive attitude towards sustainability increases trust in the water board's flood protection. On the other hand, a negative value means that a more positive attitude towards sustainability increases the trust in the water board's flood protection. The independent with the highest significance. None of the independent variables have a lower value than 0.05 in the significance column. Therefore no independent or control variables were significant. The most significant independent variables will be discussed. However, no scientific statements can be backed up by using the statistical results in this research.

Model	R	R-Squared	Adjusted R-squared	Std. Error of Estimate
1	.290	.078	.017	1.1462
2	.371	.138	.028	1.13602
Difference	.081	0.60	.011	0.01018

Table 5: Model Summary Models 1 and 2

Model 1	Unstandardised Coefficient B	Std. Error	Standardised coefficient Beta	t	Sig.
Constant	7.655	0.525		14.576	< 0.01
Willingness to Become Sustainable	0.092	0.077	0.144	1.196	.235
Meat eating	-.074	.288	-.031	-.262	0.794
Domestic Heating	-.368	.290	-.145	-1.267	.209
Showering	-.390	.281	-.167	-1.390	.169
Driving	-.403	.276	-.164	-1.461	0.184

Table 6: Regression Model 1 (Dependent variable: ‘trust in water board’s flood protection’)

Model 2	Unstandardised Coefficient B	Std. Error	Standardised coefficient Beta	t	Sig.
Constant	7.870	1.453		5.415	< 0.001
Willingness to Become Sustainable	.094	.081	.149	1.165	.248
Meat eating	.017	.294	.007	.059	.953
Domestic Heating	-.347	.303	-.140	-1.143	.257
Showering	-.473	.316	-.204	-1.496	.139
Driving	-.186	.296	-.076	-.630	.531
Gender (Control)	-.470	.288	-.201	-1.630	.108
Income in euros (Control)	.320	.396	.140	.809	.421
Age (Control)	.011	.011	.162	.932	.355
Education (Control)	.061	.296	.027	.207	.837
Flood risk (Control)	-.105	.552	-.023	-.191	.849

Table 7: Regression model 2 (Dependent variable: ‘trust in water board’s flood protection’)

The most significant independent variable in models 1 and 2 is consistently ‘Showering’. The t value of ‘showering’ is -1.496. This means showering in shorter periods decreases the trust in the water boards. This would mean a more positive attitude towards sustainability would decrease trust in the water board’s flood protection. This contrasts the hypothesis based on the articles from Lim and Moon (2020, 2022). They found that abiding by social norms for communal causes can increase political trust (2020, 2022).

The t-values of the variable ‘willingness to become sustainable’ are consistently positive. This means a higher willingness to become could increase trust in the water boards. However, the variables that measure the sustainability of behaviour mostly have negative t-values. This difference between the t-values of ‘willingness to become sustainable’ and other variables that measure the concept of attitude

towards sustainability raises a question. Do willingness to become sustainable and the sustainability of an individual both measure attitude towards sustainability?

None of the control variables were statistically significant. The most significant control variable is gender. The result shows a negative t-value which means women are less trusting of the water board's flood protection than men. This is similar to the results from the literature (Vollaard et al., 2021; Voogd et al., 2021). The control variables 'education' and 'age' were consistent with the findings of other research (2021). However, the variables 'income in euros' and 'flood risk' show a divergence from the literature. Lower-income groups and people living in flood-risk areas show more trust in the water board's flood protection, contrary to the literature (Schoon and Cheng, 2011; Kettle, 2018; Voogd et al., 2021).

## Conclusion

In conclusion, this research aims to answer the question 'To what extent does attitude towards sustainability and demographic characteristics influence flood protection trust in the water boards?'. This is done by using multiple linear regression and interpretation of primary data collected in the municipality of Heerenveen. Several key findings have emerged.

Despite hypothesizing that a more supportive attitude towards sustainability would increase the trust in the water board's flood protection. The results do not show any statistically significant relationship between the independent variables (willingness to become sustainable, meat-eating, domestic heating, showering and driving) and the dependent variable (trust in water board's flood protection). This means that within the parameters and methodology of this research, there is no statistical evidence that attitude towards sustainability can significantly predict trust in the water board's flood protection.

The strength of this research is the collection of data tailor-made for this research. However, it is important to stay critical and evaluate the weaknesses of this research. The data set is also more geographically focused than previous studies.

The biggest weakness of this research is the sample size. Although the collection of primary data took several months, the data set contains answers from 81 participants. This is a very low number of observations compared to the data set from Voogd et al., (2021) which contains 2041 cases. This low number is the reason for low adjusted R-square values. This could be because the number of cases is low compared to the number of variables in the model. Despite this, the adjusted R-square value increased when control variables were added.

A second weakness of this research is the low knowledge of the participants. The participants who were surveyed in person acted indifferent or ignorant of the water board's activities. This means that rating their trust in the water board's flood protection may have been done without being properly informed.

A third weakness is the focus on quantitative data alone. A mixed-method approach could find information that cannot be collected quantitatively.

While the current study found no statistically significant relationship, it contributes to the broader body of literature by emphasizing the complexity of trust in the water boards and other governmental bodies. Future research could benefit from using a mixed-method approach to study trust in the water boards. This could give a more comprehensive understanding of the complexity of trust in governmental bodies by using the strengths of quantitative and qualitative research.

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## Appendices

### Appendix A

#### Survey (translated)

What is your gender?

- Man
- Woman
- Other

How old are you?

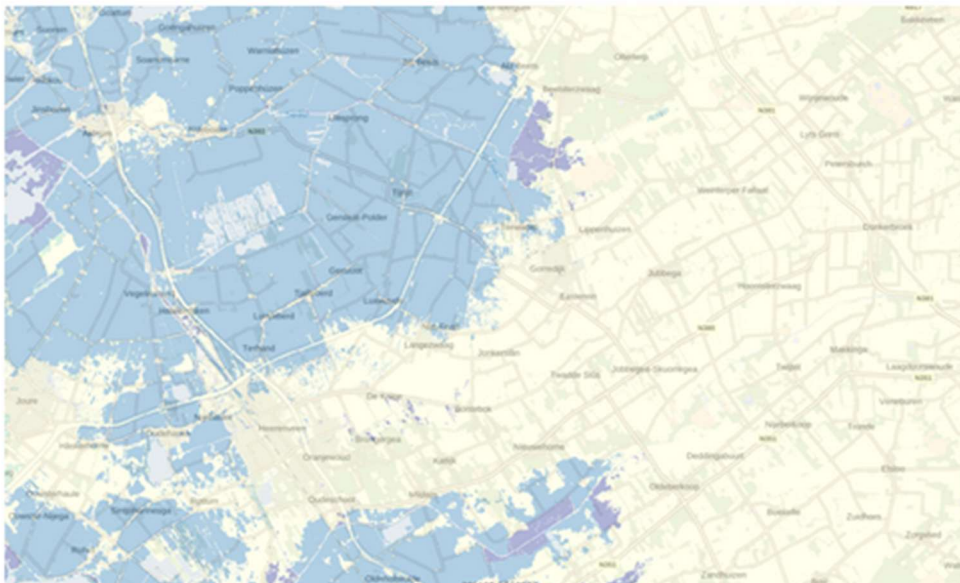
What is your annual net income?

- Less than 24 000
- Between 24 000 and 36 000
- More than 36 000
- I do not know

What is your most recently achieved education level?

- VMBO/ Practical Education
- HAVO/ VWO
- MBO
- HBO/ WO

Do you live in a flood-risk area?



- Yes
- No
- I do not know

How would you rate your trust in the water board's flood protection? On a scale from 0 (no trust) to 10 (complete trust).

0	1	2	3	4	5	6	7	8	9	10

What do you do more often when it is cold at home?

- Putting on warm clothes
- Increase domestic heating

How long do you shower?

- Shorter than 5 minutes
- Longer than 5 minutes

If u drive, which description describes you the best?

- I drive distances of 5 km or shorter more often than once a week
- I drive distances of 5 km or shorter less often than once a week
- I do not drive

Do you find the durability of clothing important?

- Yes
- No

How would you rate your willingness to sacrifice things for the sake of sustainability? On a scale from 0 (no willingness) to 10 (complete willingness).

0	1	2	3	4	5	6	7	8	9	10
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Appendix B

	Value	Category	Meaning
Meat eating	0	Eats meat often	Eats meat 5 to 7 days per week
	1	Eats meat less often	Eats meat 0 to 4 days per week.
Domestic Heating	0	Increase domestic heating	Increases domestic heating when it is cold inside
	1	Putting on warm clothes	Puts on warm clothes when it is cold inside
Showering	0	5 minutes or longer	Showers less than 5 minutes per session
	1	Less than 5 minutes	Showers more than 5 minutes per session
Driving	0	commutes sustainably often	Drives a distance shorter than 5 km more often than once per week
	1	commutes unsustainably often	Drives a distance shorter than 5 km less than twice per week or never drives
Gender (Control)	0	Man	Man
	1	Woman	Woman
Income in Euros (Control)	0	High income	Has a standardised net household income higher than 24 000 euros per year
	1	Low Income	Has a standardised net household income lower than 24 000 euros per year.
Education (Control)	0	Lower education levels	VMB/ Practical Education/ MBO/ HAVO/ VWO
	1	Higher education levels	HBO/ WO
Flood risk (Control)	0	Yes	Does live in a flood risk area
	1	NO	Does not live in a flood risk area

Table 8: Summary of how variables are coded

Age	Frequency	Percentage	Cumulative Percentage
18	5	6.2	6.2
19	4	4.9	11.1
20	11	13.6	24.7
21	9	11.1	35.8
22	5	6.2	42.0
23	3	3.7	45.7
27	1	1.2	46.9
29	1	1.2	48.1
30	1	1.2	49.4

31	1	1.2	50.6
32	1	1.2	51.9
35	2	2.4	53.1
36	3	3.6	55.6
37	3	3.6	59.3
40	2	2.4	61.7
41	1	1.2	63.0
42	1	1.2	65.4
44	1	1.2	66.7
45	1	1.2	67.9
46	1	1.2	69.1
47	1	1.2	70.4
48	1	1.2	71.6
50	1	1.2	72.8
52	2	2.4	74.1
53	1	1.2	79.0
54	1	1.2	80.2
55	1	1.2	81.5
56	3	3.6	85.2
58	2	2.4	87.7
59	3	3.6	91.4
63	2	2.4	93.8
66	1	1.2	95.1
69	1	1.2	96.3
71	2	2.4	98.8
77	1	1.2	100.0
Total	81	100.0	100.0

Table 9: Frequency table age (independent variable)

### Appendix C

	Variables	Collinearity Statistics
		VIF
Model 1	Willingness to Become Sustainable	1.187
	Meat eating	1.126
	Domestic Heating	1.063
	Showering	1.169
	Driving	1.027
Model 2	Willingness to Become Sustainable	1.242
	Meat eating	1.157
	Domestic Heating	1.132
	Showering	1.411
	Driving	1.102
	Gender (Control)	1.145

	Income in Euros (Control)	2.265
	Age (Control)	2.295
	Education (Control)	1.266
	Flood risk (Control)	1.085

Table 10: Collinearity statistics model 1 and 2 (The threshold is 10.0 VIF)

		Minimum	Maximum
Model 1	Standardised Predicted value	-1.941	-1.942
	Standardised Residual value	-2.585	2.067
Model 2	Standardised Predicted value	-2.010	2.193
	Standardised Residual value	-2.463	1.926

Table 11: Residual statistics model 1 and 2 (Threshold of minimum -3.0 and maximum 3.0)