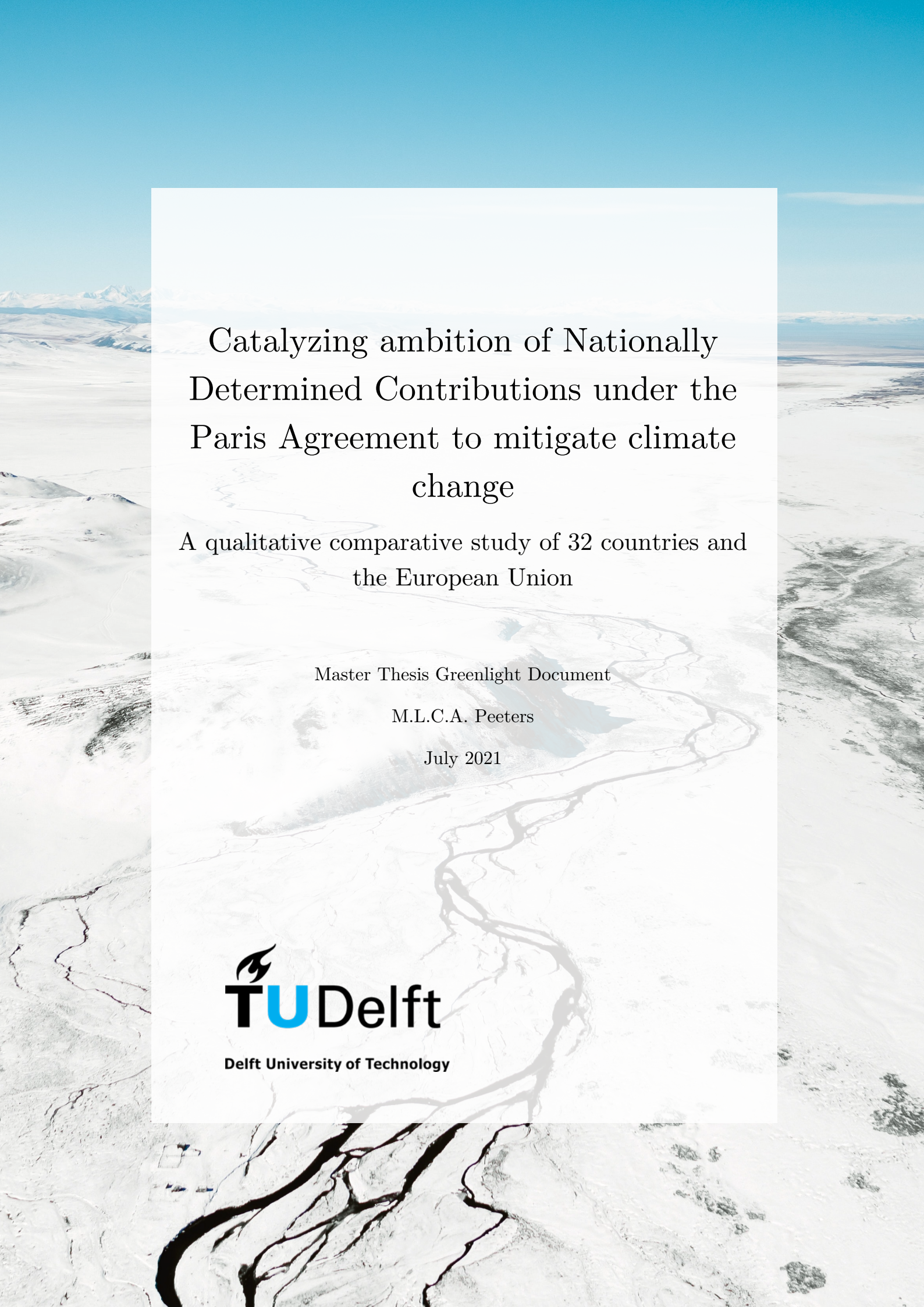

Catalyzing ambition of Nationally Determined Contributions under the Paris Agreement to mitigate climate change

A qualitative comparative study of 32 countries and the European Union

Master Thesis Greenlight Document

M.L.C.A. Peeters

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Menthe Liesbeth Catharina Anna Peeters

439622

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Graduation committee

First supervisor (Chair): Dr. Thomas Hoppe

Second Supervisor: Prof. dr. Kornelis Blok

Advisor: Dr. Nihit Goyal

Executive Summary

On December 12, 2015, at the 21st session of the Conference of the Parties, 195 countries adopted the Paris Agreement (PA) to address climate change and its negative impacts, with the goal of limiting human-caused climate change to slightly less than 2°C, preferably 1.5°C, from pre-industrial levels (United Nations, 2015). From that point on, these countries were expected to share their own mitigation and adaptation plans, which are known as their Nationally Determined Contributions (NDCs). Parties were asked to resubmit the next round of NDCs by 2020, and every five years thereafter (United Nations Climate Change, 2021). The new NDCs should go beyond the commitments made in the previous cycle and reflect the "highest possible ambition" (UNFCCC, 2015). However, there are significant differences in the level of ambition between countries' NDCs (Tobin, 2017), leaving room to reflect on why some countries have included more ambitious mitigation targets in their pledge compared to others. A literature review revealed two gaps, whereby further research on NDC ambition should focus on comparing countries at the global level (first gap), while considering combinations of influencing national factors (second gap). There is a multitude of national factors that influence NDC ambition. Hall's (1997) "Ideas, Interests and Institutions framework", serves as a theoretical checklist in policy making (Walt et al., 2008), and is used to organize the variables. Based on recommendations from previous research (van Coppenolle, 2002; Lamb & Minx, 2020), a fourth " societal" category was added to the framework. The main research question is therefore: *How can national conditions (ideas, interests, institutional or societal) explain the presence or absence of ambition in a country's Nationally Determined Contribution under the Paris Agreement?*

The aim of this study was to explore what combination of national conditions influence the ambition of NDCs submitted to the PA and therewith, being able to provide recommendations for national policymakers, decision-makers and more specifically the governing bodies of the Conference of the Parties (COP), who are the decision-makers of the UNFCCC, seeking to understand collective progress. Firstly, to identify the most relevant national conditions that affect NDC ambition, a desk study was performed. This led to the identification of six national conditions in total. The national conditions selected and analyzed in this research were corruption, democracy, individualism, dependency on natural resources, vulnerability to climate change and a country's wealth. In this report, an NDC was considered ambitious if the pledges were consistent with a fair share effort to hold warming below 2°C. In contrast, an NDC was considered unambitious if the commitment was inconsistent with a fair share effort to hold warming below 2°C. A fair share effort is based on what a country its total contribution would need to be to implement the PA. In total, the ambitiousness of NDCs of 32 countries and the European Union have been compared, which together account for 80 percent of global emissions (CAT, 2021).

As a main method, it was decided to apply a fuzzy-set Qualitative Comparative Analysis (fsQCA). fsQCA is a configurational approach, which considers the possibility that NDC ambition is the outcome of a combination of factors as opposed to the sum of net effects (Ragin & Fiss, 2008). This method is selected as a main method over other statistical approaches, such as regression analysis, because NDC ambition is a complex issue for which it is assumed that the conditions do not act independently of each other. However, to check whether this assumption is correct, and to see whether a statistical approach might give additional insights, a series of bivariate correlation analyses have been performed as well. In addition, two semi-structured interviews were conducted to verify that the results were valid. The two interviewees have been selected and approached based on their expertise on subjects

related to the comparison of national climate commitments and their expertise on which factors explain their success and the lack thereof.

The results of the fuzzy-set Qualitative Comparative Analysis and the correlation analysis have been combined and provided insights into why certain countries submit ambitious NDCs, and why other countries submit non-ambitious NDCs. In total one configuration is obtained that is sufficient in explaining the submission of ambitious NDCs, and four configurations are obtained that is sufficient in explaining the submission of non-ambitious NDCs. With fsQCA, a configuration is a set/combination of conditions that explains a certain outcome. It is found that the combination of not being dependent on natural resources and being vulnerable to climate change is sufficient to explain the submission of ambitious NDCs. When such a country also has a low gross national income (GNI) and is corrupt, there is an even greater likelihood that the submitted NDC is ambitious. Regarding the submission of non-ambitious NDCs, it is found that being dependent on natural resources and/or not being vulnerable to climate change is sufficient to explain the submission of non-ambitious NDCs. When a country presents either one of these two factors, it is already adequate to submit an unambitious NDC. Besides these (core) conditions, the chance of submitting an unambitious NDC is even greater when the society of a country is rather collectivistic, meaning people easily sacrifice individual benefit for the success of a group. It was more difficult to draw general conclusions regarding the effect of GNI or corruption. The fuzzy-set Qualitative Comparative Analysis showed that the obtained configurations are sufficient, but not necessary to occur. In general, this means that knowing the configuration to be true, is adequate grounds to conclude that the outcome (NDC ambition) is true; However, knowing that the configuration is not to be true does not necessarily mean that the outcome (NDC ambition) is not true. This highlights the need for good governance, monitoring and decision-making processes. Additionally, in 2023, the global stock take will take place, in which the collective progress made towards achieving the long-term goals of the Paris Agreement will be assessed. The aim of the global stock take is to become a driver of ambition.

Based on the findings of this research, recommendations for policymakers and decision makers have been established. The recommendations are of interest to all climate policy and decision-makers, but perhaps even more so to the governing bodies of the COP, who are the decision makers of the UNFCCC. The first recommendation is based on the finding that five different sufficient configurations have been identified, which shows the need for tailored strategies. For example, specific taxes can be introduced for countries that are highly dependent on natural resources, making it less attractive to show little ambition in their NDCs. The second recommendation is to emphasize just transitions principles. This recommendation is based on the finding that GNI plays an ambiguous role, and that countries with ambitious NDCs set unrealistic goals in the hope to receive financial support. Policymakers and decision-makers should focus on achieving an equitable transition, addressing country-specific challenges, and sharing the benefits of achieving PA equitably. This implies a fair distribution of both the expenses and the gains. The third recommendation is the use of iterative risk management. This recommendation is based on the finding that being vulnerable to climate change is a prerequisite for submitting ambitious NDCs. It is likely that more countries will become vulnerable to the climate as global surface temperatures rise. Iterative risk management is a framework for making decisions in such complex contexts that are marked by large potential impacts, long timeframes, and multiple climatic and non-climatic influences that change over time. Evaluating a wide range of potential impacts is critical to understand when submitting NDCs.

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M.L.C.A. Peeters

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List of Abbreviations

CAT	Climate Action Tracker
COP	Conference of the Parties
COP21	21st session of the Conference of the Parties
COR	Corruption
CoSEM	Complex Systems Engineering and Management
CPI	Corruption Perception Index
csQCA	Crisp set Qualitative Comparative Analysis
CVF	Climate Vulnerable Forum
DEM	Democracy
EU	European Union
ETF	Enhanced Transparency Framework
EUI	Economist Intelligence Unit
fsQCA	Fuzzy set Qualitative Comparative Analysis
GDP	Gross Domestic Product
GHG/GHGs	Greenhouse Gas(es)
GST	Global stock take
IND	Individualism
INDC/INDCs	Intended Nationally Determined Contribution(s)
IPCC	Intergovernmental Panel on Climate Change
NAT	Dependency on natural resources
NDC/NDCs	Nationally Determined Contribution(s)
NDGAIN	Notre Dame Global Adaptation Initiative Index
OLR	Ordinal Logistic Regression
PA	Paris Agreement
QCA	qualitative comparative analysis
TI	Transparency International
UAE	United Arab Emirates
UN	United Nations
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
USA	United States of America
VUL	Vulnerability to climate change

1. Introduction

This chapter contains the introduction to the research conducted. This research contributes to the literature on Nationally Determined Contributions (NDCs) submitted to the Paris Agreement (PA) and, more specifically, on how certain national factors might explain why some countries set more ambitious targets compared to others. Section 1.1 provides background information on the PA, NDCs and Climate Ambition. Section 1.2 defines the problem, and in section 1.3 the definition of NDCs, according to literature, is presented, and in section 1.4 the most important determinants of NDC ambition, according to literature, are presented. After which, in section 1.5 the main research question and the sub questions of this research are discussed. Section 1.6 presents the approach used to answer the research questions and in section 1.7 the social relevance, the policy relevance, and the link with the Master Complex Systems Engineering and Management (CoSEM) are discussed. Finally, the chapter finishes with an outline of the report in section 1.8.

1.1 Background

When it comes to problems of collective action, climate change is one of the most complicated and possibly the most urgent (van Coppenolle, 2020). Climate change has many different causes but is most related to the release of greenhouse gases (GHGs) caused by human activity (United States Environmental Protection Agency (EPA), 2021). Climate change is a global issue that crosses borders and therefore it needs coordinated solutions from all countries at all levels, as well as global cooperation to help countries move towards a low-carbon economy (United Nations , 2020). The PA embodies the third stage of the United Nations (UN) climate change regime. The first stage was the conceptualization of the United Nations Framework Convention on Climate Change (UNFCCC) (1990 to 1995), and the second stage is marked by the negotiation and enforcement of the Kyoto Protocol (1995 to 2004) (Bodanksy, 2016)

The Kyoto Protocol, adopted in 1997, was inspired by the Montreal Protocol, which to this day, is regarded as one of the most successful multilateral agreements ever (van Coppenolle, 2020). The Kyoto Protocol operationalized the UNFCCC by requiring industrialized states and transition economies to reduce GHG emissions according to agreed individual objectives (UNFCCC, 2008). Although this was the very first step in tackling global warming, criticism quickly arose. The agreement was binding, but lacked the threat of being enforced, leading to countries (e.g., Canada) withdrawing from the agreement when the targets could not be met. In addition, the general objective was questioned because it was not sufficiently science-based and overall insufficient to make a dent in global climate change, with some states easily reaching their targets with little difficulty (van Coppenolle, 2020). Another point of critique was the limited involvement, as only Annex I countries were involved, which excluded many large emitters of GHGs such as China, India, and Brazil. Ultimately, the protocol came to an end because negotiations on the mitigation burden were dominated by disputes (Falkner , 2016).

The establishment of the PA was considered the resolution of these conflicts and criticisms; a decentralized system with a low barrier for countries to participate and an ambitious goal. On 12 December 2015, at the 21st session of the Conference of the Parties

(COP21), 195 countries adopted the PA to address climate change and its negative impacts. The overall goal of the PA is to limit human-induced climate change to just below 2°C, preferably 1.5°C, from pre-industrial levels in this century (United Nations, 2015). To date, 197 countries have signed the agreement and 191 countries, including the European Union (EU), have ratified it (United Nations Climate Change, 2021). All these countries are expected to share their own mitigation and adaptation plans, known as their Nationally Determined Contribution (NDC).

Prior to COP21, states have been asked to submit their Intended Nationally Determined Contributions (INDCs). Since most countries ratified the agreement, most of these INDCs automatically became NDCs. Some countries however submitted an NDC other than their INDC to update their targets, define their intentions more detailed or sometimes to reduce their level of ambition (United Nations Treaties Collection, 2020) (Bodanksy, 2016) A minority of countries chose not to convert their INDC (e.g., the Philippines) or have yet to ratify the agreement (e.g., Turkey, Libya or Yemen) (United Nations Treaties Collection, 2020). With an NDC, a country outlines and presents its climate actions for the period after 2020 (United Nations Climate Change , 2021). Collectively, these climate pledges shape whether the world will meet the long-term aim of the PA by the end of this century.

The PA acknowledges that long-term objectives can only be achieved over time, and therefore builds on increasing aggregate and individual ambition over time (United Nations Climate Change , 2021). The PA operates on a five-year cycle of progressively more ambitious climate actions implemented by parties. Parties have been asked to resubmit the next round of NDCs (new or updated) by 2020, and every five years thereafter (United Nations Climate Change , 2021). The new NDCs must go beyond the commitments made in the previous cycle and reflect the “highest possible ambition” (UNFCCC, 2015). The preparation as well as the implementation process of the NDCs is predicted to step up countries' level of ambition incrementally, thus constituting the core of the realization of the PA's targets to limit the increase in global average temperature to slightly less than 2°C above pre-industrial levels and to pursue its efforts to reduce the temperature increase to 1.5°C above pre-industrial levels" (Article 2, UNFCCC, 2015). The aspiration levels in the first round of NDCs, though, were found to be inadequate to meet the PA's long-term goals, instead setting the world on a path to a pre-industrial global warming of approximately 2.7°C (Höhne, et al., 2017; Rogelj, et al., 2016)

1.2 Problem Definition

"Ambition can be seen as the 'boon and bane' of the Paris Agreement" (Streck , 2020, p. 144). The agreement stands or falls on the ability of countries to raise their ambitions and their contributions to limit global warming. However, by its design, the PA has little control over this ambition. Due to the high level of participation and the subtle distinction between developing and developed countries, the actual output of the PA is limited to the pledges made by the parties themselves (Rajamani, 2016). The UNFCCC (2021) released a synthesis of ambition for climate action as reflected in countries' new or updated NDCs, indicating that all countries would need to double their climate action commitments if they were to meet the PA target of limiting the global temperature increase to 2°C by the end of this century. The report covers NDCs submitted up to 31 December and includes the

new and updated NDCs of 75 parties in total. According to the report, the new and updated pledges will reduce emissions by only about 2.8 percent extra, compared to the pledges these countries have submitted five years ago. In other words, the increased ambition of these 75 countries together, is roughly equivalent to 3 percent less emissions in total on the long term. To limit temperature change to 1.5 °C, the new or updated NDCs must reduce emissions by about 55 percent by 2030 compared to the original commitments (Fransen & Waskow, 2021). It must be noted that this UN report is not the complete image as only 75 countries were analyzed, and the total amount of countries that have endorsed the PA is 179. What the remaining countries do collectively in the coming months in the run-up to COP21 (November 2021) will be crucial.

At the heart of the problems surrounding international climate agreements and ambitious mitigation targets is the inherent difficulty of solving climate change, as well as the underlying problem of free riding on the provision of public goods (van Coppenolle, 2020). The PA has tried to address the problem of free riding with the establishment of the Enhanced Transparency Framework (ETF), which is designed to build trust and confidence that all countries are contributing their share to the global effort through a set of core arrangements regarding reporting, technical expert view and facilitative multilateral consideration of progress (UNFCCC, 2019). According to Keohane & Oppenheimer (2016), the bottom-up nature of the PA is to encourage countries to join, with the promise of being confidential and simultaneously provide vague instructions regarding the setting of their targets (ETF), after which the transparency framework allows naming and shaming to put pressure on countries to increase their ambition. Naming and shaming occur when certain actors publicly condemn others because they are doing something incorrectly. Nations may apply this strategy to climate change by blaming countries for violating their promises under the PA. Jacquet and Jamison (2016) called the potential for shaming laggards the soft but significant force of the PA, and Falkner (2016) considers the shaming to be the most important tool countries can use to encourage laggards to improve their game. In this way, the agreement seeks to counteract the trade-off between superficial agreements and high participation, as parties complicate and dilute negotiations (Tørstad, Sælen, & Bøyum, 2020). The "pledge and review" -approach permits countries to take an ambitious top-down approach, while considering their own contributions and national factors.

A key consideration remains whether the NDCs reduce GHG emissions. The NDCs are non-binding and there are no sanctions or retaliatory measures in case countries fail to meet them (Held & Roger, 2018). Only time will tell whether the 'naming and shaming', as mentioned earlier, and the 'pledge and review' approach will bear fruit. In 2023, the global stock take (GST) will take place (United Nations Climate Change, 2021). The GST is intended to assess the world's collective progress in achieving the agreement's goal. It will be a very important moment and serve several purposes: it will set the pace of the PA process, it will ensure accountability, while driving NDC ambition and providing direction for the entire process (Hermwille, Siemons , Forster, & Jeffery, 2019). The Intergovernmental Panel on Climate Change (IPCC) Special Report (2019) indicates that the world possesses the scientific insight, the technological capacity, as well as the finances to respond to climate change. However, they also mention that political will is needed to accelerate the unprecedented, coordinated actions needed to stabilize temperature rise. This clearly illustrates the issue; it is time to step up the challenge and increase ambition (Levin, 2018).

Significant differences exist in the level of ambition of climate policies between countries (Tobin, 2017). The United States, for example, is a lot less ambitious compared to the European Union (Skjærseth & Eikeland, 2013). Why are some countries more ambitious in their response to climate change compared to others? To gain an in-depth understanding of NDCs and their ambition, the purpose of this study is to analyze current NDC ambition and its national determinants to understand the extent to which NDC ambition can be explained by national determinants.

1.3 NDC AMBITION

The purpose of this section is to study the definition of NDC ambition according to previous literature and to identify a gap in knowledge.

Ambition can be seen as the prelude to policy outputs, for example in the form of legislation, which can result in policy outcomes or actual emissions reductions (Avrami & Sprinz, 2018). While some researchers prefer more obvious and reliable "dependent variables," such as actual emission reductions or total emission rates (e.g., Jahn, 2016), other researchers prefer policy outputs (e.g., Knill, Debus, & Heichel, 2010; Avrahmi & Sprinz, 2018). These socio-political variables are expected to affect mainly actual policy outputs, while environmental outcomes have more potential externalities, leaving more room for bias in the results. Climate ambition as such, is less frequently analyzed, although this does not diminish the overall value and validity of this analysis, since ambition is a crucial part of the PA.

In the existing literature, several researchers have examined NDCs. Some papers address the pledges from a particular perspective, e.g., a specific country or region. While other articles dealt with non-state and sub-national actions (Hsu, Brandt, Widerberg, Chan, & Weinfurter, 2019). Whereas the research of Jernnäs, Nilsson, Linnér, & Duit (2019) focuses on cross-national patterns of governance mechanisms in NDCs under the PA, Bel & Teixido (2020) look at the relationship between climate ambition and inequality, and Pauw (2019) looks at the role of conditionality in NDCs. Country or region specific analyses looked at Japan (Kuriyama, Tamura, & Kuramochi, 2019), countries that are part of the G20 (den Elzen, et al., 2019), the Annex II countries (Tobin, 2017), or the small island states of the Pacific (Michalena , Kouloumpis , & Hills , 2018). As little research has been performed comparing NDCs on a global level, including small, big, poor, and rich countries, the first scientific gap is revealed. Additionally, a second gap in science exists, namely, that the aforementioned studies only examine the individual relationships between factors and the NDCs, rather than looking at the effect of the combinations of factors with NDCs. Apart from the work of Tobin (2017), who assessed factors in combination that may explain policy variation among the Annex II developed states. As climate change is a complex issue, it is worth examining the relationship of factors combined, assuming interrelatedness between them. The absence of research into these two defined gaps provides a solid foundation for this research.

The motivation for analyzing NDC ambitions is that NDCs are a tangible form of climate ambition, or at least of participation in an international climate regime, covering all countries under the PA over a comparable period (van Coppenolle, 2020). An additional benefit of analyzing NDC ambition is that it overcomes one of the major misconceptions of most environmental policy research, which is generally limited to developed countries with

high GHG emissions (Pasgaard & Strange, 2013). Also, the NDCs are provided in a uniform context, with uniform expectations and uniform timelines. One limitation of the NDCs is the fact that not all contributors followed the same preparation process leading up to the publication of the NDCs. Some developing countries were pressured by developed countries to set more ambitious targets, which they may not ultimately be able to meet (Röser, Widerberg, Höhne, & Day, 2020). This problem regarding the context of the NDCs prior to submission is not the subject of this study, but it should be kept in mind when comparing the NDCs as there are varying backgrounds.

Ultimately, the PA is an experiment in global agreement making, from which many lessons can be learned about this approach to enforcement (van Coppenolle, 2020). Whether the approach is successful only time will tell, but uncovering which determinants influence countries' ambition levels is valuable, especially as the 2023 stock take is nearing (van Coppenolle, 2020), which has the objective to raise ambition by helping countries to identify the approaches that can be taken to enhance their efforts at international and national level (UNFCCC, 2020).

1.4 Determinants of NDC ambition

The purpose of this section is to bring together previous research on different determinants influencing NDC aspirations, and to further define the gaps in our knowledge.

Iacobuta, Dubash, Upadhyaya, Deribe, & Höhne (2018) identified two orientations in the field of international climate policy: i) examining national climate policy mechanisms and ii) research that seeks to explain the evolving nature of climate policy through time and jurisdiction analysis. This study can be categorized in the first orientation, as it focuses on comparative environmental policies and attempts to explain variances using national factors.

Other research within this specific orientation has considered the effect of state capacity on climate policy (Meckling & Nahm , 2018). Their study suggests that a critical component of state capacity is the division of labor between the bureaucracy and the legislature in policy design. In bureaucratic policy design scenarios, the legislature sets policy goals and then delegates policy design to the bureaucracies, shifting distributional disputes to independent bureaucracies, enabling effective policy design. Bel & Teixido (2020) assessed the effect of inequality on policy and found that low-income countries tend to be more ambitious in setting their goals when they receive external support, and Tobin (2017) focused on the governance of climate policy among Annex II developed countries. He found that the existence of a leftist government appears to be sufficient for ambitious climate policies, as does having a high Gross Domestic Product (GDP) per capita combined with strong ties to the European Union and limited political constraints.

In particular, the research of Lamb & Minx (2020) and the research of van Coppenolle (2020) are important to this study because they have established a foundation for further research. Lamb and Minx (2020) used a comparative political economic lens to identify national constraints that actively impede the progress of climate policy. Using cluster analysis, they identified common constraints for five different groups: i) oil and gas dependent countries, ii) countries vulnerable to climate change, iii) countries with a lot of coal-dependent development, iv) non-democratic countries, and v) wealthy OECD member

countries. Lamb and Minx (2020) further argue that little attention has been paid to both conceptual and methodological questions inherent in climate policy research and point to variables that could influence climate policy. The research of van Coppenolle (2020) did pay additional attention to these conceptual and methodological challenges. She found a significant correlation between climate ambition and a variety of eighteen variables such as median age of a population, environmental vulnerability, and GDP per capita, but recommends that attention also needs to be paid to notions of equity, such as the relationship with historical emissions or the ambition gap. Another recommendation is to reduce the number of variables in the study so that they can be analyzed more thoroughly.

This research is supported by these two studies and like these two studies, Hall's (1997) "Ideas, Interests and Institutions framework" is used to organize the variables and maintain structure. Moreover, it was decided to organize the variables according to this framework because it combines three of the most well-known factors on which the political science literature relies to understand the processes of policymaking. This framework argues that policymaking is influenced by the interests, ideas, and institutions of actors (Hall, 1997; Lavis, et al., 2002; Pomey, et al., 2010). It acts as a theoretical checklist, useful both retrospectively and prospectively to help understand past policy choices and plan for the implementation of policies in the future (Walt , et al., 2008), which is of value to this study when making recommendations to policy makers. This framework is further discussed in chapter two, where the theoretical framework is presented. Based on the recommendations of Lamb and Minx (2020) and van Coppenolle (2020), a category of social conditions is added, and particular attention is paid to the equity principles, while focusing on a limited set of variables.

1.5 Main research question and sub questions

The purpose of the study is to understand the extent to which NDC aspirations can be explained by a combination of national determinants. Based on the defined knowledge gaps, it can be concluded that no exploratory study has yet been conducted that considers the combined influence of 'ideas', 'interests', 'institutions' and 'societal' conditions of a country on NDC aspirations. Therefore, the main research question and the sub-research questions were formulated as follows:

How can national conditions (ideas, interest, institutional, or societal) explain the presence or absence of ambition in a country's Nationally Determined Contribution under the Paris Agreement?

1. What is considered an ambitious nationally determined contribution and what is considered a non-ambitious nationally determined contribution?

   The answer to this question explains the definition of the dependent variable of this study: ambitious NDCs and non-ambitious NDCs.

2. What are the national (idea, interest, institutional and societal) conditions that influence the NDC ambition?

   This question forms the theoretical framework for the study. The literature review suggests that national circumstances influence the ambition of NDCs. It has been found that Peter Hall's (1997) 'ideas, interests and institutions' framework can help to understand what circumstances may play a role.

3. What combination of national conditions explain the presence and/or absence of NDC ambition?

   This question established the solution pathways of the analysis by explaining what combination of conditions is sufficient or necessary to achieve a particular outcome.

4. How do individual national factors relate to whether a country is ambitious in terms of its NDC?

   This question is answered to determine if there is a relation between the national conditions and the outcome. The purpose of this question is to gather additional information about the conditions to gain deeper knowledge about the solution pathways obtained in the third sub question.

5. To what extent does the examination of conditions in combination provide a different or additional explanation for NDC ambition, compared to the examination of conditions separately?

   The purpose of this question is to combine the answers to sub-questions three and four, compare the results, and analyze the benefits and limitations of both approaches.

1.6 Approach

The purpose of this study is to explore what combination of national determinants influence the ambition of NDCs submitted to the PA and thereby answer the main research question. A configurational approach aids the objective of providing a detailed but interpretable view of the phenomenon (Harms, Kraus, & Schwarz, 2009) and considers the possibility that NDC ambition is the outcome of a conjunction of factors as opposed to the sum of net effects (Ragin & Fiss, 2008). The analytical method fuzzy-set Qualitative Comparative Analysis (fsQCA: see (Ragin, 2008)) is used to conduct a cross-country analysis with NDC ambition as the dependent variable and the chosen national determinants as independent variables (conditions). QCA is selected as a main method over for example regression analysis, because with a topic as complex as variation in NDC ambition, a single causal condition is rarely sufficient to explain the presence of a particular outcome. QCA has potential to provide evidence of causality in such complex systems, and it is increasingly used to evaluate the impacts of conditions on climate policy. QCA is suitable to identify multiple combinations of conditions that are sufficient for a given outcome. In regression, these interdependencies are usually modelled as interaction terms. However, these become increasingly difficult to interpret once the number of interacting variables exceeds one or

two (Fainshmidt, Witt , Aguilera, & Verbeke , 2020). Desk research is conducted to understand and decide which independent variables to include, while Peter Hall's (1997) 'ideas, interests and institutions' framework is used as an anchor. Hall's (1997) framework was chosen because it captures public policy development processes ((National Collaborating Centre for Healthy Public Policy (ncchpp), 2014)), one of which is the submission of NDCs to the PA. It brings together the most common factors that the political science literature focuses on in understanding public policy development processes.

The dependent variable includes 32 countries and the European Union that together cover about 80 percent of global emissions, including the large and small emitters, and developed and developing countries, making this a representative sample and it addresses the initial knowledge gap. In addition to the fsQCA, a complementary analysis and semi-structured interviews are conducted to supplement the findings and validate the results obtained, respectively. The study aims to provide recommendations for national policy makers, as well as for the governing bodies of the Conference of Parties (COP), who are the decision-makers of the UNFCCC, seeking to understand collective progress.

The nature of this research is a comparative explanatory deductive research; aiming to explain why the variation in NDC ambition occurs and to predict future occurrences. In general, configurational analyses do not lend themselves to prior hypothesis, as is especially possible when explicit individual connections between theoretical concepts are explored (Schneider & Wagemann, 2012, p. 296). Nevertheless, since the study is deeply rooted in connections between theoretical concepts, which draws on core concepts that have been found to be important determinants of NDC ambition in previous research, and because an additional complementary analysis that assesses the relationship of individual concepts and NDC ambition will be carried out, it is decided to establish hypotheses.

1.7 Relevance of research

In this section, the policy and social relevance of this research are presented, as well as the link between this research and the master's degree Complex Systems Engineering and Management.

1.7.1 POLICY AND SOCIETAL RELEVANCE

Agreements and negotiations on climate change have always been based on scientific data: the adoption of the PA in 2015 was due, in part, to the IPCC's Fifth Assessment Report, released a few months before COP21 (Ourbak & Tubantia , 2017). The end of 2020, the time when countries had to formally make more ambitious commitments, along with the GST taking place in 2023, will require further interaction between scientists and policymakers. This study proposes a helicopter perspective of the global emissions target, focusing on individual countries. The links and interactions between scientists and policy makers can be strengthened to help and encourage countries to make more ambitious commitments to reduce their emissions by putting science at the center of the transformation.

Climate change is not only relevant to policy, but also of great importance to society. Climate change can affect society through its impact on various social, cultural,

and natural resources. For example, climate change may affect human health, infrastructure, and transportation systems, as well as energy, food, and water supplies. It is likely that some groups will face greater challenges than others. To ensure that the world remains livable and to meet the PA target, it is essential that ambition is raised collectively by building social change from the bottom up.

1.7.2 Link to Complex Systems Engineering and Management

The thesis is aligned with the CoSEM master's degree because the emphasis is on environmental issues within the field of governance and management. The primary focus of the CoSEM curriculum is complex socio-technical systems. The complex socio-technical system analyzed for this thesis is global warming, with a special focus on NDC ambitions. Climate change is one of the most important but difficult challenges of our time. Analyzing mitigation efforts of climate change requires understanding of a complex system that links emissions from different sources, global governance, and the global nature of climate change. This complex system is a social system, as society is both the source and the solution to the problem. This complex system is also a technical system, as it relies almost entirely on (infra)structures of political governance to bring about change to reduce emissions and strengthen the NDC ambition.

1.8 Structure

A research flow diagram, including the outline of this research, is presented in Figure 1.8.1. Chapter two, the next chapter, presents the theoretical framework that guides the research. Chapter three discusses the research methodologies used and chapter four provides the results of the qualitative comparative analysis (QCA). Chapter five provides the results of the complementary analysis. The sixth chapter contains the validation of the results, which were obtained by conducting semi-structured interviews. Chapter seven concludes the report with the conclusion and discussion, including the limitations of this study and recommendations for future research and policy makers.

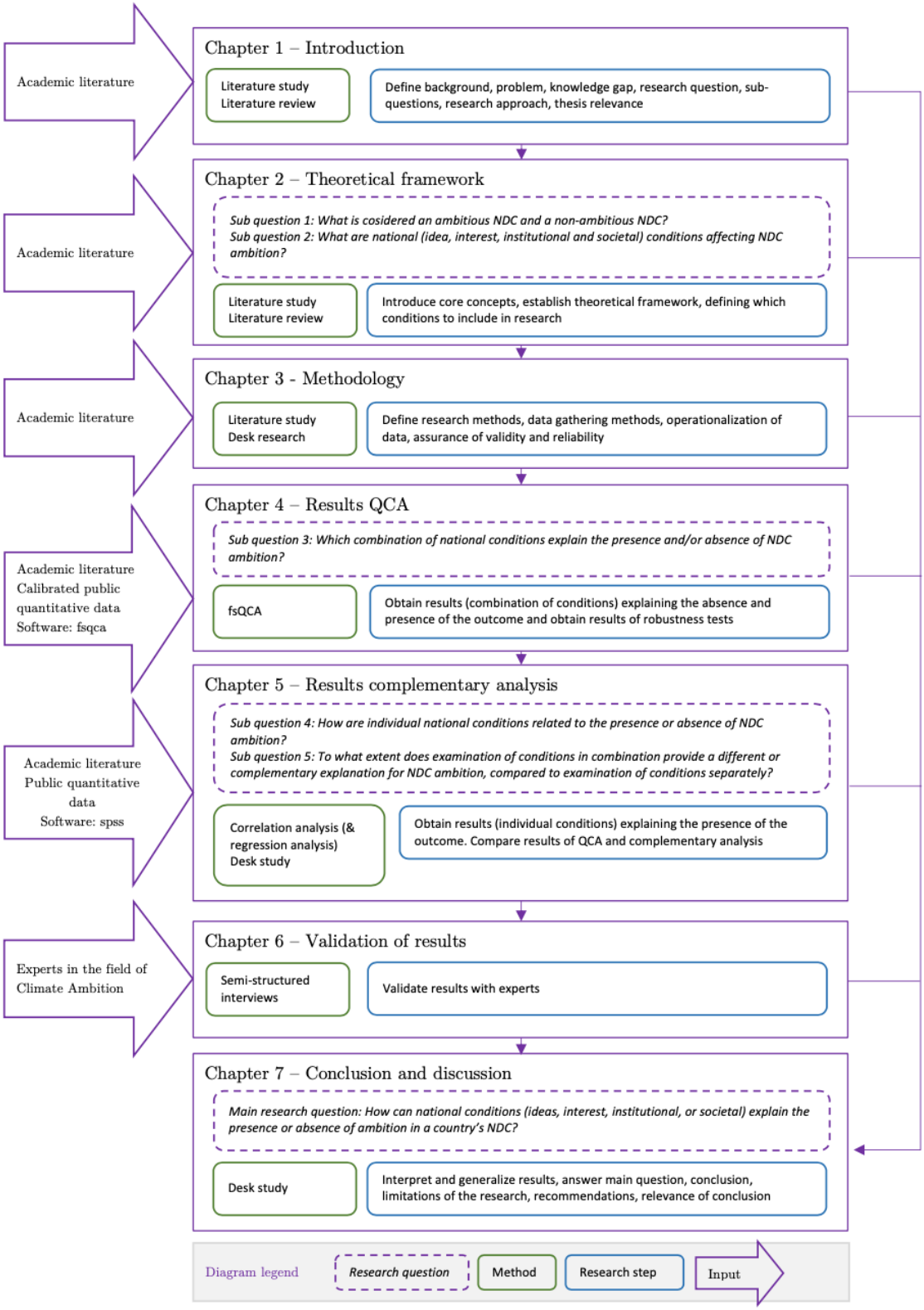

FIGURE 1.8.1 RESEARCH FLOW DIAGRAM

2. Theoretical Framework

This chapter provides a review of the literature that constitutes the theoretical framework. Section 2.1 provides a brief description of the dependent variable NDC ambition. As mentioned in the previous chapter, Peter Hall's (1997) "ideas, interests and institutions" framework is applied to organize the variables. Section 2.2 discusses the four (a new category is added) categories of the framework and the determinants that have been identified within each category.

2.1 NDC Ambition

As mentioned earlier, climate ambition is not often used as a dependent variable, as authors tend to focus on more "obvious" outcome variables. For example, Lamb & Minx (2020) opted against using climate ambition or using NDCs because of the heterogeneous nature of the outcomes of international agreements and the potential for discrepancies between a country's ambition and their actual actions. These concerns are valid, however, focusing on the mitigation goals formulated in the NDCs still provides some homogeneity in the dependent variable, as they serve the same purpose and are published in the same international environment which covers the aforementioned weakness. Yet, in addition to this research, there have been other studies that have used NDC ambition as the dependent variable, for example, the research of Tobin (2017), van Coppenolle (2020), or Röser, Widerberg, Höhne, & Day (2020). This research should be contextualized as a specific analysis of ambition within the PA. It is not intended as an assessment of the implementation of the pledges. The goal is to gain a better understanding of the drivers behind these targets and these pledges, which is of value given the importance of ambition in determining the success of the PA. Since the goal of the PA is to significantly reduce global GHG emissions to limit the global temperature increase this century to 2°C above pre-industrial levels, while pursuing measures to limit the increase to 1.5°C, an NDC is considered ambitious if the commitment is sufficient to contribute to achieving the goals of the PA. In contrast, an NDC is considered unambitious if the commitment is insufficient to contribute to the achievement of the PA targets. How this variable is quantified is explained in more detail in the next chapter.

2.2 The 'ideas, interests, and institutions' framework

Like the studies of van Coppenolle (2020) and Lamb & Minx (2020), it was decided to use the "ideas, interests and institutions" framework of Peter Hall (1997) to organize the variables for the QCA and to maintain structure in this study. QCA is an analysis of data that relies on set theory to examine the relationships of conditions with an outcome, describing the relationship in terms of necessary conditions and sufficient condition (Ragin, 2008). The methodology of this analysis will be further explained in the next chapter. Hall's (1997) framework was chosen because it captures public policy development processes ((National Collaborating Centre for Healthy Public Policy (ncchpp), 2014)), one of which is the submission of NDCs to the PA. It brings together three of the most common factors that the political science literature focuses on in understanding public policy development

processes. The framework argues that policy developments are influenced by the interests, ideas, and institutions of actors (Hall, 1997; Lavis et al, 2002; Pomey et al, 2010). It acts as a theoretical checklist, in addition to being useful retrospectively and prospectively to understand past policy choices and to plan for future policy implementations (Walt et al., 2008, p.308), which is valuable for this study. Hall states, "Policymakers typically work within a framework of ideas and norms that specifies not only the goals of policies and the types of instruments that can be used to achieve those goals, but also the very nature of the problems they are supposed to be addressing. Like a Gestalt, this framework is embedded in the terminology with which policymakers communicate about their work, and it is so influential precisely because much of it is taken for granted and cannot be critically examined." (Hall, 1997, p.297)

Gough (2008) converted the model into a somewhat simplified policymaking framework; the modified version is shown in Figure 2.2.2 Gough (2008) proposes to consider the interactions between ideas, interests, and institutions, as well as policy outputs (here: NDC ambition). As in this study, a fourth category of "societal" is added based on the work of van Coppenolle (2020) and the "economic, demographic, and social" changes that Gough (2008) mentions in his model. This category designates factors such as the technical, economic, and geographical factors of a country. It can be seen in Figure 2.2.2 that the framework is a network with categories and their relationships, indicating these categories are interdependent. A key difficulty of this framework is whether the categories exert an independent influence on policy output, or whether they are merely bystanders, mediators, or moderators of the relationship between one of the categories and policy output. (Shearer, Abelson, Kouyate, Lavis, & Walt, 2016). As in other studies of complex phenomena, this framework aims to shed some light on the observed phenomena, and because this study aims to assess the influence of conditions in combinations on NDC outputs, the categories are assumed to be interdependent of each other, making this specific framework an appropriate anchor for this study.

All the conditions analyzed in this study were classified into one of the four categories that make up the framework: i) ideas, ii) interests, iii) institutions, and iv) societal. Before addressing the conditions within each category that could affect NDC ambition, each category is briefly discussed.

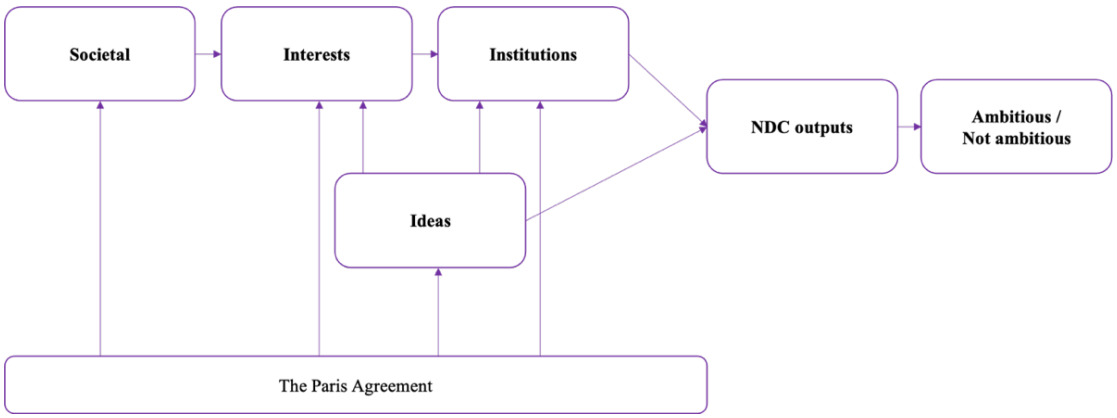

Figure 2.2.2 Simplfied model of the interaction between ideas, interests, and INSTITUTIONS (source: adopted from van coppenolle, 2020, p.13; gough, 2008, p.44).

2.2.1 Ideas, interests, institutions & Society

An idea-based analysis argues that the fundamental underlying perceptions of the world and its ideologies matter to different actors (Lamb and Minx, 2020). There are certain worldviews that can threaten political agreement on key policy issues, such as biases to rationalize the status quo (Jost, Belaji, & Nosek, 2004), or a growing distrust of "elites" such as academics and political figures (Lockwood, 2018). In addition to the voting public, the thoughts of influencing shareholders are critical to social and political transformation.

Interest-based analysis recognizes that social change materially affects various stakeholders, such as workers, the capitalists, and political figures. Such groups are actively involved in both social and political change and often form coalitions to advocate and push through common agendas (Lamb and Minx, 2020). Industries and energy interests tied to technology domains are of relevance to climate policy, as they wage political battles to prevent new entrants from entering the market or to impede the progress of regulations (Geels & Schot, 2007; Moe, 2015)

Institutional analysis is directed at the organizations and roles of the state. Typically, in political economy traditions, the state is viewed as having a pivotal role in establishing the framework conditions for social, political, and economic activities while simultaneously facilitating both markets and capital aggregation (Heilbroner, 1985). Understanding the limitations of structural change depends heavily on the quality of the institutions that perform the functions and their organizational forms (Roberts, et al., 2018)

As mentioned, based on the findings of Gough (2008), Lamb and Minx (2020) and van Coppenolle (2020), a fourth category "societal" was added. This category indicates factors such as a country's economic and technical resources, geographical factors that may affect the NDC ambition, such as vulnerability to climate change, etc. (van Coppenolle, 2020). This is a non-political category that delineates the boundaries of socio-political intervention (Gough, 2008; Lamb and Minx, 2020).

2.2.2 The determinants

This subsection identifies, based on literature review, the conditions that influence NDC aspirations. These conditions serve as inputs to the QCA, as well as the complementary analysis. Since QCA is the main approach used in this study, the specific QCA nomenclature will be used. Independent variables are referred to as causal conditions and the dependent variable is referred to as the outcome (Pappas & Woodside, 2021). Due to the time constraints of this study and the statement of Berg-Schlosser & de Meur (2009), who mention that QCA is designed for intermediate-N analysis and that "an intermediate-N analysis (10-40, in this study: 33) would consist of selecting four to six-seven conditions" (p.28), it is decided to focus on a total of six independent conditions, with at least one condition included in each category.

Ideas

Climate policy has been, for a lengthy time, a battle of ideas, with considerable debate over the existence, severity, and human-caused nature of climate changes (Lamb & Minx, 2020). It is often the case that when public opinion places a high value on the environment, the

more attention climate action and climate policy will receive from policy makers (Hughes & Urpelainen, 2015). Tjernström & Tietenberg (2008) research examines the relationship between individual attitudes and climate policy. Their research shows that attitudes towards climate change can indeed influence climate policy.

Previous research has identified circumstances at the individual level that may determine a person's beliefs and ideas about climate change. Much of this research is based on Inglehart's post-materialism theory (Inglehart , et al., 2014). For example, Booth (2017) his research found that if an individual identified as post-materialist, he or she considered the environment more important compared to individuals who did not identify as post-materialist. The theory that supports this finding is Maslow's hierarchy of needs. In this theory, personal and economic well-being allows individuals to shift their focus from economic and personal security to political and environmental protection (Mostafa , 2016). Thus, this is a condition that may affect public ideas about climate policy and thus the NDC ambition. However, as mentioned by Fairbrother, Sevä, & Kulin. (2019), the fact that one believes in climate change does not directly mean that one supports climate policy and thus subsequently results in ambitious' NDCs.

One further condition at the individual level is belief in a culture, which plays a crucial role in both climate change mitigation and adaptation (Adger, Barnett, Brown , & Marshall, 2013) and is defined as having shared norms, values, and beliefs in a society that guide behavior and the decision-making process by offering a dominant rationale (Hofstede , Hofstede , & Minkov , Cultures and Organizations: Software of the Mind, 2010). Kahan, et al. (2021) showed that individualists, who exhibit a strong belief in authority, are less concerned about the dangers of climate change compared to egalitarian communitarians, who adhere to egalitarian and communitarian principles. Given this theory, Zheng et al. (2021) hypothesized that cultural factors may play a key role in formulating NDCs and found that states with higher levels of individualism tend to propose higher mitigation targets in NDCs. Although the formulation of NDCs is a matter of political decision-making, politicians rarely formulate mitigation targets themselves. They rely on suggestions and contributions from stakeholders to reach decisions. In collectivist countries, scientists are more likely to consider the preferences of policymakers and national interests, and therefore tend to propose targets with low ambition (Zheng, et al., 2021).

In addition to the influence of individual ideologies, political ideology is also analyzed in detail. Several researchers have looked at the influence of a left or right orientation of both political parties and the public on climate policy preferences. Overall, the findings show that left-leaning political groups and audiences are generally found to be associated with more support for climate policy, and that right-leaning political groups and audiences are generally found to be associated with less support for climate policy (Drews & van den Bergh, 2016; Tobin, 2017; Smith, Kim, & Son, 2017). This association also appears to be very robust. Other studies deviated from the left-right distribution and examined whether the output of climate policy is more influenced by the degree of attention parties pay to environmental issues (Knill , Debus , & Heichel , 2010). The study of Knill, Debus & Heichel (2010) argues that environmental issues are not as clearly distributed across the left-right spectrum as, for example, tax policy. It is important to note that most existing research analyzing the relationship has focused on developed countries. Knill, Debus, and Heigel (2010) looked at OECD countries, Drews and van den Berg (2016) looked at Switzerland, Sweden, and the United States, and Tobin (2017) looked only at Annex I countries.

In conclusion, a variety of idea-related conditions can be identified that may explain variation in NDC ambition. The most intriguing conditions found in the literature are post-materialism, individualism, and left or right political parties. These three conditions relate to political ideas and individual ideas of both the public and policy makers. In this study, the condition individualism is assessed for the following three reasons; i) the studies show a clear relationship between individualism and NDC ambition (Zheng et al., 2021); however, the relationship between individualism and NDC ambition has not yet been assessed in combination with other conditions ii) their research states that this condition touches on the condition at the policy and individual level; iii) there is sufficient current data for this condition, keeping in mind the scope, unlike the other two idea related conditions.

Interests

A rigid climate policy will be beneficial to one group of stakeholders, while it will be detrimental to another; this is the distributional effect of climate policy.

Fullerton (2011) defined six distributional effects of a stringent climate policy: i) consumer prices will rise because the cost of highly polluting production will increase ii) production will fall because workers and investors in highly polluting sectors will be squeezed, leading to iii) scarcity effects for the surviving polluting firms. In addition, this will result in iv) environmental gains, which will have v) capitalization effects. Finally, there will be vi) transition effects that will result in the need for retraining or unemployment. These distributional effects show how far-reaching the effects of environmental policy are and underscore the importance of looking not only at the industries that emit high levels of GHGs, but at all parties affected by climate policy and how these parties themselves want to influence climate management.

Companies and sectors often make decisions based on cost-benefit analysis. Emissions are often a parameter used as a proxy in these deliberations. If the cost-benefit analysis shows mainly benefits, this will lead to support for ambitious climate policies. On the contrary, there will be a lack of support if the analyses show very high costs (Fullerton & Muehlegger , 2019). This finding is supported by the study by Genovese (2019), which looks at the combined effect of a sector's GHG emissions and its openness to trade. The results show that while these factors by themselves do not have a statistical correlation with climate ambition, they do have a significant correlation when considered together. It can be concluded that there is a positive relationship between high reliance on trade and positive feelings towards climate ambition when GHG emissions in a sector are low or close to zero. Another factor that previous literature suggests has an influence on climate policy is dependence on fossil fuels and other natural resources, as in a country's overall energy mix (van Coppenolle, 2020; Lamb & Minx, 2020). Research by Golob, Lugovoy, & Potashnikov (2019) and Lamb and Minx (2020) both concluded that the more a country relies on fossil fuels, the less ambitious its climate policy is. However, van Coppenolle's (2020) study concludes that natural resource revenues (as a share of GDP) have a significant positive relationship with climate ambition.

The most distributional effects assessed in previous literature have been mentioned. There will undoubtedly be other distributional effects that drive actors or climate policies. For example, openness to trade, the presence of environmental NGOs, or the presence of environmental industries (van Coppenolle, 2020). Because ambiguity exists in the literature

regarding the dependency on natural resources and because this condition includes many polluting industries, this condition is used as an interest related proxy for NDC ambition.

Institutions

Institutions of countries are the formal and informal procedures that determine how a country is governed (van Coppenolle, 2020). Previous research on institutions and climate policy has focused on the effects of democracy. Bättig & Bernauer (2009) argue that democracy has a positive effect on climate policy, which is explained by the fact that democracies have a positive effect on the demand and supply of public goods. This is based on collective action theory, which confirms that policy choices in democracies are influenced more by the interests of the median voter or the total electorate than by those of a select group of elites. In contrast, this proposition is also criticized by Bättig & Bernauer (2009), who emphasize the influence of other factors, such as the climate views of the median voter or the influence of interest groups or the views of elite voters on policy choices. In their study, they conclude that the democratic-environment hypothesis alone is not a satisfactory explanation for climate ambitions, as context and other such variables must also be considered. There is also a theory of "authoritarian environmentalism," which argues that democracies are reluctant to interfere with markets or govern lifestyles, thus allowing for more repressive climate policies (Clulow, 2019). (Gilley , 2012) research, focusing on China, defines authoritarian environmental policy as a public policy paradigm in which authority is centered in a few executive agencies staffed by competent and unimpeachable elites who strive for better environmental outcomes" (Gilley, 2012, p. 289).

In terms of state capacity, it often comes down to bureaucratic autonomy and the resources a state has access to and control over corruption (Meckling & Nahm, 2018; Lamb and Minx, 2020). Meckling and Nahm (2018) argue that in cases of bureaucratic policy design, the legislature sets policy goals and delegates policy design to bureaucracies, shifting distributive conflicts to autonomous bureaucracies, which enables effective policy design. Regarding the effect of corruption, the literature is ambiguous. It is generally found that a low level of control over corruption is associated with a lack of successful environmental policy (van Coppenolle, 2020). In contrast to this finding, Frederiksson, Neumayer, & Ujlhelyi (2007) examined the effect of government corruption on climate ambitions and found a causal relationship driven by the rise of environmental pressures and lobby groups. This clearly shows the interdependence of the categories. This is an additional argument in favor of the configurational approach because it highlights the interconnectedness of the conditions.

Ultimately, how institutions are designed and implemented is likely to affect a country's NDC aspiration. The conditions that this study considers are based on this literature review and assumes that the degree of democracy and the degree of corruption affect NDC aspiration. These conditions are selected because there exist contradictions about the influences of these conditions on NDC ambition.

Societal

The fourth category of the framework examines social conditions that may affect NDC ambitions, which are not included in the framework of ideas, interests, and institutions. The circumstances included in this category define the boundaries of political action.

A central aspect to be included in the framework is a country's wealth, which is often expressed as GDP or Gross National Income (GNI) per capita. According to Booth (2017), increased wealth is predicted to have a positive effect on attention to environmental issues. This observation is consistent with the Environmental Kuznets curve (EKZ), which shows that the relationship between wealth and environmental performance is a U-shaped relationship. Initially, more wealth leads to more emissions and pollution, but a sustained increase in wealth eventually reduces these emissions (Sprinz D. F., 2004). This is something to keep in mind when evaluating the conditions and the correlations, as it might not define a linear correlation and depends on other determinants, such as development or wealth. Yet another observation, in accordance with the finding of Booth (2017), was made by Bel and Teixido (2020) who found that being a low- or middle-income nation has a negative effect on climate ambition and being a high-income nation has a positive effect on climate ambition.

Another condition that deserves attention because it is often mentioned in previous research is geographically related. The relationship between exposure to extreme weather events and support for environmental policies has been examined a few times in the literature, but the findings are ambiguous (Drews & van den Bergh, 2016). Tjernström and Tietenberg (2008) proposed the Steiniger effect as a patch, where income reduces the concern for geographically different outcomes. However, it can still be theorized that a country's overall vulnerability to climate change or the amount of domestic environmental challenges have a positive impact on a country's level of ambition for mitigation. As Sprinz and Vaahtoranta (1994) indicate, states are not equally affected by climate change/environmental degradation. Rather, environmentally vulnerable states are expected to be actively involved and foster international environmental action through, for example, the PA, because their own climate policies would likely be insufficient to mitigate climate. This is reflected in the Paris Agreement, in which the low-lying island states (small Alliance of Small Island States) and the EU tried to push the negotiations further (Falkner, 2016; Stensdal, 2015).

2.3 Use of the theoretical framework

The preceding categories discuss contextual conditions that may affect the NDC ambition. It should be noted that there are many national conditions that can influence the NDC ambition. Due to the limited time, scope, and type of method used to assess the conditions, only the most important and ambiguous conditions, according to the literature review, are included in this assessment. Additional distinctions were made based on data availability. An overview of the included conditions is given in Figure 2.3. For future research it may be of interest to include more and/or different conditions in the assessment.

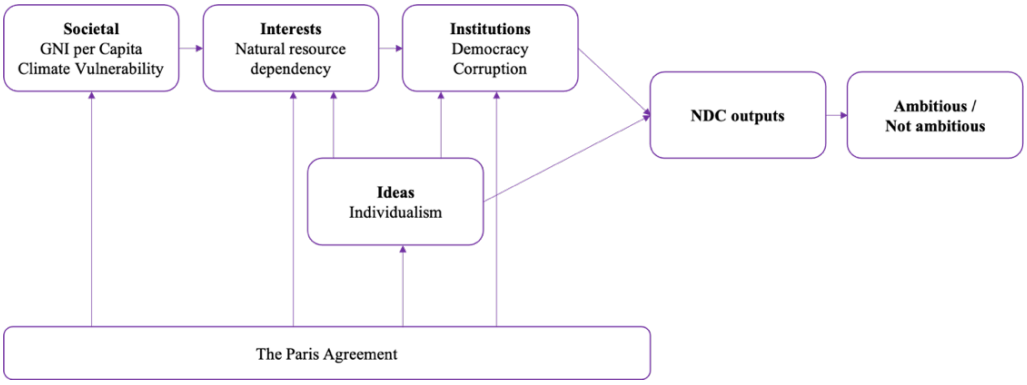

FIGURE 2.3 THEORETICAL FRAMEWORK CONTAINING THE CONDITIONS EXAMINED IN THIS STUDY

2.3.1 HYPOTHESIS

As mentioned previously, the key difficulty of this framework is whether the categories exert an independent influence on NDC ambition, or whether they are merely bystanders, or moderators of the relationship between one of the conditions and policy output, assuming a relationship exists. In this study, besides assessing which combination of conditions exert influence on NDC ambition, the individual influence of individual conditions on NDC ambition will be assessed as well. Therefore, hypotheses are established based on the literature review. The hypothesis tested in the analysis are organized according to the same framework used in the literature framework, indicating that they are categorized in either the societal, interests, institutions, or ideas category. In total, six hypotheses are formulated, which will be individually operationalized in the next chapter.

Hypothesis "Ideas"

Based on the literature review, one idea related hypothesis is formulated. The goal of this hypothesis is to determine the relation between individualism and NDC ambition. As described in the theoretical framework, Zheng et al. (2021) found that countries that are more individualistic tend to submit higher mitigation targets in their NDCs. Following this, the expectation of this research is that a higher level of individualism in a country will result in a higher NDC ambition, indicating a positive relation.

H1: Individualism has a positive relation with NDC ambition.

Hypothesis "Interests"

One interest related hypothesis is formulated based on the literature review. The goal of this hypothesis is to determine whether the level of dependency on natural resources affects NDC ambition. Following the research of Golub, Lugovoy, & Potashnikov (2019) and Lamb & Minx (2020), it is expected that countries that are dependent on natural resources are submit non-ambitious NDCs, which indicates a negative relationship.

H2: Natural resource dependency has a negative relationship with NDC ambition.

Hypotheses "Institutional"

From the literature review, two institutional related hypotheses are formulated. The aim of the third hypothesis is to determine the relation between the level of democracy and NDC ambition. Bättig & Bernauer (2009) argue that democracy has a positive effect on climate policy, which is explained by the fact that democracies have a positive effect on the demand and supply of public goods. Following the findings of Bättig & Bernauer (2009), it is expected that democratic countries submit more ambitious NDC's compared to non-democratic countries. The aim of the fourth hypothesis is to determine the relation between the level of corruption and NDC ambition. It is generally found that a low level of control over corruption is associated with a lack of successful environmental policy (van Coppenolle, 2020), which indicates a negative relation.

H3: Democracy has a positive relationship with NDC ambition.

H4: Corruption has a negative relationship with NDC ambition.

Hypothesis "Societal"

Regarding societal conditions, two hypotheses are formulated based on the literature review. The aim of the fifth hypothesis is to determine the relation between GNI and NDC ambition. As mentioned in the theoretical framework, no consensus exists regarding this relation. However, following the findings of Booth (2017) and Bel & Teixido (2020), it is expected that the more wealth a country is, the more ambitious its NDCs are, indicating a positive relationship. The aim of the sixth hypothesis is to determine the relation between climate vulnerability and NDC ambition. In the theoretical framework it was theorized that a country's overall vulnerability to climate change or the amount of domestic environmental challenges have a positive impact on a country's level of ambition for mitigation, indicating a positive relation (Drews & van den Bergh, 2016; Sprinz & Vaahtoranta, 1994).

H5: GNI has a positive relationship with NDC ambition.

H6: Climate vulnerability has a positive relationship with NDC ambition.

In conclusion, six hypotheses are formulated based on the literature review. The relationships will be determined by applying a complementary analysis, which analyzes the individual relations. As previously mentioned, in addition to these six conditions, other conditions might impact NDC ambition as well. Due to the limited time, scope, and type of method used to assess the conditions, only the most important and ambiguous conditions, according to the literature review, are included in this assessment.

3. Research Design

This chapter consists of five parts. In the first part, the main method, fuzzy set QCA and its limitations are presented. The second section presents the data, showing the sample selection as well as the operationalization and calibration of the outcomes and conditions. Section 3.3 details the data analysis of the fsQCA, and the fourth section discusses the additional analysis, a correlation analysis, and a logistic regression analysis. The final section, Section 3.5, explains how the validity and reliability of the results is ensured.

Before explaining the analyses that will be performed, some information about the desk research conducted in chapter two is given. This desk research was conducted to establish the theoretical framework, meaning that data that was used is compiled and generated by someone else (van Thiel, 2014). An extensive literature review was conducted to establish this framework. The literature review was conducted using academic databases, such as Scopus. This review helped to understand the findings of previous researchers within the area of interest 'comparison of NDC ambition', and it also helped to identify the six national conditions that can influence NDC ambition. Efforts were made to ensure that only data that closely approximated the purpose of the study were accessed. These six identified national conditions serve as inputs to the QCA and correlation analysis, which is explained in more detail in the remainder of this chapter.

3.1 Qualitative Comparative Analysis

QCA is applied because there are valid reasons to believe that NDC ambitions are best understood through set relationships. Based on the theoretical framework outlined in chapter two, this study seeks to identify the most appropriate combinations of "idea, interests, institutions, and societal" conditions that drive or hinder a country's NDC ambition. For this reason, a configurational approach is valuable because it allows for the analysis of interrelationships and configurations among conditions that collectively lead to an outcome (Fiss, Cambre, & Marx, Chapter 1 Configurational Theory and Methods in Organizational Research: Introduction, 2013). According to Fiss, Marx & Cambre (2013), a configurational approach assumes and examines interactions between conditions. These interactions can be positive and/or negative complementarities that lead to the absence or presence of an outcome. All possible configurations are presented separately, allowing to see which configurations result in the presence or absence of the outcome (Plaats, 2017). Another reason why this approach is appropriate for this study is that for studies with an intermediate N (10-50 cases), the ability to detect causal configurations of configurational comparative methods is a strong advantage (Vis, 2012). As briefly mentioned in Section 1.6, the sample analyzed in this study consists of 33 cases (countries). If the number of cases is very small, a case study could probably provide more insights about the cases, and if the number of cases is very large, a regression analysis could probably provide more insights about the cases. However, a regression analysis does not tell anything about the combinations of factors, which is so important in this research. In addition, with a relatively small number of cases and a configurational approach, it is possible to go back and forth between theory and evidence. it could be possible for different paths to lead to a similar result (Schneider & Wagemann, 2012), this phenomenon is known as equifinality. All in all, a configurative approach is appropriate because it provides a comprehensive understanding

and a holistic view of the interrelated conditions that lead to countries' NDCs, ambitious or unambitious.

In general, QCA identifies configurations of conditions that are subsets or supersets of the outcome, which in turn achieve sufficient and/or necessary conditions (Schneider & Wagemann, 2012). If always when the condition is present, the outcome is also present, the condition can be interpreted as sufficient. If a condition is sufficient, the condition can be perceived of as subset relations between the condition and the outcome (Schneider & Wagemann, 2012). Contrasting, in case that always when the outcome is present, the condition is also present, the condition is necessary. If a condition is necessary, the condition is a superset of the outcome (Ragin, 2000). If pertinent conditions are omitted from QCA, the explanatory power of the analysis decreases. However, because the model is based on Boolean algebra, there will be no condition bias compared to regression, which is based on correlations, where a lack of relevant conditions/variables will result in biased coefficients (Fainschmidt et al., 2020). In addition, configuration theories are based on the principle of causal asymmetry, which means that when (a combination of) conditions explain the presence of an outcome, these (combination of) conditions do not necessarily explain the absence of the outcome. For example, high perceived individualism may lead to high NDC aspiration, while low perceived individualism may not lead to low NDC aspiration, usually due to the existence of other conditions. This may seem common, but when using variance-based approaches, the findings imply that the relationship between two variables is symmetric. To test whether asymmetric causality exists, two different QCAs are performed, one to explain the outcome and one to explain the negated outcome (Pappas & Woodside, 2021).

3.1.1 FsQCA

QCA was developed by Ragin (1987, (Ragin, 2008) and allows for a case-oriented approach, which is well suited for the investigation of macro comparative and medium N data. QCA has two main types that differ in their sets; i) crisp-set QCA, also called csQCA, and ii) fsQCA. In csQCA, the sets are dichotomous, they can have a score zero or one; zero represents non-membership and one represents membership. In the case of NDC ambition, it can be said that all series with a value of one represent ambitious NDCs and all series with a value of zero represent unambitious NDCs. This type received much criticism because dichotomous values often lead to a loss of valuable knowledge. In contrast, FsQCA allows different ranges of membership values between zero and one. Based on this argument, this study uses fsQCA instead of csQCA. As mentioned by Duşa (2021), calibration is a fundamental process in fsQCA. It is the process of transforming the raw numerical data into a set of membership scores, which is composed of a given number of qualitative anchors or thresholds. The whole process is far from mechanical, since the choice of calibration thresholds is a theory-based decision that significantly alters the outcome of the calibration process. Illustrations of the membership range of crisp sets and fuzzy sets are shown in Table 3.1.1. When calibrating into fuzzy sets, i.e., assigning partial membership based on relevant information in the raw data, it is advised to seek and provide theoretical justifications for the qualitative anchors (value of "x" in Table 3.1.1), preferably based on sources outside the empirical data to be analyzed (Schneider & Wagemann, 2012). Interpretation and qualitative judgement are thus constitutive to the calibration process, which is also a reason why robustness tests are seen as an integral part of best practice

(Schneider & Wagemann, 2015). fsQCA can be used to analyze crisp sets or fuzzy sets simultaneously (Schneider & Wagemann, 2012). This may ultimately add more meaning to the results (Schneider & Wagemann, 2012).

Table 3.1.1 An overview of crisp-set and fuzzy-set membership scores (Ragin, from fuzzy-set to crisp truth tables, 2005)

Crisp Sets	**Fuzzy sets with three values**	**Fuzzy sets with four values**	**Fuzzy sets with six values**	**Continuous fuzzy sets**
0 (fully out)	0 (fully out)	0 (fully out)	0 (fully out)	0 (fully out)
1 (fully in)	0.5 (not fully and not fully out)	0.33 (more out than in)	0.1 (mostly but not fully out)	0<x<0.5 (degree of more out than in)
	1 (fully in)	0.67 (more in than out)	0.4 (more or less out)	0.5 (crossover; neither in nor out)
		1 (fully in)	0.6 (more or less in)	0.5<x<1 (degree of more in than out)
			0.9 (mostly but not fully in)	1 (fully in)
			1 (fully in)	

3.1.2 Limitations fsQCA

fsQCA is an ambitious methodology that seeks to unite the strengths of qualitative and quantitative analysis. When properly applied, it can bridge the gap between the two approaches. Yet it should be noted that the methodology has also been criticized. Critics point to the apparent prevalence of false positives (Braumoeller B. , 2015), problems with multi-configurative causality and timeliness (Fischer & Magetti, 2016), and failing to show why set theory offers clear advantages over the use of statistical modeling (Paine, 2016). In response, opponents emphasize that the methodology assumes different assumptions from statistical methods (Thiem, Baumgartner, & Bol, 2016), and highlight perceived weaknesses in its critical applications (Rohlfing, 2016). The existing debate sheds light on the perceived benefits and shortcomings of the methodology for the purpose of analyzing comparative ambition in climate policy. This study attempts to apply fsQCA in line with the best practices of its proponents. Accordingly, the findings will not be interpreted as a definitive explanation for variation in climate policy, nor is it claimed that fsQCA is superior to other approaches, such as regression. Rather, fsQCA allows for testing variables in combination, is a nascent and conversational approach that remains to be put into practice on the important topic of variation in climate policy (Tobin, 2017). In this way, fsQCA can be complementary to other methodologies as part of a nested analysis.

3.2 The data

3.2.1 Case Selection

This research focuses on the presence or absence of ambition in an NDC submitted by a country to the Paris Agreement. In this study, an NDC is considered ambitious if the commitment is sufficient to contribute to achieving the Paris Agreement goal of limiting the rise in global temperature to 2°C above pre-industrial levels, and an NDC is considered unambitious if the commitment is not sufficient to contribute to limiting the rise in global temperature to 2°C above pre-industrial levels. The goal is to better understand the drivers of these targets by comparing NDCs at the national level.

Over the years, many datasets describing commitments in detail have been published. Most of these are descriptive, such as the IGES NDC Database or the World Bank's NDC platform (Institute for Global Environmental Strategies (IGES), 2020; World Bank, z.d). NDCs are notoriously diverse, as they vary not only in level of detailedness, but also in how they are constructed (Rowan, 2019). This reflects concerns that are intrinsic to the PA, which sought a high level of participation at the expense of detail and transparency (Held & Roger, 2018). These descriptive databases translated the diverse content of the pledges into structured files, allowing for a clear overview of the states' different approaches.

There are other datasets that go beyond the descriptions and provide quantified estimates of each state's projected emissions (e.g., Meinshausen & Alexander (2016) and Robiou du Pont & Meinshausen (2018)). In addition to their diverse nature, there is also considerable complexity associated with calculating the total emissions impacts of each of these NDCs. Rogelj, et al. (2017) identify six definitions of uncertainty: i) basic socioeconomic variability ii) historical emissions variability, iii) conditionality variability, iv) range specifications, v) alternative energy accounting methods, and vi) non-commercial biomass allocation. variability in these dimensions yields 144 different possible scenarios for NDC assessments. Given the complex nature of all these estimates and calculations, the use of an established dataset that is already uniform in its approach to interpreting the various mitigation targets is warranted.

In this respect, the Climate Action Tracker (CAT) dataset stands out. CAT is an independent science-based assessment that compares governments' climate action against the globally endorsed goal of keeping global warming just under 2°C and continuing to strive for global warming of no more than 1.5°C. It is produced by two research institutions: NewClimate Institute and Climate Analytics (Climate Action Tracker , 2020). In total, they track the NDCs of 33 countries, representing about 80 percent of global emissions, including major emitting countries and a representative cross-section of low-emitting countries, ensuring the completeness of this study (Climate Action Tracker , 2020). The full list of included countries is provided in Appendix A. The dataset is appropriate for its intended purpose of comparing small and large countries. This constitutes the biggest difficulty since countries differ considerably from each other. CAT deals with this problem by looking at whether a government is making its "fair share" compared to other governments (Climate Action Tracker , 2020). To make a fair contribution to achieving the goals of the Paris Agreement, developed countries must both make domestic emission reductions and help less developed countries reduce their emissions. Thus, a country's total "fair share" of the NDC is the total sum of its domestic emissions plus its overseas emission reductions through climate finance, resource mobilization or implementation, or the

acquisition of emission units if discounted in the host country (Climate Action Tracker , 2020)

A limitation that must be remembered in the analysis is that the total number of Parties that submitted an NDC for the Paris Agreement is 192 (UNFCCC, 2021), and the number of countries analyzed in this study is 32 countries plus the EU (27 countries), which amounts to 59 countries. Thus, the sample does not cover a large part of the number of countries, but it does cover a large part of the total GHG emissions (80 percent) and the total world population. Additionally, QCA is well suited for analyzing medium N samples (10-50), which makes this sample particularly suitable.

3.2.2 Operationalization and calibration

As Schneider & Wagemann (2012) mention, the operationalization and calibration of the outcome and conditions are a very important step in the configurational approach. This subsection is divided into the outcome and the four categories that are part of the theoretical framework: ideas, interests, institutions, and societal. For the outcome and the conditions in each category, the operationalization, in which concepts are linked to variables, is presented along with the calibration in fuzzy sets. A condensed overview of the operationalization and the calibration of the outcome and the conditions is presented in table one, two and three in Appendix B. For the calibration in fuzzy sets, it is necessary to determine, based on literature, when a value is in or out of a set. Therefore, an anchor is placed to determine the crossover point. The crossover point is the threshold at which a value is neither in nor out of the set (Schneider & Wagemann, 2012). It is important that contextual information and knowledge must be considered when determining this value.

The outcome: NDC Ambition

The outcome variable in this study is the NDC ambition as measured by Climate Action Tracker (CAT), a collaborative effort of two Germany-based institutions, Climate Analytics and New Climate Institute. The CAT measures and evaluates mitigation pledges and assesses whether countries are on track to meet these pledges. Countries' expected actions are combined to the global level, which determines the likely temperature increase by the end of the decade. For each country, it assesses whether a country's government is making a 'fair share' of emission reductions, based on the effects of the NDCs, relative to the contributions of others to meet the Paris targets." This information is used to calculate the gap between the commitments made to date and the work needed to meet the targets. The calculations are derived from the "Model for the Assessment of Greenhouse Gas Induced Climate Change" (MAGICC), developed by the U.S. National Center for Atmospheric Research and the Potsdam Institute for Climate Impact Research (Climate Action Tracker , 2020). This metric of NDC ambition is also used in several other studies and proves its worth here (e.g., Tørstad, Sælen, & Bøyum, 2020).

The calibration of the outcome variables was based on the classification system used by CAT. CAT classified the outcomes into six categories: i) critically insufficient (4°C), ii) highly insufficient (<4°C), iii) insufficient (<3°C), iv) compatible (<2°C), v) compatible with the Paris Agreement (<1.5°C), and vi) role model (Climate Action Tracker , 2021). Since no country in the dataset was rated 'role model', it was decided to calibrate

the outcome variable with five anchor points. Here, 'compatible with the Paris Agreement (<1.5°C)' means that an NDC is ambitious (1) and 'critically insufficient (4°C)' means that an NDC is unambitious (0) (Climate Action Tracker , 2021). Table 3.2.2 provides an overview of the calibrated values and their definitions. 0.5 was chosen as the threshold value because it means that the country is neither ambitious nor unambitious.

Table 3.2.2 Overview of the calibration of the outcome variable NDC ambition (source CAT rating: Climate Action Tracker, 2021)

Qualitative coding	**FsQCA Label**	**CAT-rating**
0	Full non-membership	Critically Insufficient (4°C)
0.25	Mostly out	Highly Insufficient (<4°C)
0.5	Indifference	Insufficient (<3°C)
0.75	Mostly in	Compatible (<2°C)
1	Full set membership	Paris Agreement Compatible (<1,5°C)

The conditions

This subsection presents the operationalization and calibration of the conditions of the ideas, interests, institutions, and social conditions that have been defined in the theoretical framework of chapter two.

Ideas

Hofstede's cultural dimension theory is used as a source for the condition "individualism." This is the most widely used dimension framework and was created by social psychologist Geert Hofstede (Hofstede , Hofstede , & Minkov , Cultures and Organizations: Software of the Mind, 2010). The framework is used to help understand the variations in cultures across nations. Hofstede originally constructed four cultural dimensions, one of which is individualism-collectivism. Although the time-based stability of Hofstede's framework has been critiqued as being out of date, it has been shown to remain representative of contemporary globalizing societies, as countries have continued to follow the same path, with continued comparative differences between nations (Beugelsdijk, Maseland, & van Hoorn, 2015; Zheng et al., 2021).

(Hofstede , Hofstede , & Minkov , Cultures and Organizations: Software of the Mind, 2010) defines individualism as the degree to which people advocate a way of life based on a profound feeling of a personal identity. Most of the world's cultures have a low individualism score. When a country has a low individualism score, individuals are members of a very strong community. They have the tendency to act and think as a group, and in which individuals will be more prepared in sacrificing their individual gains for the greater

good. On the contrary, in countries with high individualism scores, individuals tend to have more relaxed relationships with each other and operate and think as individuals, taking care of themselves and their close friends and family, while making up their own decisions (Hofstede, Culture's Consequences: Comparing Values, Behaviors, Institutions and Organizations across Nations, 2001). In Hofstede's cultural dimension theory, scores are given on a scale from one (no membership) to one hundred (full membership). According to (Hofstede , Hofstede , & Minkov , Cultures and Organizations: Software of the Mind, 2010), nations with a score of 60 or higher can be considered an individualistic society. Therefore, the threshold is set at 59. From now on, the condition will be referred to as *IND*.

Interests

To quantify natural resource dependence, we look at the total revenue a country derives from its natural resources, expressed as a percentage of GDP. The data is from the World Bank's data portal for the year 2019. The metric includes total revenue from oil, natural gas, coal, minerals, and forests (The World Bank, 2020).

Countries that rely heavily on natural resources face the dilemma of being extremely vulnerable to and subject to climate change mitigation efforts. These countries, heavily dependent on oil, gas, and coal, are most at risk of being disrupted by a low-carbon transition. Stakeholders in these countries know that efforts to limit global warming will lead to a global downturn in their industries and the related value chains on which their economies depend. (The World Bank, 2020). Although all countries that are highly dependent on natural resources are unique in many ways, together they account for nearly one-third of the world's total population, 20 percent of global GHG emissions, and more than 80 percent of global emissions expressed in terms of known oil and gas (The World Bank, 2020). Since the lowest score equals zero, the value is chosen as the value for no membership and the value 25 (Saudi Arabia) as the value for full membership, since that is the highest value obtained by the countries included in the dataset. The World Bank Group considers countries with a score of less than 2.5 percent to be non-dependent on natural resources, and this value is therefore taken as the threshold value for the calibrations. In the rest of this study, this condition will be referred to as NAT.

Institutions

To measure the relationship between NDC aspirations and democracy, data from the Democracy Index, produced by the Economist Intelligence Unit (EUI) (2020), is used. The index is designed to assess the degree of democracy in 167 countries. The index is composed of 60 indexes in five different categories, which measure pluralism, civil liberties, and political culture (The Economist Intelligence Unit, 2020). Most answers are expert opinions. Some answers are from opinion surveys in the countries concerned. Each country is given a score and based on this score, the country is classified into one of four regime types: full democracies, flawed democracies, hybrid regimes and authoritarian regimes (The Economist Intelligence Unit, 2020).

Full democracies are those nations where political and civil liberties are cherished and reinforced by a political culture that fosters the flourishing of democratic principles. Such nations have a robust system of checks and balances in the government, an

independent judiciary whose decisions are enforced (The Economist Intelligence Unit, 2020). A nation has a flawed democracy if its elections are fair and free and basic civil liberties are respected, but there may still be problems. These can include freedom of the press violations and mild repression of political opposition and their criticizers. In addition, these countries have weaknesses in other areas of their democracy, such as an insufficiently developed political culture or low public participation in elections (The Economist Intelligence Unit, 2020). A hybrid regime means that a country regularly engages in electoral fraud, which implies that the country cannot be a fair democracy. Such nations often have regimes that pressure political resistance, a non-independent judicial system, extensive levels of corruption, and pressures on the media (The Economist Intelligence Unit, 2020). If a state falls into the last category, an authoritarian regime, it indicates that political diversification is non-existent or severely limited. These countries are usually in the form of either absolute monarchies or tyrannies (The Economist Intelligence Unit, 2020). The scoring range of the EUI runs from zero to ten, so the score for non-membership is zero and the score for membership is ten. A score of six was chosen for the transition threshold because it represents the transition from a flawed democracy to a hybrid regime as defined by the EUI. The condition will henceforth be called *DEM*.

The level of corruption is represented by data from the Corruption Perception Index (CPI) (2020). This index is published by Transparency International (TI) and ranks countries according to their perception level of corruption in the public sector, as determined by both experts and opinion surveys. The CPI is based on perception, as corruption generally involves illegal activities that are intentionally hidden and only come to light through scandals, investigations, or prosecutions (Transparency International, 2021). Although researchers from academia, civil society, and governments have made progress in objectively measuring corruption in certain sectors, to date there is no indicator that objectively measures national corruption levels in a direct and comprehensive manner. Since the source contains considered opinions of stakeholders and is composed of 13 data sources from 12 institutions specialized in governance (Transparency International, 2021), it was selected as a valid and high-quality source. Examples of manifestations of corruption measured by the CPI include bribery, misappropriation of public funds, government's ability to curb corruption and enforce effective integrity, civil society's access to information on public affairs, etc. (Transparency International, 2021).

Countries included in the index are given a score ranging from zero (very corrupt) to 100 (very clean). To facilitate the analysis of the data, it was decided to invert/mirror the data so that 100 represents full membership (very corrupt) and zero represents non-membership (very clean). The average global score of the entire dataset for a country is 43 *(Transparency International, 2021)*, and therefore 57 (100-43*, inverted*) was chosen as the transition point. The data are inverted so that high corruption scores correspond to high ambition levels. Thus, countries with lower scores are considered corrupt and countries with higher scores are considered clean. In the remainder of this study, this circumstance will be referred to as *COR*.

Societal

To assess the relationship between economic wealth and NDC aspirations, data from the World Bank's Data Portal is used, which shows GNI per capita in USD in 2019 (The World Bank, 2020). Although gross domestic product (GDP) is considered one of the most

important economic indicators, gross national income (GNI) can serve as a more accurate proxy for the overall economic condition of a country with an economy involving significant overseas investment (The World Bank, 2020). For the calculation, the World Bank (2020) uses data from the OECD National Accounts and National Accounts databases. In terms of income, the World Bank classifies the world's economies into four income groups: high, upper-middle, lower-middle, and low. Low-income countries are defined as those with per capita GNI of $1035 or less; lower-income countries are those with per capita GNI between $1,036 and $4,045; upper-middle-income countries are those with per capita GNI between $4,046 and $12,535; high-income countries are those with per capita GNI of $12,536 or more (Serajuddin & Hamadeh, 2020). A value of $116430 is the score for full membership and $130 is considered the score for non-membership. A value of 4046 is used for the threshold, or transition point, as this is the threshold between upper-middle-income and lower-income countries, as determined by the World Bank (Serajuddin & Hamadeh, 2020). In the remainder of this study, the condition will be referred to as *GNI*.

The data used to determine the state of environmental vulnerability comes from the University of Notre Dame's Notre Dame Global Adaptation Initiative (Notre Dame Global Adaptation Index, 2021). Their ND-Gain index combines a country's vulnerability to climate disruption with a country's willingness to attract funds and investment for adaptation activities. It is only the first measure that is considered in this study. The ND-Gain index is used as it is a representative measure of climate vulnerability, was made available to all countries within the scope of this study and was also used in previous studies (van Coppenolle, 2020; Tørstad, Sælen, & Bøyum, 2020), which confirms that the data quality level is sufficient. ND-Gain defines vulnerability as the tendency or predisposition of human communities to be adversely affected by environmental threats (Notre Dame Global Adaptation Index, 2015). They review this definition by considering six life support sectors: food, water, health, ecosystem services, human habitat, and infrastructure (Notre Dame Global Adaptation Index, 2015). Each of these sectors, is in turn, represented by six indicators that represent three cross-cutting components: the sector's exposure to climate-induced or climate-enhanced threats; the sector's sensitivity to the impacts of the threat; and the sector's adaptive capacity to cope with or adapt to the impacts. Hence, in total, the vulnerability is made up of 36 indicators. Each component has 12 indicators that cross 6 sectors (Notre Dame Global Adaptation Index, 2015). The scores of this condition run on a scale from zero (least vulnerable) to 0.675 (most vulnerable). Therefore, zero is selected as the score for non-membership, indicating that a country is not vulnerable, and 0.675 is selected as the score for full membership, indicating that a country is highly vulnerable to climate change. 0.425 is used as a transition point because it is the threshold set by ND-Gain between an ecologically vulnerable country and a non-sensitive country (Notre Dame Global Adaptation Index, 2015). In the remainder of this study, this condition is referred to as *VUL*.

An overview of the operationalization of the outcome and the conditions and their values for calibration can be found in tables one, two and three in Appendix B.

3.3 fsQCA Data analysis

After the result and conditions are identified, operationalized, and calibrated, this section explains how to analyze the data using fsQCA.

To perform fsQCA, the software fsQCA 3.0 (retrieved from www.compass.org) is used. In line with Schneider & Wagemann (2012), an analysis of necessary conditions and an analysis of sufficient conditions are performed, in which the analysis of necessary conditions is segregated and precedes the analysis of sufficient conditions. Moreover, to be able to answer the main research question, the emergence of NDC ambitions and, second, the absence of NDC ambitions, must be explained. Thus, a total of four analyses are conducted: i) analysis of necessary conditions that explain NDC ambition, ii) analysis of necessary conditions that explain the absence of NDC ambition, iii) analysis of sufficient conditions that explain NDC ambition, and iv) analysis of sufficient conditions that explain the absence of NDC ambition. Furthermore, QCA utilizes truth tables and straightforward rules of logical minimization to identify set relationships (Schneider & Wagemann, 2012). The truth tables represent all combinations/configurations that could possibly lead to the occurrence or non-occurrence of the outcome, with each row representing one configuration of conditions. In this study, a total of two truth tables is constructed, one to analyze the configurations leading to NDC ambition, and one to analyze the configurations leading to the absence of NDC ambition.

To be able to determine whether a condition is necessary, a consistency benchmark needs to be selected and applied. As recommended by Schneider & Wagemann (2012), a consistency value of 0.9 is applied in this study. To determine whether a condition is sufficient, the truth table need to be employed and a consistency level needs to be selected as well. For the analysis a consistency benchmark of 0.75 is applied based on the Schneider & Wagemann (2012), who mention that 0.75 is an appropriate cut-off point. Furthermore, they also state that values above 0.5 should be used with caution and that values below 0.5 are inappropriate for interpretation because there would be more evidence against than for the configuration to be sufficient. It might happen that the truth table presents a contradictory row, which means that similar rows (same configuration of conditions) results in both the occurrence and non-occurrence of the outcome (Schneider & Wagemann, 2012, p.120). When contradictory rows exist, it is recommended to either try different calibrations or exclude the conflicting rows during the process of logical minimization. QCA is an iterative process in which there is a constant dialogue between cases and theory. After determining whether is necessary and/or sufficient or neither, it should be determined whether the configurations are relevant by obtaining solutions and compiling the coverage levels of the separate solutions. In total, there are three main types of solutions (parsimonious, complex, and intermediate), and each of them can be appropriate in different circumstances. More information on the different types of solutions, and the types of solutions used in this study, is presented in chapter four.

3.4 Complementary Analysis

Some authors suggest that QCA should always be complemented by other approaches (Ragin, 2008; Rihoux, 2006). Applying a complementary analysis gives more understanding of the subject matter and aids in answering the fourth sub-question of this study. Moreover, it also increases the robustness of the results and may provide additional insights into the conditions included in this research. Since the purpose of the fourth sub-question is to identify specific individual factors that drive or limit NDC ambition, and the collection of case studies includes a significant number of countries with similar goals, a quantitative research approach is appropriate. The most common method used to determine which variables influence a topic of interest is regression analysis. This type of analysis allows one to determine what the most important variables are, what variables can be disregarded, and how these variables affect each other.

3.4.1 Regression and QCA

Rihoux & Ragin (2008) state that conventional quantitative methods, such as regression analysis, cannot be compared to configurational comparative methodologies, such as QCA. They imply that the two approaches simply do not compete for the equivalent turf (Rihoux & Ragin, 2008). In accordance with this statement, it can be argued that, since the two approaches are substantially different, they cannot be used to answer the same research question, no matter how large or small the sample is (Seawright, 2005). However, scientists with a more practical view, argue that the difference in epistemology is rather an advantage than a disadvantage because a combination of the two approaches enable two different but complementary lenses on the same research question.

The most important distinction between regression and QCA is that, for medium N studies, configurational comparative methods, such as QCA, have the advantage that they can detect causal configurations. In regression analysis, such configurations are evaluated by interaction effects. There exists, however, a limit to the amount of interaction effects that can be analyzed in a single analysis. Usually, for a sample of medium N, the number of interaction effects that can be included is usually around one. Accordingly, there is little or no opportunity to test complex theoretical arguments. Another strength of configurational comparative approaches in all N-studies, compared to regression analysis, is their ability to detect multiple causal configurations, which might involve more than two causes. With regression analysis, it is extremely challenging to interpret an interaction that consists of more than two variables (Braumoeller, 2004). Similarly, analyzing multiple configurations also requires some detailed work. Another disparity is that with regression analysis, when the dependent variable is present while the specified independent variable is not, this is considered as negative evidence for the strength of that causal relationship (Epstein, Duerr, Kenworthy, & Ragin, 2008). While this may imply that a causality affects only a subset of cases, this does not take away the possibility that certain cases may be excluded from the regression analysis. It merely increases the variance and decreases the coefficients. If a condition/variable is left out from QCA, this will result in a decrease of the explanatory power of the model but not in omitted variable bias as is the case with regression. This difference is because QCA draws on Boolean algebra instead of correlations (Fainshmidt, Witt , Aguilera, & Verbeke , 2020). An overview of the most important disparities between regression analysis and QCA can be found in Appendix C

Given these disparities, it is not unexpected that the conclusions drawn from regression analysis and QCA may be different. Empirical findings show that regularly a lot can be learned from the data when using both QCA and regression (Rihoux, 2006), so they rather complement than negate each other. Therefore, it is useful to apply a sequential approach of the two approached (Rihoux, Ragin, Yamasaki, & Bol, 2009), and so it is decided to explore whether a regression analysis as complementary analysis is suitable in this study.

3.4.2 Assumptions ordinal regression analysis

The aim of the complementary analysis is to estimate models that predict NDC ambition based on individual national conditions. There are multiple types of regression analysis that can be used. Choosing the best model depends on the type of data that is used for the dependent variable and which model offers the best model fit. Linear regression is the first type that often comes to mind as it is well known and often used. However, the sample size in this research is rather small and this type requires a continuous dependent variable (Baarda & Goede, 2006). However, the dependent variable in this research, NDC ambition, is measured in five different categories, with a special order: i) critically insufficient (0), ii) highly insufficient (0.25), iii) insufficient (0.5), iv) compatible (0.75), and v) compatible with the Paris Agreement (1). Different types of regression analysis exist for data with categorical dependent variables, e.g., binary logistic regression, multinomial logistic regression, or ordinal logistic regression. Binary logistic regression is applied for dependent variables with only two outcomes. Multinomial regression is applied when the dependent variable is classified into categories and these categories are not ordered. Ordinal regression applied when the variable is classified into three or more categories and these categories are ordered. Because the dependent variable NDC ambition is classified into five categories and because these categories are ordered from high ambition to no ambition, and the independent variables are continuous, it is decided to check the other assumptions for Ordinal Logistic Regression (OLR). OLR uses cumulative probabilities to relate different independent variables to independent variables (Williams, 2008), and enables to determine which of the independent variables have a statistically significant effect on the dependent variable.

Four assumptions should be tested prior to carrying out the analysis. In case one of the assumptions are violated, the results might not be valid. The same data that has been used for the fsQCA will be used for the complementary analysis, however, uncalibrated. The assumptions are tested and presented in appendix D. The first and second assumption are met since the dependent variable is measured on an ordinal level and the independent variables are continuous. The third assumption relates to multicollinearity. The test for multicollinearity indicates that there exist a lot of correlations between the conditions which leads to problems related to understanding which variable contributes to the explanation of the dependent variable. Additionally, it also leads to technical issues in calculating an ordinal regression. The fourth assumption relates to proportional odds. This is a fundamental assumption for this specific type of regression as assuming proportional odds means that each independent variable has an identical effect at each cumulative split of the ordinal dependent variable (Bender & Grouven, 1997). The test shows that the ordinal model does not meet this assumption. Because two out of the three assumptions are not met, it is decided to not conduct the ordinal regression analysis in this research as it will result in invalid results.

Given the high multicollinearity and the violation of the proportional odds assumption amongst the independent variables, it is decided to take a profound look at the existing correlations. The decision is made to take a more profound look at the bivariate correlations between the dependent variables and the independent variables. Three types of bivariate correlations exist: Pearson, Kendall's tau, and Pearson's R, which all have their own advantages, disadvantages, and assumptions. For a Pearson correlation, each variable should be continuous, therefore this type of correlation cannot be applied. Both Spearman and Kendall's Tau measure monotonicity relationships and are easy to interpret. However, as compared by Croux & Dehon (2010)., Kendall is preferred over Spearman because of a smaller gross error (therefore it is more robust) and a smaller asymptotic variance. Additionally, Kendall's Tau is more accurate with smaller sample sizes (Rindskopf & Shiyko, 2010).

However, it must be noted that focusing primarily on correlation analysis has limitations that require consideration. The most important limitation is that correlational testing reveals nothing about causation. It is being used to examine the degree to which any two variables are correlated, not looking at the presence or effect of other variables outside the two being explored. Additionally, correlation cannot accurately describe curvilinear relationships. These limitations should not be overlooked. The correlation analyses will be run with the same dependent variable and independent variables as in the fsQCA. The outcome denotes the dependent variable, and the conditions denote the independent variables. Instead of the calibrated values, the raw data shown in Table 1 in Appendix B will be used. These correlation analyses are carried out in the software SPSS.

3.5 Validity and reliability

For QCA, no specific steps are provided for validity and reliability (Schneider & Wagemann, 2012). Nevertheless, several steps can be taken to eliminate the appearance of any errors in the analysis. This section provides an overview of the steps that are taken to ensure internal and external validity and reliability and to avoid errors by ensuring the robustness of the data. Sub section 3.5.1 outlines the two semi-structured interviews that are conducted with experts in the field of NDC ambition to assess the validity of the obtained results.

Before the interviews are carried out, several other steps are performed to assure validity and reliability. Firstly, methodological triangulation is applied, which means that a given research question is subjected to a multi-method test. It is recommended by Liebermann (2005) and Rohfling (2007), to combine variable-oriented methods and case-oriented methods in a nested analysis. In this study, both a variable-oriented method (the complementary analysis) and a case-oriented method (fsQCA) are used, and their results are compared. Sub-question five aims to compare the two results of the two methods; the answer to this sub question is presented in chapter five. The second step regards the calibration procedures of QCA. This procedure relies on evaluation of cases, which entails a subjective element of interpretation, limiting the reliability of the inferences (Hofstad, 2019). To alleviate this, it is tested whether similar results are obtained if any subtle modifications to the calibration process are made. For instance, by making minor changes to the selected anchors, the sufficiency thresholds, and the frequency thresholds. Another step to increase both the validity and the reliability is by providing as much transparency

as possible during the operationalization and calibration process of the outcome and the conditions, as well as during the analysis process and the scope. This ensures that, if another researcher aims to repeat this research, he or she can achieve the same results.

3.5.1 Semi-structured interviews

A total of two semi-structured interviews were conducted with experts in the field of NDC ambition to assess the validity of the results obtained from the fsQCA and correlation analysis; to determine whether the results are consistent with what the experts know. The two interviewees have been selected and approached based on their expertise on subjects related to the comparison of national climate commitments and which factors explain their success and the lack thereof. The first interview is conducted with a climate policy analyst at the PBL Netherlands Environmental Assessment Agency. The interviewee is a climate policy advisor of the EU delegation of the climate negotiations, providing analytical support to the delegation and the European Commission DG CLIMA for the UNFCCC climate negotiations on these topics. In addition, this interviewee is also a professor at the Institute for Environmental Studies of the Vrije Universiteit Amsterdam. The second interviewee is a climate policy analyst at NewClimate institute and part of the core team of Climate Action Tracker, in which the interviewee tracks and evaluates climate action on the international level.

In general, there exist three interview types i) unstructured interviews, ii) semi-structured interviews and iii) structured interviews. It is decided to conduct Semi-structured interviews because they involve the combination of generic open-ended questions aimed at eliciting unexplained responses with targeted interview questions related to the verification of provided information (Hove & Anda, 2005). In addition, semi-structured interviews provide flexibility, enabling the addition of follow-up questions whenever necessary (Adams, 2015). Though it is more difficult to cross-reference answers between interviews, it is not a major concern as only two interviews are being conducted.

Of course, semi-structured interview methods also do have some limitations. In the view of Adams (2015), the main limitation is that they require a lot of time for preparation, execution, and analysis. Additionally, they are dependent on the skills of the interviewer. The first limitation is overcome by considering the time and resource needed for the interviews in the research plan. The second limitation was overcome with the creation of an interview protocol, which is shown in Appendix E. The interview protocol was constructed based on literature research on how to conduct semi-structured interviews and by asking for advice from experienced interviewers. Due to the nature of the semi-structured interviews, the interviewees are given room to elaborate their answers, in case they wished to do so. Both interviews were voice recorded using Zoom, which is licensed by the Technical University of Delft, after which both interviews are transcribed and summarized. Due to privacy issues and to follow the ethical standards, a data ethics and storage plan has been made in accordance with guidelines of Technical University of Delft. Based on this plan, it is decided to anonymize the interviewees' names.

4. Results Qualitative Comparative Analysis

This section presents the results of fsQCA. The first section, section 4.1 presents the descriptive statistics of the conditions, along with the membership criteria used for calibration and an overview of the calibrated data. Additionally, the three types of solutions that are obtained from fsQCA are discussed. The second part, Section 4.2, presents the solution paths that predict the presence of ambitious NDCs. Subsequently, Section 4.3 presents the solution paths that predict the absence of ambitious NDCs. Section 4.4 briefly discusses the findings of sections 4.2 and 4.3. The chapter ends with Section 4.5, discussing the robustness of the analyses and results.

4.1 Descriptive statistics, calibrated data and solution types

4.1.1 Descriptive statistics & Calibrated Data

Table 4.1.1 contains the descriptive statistics of the data of the uncalibrated conditions included in this study along with the membership criteria established in Chapter 3 and used for data calibration. Table 4.1.2 shows the values per country per condition after the process of calibration.

Table 4.1.1 Descriptive statistics and membership criteria of conditions

		Descriptive statistics of the uncalibrated values		**Membership criteria**		
Category	Condition	Mean	Standard Deviation	No membership	Crossover point	Full membership
Idea	IND	40	22.8566	1	59	100
Interest	NAT	3.890909	5.693184	0	2.5	25
Institutions	DEM	6.190909	2.207268	0	6	10
	COR	47	18.91448	0	57	100
Societal	GNI	23935.67	24459.34	130	4046	116430
	VUL	0.3992727	0.07247874	0	0.425	0.675

Table 4.1.2 Overview of calibrated data per country

Country	AMB	IND	NAT	DEM	COR	GNI	VUL
Argentina	0	0.34	0.38	0.67	0.52	0.55	0.46
Australia	0.50	0.91	0.60	0.90	0.14	0.80	0.34
Bhutan	0.75	0.41	0.41	0.46	0.21	0.33	0.73
Brazil	0.50	0.25	0.53	0.67	0.59	0.53	0.46
Canada	0.50	0.82	0.33	0.92	0.14	0.76	0.31
Chile	0.50	0.13	0.44	0.85	0.22	0.57	0.36
China	0.25	0.12	0.19	0.13	0.52	0.54	0.45
CostaRica	0.75	0.09	0.12	0.83	0.32	0.55	0.43
Ethiopia	0.75	0.12	0.56	0.21	0.59	0.08	0.83
EU	0.50	0.49	0.06	0.85	0.23	0.70	0.37
India	0.75	0.36	0.35	0.61	0.55	0.19	0.73
Indonesia	0.25	0.09	0.51	0.56	0.60	0.50	0.58
Japan	0.25	0.34	0.05	0.83	0.16	0.73	0.40
Kazakhstan	0.50	0.12	0.88	0.19	0.59	0.53	0.38
Kenya	0.75	0.15	0.16	0.38	0.70	0.15	0.79
Mexico	0.50	0.18	0.41	0.51	0.70	0.54	0.47
Morocco	1	0.34	0.07	0.38	0.55	0.34	0.43
NewZealand	0.50	0.81	0.25	0.92	0.09	0.73	0.32
Norway	0.50	0.68	0.65	0.95	0.10	0.89	0.25
Peru	0.50	0.10	0.28	0.60	0.59	0.52	0.54
Philippines	0.75	0.20	0.10	0.60	0.65	0.46	0.64
Russianfederation	0	0.26	0.80	0.21	0.71	0.55	0.36
SaudiArabia	0	0.15	0.95	0.12	0.37	0.62	0.46
Singapore	0.25	0.12	0.05	0.51	0.10	0.81	0.46
SouthAfrica	0.25	0.61	0.55	0.69	0.49	0.51	0.48
SouthKorea	0.25	0.11	0.05	0.82	0.28	0.69	0.41
Switzerland	0.50	0.66	0.05	0.89	0.10	0.90	0.25
TheGambia	1	0.12	0.44	0.32	0.60	0.07	0.79
Turkey	0	0.24	0.07	0.32	0.55	0.54	0.38
UAE	0.25	0.15	0.87	0.16	0.19	0.74	0.41
Ukraine	0	0.15	0.30	0.48	0.67	0.74	0.42
USA	0	0.91	0.09	0.81	0.22	0.84	0.37
Vietnam	0	0.12	0.53	0.18	0.62	0.25	0.66

4.1.2 Solution types

QCA, and hence fsQCA, is the subject of many methodological debates and developments. The "best practice" depends to a greater or lesser extent on the specific purpose and use of QCA. The debates are mainly about which solution type is the right one (Schneider, 2018; Baumgartner, 2015, Thiem, 2016). In total, three different solution types are derived when performing fsQCA: i) complex solutions, ii) intermediate solutions, and iii) parsimonious solutions (Ragin, 2008). Verweij & Trell (2019) concluded that in 73 percent of all studies that performed QCA analysis, only one solution type was reported. In essence, all three solution types are a way to deal with limited diversity and are a way to minimize the truth table, which in this study, consists of 64 rows (2^k with k being the number of conditions).

The first type of solution, the complex/conservative solution, takes all cases where the outcome (NDC ambition, or no NDC ambition) is present, and then performs the necessary minimizations in successive iterations until the simplest primary implicants are generated. The advantage of the complex solution is that no assumptions are made about unobserved configurations. However, the solution is quite difficult to interpret due to its complexity (Duşa & Thiem, 2015). The second solution type obtained is the parsimonious solution. Compared to the complex solution, the parsimonious solution is a more simplified, but equivalent solution. The parsimonious solution contains simplified empty truth table rows without any evaluation of their theoretical plausibility (Duşa & Thiem, 2015). The advantage of the parsimonious solution over the complex solution is that it is easier to interpret and more parsimonious. However, there is no evaluation of whether included unobserved configurations are meaningful. Third, there is the intermediate solution, in which only easy counterfactuals are included, and not the difficult ones that are included in the most parsimonious solution. Easy counterfactuals are consistent with the theoretical and content knowledge of the researcher. In this study, the easy counterfactuals are based on the hypotheses established in chapter two. Thus, the intermediate solution finds a balance between complexity and parsimony (Thiem, 2019). This solution type mitigates the drawbacks of the previous solution types.

As mentioned above, there is debate about what type of solution should be included. Most researchers argue that only parsimonious solutions should be used to make inferences (Baumgartner & Thiem, 2015). However, the approach of prioritizing only the parsimonious model only assumes the solution is free of redundancy, which will decrease the internal validity of this study. In addition, external validity would decrease because no assumptions are made about logical residuals (Thomann & Magetti, 2017). Therefore, this study chooses to present the intermediate and parsimonious solutions in both scenarios, as recommended in other research (e.g., Liu, Mezei, Kostakos, & Li, 2015).

Prior to obtaining the solutions, two analyses were performed, respectively one for the outcome and one for the negated outcome, to determine the necessity of the separate conditions. As stated in Chapter Three, the focus of fsQCA is on asymmetric relationships among the conditions and the outcome in the model, and thus each analysis is executed for the outcome as well as for the negated outcome. Findings of the two necessity analyses can be found in Tables 1 and 2 in Appendix F. As anticipated, no condition passed the necessity threshold of 0.9 (Schneider & Wagemann, 2012). Natural resource dependence approached this threshold very closely with a value of 0.86, whereas all remaining conditions scored below 0.84. Moreover, to control for consistency, truth tables were checked, which are presented in Tables 3 and 4 in Appendix F, considering the minimum consistency threshold

of 0.75 (Ragin, 2008). Each configuration that attained a consistency of 0.75 or higher was given a one as outcome, the others a zero. Configurations presented in the truth tables showed two contradictory configurations, which implies that the same configuration produced the same outcome in one case and the non-outcome in the other (Verweij, 2012). Contradictions are required to be dissolved before the minimization process when possible and therefore it was decided to recode the conflicting configuration of the non-outcome truth table, as recommended by de Meur, Rihoux, & Yamasaki (2009) and Rihoux & Ragin (2008). The decision is based on theoretical knowledge about the two cases within this row, India, and the Philippines, which both submitted ambitious NDCs and received higher scores for the conditions within the row. This step illustrates the iterative nature of the method QCA, in which there is a constant dialogue between cases and theory. In conclusion, having conducted the tests for necessity and consistency, it was found that there are no conditions necessary for either the outcome or the negation of the outcome. This means that for none of the conditions included it holds that if the condition is not in place in any configuration, the configuration will not produce the outcome. In this research, configurations can produce the outcome, with or without the (sufficient) conditions.

4.2 Configurations predicting the presence of NDC ambition

Using the fsQCA to obtain the solution pathway for the presence of NDC ambition produces one configuration with a consistency level of 0.744, which is a deviation of 0.06 from the consistency threshold of 0.75, and a satisfying level of coverage of 0.56, both displayed in Table 4.2. Given that the deviation of the consistency value is very small, the solution is regarded as consistent. The filled and empty circles in Table 4.2. denote whether the condition is to be present or absent, with the filled circles indicating presence and the empty circles indicating absence (Ragin, User's Guide to Fuzzy-Set / Qualitative Comparative Analysis. , 2008). Empty spaces denote irrelevance; in this context it does not matter if a condition is either present or absent. Circle size is also relevant. Larger circles point to core conditions, these are conditions that are the essence upon which the solution is built (both intermediate and parsimonious solutions), as such, they are not logically reduced even when all theoretically feasible counterfactual scenarios are included. Small circles indicate peripheral conditions, these are conditions that only appear in the intermediate solution and exhibit a weaker causal relationship with the outcome. These delineations are guided by Fiss (2011), who recommends that the importance of conditions in a configuration should be weighted by the strength of the evidence. Hence, the conditions that are only part of the intermediate and parsimonious solutions are the core of the solution pathways, where special attention is placed on the core conditions. Typically, an AND relation is denoted by "*", an OR relation is usually denoted by "+", and the absence of a condition is usually denoted by "~". (Schneider & Wagemann, 2012).

Table 4.2 Solution pathway sufficient for the presence of NDC ambition

Outcome	NDC Ambition (AMB)
Configurations	Solution pathway 1
NAT	
GNI	
DEM	
COR	
VUL	
IND	
Solution Consistency	0.7444186
Solution Coverage (raw and unique)	0.558501
Countries	Kenya, The Gambia, India, Philippines

Coverage represents the percentage of the result that is covered with a solution. A difference exists between the raw coverage and the unique coverage. The raw coverage represents what proportion of the result is being explained by a particular configuration, while the unique coverage indicates what proportion of the result is exclusively explained by a given configuration (Ragin, 2008; Schneider & Wagemann, 2007). For this solution path, the raw and unique coverage both equal 55 per cent. With an adequate coverage, the solution relevance may be determined, however, solution paths with weaker coverage scores may be theoretically relevant as well (Schneider & Wagemann, 2012). This solution path obtained has the following core conditions: ~NAT*VUL. This shows that the absence of dependence on natural resources AND the presence of high levels of vulnerability to climate change are core conditions and sufficient for an NDC to be ambitious. Additionally, the peripheral conditions captured in this pathway are ~GNI*COR, indicating that low GNI AND high levels of corruption contribute to the presence of NDC ambition. Collectively, these four conditions form the solution pathway sufficient to explain NDC ambition in four countries. It is important to notice and remember that not one of the conditions is a necessary condition. This note matters because it implies that any given country can submit an ambitious NDC.

The solution obtained explains the NDC ambition in four of the sampled countries: Kenya, Gambia, India, and the Philippines. To what extent this result compares to previous literature, to what extent it was expected or not, and for what reason these countries are part of this solution set, will be discussed in detail in chapter seven.

4.3 Configurations predicting the absence of NDC ambition

Using fsQCA to obtain the solution path for the absence of NDC ambition yielded four possible configurations, presented in Table 4.3. The series of solutions show a high consistency (0.75) and coverage (0.83). The high level of consistency, >0.75, denotes that the obtained results are significant. There is no compelling similarity among the four configurations within the solution set. The lack of correspondence between them is consistent with the separate necessity analysis performed, which revealed that there is no necessary condition for the outcome to occur. In the preceding section, which evaluated the ambition of NDCs, this lack of necessity marked a favorable finding, since it implies that any country can draft and submit an ambitious NDC. In parallel, it is less of a positive finding in this operation, as it implies that any country can draft and submit an unambitious NDC.

One thing that is corresponding among the solution paths is that for all solutions, the core conditions are part of the solution. The parsimonious solution is equal to NAT + ~VUL, which shows that either being dependent on natural resources OR not being vulnerable to climate change is present in the negated outcome 'Non-ambitious NDCs'. The second solution pathway includes both core conditions. The core conditions go hand in hand with high levels of GNI and low levels of individualism. In the third solution path, the core condition of not being vulnerable to climate change goes together with high levels of GNI, democracy, and absence of corruption. In the fourth solution, which is like solutions two and three, not being vulnerable to climate change goes together with several preconditions, namely: high GNI and corruption and low individualism. The last solution, solution five, combines the other core condition of being dependent on natural resources with a low level of GNI and democracy and a high level of corruption. One thing that stands out is that for three conditions, GNI, democracy and corruption, both the absence and presence of this condition can result in the negative outcome depending on the coinciding conditions. A further notable insight is that for all solution pathways, neither the presence of vulnerability, nor the presence of individualism, nor the absence of dependence on natural resources are sufficient to lead to the submission of unambitious NDCs. The second and the fourth solution pathways are very similar, suggesting that high dependence on natural resources and the presence of corruption are to some extent interchangeable when considering the outcome. All else being equal, both configurations produce very low unique coverage.

Table 4.3 Solution pathways sufficient for the absence of NDC ambition

Outcome	**No NDC Ambition (~AMB)**			
Configurations	Solution pathway 2	Solution pathway 3	Solution pathway 4	Solution pathway 5
NAT				
GNI				
DEM				
COR				
VUL				
IND				
Consistency	0.972646	0.844005	0.929866	0.876344
Raw coverage	0.406766	0.579217	0.468583	0.338721
Unique coverage	0.0296121	0.195819	0.0509068	0.0280535
Countries	United Arab Emirates (UAE), Russian Federation, Saudi Arabia, Brazil, Kazakhstan	Switzerland, Norway, Canada, New Zealand, Australia, EU, United States of America (USA), Japan, South Korea, Chile, Singapore, South Africa	Ukraine, Russian Federation, Turkey, Mexico, Brazil, Kazakhstan, China, Argentina	Vietnam
Solution Consistency	0.754277			
Solution Coverage	0.831558			

The solutions obtained explain the lack of NDC aspirations in 25 countries of the sample. How these results compare to previous literature and to what extent these results were to be expected is addressed in chapter seven.

4.4 Overview results QCA

This section provides an overview of the results that explain ambition and non-ambition and subsequently the findings are divided into different categories.

The relations between the presence or absence of NDC ambition with natural resource dependence, GNI, democracy, corruption, vulnerability to climate change, and individualism was explored. One sufficient solution pathway was found to explain the presence of NDC ambition, and four sufficient solution pathways were identified that explained the absence of NDC ambition. In the sample of countries, the determinants of the absence of NDC ambition are more varied, as the solution includes four different configurations, which means that the findings for the negated outcome are equifinal. Schneider & Wagemann (2012) recommends emphasizing which cases are being explained by the overall sufficient solutions and which cases are not. Table 4.4 illustrates that the countries in the sample can be divided into seven different possible categories based on the solutions pathways. Most of the countries in the sample can be explained by one of the solution pathways obtained. There are some countries, however, which cannot be explained by any of the solution pathways that have been obtained. The most important causal conditions, the core conditions, in each category are highlighted.

Table 4.4 Overview of explained and unexplained NDC ambitions by performing fsQCA

Outcome	**Solution Pathway**	**Countries covered**
Ambitious NDC	**1.No dependence on natural resources** * **vulnerability to climate change** * no GNI * corruption	Kenya, The Gambia, India, Philippines
Ambitious NDC	No sufficient solution configuration	Costa Rica, Morocco, Ethiopia, Bhutan,
Non ambitious NDC	**2.Dependence on natural resources** * **no vulnerability to climate change** * GNI * no individuality	UAE, Russian Federation, Saudi Arabia, Brazil, Kazakhstan
Non ambitious NDC	**3**.GNI * democracy * no corruption * **no vulnerability to climate change**	Switzerland, Norway, Canada, New Zealand, Australia, EU, USA, Japan, South Korea, Chile, Singapore, South Africa
Non ambitious NDC	**4.**GNI * corruption * **no vulnerability to climate change** * no individuality	Ukraine, Russian Federation, Turkey, Mexico, Brazil, Kazakhstan, China, Argentina
Non ambitious NDC	**5.Dependence on natural resources** * no democracy * no GNI * corruption * no individuality	Vietnam
Non ambitious NDC	No sufficient solution configuration	Indonesia, Peru

4.4.1 The unexplained cases

Indonesia was eliminated from the analysis for its score of 0.5 for individualism. Among the remaining 32 countries in the sample, five countries' ambitions could not be explained by the solution approaches, as is usual in fsQCA. Four of those remaining countries, Costa Rica, Morocco, Ethiopia, and Bhutan, presented ambitious NDCs. Costa Rica and Morocco displayed no high levels of vulnerability to climate change, whereas Costa Rica scored highly on GNI, while Morocco and Bhutan, on the other hand, exhibited low levels of corruption. While Ethiopia is strongly dependent on natural resources, it was not accounted for by the solution path that had been obtained. As such, continued research on these specific cases are needed to understand the ambitious NDCs attained by these four

countries. Peru is the fifth country which was not explained by a solution path. Peru submitted an unambitious NDC, is very vulnerable to climate change, is democratic, and does not rely heavily on natural resources. This case is noteworthy for being the only non-ambitious country that fails to satisfy one of the four solution pathways due to its non-existence of one of the two core conditions: being dependent on natural resources or not being vulnerable to climate change. By looking at the precise numbers of Peru, it can be observed that the threshold for VUL is set at 0.425 and the value for Peru is 0.439, meaning it is " more in than out" as it exceeds the threshold. Hence, it is not explained significantly by the solution path. Though, it is not very resembling and not entirely unique from the other countries.

4.4.2 The solution pathways

In this subsection, it will be examined to what extent the results found correspond to the findings in the literature, or whether there exists disagreement.

When considering all five solution paths, the most remarkable observation is that the core conditions for the outcome, as for the negated outcome, are the exact opposites. There is, however, a divergence, such that the findings are not symmetrical. The core configuration for ambitious NDCs is no natural resource dependence * vulnerability to climate change, whereas the core configuration for non-ambitious NDCs is natural resource dependence + no vulnerability to climate change. The first is an "AND" relationship, meaning that both conditions must exist simultaneously in any given case to achieve NDC ambition. As for the negating outcome, this is an 'OR' relationship, which implies that it is sufficient if only one of the two core conditions is present.

The pathway of the first solution contributes to explaining the ambitious NDCs of Kenya, Gambia, India, and the Philippines. The NDCs of Kenya, India, and the Philippines were rated by the CAT as "2°C-compatible," and The Gambia was rated "1.5°C-compatible with the Paris Agreement," making it, along with Morocco, the most ambitious in the entire sample, indicating that its government's NDC constitutes the most rigid part of its fair share range. The pathway from the second to the fifth solution helps explain the unambitious NDCs submitted by Switzerland, Norway, Canada, New Zealand, Australia, the EU, the US, Japan, South Korea, Chile, Singapore, South Africa, Ukraine, the Russian Federation, Turkey, Mexico, Brazil, Kazakhstan, China, Argentina, Vietnam, the UAE and Saudi Arabia. Of which the least ambitious countries, assigned a value of zero during calibration, are Turkey, the USA, Ukraine, Argentina, Vietnam, Russia, and Saudi Arabia.

4.5 Robustness of results

QCA has been designed to be employed in an iterative and reflexive manner – informed by elaborate theoretical reflections and by empirical understanding - and they never adhere to a "press the button" rationale (de Meur, Rihoux, & Yamasaki, 2009, p. 158). Nonetheless, an important matter deserving close attention is the robustness of QCA findings. Clearly, researchers must always account for every analytical move by arguments grounded in theoretical, methodological, and empirical understanding. To find out whether the results are robust, three types of robustness checks have been performed. Firstly, adjustments are

made to the thresholds that have been decided upon during calibration. Secondly, the frequency of cases that are linked to configurations is adjusted. During the main analysis, this frequency was equal to two. Thirdly, the consistency levels of configurations have been adjusted. During the main analysis, the consistency levels were equal to 0.75. During all three tests, the parsimonious solution for the outcome is compared to the main results. An overview of these steps is presented in Appendix G.

The first test included three different adjustments regarding the calibration of the raw data into the set memberships. First, the outcome variable was calibrated from a fuzzy set into a crisp set, in which zero's denote no membership (non-ambitious NDC) and ones denote membership (ambitious NDCs). This results in no satisfactory solution sets explaining NDC ambition. This was expected as the transformation of only the outcome results in a high loss of information. The second adjustment transformed both the outcome and the conditions from fuzzy sets into crisp sets. This adjustment produced very comparable results compared to the results obtained in this chapter. This is probably the case because similar thresholds were used to decide which cases received a one (e.g. not vulnerable to climate change) or a zero (e.g., vulnerable to climate change). The third adjustment related to the threshold values that were defined during the operationalization and calibration in chapter three. These values were adjusted slightly to check if this would result in major differences in the solutions. Remarkably, the absence of GNI became a core solution, which was an intermediate solution in the results that have been obtained in chapter four. This emphasized that GNI might have a bigger influence on NDC ambition, as with minor changes, the condition became part of the parsimonious solution. Additionally, this shows the importance of setting the right threshold values.

Following the calibration tests, two other tests have been performed. First, the frequency threshold got decreased from two to one. This resulted in a less coherent superset, which was expected because decreasing the frequency threshold means more configurations are included in the solution. For the third test, the consistency level was adjusted, increased, and decreased. Again, GNI came into play, which emphasized the importance of this condition. However, what is striking is that instead of a negative condition (negated GNI) found in the first test, a positive correlation (GNI) appears, indicating ambiguity regarding the relationship of GNI with NDC ambition.

5. Complementary analysis

This chapter presents and discusses the results of the conducted bivariate correlation analyses. The chapter consists of four sections. In the first section, the results are presented that have been obtained from the bivariate correlation analyses. In the second section, the hypotheses will be discussed individually based on the results. In the third section, the results of the bivariate correlations are compared with the results of the fsQCA to see if the use of a variable-oriented method and case-oriented method complement or contradict each other. the chapter concludes with the fourth section, in which a conclusion of the main findings of the complementary analysis is presented.

5.1 Results correlation analysis

As indicated in chapter four, it was examined whether an additional regression analysis could be performed. Because the dependent variable NDC ambition is ordinally distributed, it got quickly apparent that linear regression, the most commonly used form of regression, was not an option. Additionally, given the high multicollinearity and the violation of the assumption of proportional probabilities among the independent variables, performing an ordinal logistic regression would give invalid results. Therefore, it was decided to take a closer look at the Kendall's tau bivariate correlations between the dependent variable and the independent variables.

Table 5.1. presents the correlations that have been obtained. Kendall's tau is being interpreted as indicating that a correlation is very strong if the value is greater than 0.50, strong if it is between 0.26 and 0.50, weak if it is between 0.11 and 0.26, and very weak if the value is less than 0.11 (Sen, 2012) and the correlations are significant at the 0.05 or 0.01 level. The table also shows the expected correlations based on the hypotheses and the expected correlations based on the results of fsQCA. It is worth to note that configurational approach assumes asymmetry. Since the results of both the absence and the presence of NDC ambition with fsQCA show considerable symmetry at the condition level for the core conditions, the expectations are met for both the outcome and the negated outcome. No expectancies have been entered for the conditions/variables that may or may not be present for the same outcome. To aid in interpreting, all the significant positive correlations are highlighted in green, and the significant negative correlations are highlighted in red. The significance of each relationship found is indicated by one or two asterisks for the 0.05 and 0.01 significance levels, respectively. An overview of all the (Kendall's tau) correlations, between the independent and dependent variables, is included in Appendix H.

Table 5.1 Results of the correlation analysis (Kendall's Tau) with NDC ambition as dependent variable

Independent variable	Expected correlation based on hypotheses	Expected correlation based on fsQCA	Bivariate correlation With NDC ambition
NAT	-	- (Core)	-0.083
IND	+	+	0.006
DEM	+	+/-	-0.146
COR	-	+/-	-0.021
GNI	+	+/-	-0.308*
VUL	+	+ (Core)	0.171

5.2 The hypotheses

Table 5.1 reveals that none of the variables significantly affect NDC ambition, apart from GNI, which shows a significant negative correlation. Most of the other variables were not able to even come close to a statistically significant value, which makes the interpretation of the results very difficult as the data is not sufficient to make a conclusion. Almost all hypotheses cannot be accepted, nor can they be rejected. The only exception is hypothesis five, which is the only hypothesis with significant results. The insignificance of the correlations might indicate that the correlation in the population is zero, or that the power of the test was not large enough. The latter reason, a lack of power, is a reasonable explanation for the insignificant result as only 33 cases have been included in the analysis and that all correlations are extremely small, which is assumed to be weak or even very weak according to Kendall's tau. The insignificance of the correlation coefficients of interest increases the emphasis to understand and explore the theoretical and political context. The results are not significant, but the negative or positive sign of the coefficient in relation to the theoretical framework might lead to valuable lessons. However, one must be very careful with interpreting insignificant results. However, the hypotheses will be briefly addressed one by one.

H1: Individualism has a positive relation with NDC ambition.

For this hypothesis, no significant correlation is obtained, and therefore this hypothesis is not rejected and not accepted. This insignificance is contrary to the findings of Zheng et al. (2021), while this study used the same data for individualism as their study. Which is odd, because they showed that individualism is a significant and robust predictor for the mitigation levels of NDCs. Correlation coefficient is extremely small, but the positive direction is similar to the hypothesis and the results that have been obtained with fsQCA.

H2: Natural resource dependency has a negative relationship with NDC ambition.

For the second hypothesis, no significant correlation is obtained. However, the coefficient does show a negative sign, which is consistent with the results obtained with the fsQCA. The direction of the sign is also in accordance with the findings of Golub, Lugovoy, & Potashnikov (2019) and Lamb & Minx (2020).

H3: Democracy has a positive relationship with NDC ambition.

For hypothesis three no significant correlation is obtained. When looking at the direction, the obtained sign is negative, which is different from what was expected from prior literature. However, there is also a theory of "authoritarian environmentalism," which argues that democracies are reluctant to interfere with markets or govern lifestyles, thus allowing for more repressive climate policies (Clulow, 2019). The findings of fsQCA are different per set of countries. For certain countries, being democratic was part of the solution pathway for explaining the lack of democracy, while for other countries, not being democratic was part of the solution pathway for explaining the lack of democracy.

H4: Corruption has a negative relationship with NDC ambition.

For the fourth hypothesis, no significant correlation has been obtained. The negative direction of the coefficient is similar to what was expected from prior literature. It is generally found that a low level of control over corruption is associated with a lack of successful environmental policy (van Coppenolle, 2020). However, one should be very careful with interpreting these directions as the relation between corruption and NDC ambition are different per set of country with the fsQCA.

H5: GNI has a positive relationship with NDC ambition.

The fifth hypothesis is rejected as a significant positive correlation has been obtained instead of a negative correlation. The strength of the correlation is equal to -0.308*, which means that the correlation is strong. The finding is interesting as it is not in line with the findings of Booth (2017) and Bel & Teixido (2020). However, the finding is in line with the findings of solution pathways one to four which have been obtained with fsQCA. However, the relationship between GNI and NDC ambition with QCA in solution pathway five is reversed. As mentioned in the previous section, the country included in this solution pathway is Vietnam, which deviates from the majority. Moreover, the robustness test conducted in the previous section showed that the absence of GNI is extremely close to being a core condition, suggesting the equivalent direction of the correlation found in this analysis. In addition to the correlation that exists with the dependent variable, the correlation table in Appendix H also shows that GNI correlates with other conditions, such as corruption and democracy, negatively and positively consecutively. What can be concluded from this is that this condition, has quite a strong link with both the outcome and the national conditions included in this analysis, which might indicate that this factor is masking other underlying factors for example.

H6: Climate vulnerability has a positive relationship with NDC ambition.

The sixth hypothesis is not rejected or accepted as no significant correlation is obtained. The positive direction of the coefficient is in line with what was found in prior literature (Drews & van den Bergh, 2016; Sprinz & Vaahtoranta, 1994), and what was found with fsQCA.

5.3 Comparing results fsQCA and correlation analysis

This section compares the results of the fsQCA with those of the correlation analysis to see if additional insights may be derived.

Correlation analysis is a type of statistical analysis, which aims to determine to which extent two variables are correlated with each other. (Bujang & Baharum, 2016). It must be emphasized that, to have enough power, the sample size should have a certain size (Pallant, 2005). Based on the recommendations of Cohen (1992) a power analysis is applied, which he presents in a nifty table. In this table he recommends a minimum N for a statistical analysis, based on the power level, the effect size, the number of independent variables (conditions) examined in the research, and a criterion of significance. A significance criterion of 0.05 and a power level of 0.80 are used in this study, both of which are common in a power analysis (Drost, 2011). The effect size is equivalent to 0.45 (large), which is derived by computing the R2. Following Cohen (1992), the minimum sample size required for a statistical analysis with six independent variables is 45. The sample of this study includes 33 countries, including the EU. Therefore, this minimum sample size is not met. This is reflected in the fact that (almost) no significant correlations with the dependent variable were found. This corresponds to the study by Katz, Vom Hau, & Mahoney (2005), who performed a statistical analysis with a total of 15 cases and failed to find any meaningful or significant results.

In general, the findings of the fsQCA were more extensive compared to the findings of the correlation analysis, as a total of five solution pathways consisting of at least four conditions, were obtained. Still, the results of the two analyses seem rather complementing than contradicting as the observed correlations all have the same direction as the core findings of fsQCA. The only significant correlation obtained was a negative correlation coefficient for GNI and NDC ambition. This finding is rather intriguing, as it is consistent with the findings of solution pathway one to four. However, the relationship between GNI and NDC ambition with QCA in solution pathway five is reversed. As mentioned in the previous section, the country included in this solution pathway is Vietnam, which deviates from the majority. Moreover, the robustness test conducted in the previous section showed that the absence of GNI is extremely close to being a core condition, suggesting the equivalent direction of the correlation found in this analysis. In addition to the correlation that exists with the dependent variable, the correlation table in Appendix H also shows that GNI correlates with other conditions, such as corruption and democracy, negatively and positively consecutively. What can be concluded from this is that this condition, has quite a strong link with both the outcome and the national conditions included in this

analysis, which might indicate that this factor is masking other underlying factors for example. This is a suggestion that can be properly put to the test by asking experts in the field of NDC ambition.

Additionally, the fsQCA analysis showed that the direction between corruption and democracy with NDC ambition can go either way. Both high levels and low levels of these conditions are part of a solution path that explain the absence of NDC ambition. For example, being democratic leads to the absence of NDC ambition in solution pathway three, where not being democratic leads to the absence of NDC ambition in solution pathway five. In a correlation analysis, however, such a pattern would amount to a non-significant finding, which was indeed observed. In general, a weak correlation coefficient, as in the case for most of the independent variables, does not exclude the existence of a necessary and/or sufficient relationship (Mahoney, 2004).

5.4 Conclusion

With fsQCA, a total of five solution pathways were obtained, each containing at least four conditions. With the bivariate correlation analysis, a total of one significant correlation was found. The comparison of these two findings shows that in this study, the findings of fsQCA were more comprehensive than the findings of the correlation analysis. It should be noted that this low number of significant correlations may be because the analysis lacked power due to the small sample size.

As mentioned in chapter three, some researchers argue that conventional quantitative methods cannot be compared with configurational comparative methodologies, such as QCA. They imply that the two approaches simply do not compete for the equivalent turf (Rihoux & Ragin, 2008). However, the findings obtained complement rather than contradict each other. The core conditions identified with fsQCA that are sufficient for ambitious NDCs are: vulnerability to climate change and non-dependence on natural resources. The correlation coefficients were not significant, but the direction of the coefficient is similar. In addition, the negative significant correlation coefficient between GNI and NDC ambition is partially consistent with the findings of fsQCA, but this provides additional insights rather than conflicting insights. It could be that GNI is a measure of other independent variables not included in the analysis and it confirms that solution path five is less relevant, as it is the only solution path that contradicts the finding of negative correlation and consists of only one country. All in all, it is worth noting that the findings of this study are consistent with the assertion of Ragin (2008), Rihoux. (2006), and others that although traditional statistical approaches and configurational-comparative methods have different epistemological bases, they do not compete for the same turf.

6. Validation

To validate the results of the two methodologies, two semi-structured interviews have been conducted. As mentioned in chapter three, the two interviewees were selected and approached based on their expertise on subjects related to the comparison of national climate commitments, and on their knowledge about which factors explain their success and the lack thereof. The first interviewee is a climate policy analyst at the PBL Netherlands Environmental Assessment Agency. The interviewee is a climate policy advisor of the EU delegation of the climate negotiations, providing analytical support to the delegation and the European Commission DG CLIMA for the UNFCCC climate negotiations on these topics. In addition, this interviewee is also a professor at the Institute for Environmental Studies of the Vrije Universiteit Amsterdam. The second interviewee is a climate policy analyst at NewClimate institute and part of the core team of Climate Action Tracker, in which the interviewee tracks and evaluates climate action on the international level.

At the start of the interview, the interviewee was provided with information about the aim of the study and the goal of the interview. Thereafter, the structure of the interview was presented, which addressed four main topics, with the purpose to validate or to gain more in-depth results: i) general questions, ii) factors in general, iii) factors of the research, and iv) the countries. The interview protocol that was used is included in Appendix E. The main findings are discussed in this chapter. This chapter consists of five sections in total. Section 6.1 contains the discussion on the general questions. Section 6.2 presents the findings on the influencing determinants in general. Section 6.3 presents the findings about the conditions included in the study and Section 6.4 presents the findings about the configurations that were found in the QCA. The chapter concludes with Section 6.5, which presents a small conclusion about the main findings of this validation.

6.1 General

In this section, the key findings regarding general issues are covered, such as how the interviewees are involved in the PA, what their views are on the design of it, and how they believe ambition can best be measured.

Both interviewees are working and doing research in the field of global warming and the PA. Therefore, they are well informed about the process and the countries that are part of the PA. In terms of the design of the PA, they agree that the design of the agreement, which requires countries to submit new or updated NDCs every five years, is a good mechanism for ensuring that ambition increases and that all sorts of countries are involved. But special attention must be paid to countries that "cheat" with their new or updated NDCs. It may happen that it seems that a particular country is increasing its ambition, when in fact it is lowering its ambition by adjusting its reference year, which is the case for Brazil for example. A further comment is that the process is rather slow and that the ambition of countries needs to increase for the PA to be effective. The interviewees mentioned that more research into the explanatory factors is needed, because the issue is complex, and all influencing factors are interrelated.

As for the definition and measurement of ambition, both interviewees agree that ambition is indeed measurable, but that there exists much debate on this topic. A lot of

criteria must be considered (e.g., equity, per capita emissions, peaks in emission levels). CAT is seen as a valuable tracker as it tried to reduce the equity bias by excluding objective judgements as much as possible. However, it must be considered that the rating is not very granular, which makes it difficult to interpret.

6.2 General influencing factors

This section discusses the general key factors that interviewees with experts in the field of NDC ambition believe affect NDC ambition. In addition, it discusses which countries they believe will have low or high ambition, regardless of the results obtained in this study. In this way, it is verified whether the main influencing factors have been addressed in this study.

In the view of both interview participants, income is an important factor, with high income leading to high aspirations. Which is in line with the finding for Vietnam (solution pathway five), but not in line with the other solution pathways. It is mentioned, however, that income should be considered as a proxy for other factors, such as institutional capacity or corruption. Since GNI correlates strongly (see Appendix H) with other factors, this statement is consistent with the results obtained. It can be seen as a good indicator to do more, but whether it does enough is another question. Another important factor mentioned is political will, regardless of whether a government is left or right, it is more important to assess the consistency of a government. This factor has not been considered in this research but creates a nice foundation for future research. Both interviewees mentioned natural resource dependence as an important factor, which verifies the use of this condition in this research as it appeared to be a core condition in both the outcome and the denied outcome of the fsQCA; suggesting that the results are valid. Based on this proposition, oil producing countries, for example Saudi Arabia, Turkey, or Russia, are expected to show little ambition. The results of this study show that indeed Saudi Arabia and Russia show little ambition due to their high dependence on natural resources (solution pathway two). Another factor mentioned is the extent to which civil society is concerned with the climate. One would expect that the more people are concerned, the more climate is present in politics as an important factor in elections. This factor was not included in the study but does indicate that it is a good factor that could be included in future research. As was also confirmed by the interviewees, it is impossible to identify all the national factors, but even if it is incomplete, the research will still be complementary.

6.3 Factors included in the research

This section presents the interviewees' opinions and knowledge about the six national factors that are included in the study. Whether they expect these factors to have a positive influence, a negative influence, or no influence on NDC ambition. In addition, interviewees were invited to discuss what they anticipate being the combination of factors that will lead to ambitious or unambitious NDCs.

Being dependent on natural resources

One interviewee is very sure that being dependent on natural resources affects the ambition of NDCs substantially; explaining that most countries that are highly dependent, struggle to submit ambitious NDCs because of multiple reasons. The main reason is the distributional effects, e.g., the type of jobs, which, according to the interviewee, is difficult to discuss with policy makers. In this research, being dependent on natural resources appeared to be a core condition for both the outcome and the negated outcome of the results and is validated by the interviewee.

Gross National Income

The influence of this factor depends heavily on how ambition is defined. Regardless, both interviewees strongly agree that it has a large effect on ambition, but it probably hides other factors. Therefore, this factor should be interpreted with caution. A further explanation for the ambiguity of this factor is that it can have positive and negative effects on ambition. For example, GNI has a negative impact on ambition when the incumbent industry is very clear, and GNI can have a positive impact on ambition because it increases the possibility of innovation.

Democracy

The two interviewees agree and acknowledge that this factor probably has no impact on ambition. They recommended to focus on political stability instead, as this temporal factor may explain ambition better. The factor democracy did appear in solution pathways three and five, with different explanations for non-ambitious countries. To test whether the solution obtained would be different without this factor, the analysis is conducted again, but this time without this condition. The results are presented in Appendix I (table one and two). As can be seen, for the presence of NDC ambition and the absence of NDC ambition, the same core conditions are obtained. While for the denied outcome, only the intermediate solution is a little different. Instead of four solution pathways, there are three pathways. The solution pathways are almost identical to the primary outcomes except that they do not include democracy. Therefore, it is possible to argue that democracy has no significant effect on the NDC ambition, since the results obtained with and without this condition are comparable. For future research, it might be valuable to include the factor of political stability as an additional factor instead of democracy.

Corruption

In the results obtained, corruption is related to having an ambitious NDC. For the solution directions obtained for the lack of NDC ambition, the results were somewhat ambiguous. The interviewees expected corruption to have a negative relationship with NDC ambition, indicating that a high level of corruption would lead to NDCs without ambition. This is the case for solution pathway three, which explains the lack of NDC ambition for Switzerland, Norway, the EU, the US, and Singapore, among others. Interviewees argue that the more corrupt a country is, the more likely it is to be influenced by established industries. Interviewees explain that even if a country's politicians have a strong intention

to mitigate climate change, a transition to higher levels of mitigation is slowed by political resistance from the incumbent industrial regime, leading to lack of transparency and an increase in corruption from the government. Such a statement demonstrates the interdependence with the condition dependency on natural resources, because when a country is heavily dependent on natural resources, it is expected to be more corrupt and not transparent. However, such a statement does not explain the solution pathway explaining NDC ambition.

Being vulnerable to climate change

Both interviewees affirm this to be an influencing factor, which validates that the findings regarding this condition is validated. The findings are that being vulnerable to climate change is a core condition for both the outcome and the negated outcome. The more vulnerable a country is, the easier it is to convince stakeholders to increase ambition. However, one interviewee does mention that this might vary a lot per country. For example, for countries in Africa it is very important because they have a low GNI. Looking at the obtained solution pathways, having a low GNI and being vulnerable to climate change is indeed present in the solution pathway explaining NDC ambition in countries such as Kenya.

Individualism

Both interviewees are adamant that this factor does not impact NDC ambition. It is a complicated factor, as Western countries tend to be more individualistic. From this perspective, one of the interviewees indicated that the factor is unlikely to occur alone or as a core condition, but rather in combination, which is indeed the case. To check the influence of this condition, the analysis was conducted again, but this time without the condition IND and without the condition DEM. The results are presented in Appendix I. It shows that in explaining NDC ambition, the core conditions and the peripheral are the same as the 'baseline' solution, indicating this condition does not matter for the outcome NDC ambition. In explaining the absence of NDC ambition, it is seen that the core conditions are exactly the same and did not change after eliminating both DEM and IND. However, the solution set now consists of two configuration pathways, having the exact same solution coverage and solution consistency as when only DEM was eliminated. When comparing the consistency and coverage levels of the baseline solutions, it is seen that the consistency level is the same (0.83), but the solution coverage is slightly less (-0.01) compared to the primary solution.

Combination

The experts were requested to indicate what combination of these six factors they believe to be present or absent in explaining the NDC ambition. The purpose of this question was to verify that the results obtained could be validated in the absence of obtained results. The first interviewee was extremely close, predicting the configuration completely correctly, except for one factor: GNI. This demonstrates that the obtained results are validated, but it also demonstrates that the relationship with GNI is rather complex and perhaps ambiguous. The factor emerged from both analyses, fsQCA and correlation analysis,

however ambiguously. As indicated by one of the experts, GNI can have positive and negative influences on ambition, which differs from country to country. This reflects the interconnectedness of conditions, and it also reflects the uniqueness of countries. It is more worthwhile and beneficial to look at the countries in groups of countries (fsQCA) rather than in a generic manner (correlation analysis).

6.4 Solution Pathways

The five solution pathways obtained by applying fsQCA were presented to the interviewees. They have been invited to express their opinions and indicate the extent to which they agree with the findings. Their responses are summarized in this section.

Presence of NDC ambition

Both interviewees agree with the solution path obtained for the presence of NDC ambitions. The first interviewee immediately tried to find an explanation for why certain countries are included in this configuration. For example, it was suggested and confirmed that for the Philippines, vulnerability to climate change indeed plays a crucial role. In addition, for Kenya and The Gambia, GDP and ecotourism could play a role. Having an ambitious NDC could help and facilitate making a good impression in the west, which would increase ecotourism. This might be a plausible explanation. Low GNI is likely present because of a desire to receive extra money, which plays a role in setting high (and expensive) goals.

In addition to both interviewees confirming the validity of the results, one interviewee noted that the results obtained are highly dependent on the dataset used for the NDC ambition. Since equity is considered in this dataset, the countries with low GNI are less responsible and thus more easily receive a higher CAT rating. If a different dataset would have been used, such as, for example, the projected change in per capita emissions from now to 2030, the results would be quite different.

Absence of NDC ambition

For lack of NDC ambition, it is slightly more complicated to validate the results, as there are multiple solution pathways sufficient for the absence of NDC ambition.

It is commented that the CAT tends to be a bit negative, by stating that countries are not ambitious. While some countries are totally unambitious now, however, there is a good chance that this will alter in the coming years, in the case of China for example. Regarding the conditions included in the solution pathways, dependency on natural resources is indeed identified as important, indicating that it is mainly addressed to OPEC countries. When checking the results of the fsQCA, it is true that this is the case for Saudi Arabia, for example. The ambiguous results obtained for democracy were expected by the experts, as was already mentioned in section 6.3. Based on the knowledge of the experts, it was expected that individualism would show contradicting results, however, this was not the case in the results obtained. All solution pathways indicated that the lack of individualism results in a lack of NDC ambition. However, it has been shown that eliminating this condition, did not alter the outcomes drastically. Lastly, the fact that being vulnerable to

climate change appears as a core condition, was totally as expected, and predicted by the experts.

6.5 Conclusion

All in all, the interviewees mentioned the validity of the solution approaches and emphasized that it is simply impossible to identify all national factors within one research. However, even if the factors are incomplete, the study is still additional. As for the dependent and independent variables, the dependent variable is worthwhile because it includes equity as objectively as possible and given that NDC ambition is such a complex phenomenon to measure, there is no one right or wrong. It must be mentioned, however, that the metrics used for the dependent variable will greatly affect the results. As for the independent variables, four of the six are considered to be important, except for the inclusion of democracy and individualism, which was doubted. Because of doubts about the role of these two conditions, two more analyses were conducted, one without the inclusion of democracy, and one without the inclusion of individualism and democracy. Results showed that this had no significant effect on the findings on the explanation of NDC aspirations. Excluding these conditions did have an effect on the findings for the lack of NDC ambition, but this only changed the peripheral conditions slightly; the core conditions remained the same. Both of the interviewees stressed the relevance of the core conditions obtained in the fsQCA, namely vulnerability to climate change and dependence on natural resources. About the influence of GNI much uncertainty existed, which was also visible in the results obtained. An explanation is that GNI can have both a positive and a negative impact and may also be inclusive of other factors, so it plays a different role in each solution process. This underlines the relevance of fsQCA in this study. Moreover, both interviewees were unanimous that all conditions are interconnected and that it is advantageous to consider the countries as groups and the conditions as configurations.

7. Conclusion and Discussion

This chapter consists of five sections. The first section, Section 7.1, provides the overall conclusion of this study, and Section 7.2 contains a discussion, which interprets and describes the findings. Then, in Section 7.3, the limitations of this study are presented. Followed by the provision of recommendations for future research and policy makers in Section 7.4. Ending this research with Section 7.5, which outlines the social relevance, academic relevance, and connection of this research to the master's program CoSEM.

7.1 Conclusion

Ambition of Nationally Determined Contributions needs to be catalyzed to mitigate climate change and reach the aim of the Paris Agreement to limit human-induced climate change to just below 2°C, preferably 1.5°C, from pre-industrial levels in this century (United Nations, 2015). The ambition of NDCs varies enormously from country to country. To achieve a profound understanding of NDC ambition and why there is this variance in ambition, the aim of this research was to compare countries' NDC ambition to understand the extent to which NDC ambition can be explained by national factors. To aid the objective of this study and to answer the main research questions, five sub-questions were established and answered.

1. **What is considered an ambitious NDC and a non-ambitious NDC?**

Since the goal of the Paris Agreement is to significantly cut global GHG emissions to keep the global temperature rise this century to 2°C above pre-industrial levels while striving for measures to limit the rise to 1.5°C, an NDC is considered ambitious if the pledges are consistent with a fair share effort to hold warming below 2°C. In contrast, an NDC is considered unambitious if the commitment is inconsistent with a fair share effort to hold warming below 2°C. A fair share effort is based on what a country its total contribution would need to be to implement the PA. To make a fair contribution, the developed countries need to make domestic reductions and assist poorer countries to reduce their emissions based on four main categories: equality, responsibility, cost effectiveness and capability need.

2. **What are national (idea, interest, institutional and societal) conditions affecting NDC ambition?**

The six conditions included and analyzed in this study are (i) democracy, (ii) corruption, (iii) gross national income per capita, (iv) vulnerability to climate change, i.e., the extent to which a country is sensitive to and able to cope with the adverse effects of climate change, (v) dependence on natural resources (gas, coal, minerals and forests) and finally (vi) the degree of individualism of civil society. These conditions were identified using Peter Hall's (1997) "interest, ideas, institutions" framework. Based on recommendations from previous research, a fourth category was added, which includes social conditions. Together

these six conditions made up the theoretical framework of this research, which can be seen in figure 7.1.

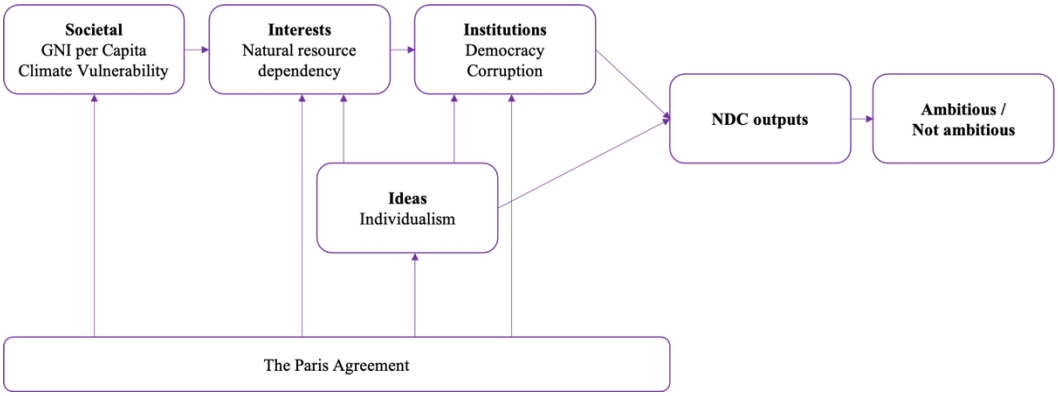

Figure 7.1. Adjusted model of the interactions between ideas, interests, institutions and societal conditions (source adopted from van Coppenolle, 2020; Gough, 2008, p.44)

3. Which combination of national conditions explain the presence and/or absence of NDC ambition

The results of the Fuzzy Set Qualitative Comparative Analysis show that for the countries Kenya, the Gambia, India, and the Philippines, ambitious NDCs are explained by the configuration: Not being dependent on natural resources, while being vulnerable to climate change, having a low GNI and being a corrupt country. In which, the combination of not being dependent on natural resources and being vulnerable to climate change, are core conditions which means that this configuration is the most important in explaining a country's NDC ambition.

The results of the fsQCA show that for the countries UAE, Russian Federation, Saudi Arabia, Brazil, Kazakhstan, the lack of ambition is explained by the configuration: being dependent on natural resources, while not being vulnerable to climate change, having above average gross national income and having a collectivistic society. For the countries Switzerland, Norway, Canada, New Zealand, Australia, EU, USA, Japan, South Korea, Chile, Singapore, South Africa, a lack of NDC ambition is explained by above average GNI, being democratic, not being corrupt while not being vulnerable to climate change. For the countries Ukraine, Russian Federation, Turkey, Mexico, Brazil, Kazakhstan, China, Argentina, a lack of ambition is explained by above average GNI, being corrupt, not being vulnerable to climate change and having a collectivistic society. For the country Vietnam, the lack of ambition is explained by being dependent on natural resources, not being democratic, having below average gross national income and having a collectivistic society. In all these four configurations, the conditions being dependent on natural resources or not being vulnerable are the core conditions, which means that these are the most important condition in explaining the absence of NDC ambition. For the countries Indonesia, Peru, Costa Rica, Morocco, Ethiopia, Bhutan, there was no configuration of national conditions explaining the presence and/or absence of NDC ambition.

4. How are individual national conditions related to the presence or absence of NDC ambition?

Because of the characteristics of the data, a series of bivariate correlation analyses were conducted and analyzed. The results of the correlation analysis showed that only gross national income showed a significant (negative) correlation with the dependent variable NDC ambition, while all other conditions did not show a significant correlation. The negative significant correlation between gross national income and NDC ambition implies that a high gross national income of a country is related to low ambition in a country's NDC. However, the directions of the correlations, even if not significant, might say something about the existing relationship. Dependency on natural resources, democracy and corruption showed a negative direction, which could indicate that when a country is dependent on natural resources, democratic or corrupt, this might be related to lower NDC ambition. The condition individualism and vulnerability to climate change showed a positive direction, which might indicate that when a country has an individualistic society and it vulnerable to changes of the climate, it is related to higher NDC ambition. However, the results were not significant, so interpreting the correlations must be done with care as no conclusions can be drawn for these conditions.

5. To what extent does examination of conditions in combination provide a different or complementary explanation for NDC ambition, compared to examination of conditions separately?

The main analysis, fsQCA, was used to explain NDC ambition by examining conditions in combination. As a complementary analysis, bivariate correlations between the dependent variable and the independent variables have been analyzed. Correlation analysis is a statistical measure that expresses the extent to which two variables are linearly related.

With fsQCA, a total of five solution pathways were obtained, each containing at least four conditions. With the bivariate correlation analysis, a total of one significant correlation was found. The comparison of these two findings shows that in this study, the findings of fsQCA were more comprehensive than the findings of the correlation analysis. It should be noted that this low number of significant correlations may be because the analysis lacked power due to a small sample size (33 cases).

The negative significant correlation coefficient between GNI and NDC ambition is consistent four out of the five solutions pathways that were obtained with fsQCA. These results together confirm that solution pathway five is less relevant, as it is the only solution path that contradicts the finding of negative correlation and consists of only one country. Additionally, it could be that GNI is a measure of other independent variables not included in the analysis. For the other conditions, only the direction can be compared with the results of fsQCA. The comparison shows that the direction of the correlation coefficients of being dependent on natural resources and being vulnerable to climate change, are in line with the findings of the fsQCA. A negative relationship is obtained between dependency on natural resources and NDC ambition, and a positive relationship is obtained between vulnerability to climate change and NDC ambition. It should be kept in mind that the findings of fsQCA tell something about the conditions in combination rather that the condition separately. When comparing the direction of the correlation coefficient of individualism with the results of the fsQCA, the results of the fsQCA shows that

individualism does not play a role in explaining NDC ambition. However, it also shows that individualism does relate to a lack of NDC ambition. The direction of the correlation coefficient of individualism is like the relationship found with fsQCA; A lack of individualism is related to a lack of ambition. Regarding the condition democracy and corruption, ambiguity exists. The correlation analysis shows a negative direction, while the fsQCA shows both positive and negative relationships in its configurations. This provides additional insights rather than conflicting insights, and therewith deepening understanding, the results are complementary rather than conflicting. It is worth noting that the findings of this study are consistent with the assertion of Ragin (2008), Rihoux. (2006), and others that although traditional statistical approaches and configurational-comparative methods have different epistemological bases, they do not compete for the same turf.

Main research question

This research explores which combination of national conditions are relevant to NDC ambitions. It provides a national comparison perspective to answer the main research question:

How can national conditions explain the presence or absence of ambition in a country's Nationally Determined Contribution under the Paris Agreement?

A modest step is taken in answering this question by conducting an fsQCA, analyzing bivariate correlations, and conducting two semi-structured interviews with two experts in the field of NDC ambition.

In total, two fuzzy-set QCA's have been performed. One to explain the presence of NDC ambition, and one to explain the absence of NDC ambition. For the presence of NDC ambition, one solution pathway is found to be sufficient. This solution pathway explained why four countries submitted an ambitious NDC. For the absence of NDC ambition, four solution pathways have been found to be sufficient. These four solution pathways together explained the lack of NDC ambition in 23 countries.

Countries that are both vulnerable to climate change and not dependent on natural resources, are expected to submit ambitious NDCs. These conditions must be present in combination to be sufficient in explaining ambitious NDCs. Additionally, when such a country also presents a low gross national income and is corrupt, there is an even greater change that the submitted NDC is ambitious. For the question why certain countries submit non-ambitious NDCs, four different sufficient explanations have been obtained. In general, countries that are not vulnerable to climate change and/or are dependent on natural resources, are expected to non-ambitious NDCs. Presenting only one of these two conditions is already sufficient in explaining the lack of NDC ambition. Besides these core conditions, other conditions are part of the solution pathways and explain the submission of non-ambitious NDCs. Namely, when besides one or two of the core conditions, the society of a country is rather collectivistic, meaning people easily sacrifice individual benefit for the success of a group, there is an even greater chance that the country submits an unambitious

NDC. It was not possible to draw general conclusions regarding the effect of a country's economic wealth or the levels of corruption in a country on NDC ambition.

All five solution pathways obtained were sufficient instead of necessary. In general, this means that knowing the configuration to be true, is adequate grounds to conclude that the outcome (NDC ambition) is true; However, knowing that the configuration is not to be true does not necessarily mean that the outcome (NDC ambition) is not true. This means that any country can submit an ambitious or unambitious NDC in the next round of submissions in 2025. This highlights the need for good governance, monitoring and decision-making processes.

7.2 Discussion

The conditions selected within the theoretical framework are democracy, corruption, GNI, vulnerability to climate change, dependence on natural resources, and individualism. These conditions were selected based on an extensive literature review. The results of the fsQCA, the correlation analysis, and the results of the validation can be used to determine whether the results are consistent with previous research or whether there are new findings. This section consists of two parts. The first part interprets the solution approaches and examines the significance of the findings in light of what was already known. In the second part, the same is done for the national conditions separately.

7.2.1 The solution pathways

The results obtained for the presence of NDC ambition suggests a complex solution of one configuration, covering 55.8 percent. The solution shows that for the countries Kenya, India, the Gambia, and the Philippines, NDC ambition is explained because these countries are not dependent on natural resources, present a low gross national income, are highly corrupt and finally, they are also vulnerable to climate change. The core conditions, which are the very heart of this solution and ensuring the outcome to occur, are the fact that these countries are dependent on natural resources and vulnerable to climate change. On the other hand, the results for the absence of NDC ambition suggest a complex solution of four configurations. All equifinal, which means that all of them result in the same outcome, the absence of NDC ambition yet differ in coverage. The difference in coverage might hint towards empirical relevance. However, as the theoretical relevance is rooted in the outliers, all solution pathways explaining the absence of NDC ambition are considered. What the countries that are a part of one of these four solutions have in common is that they are either not vulnerable to climate change, or they are dependent on natural resources, or demonstrating both. The remaining national factors that have a sufficient relationship to the absence of NDC ambition are not the root, but they are part of the solution. The explaining national conditions are gross national income, both high and low, being democratic or non-democratic, being corrupt or not corrupt, and having a rather collectivistic civil society. As can be seen, there is no one restriction on NDC ambitions, but instead there are several conditions that come together in a variety of architectures.

The solution pathways focus on the robust connections between institutional, interest, idea, and societal based conditions. The configurations of solutions are linked back

to the framework of Peter Hall (1997) and are presented in Appendix J. These figures show that each solution pathways consist of a minimum of four national conditions, emphasizing the interrelatedness of national conditions. However, these figures also show that only for one solution pathway, conditions in all four categories are present. For the other four solution pathways, there is always a category missing, e.g., the idea category in solution pathway one and the interest and idea category in solution pathway three. This could indicate two things. On the one hand it could indicate that the framework may not be the right one for this research and that adjustments are needed, even though it seemed to be the right one based on previous literature. Two possible adjustments to the framework are adding and/or removing categories. At the same time, it could also mean that the conditions selected there are not comprehensive or valuable. This would mean that the influence of other, or more, conditions on NDC ambition should be assessed. The next section will further elaborate on this limitation.

Since this is the first study to consider the effect of these specific conditions in combination on NDC aspirations, all configurations obtained are new and have not been identified in previous research. However, there have been other studies that have examined the individual relationships of these conditions with climate ambition and have obtained results accordingly. To make the results of this study comparable, it will be verified for each condition whether the relationship found, absent or present or ambiguous, is in line with the results found by previous studies and simultaneously the hypotheses.

7.2.2 The national conditions

The finding that the core condition, being dependent on natural resources is negatively related to NDC ambition, as it is absent in the configuration leading to NDC ambition and present in the configurations leading to the absence of NDC ambition, is in line with hypothesis two, and the findings of Golob, Lugovoy, & Potashnikov (2019) and Lamb and Minx (2020). Though, the study of van Coppenolle (2020) found opposite results, namely, the more a country is dependent on natural resources, the higher the climate ambition. This is odd as the exact same dataset has been used, incorporating multiple types of natural resources. This highlights the need to pay extra attention to the dataset used, as it includes not only fossil fuels, but also oil, gas, and forestry. Tørstad, Sælen, & Bøyum (2020) even made a distinction in type of natural resources, stating that while the effect of oil and gas are negligible, coal rent has a negative effect on ambition in their sample. A possible explanation for the difference in findings might be that this research taken other conditions into account as well, as compared to the linear relationship studied by van Coppenolle (2020). Besides the fact that most of the research have identified a similar positive relation, this relationship was validated by experts in the field as well, who mention that indeed, countries are often inhibited from submitting ambitious NDCs if they are dependent on natural resources because it results in distributional effects, which often do not appear to be of immediate benefit to policymakers.

The second core condition, being vulnerable to the climate change, is positively related to NDC ambition, as it is present in the configurations leading to NDC ambition, and absent in the configurations leading to non-ambitious NDCs. This finding is in line with hypothesis six. However, according to Drews and van den Bergh (2016), the relationship between being vulnerable and being ambitious is somewhat ambiguous. However, in this research, the condition did not showcase any ambiguity as the relationship

presented a similar direction in each pathway. This finding is in line with the findings of Sprinz and Vaahtoranta (1994), who argued that there exists a positive relationship between vulnerability and NDC ambition. The experts in the fields affirm that this is a key influencing factor and explain that the more vulnerable a country is to climate change, the easier it is to convince stakeholders to increase ambition. However, it has been mentioned that this may be country specific and correlating with gross national income, in countries within Africa for example. This statement is consistent with the findings in this study and the recently mentioned statement of the Climate Vulnerable Forum (CVF), which is a worldwide consortium of countries that have been affected by the consequences of global warming disproportionately. They declare that vulnerable countries are leading the way in the exploration of possibilities to increase ambition through new or updated NDCs (World Resource Institute, 2018). Tjernström & Tietenberg (2008) suggest that geographical effects decrease with income, which could be an explanation for the conjunctions found in four out of the five solution pathways. Namely, that high vulnerability is in conjunction with low gross national income, leading to ambitious NDCs, and the other way around.

Gross National Income is found to be a sufficient condition in the configurations, however, not a parsimonious solution, indicating it is less significantly related compared to the core conditions. The relationship with GNI and the lack of NDC ambition is somewhat ambiguous, while it is found to be negatively related to NDC ambition. The correlation analysis performed showed a significant negative relationship, confirming the observations made in fsQCA. This finding is not in line with hypothesis five, which expected a positive relationship between GNI and NDC ambition. The experts in the field have mentioned that this factor needs to be interpreted with caution, as GNI can have a negative impact on ambition when the incumbent industry is very clear, and simultaneously, in other countries, GNI might have a positive impact because it increases the possibility of innovation. Prior research regarding this condition is ambiguous. Booth (2017) says that increased wealth is predicted to have a positive effect on attention to environmental issues, which is in contrast with the findings of solution pathway one until four. Bel and Teixido (2020), on the other hand, state that being a low- or middle- income country has a negative effect on climate ambition and being a high-income country has a positive effect on climate ambition. These findings are equivalent to the findings in this research. The four countries that are included in the solution pathway explaining NDC ambition, the Gambia, Kenya, India and the Philippines, are all vulnerable to climate change, and also present a low GNI. According to CAT (2020), By proposing an ambitious conditional target that would bring down its emissions, The Gambia is a rarity in the world's low-income developing countries. The same holds for Kenya, India and the Philippines, as they are developing countries as well. A report created by the United Nations Development Programme (UNDP) (2019), agrees with these findings. According to the report, many the world's most vulnerable nations have made courageous moves to cut their GHGs and strengthen their resistance to the consequences of climate change. Yet at the same time, the greatest limiting factor to any climate action ambitions is access to or availability of finance, the report said. While global climate-related finance flows keep increasing, this amount still falls short of what is needed (UNDP, 2019). A possible explanation could be given by Pauw et al (2019), who argues that when countries declare their planned support around the same time that developing countries are considering raising their own ambition, this can be an important reassurance to developing countries that support for the implementation of their NDC will be promised. When looking at one of the countries included in the solution, Kenya for example, notes that the total cost of implementing mitigation actions in the updated NDC (2020) is

estimated at 62 billion. Kenya commits to mobilize resources to meet 13 percent of this budget and will require international support for 87 percent of the budget (CarbonBrief, 2021). Which confirms the statement of Pauw et al. (2019) indicating this is a probable explanation for the low gross national income and vulnerability to climate change in ambitious countries.

The other peripheral condition that is sufficient in explaining both NDC ambition and the lack of NDC ambition, is the level of corruption. This condition is present in the configuration leading to NDC ambition, while it can be both present and absent in the configuration leading to unambitious NDC, indicating contrasting relationships. These results are in line with prior scientific findings, which are slightly ambitious. Generally, it was found that poor control of corruption is associated with a lack of successful environmental policies (Drews & van den Bergh, 2016; Lamb & Minx, 2020; Povitkina, 2018), which resembles the findings of solution pathway four and five, explaining the lack of ambition for the countries Ukraine, Russia, Turkey, Mexico, Brazil, Kazakhstan, China, Argentina, and Vietnam. This is also in line with hypothesis four, which expected a negative relationship between corruption and NDC ambition. In contrast, Fredriksson, Neumayer and Ujhelyi (2007) found that high levels of corruption in a country can have a positive influence on climate ambition, resembling the findings of solution pathway one and three, explaining the outcome and the negated outcome. It is a remarkable finding, as it is difficult to understand how higher levels of corruption are related with high NDC ambition. Fredriksson, Neumayer and Ujhelyi (2007) argue that the high levels of NDC ambition are present because due to the corrupt nature of a country, the influence of environmental pressure and lobby groups might be raised. The Philippines for example, part of the first solution pathway, showing high levels of corruption and high levels of NDC ambition, received a high rating of the Climate Action Tracker because they are among the first among the coal-dominated Southeast countries (high dependency on natural resources) to implement a moratorium on new coal. However, there exists a lot of uncertainties economic developments are unclear (low GNI) and their draft 'Philippine Energy Plan' (PEP), including GHG emission targets, does not include the moratorium. This again, is not in line with President Duterte's speech in July 2019, when he stated the need to fast-track the development of renewable energy sources and to reduce dependence on traditional energy sources such as coal (BRON). Due to the high levels of corruption in this country, accountability, and transparency of the actual actions it will perform, are undermined (Hirsch, 2018). Resulting in a nice future research gap, as only time will allow for comparison between the projected targets and the actual actions that have been implemented. The experts that have been interviewed about their opinion about the conditions, confirmed that this factor may influence ambition and argues that the more corrupt a country is, the more likely it is to be influences by incumbent industries. This statement clearly confirms the interdependence obtained between the condition of being dependent on climate change and being corrupt, which are present in conjunction in the configuration explaining NDC ambition.

The peripheral conditions, whether a country is democratic or individualistic, are not sufficient for a country to have ambitious NDCs. However, they are of influence for the outcome non-ambitious NDCs. The condition democracy shows conflicting influence, meaning they can both be present of absent for the occurrence of unambitious NDCs, dependent per country and other conjunct conditions. Therefore, the findings are not in line with the expectations of hypothesis three, as democracy was expected to have a positive

relationship with NDC ambition. The findings show similarity with existing research, as ambiguity regarding the relationship of democracy and climate ambition exists. Bättig & Bernauer (2009) and Tørstad, Sælen, & Bøyum (2020) The rationale for this is that in general, democratic countries have more incentives as compared to non-democracies to deliver public goods, like protection of the environment. On the contrary, democracies are also accused of creating climate policy issues of inertia by promoting myopic political figures who are sensitive to interests (Jamieson, 2014; Runciman, 2018). Countries that are democratic and being unambitious are identified in the third solution pathway, showing a. unique coverage of 20 percent (Switzerland, Norway, Canada, New Zealand, Australia, EU, USA, Japan, South Korea, Chile, Singapore, South Africa), where countries that are not democratic and unambitious are identified in the fifth solution pathway, showing only a unique coverage of 2 percent (Vietnam). Indicating that the presence of ambition is more often related to having unambitious NDCs. However, based on expert recommendation, the analysis was run again, this time without the condition democracy. The results obtained were like the results obtained including this condition (same coverage and consistency levels) which indicates that the condition democracy is not relevant for the outcome to occur.

The last peripheral condition is the condition individualism, that, based on prior research, was expected to have a positive effect on the ambition of NDCs (Zheng et al., 2021), resulting in the formulation of hypothesis one. The results of this research indicate that this condition does not explain the submission of ambitious NDCs, but it does explain the submission of non-ambitious NDCs in solution pathways two, four and five, in which individualism is absent. A society that is not individualistic, is assumed to be collectivistic, emphasizing the needs and goals of the group instead of the needs and goals of the individual. Zheng et al (2021) argued that in collectivistic countries, scientists are more likely to consider policymakers/ preferences and national interest, which results in the submission of low-ambition targets. There exists a widespread discussion on the factors that affect climate change mitigation ambitions, and most researchers consider the lack of ambition as either a technical or financial problem (Willis, 2017). However, the finding that being a collectivistic society is sufficient to result in an unambitious NDC, shows that cultural considerations also play a role in the ambitiousness of NDCs. The experts states that they did not expect this condition to occur in a solution alone, which is true, as it did not appear in the correlation analysis. The rationale behind this statement is that in average, western countries are usually more individualistic and Western countries often have a higher gross national income and are therefore have more capabilities to deal with climate change vulnerability. However, the results only present findings on the absence of individualism, and not on the effect of the presence of individualism, which is why the western countries in this research (e.g., the EU, Switzerland, and Norway) do not include the condition individualism in their explaining configuration. As Zheng et al. (2021) states, the effect of culture on climate change ambition are complicates, as they mediate or are being mediated by multiple other factors. This study does not intend to advocate or criticize any specific culture, but it does show that cultural engagement is incorporated into understanding of NDC ambition, and therewith, laying the foundation for further research regarding the importance of cultural contexts in NDC ambition.

All in all, new results are obtained, some results have been found that are in accordance with existing literature and other results have been found that are in contrast with existing literature. However, as this is the first research that has looked at these

specific national conditions in combination, it may be suggested that all findings are new. What stands out is that all countries are extremely unique and therefore, different solutions lead to the same outcome. This variance between countries makes it hard to define clear linear relationships between conditions and NDC ambition, as can be seen in the results obtained for corruption, democracy, and gross national income. In contrast, the results do show agreement in the relationship between the core conditions, being vulnerable to climate change and being dependent on natural resources, and NDC ambition.

7.3 Limitations & Recommendations for future research

This study has several limitations even though the sub-questions and the main research question of this study have been answered. It is important that the findings of this study are interpret in the context of the limitations of this study. The limitations are related to generalizability, the theoretical framework, the research method, scope, and other practical aspects. Future research is proposed to deal with the mentioned limitations of this research.

The first limitation relates to the generalizability of this study. The study focuses on 32 countries and the EU because of the adequacy of the sample data and for practical reasons. To date, 195 countries have submitted an NDC or an INDC, as they are part of the PA. This raises the question of whether the results are generalizable. The sample used in this study includes all major emitting countries and a sample of smaller emitting countries covering 80 percent of global emissions and about 70 percent of the world's population, which could indicate that the sample is representative and thus the results could be generalizable. However, this analysis also showed that each country is unique, whether large or small, developed, or undeveloped, and that it is difficult to draw clear conclusions or find causal relationships. Furthermore, when looking at the number of countries in the sample, only a small portion of the 195 countries were included in this study, all of which reduces generalizability. Besides the generalizability, characteristics of the dependent variable used, may be seen as the second limitation. Data from the Climate Action Tracker has been chosen as they attempt to make countries' NDC ambition comparable through incorporating a fair share range. This fair share range has the great advantage that it allows for comparison between countries. However, there are also disadvantages related to the selection of this data source. The Climate Action Tracker draws a rather negative picture, as it seems that only developing countries are awarded with a high score. In total, only seven out of 33 countries have been labeled as ambitious. The type of data used to measure the dependent variable affects the results of the fsQCA tremendously. Having only seven ambitious countries, make it hard to draw conclusions regarding ambitious NDCs. Another limitation of this dataset is that is the rating is not very granular, which makes it difficult to interpret resulting in a loss of valuable information.

To avoid the problem of generalizability and the granular, negative view of the data for the dependent variable, it is recommended to use a different dataset to measure NDC ambition. This dataset should cover a larger number of countries and should be less "colored", which is slightly the case by the dataset of Climate Action Tracker. It might also be possible to create your own dataset based on other data. An example would be to compare

the expected emissions per capita in 2030 with the emissions per capita today. This would already provide a much more objective measure, and would mainly focus on reductions of emissions, what it is ultimately all about.

The third limitation concerns the independent variables, or conditions, included in this study. A total of six national conditions were identified and included in this study due to time and methodological constraints. However, as climate change and NDC ambitions are very complex topics, these six conditions do not provide a complete picture, as there are a multitude of conditions that affect NDC ambition.

For future research, to recommendations are made. Firstly, it is recommended to perform the analysis with a larger set of conditions to provide a more complete picture. Examples of conditions that are identified in this research and are of interest to NDC ambition but have not been included in this analysis are the amount of renewable energy a country consumes, the amount of fossil fuels (instead of natural resources) a country consumes, comparison between what targets have been stated in the NDC and what has been implemented to date (ambition gap). The experts in the field also mentioned interesting conditions that may provide a foundation for future research. The factors they mentioned are the stability of the government or politics, how much the society cares about the environment and the reliance of incumbent industries. The second recommendation is to, instead of increasing the number of conditions, keep the same number of conditions (to keep the results easier to interpret) but focus more on one aspect of the framework. For example, only focus on the institutions category and collect conditions within this category. Examples could be to include bureaucratic autonomy or left-wing right-wing ideology, both identified during the literature review. Focusing more on one aspect helps to, instead of getting a general view of the influencing conditions, get a more specialized view of the current system. Additionally, it was also mentioned in this research that it there are more than six conditions affecting NDC ambition.

The fourth limitation regards the method fsQCA and its problem of causal ambiguity. Although fsQCA can be used as an appropriate methodological tool to analyze causal complexity, it could not demonstrate causality in this research because there were no necessary conditions identified. The method was able to identify configurations that were sufficiently consistent to produce outcomes. Another limitation regarding the methodology fsQCA is the sensitivity to subjectivity of the calibration and operationalization of the conditions. Setting thresholds during the calibration process relies on prior knowledge of the researcher about the topic. To check the robustness of the data, several steps have been undertaken. However, this subjectivity of the process questions the reliability of the findings. A fifth limitation also relates to the methodology used, the correlation analysis, was already mentioned in the study itself. Correlation analysis is also unable to demonstrate causality, like QCA. The study could not make statements about causal relationships because it was limited to testing correlations rather than performing regression analysis, due to the high degree of multicollinearity. Another shortcoming is that the use of Kendall's tau, the coefficient used in this analysis, can only test linear correlations and thus individual nonlinear relationships could not be tested with this design.

To deal with the issue of the methodology, it is recommended to try out different methodologies. In essence, set relationships are not themselves causal mechanisms, therefore it is recommended to perform (an additional) variable-based methodology. In this analysis, a correlation analysis has been performed as complementary analysis as it quickly

became clear that linear regression was not an option since the underlying assumptions of linear regression cannot be met. However, keeping in mind the characteristics of the data (ordinal dependent variable), performing a logistic regression, either ordinal or multinomial, might give interesting results.

The sixth limitation regards the complementary analysis, which was not able to tell anything about cause and effect. Because the dependent value data are distributed ordinally, it was simply not possible to perform a linear regression. Ordinal logistic regression offers a nice alternative for this type of dependent variables. After checking the condition of ordinal logistic regression, it quickly became apparent that performing this type of regression would produce invalid results. Therefore, it was decided to perform a series of bivariate correlations to see to what extent significant correlations exist between the dependent and independent variables. Not running a regression does have some limitations. As a result, it was not possible to look at the presence or effect of other variables beyond the two that were examined. Importantly, correlation does not tell anything about cause and effect.

To deal with this issue, it is recommended to explore different types of regression analysis that fit the data. Running a regression would be able to provide insights into explained variance of the model, the configurations, and the individual conditions. A suggestion would be to perform a multivariate logistic regression. In this research, it was decided to not perform a multivariate regression analysis because interpreting the results might be time consuming and the findings would function as complementary findings rather than the main findings. However, this leaves room for future research to conduct a (multivariate) regression analysis.

Lastly, a limitation exists regarding the used framework of Peter Hall. The framework was selected because it has proven its suitability to define and select national conditions that are of importance in climate ambition. However, the fit between the used methodologies and the framework is not good. The framework assumes that there are intermediate variables in the system, which are not analyzed in that way during QCA or regression. During the study, the intermediate variables from the framework were treated as if they all had the same dependent variable (NDC ambition). However, this indicated that the model was not used as an anchor and thus it was not able to display its added value.

For future research, it is recommended to only focus on simple hypotheses. In this research, hypotheses have been established, however, complementary to the framework. Only focusing on the hypotheses will help to not make things unnecessarily difficult and keep structure.

7.3.1 Recommendations for policy makers and decision-makers

Raising ambition will be crucial to mitigate global warming. The lessons learned from this research can be used to create recommendations for policymakers and decision-makers within the context of the PA agreement. Additionally, in 2023, the GST will take place, in which the collective progress made towards achieving the long-term goals of the PA will be assessed. The aim of the GST is to become a driver of ambition. The aim of this research

was to understand why certain countries a driver of ambition and why other countries are not. The recommendations are of interest to all climate policy and decision makers, but perhaps even more so to the governing bodies of the COP, who are the decision makers of the UNFCCC.

Tailored strategies

The first recommendation is based on the finding that five different solution pathways have been identified. Which shows the need for tailored strategies, which points towards a just transition in climate change. The GST takes a collective rather than an individual approach. During this stock take, countries will not be singled out and the stocktaking process will not allow conclusions to be drawn about the state of implementation of individual stated for example. However, this research shows that indeed, collective action is required, but that countries vary enormously. It is simply comparing apples to oranges. The results show that in each country, a different combination of factors is present that ultimately make them submit ambitious NDCs or not. For example, a lack of NDC ambition in Vietnam relates to the high dependence on natural resources, and the lack of NDC ambition in Switzerland relates to the low vulnerability to climate change. Specific taxes can be introduced for countries that are highly dependent on natural resources, making it less attractive for countries to show little ambition in their NDCs. Another element of the tailored strategy could be to provide a defined number of financial resources to countries that are highly vulnerable to climate change, regardless of their defined targets. This will make it easier for these countries to cope with the challenges of climate change, and therefore make it less "tempting" to set unrealistic goals.

Just transitions

The second recommendation is based on the findings that GNI plays an ambiguous role, that countries with ambitious NDCs could set unrealistic goals that are not achievable without international assistance, and that submitting ambitious NDCs poses challenges for countries that depend on natural resources and countries that are vulnerable to climate change. For example, Kenya is a country that has set very ambitious goals, but they cannot be achieved without financial support from other countries or from a financial system designed for the PA that emphasizes collective responsibility. In general, achieving the goals of the PA requires the transition to a net-zero economy. This is of great importance to society as a whole and will bring significant economic and social benefits. However, it also poses a challenge for certain countries that are for example dependent on natural resources. Therefore, policymakers and decision-makers should focus on achieving an equitable transition, addressing country-specific challenges, and sharing the benefits of achieving PA equitably. This implies a fair distribution of both the expenses and the gains. In practice, it may involve the provision of affected workers and populations with the support, protection, and investment they require, equitable replacement of the revenue streams governments receive from natural resources, and an ongoing social dialogue between stakeholders, governments, and communities.

Iterative risk management

The third recommendation is based on the finding that being vulnerable to climate change is a prerequisite for submitting ambitious NDCs. This finding, based on data prior to 2021, shows that countries vulnerable to climate change often submit ambitious NDCs. This condition should not be underestimated by policymakers and decision-makers, as it is likely that more natural disasters will occur in the future as global surface temperatures rise. Consequently, there is a possibility that NDC ambitions will be raised when it is too late, after more natural disasters have occurred. Therefore, it is recommended that the importance of higher NDC ambitions be emphasized. Iterative risk management is a helpful framework for making decisions in such complex contexts that are marked by large potential impacts, persistent uncertainties, long timeframes, and multiple climatic and non-climatic influences that change over time. Evaluating a wide range of potential impacts is critical to understanding the benefits of alternative risk management measures within the submission of NDCs.

7.4 Relevance of findings

At its core, the findings of this study relate to climate change. Climate change, and therefore NDC ambition, is perhaps one of the most profound challenges that human social, political, and economic systems have ever faced. Some effects of climate change can be directly experienced, for example, floods or droughts, but the relevance of new knowledge related to NDC ambition cannot be directly experienced. Nevertheless, there is relevance for society and academics. This section is divided into three parts. The first part discusses societal relevance, and the second part discusses academic relevance. The section concludes by aligning these findings with the master's program CoSEM.

7.4.1 Societal relevance

The consequences of climate change are becoming more and more apparent. On the one hand, because it is becoming more obvious to society as more disasters are happening in everyone's close vicinity. On the other hand, because of the reports that are published and the attention that the media gives to the subject. It might be stated that consensus exists about the reality of climate change. However, this does not mean that science is accepted as the basis for climate policy. Therefore, it is important to demonstrate how scientific findings relate to individuals and society.

The findings of this study may be of value to the economy, government, policy makers and the public. The findings shows that the combination of national factors is important to the presence or absence of NDC ambitions. When there is a better understanding of these factors, better action can be taken, and climate change can be better mitigated. For example, if policymakers and economists know that a country, that depends on fossil fuels and is not vulnerable to climate change, is unlikely to submit an ambitious NDC, it allows them to create customized policy instruments to achieve the desired level of ambition, resulting in the desired level of mitigation. The scientific knowledge informs discussions on national policy instruments, as well as global policy. The findings also showed that societal national conditions, such as GNI or individualism, play a role in the absence or presence of NDC ambition. This shows the importance of involving the public in the

NDC or background documentation and strengthening the dialogue. If the NDC ambition remains unchanged, the impact on the public will ultimately affect human health and livelihoods drastically.

7.4.2 Academic relevance

NDCs are at the core of PA and are critical to mitigating and adapting to the effects of climate change. Scientific studies lay the foundation for understanding how our lives are affected by climate change and what needs to be done to mitigate the effects of climate change, for example by increasing NDC ambition. The two identified knowledge gaps already indicate the relevance of this research to the academic community, as the results present new knowledge that has not been studied before. In addition to the new knowledge, this research also lays a foundation for future research, as outlined in the previous chapter. For example, by performing a case study or include a different set of national conditions. The results of the study contribute to the existing scientific body of knowledge (van Coppenolle, 2020; Lamb and Minx, 2020; Meckling & Nahm, 2018; Bel and Teixido, 2020; Tobin, 2017) that together provide a basis for further research on the given topic. Also, this study provides new insights and understanding into the effect of national factors on countries' NDC ambition. The topic has a temporal nature and is constantly evolving, which makes it especially important for new research to be conducted on an ongoing basis.

7.4.3 Alignment with Complex Systems Engineering and Management

This thesis was conducted in completion of the master's program in CoSEM. The master's program is concerned with finding innovative solutions to large-scale complex socio-technical problems. During this research, the complexity of NDC ambitions becomes apparent, as it is not possible to give a one-size-fits-all answer as to why some countries present NDCs with high ambition, and other countries present NDCs with low ambition. The research shows that there are several factors that can explain the level of ambition of a country's NDC. Societal factors, institutional factors, and factors related to a country's ideas or interests all play a role. In addition to playing a role, they are also highly interrelated, which makes it even more complex. Each of the factors relates to a different or overlapping group of actors, e.g., social factors relate to the public and institutional factors relate to governing bodies. This suggests that the issue examined in this study is a truly multi-actor issue, with each group of actors having their own views, values, and interests. In discussing the metrics of conditionality, and especially outcome, the technical aspect of this study becomes clear. NDC ambition consists of historical, current, and future greenhouse gas emissions, and comparability of efforts, which include variables such as cost, per capita emissions, and responsibilities. In addition, a small glimpse into the effects of renewable energy sources and other types of climate change innovations is provided. All in all, this research aimed to optimize the understanding of NDCs and compare them in a systematic way. All in all, this research involves a social, a technical and a complex aspect, making it an appropriate thesis for the master's program in CoSEM.

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Appendix A – List of countries

Table A.1 – the list of countries

N	Country	CAT Score
1	Argentina	Critically Insufficient (4C)
2	Russian federation	Critically Insufficient (4C)
3	Saudi Arabia	Critically Insufficient (4C)
4	Turkey	Critically Insufficient (4C)
5	USA	Critically Insufficient (4C)
6	Ukraine	Critically Insufficient (4C)
7	Vietnam	Critically Insufficient (4C)
8	China	Highly Insufficient (<4C)
9	Indonesia	Highly Insufficient (<4C)
10	Japan	Highly Insufficient (<4C)
11	Singapore	Highly Insufficient (<4C)
12	South Africa	Highly Insufficient (<4C)
13	South Korea	Highly Insufficient (<4C)
14	UAE	Highly Insufficient (<4C)
15	Australia	Insufficient (<3C)
16	Brazil	Insufficient (<3C)
17	Canada	Insufficient (<3C)
18	Chile	Insufficient (<3C)
19	EU	Insufficient (<3C)
20	Kazakhstan	Insufficient (<3C)
21	Mexico	Insufficient (<3C)
22	New Zealand	Insufficient (<3C)
23	Norway	Insufficient (<3C)
24	Peru	Insufficient (<3C)
25	Switzerland	Insufficient (<3C)
26	Bhutan	Compatible (<2C)
27	Costa Rica	Compatible (<2C)
28	Ethiopia	Compatible (<2C)
29	India	Compatible (<2C)
30	Kenya	Compatible (<2C)
31	Philippines	Compatible (<2C)
32	Morocco	Paris Agreement Compatible (<1,5C)
33	The Gambia	Paris Agreement Compatible (<1,5C)

Appendix B – Operationalization and the conditions

Table B.1 – Operationalization of outcome and conditions

Outcome/Condition	Measure	Categories/Scale	Reference
NDC Ambition (outcome)	Rating a government's NDC against their fair share contribution towards reducing emissions from fossil fuel combustion, industry, agriculture, and waste sources. For the fair share range of each country each year, the ranges result from seven specific effort sharing categories: responsibility, capability/need, equality, equal cumulative per capita emissions, responsibility/capability/need, capability/cost, staged.	Critically insufficient; Highly insufficient; Insufficient; 2°C Compatible; 1.5°C Paris Agreement Compatible; Role model	Climate Action Tracker (2021).
Individualism	Hofstede's "Culture Consequences" measures the degree to which societies are integrated into groups and their perceived obligations and dependence on groups.	100-point scale of measurement	(Hofstede , Hofstede , & Minkov , Cultures and Organizations: Software of the Mind, 2010).
Natural resource dependency	Total revenue from oil, natural gas, coal, minerals and forests, a country derives from its natural resources.	Percentage of GDP	World Bank (2019).
Democracy	A composition of 60 indexes in five different categories, which measure pluralism, civil liberties, and political culture of a country.	Full democracy; Flawed democracy; Hybrid regime; Authoritarian regime.	Economist Intelligence Unit (2020).
Corruption	The perception level of corruption in the public sector, as determined by both experts and opinion surveys.	100-point scale of measurement	Transparency International (2020).
Wealth of a country	A Country's Gross National Income which is the total amount of money earned by a nation's people and business.	High; Upper-middle; Lower-middle; Low.	The World Bank (2019)
Environmental Vulnerability	A country's vulnerability to climate disruption, which is the tendency or predisposition of human communities to be adversely affected by environmental threats measured by considering six life support sectors: food, water, health, ecosystem services, human habitat and infrastructure.	0 to 1 scale of measurement.	Notre Dame Global Adaptation Index (2021)

Table B.2 – List of conditions and their outcome (raw data)

Country	Dependence on natural resources	Democracy (DEM)	Corruption (COR)	Gross National Income (GNI)	Vulnerability to climate change (VUL)	Individuality (IND)
Argentina	2,1	6,95	58,00	11130	0,403	46
Russian federation	13,1	3,31	70,00	11260	0,343	39
Saudi Arabia	24,8	2,08	47,00	22840	0,404	25
Turkey	0,3	4,48	60,00	9690	0,356	37
Ukraine	1,8	5,81	67,00	43470	0,382	25
USA	0,6	7,92	33,00	65850	0,35	91
Vietnam	3,4	2,94	64,00	2590	0,48	20
China	1,3	2,27	58,00	10390	0,399	20
Indonesia	2,9	6,3	63,00	4050	0,451	14
Japan	0,1	8,13	26,00	41710	0,369	46
Singapore	0	6,03	15,00	59590	0,401	20
South Africa	3,9	7,05	56,00	6040	0,413	65
South Korea	0,1	8,01	39,00	33790	0,371	18
UAE	16,8	2,7	29,00	43470	0,374	25
Australia	5,4	8,96	23,00	55100	0,331	90
Brazil	3,5	6,92	62,00	9130	0,402	38
Canada	1,9	9,24	23,00	46360	0,314	80
Chile	2,3	8,28	33,00	15010	0,341	23
EU	0,2	8,29	34,00	35807	0,352	58
Kazakhstan	17,6	3,14	62,00	8820	0,353	20
Mexico	2,2	6,07	69,00	9480	0,407	30
New Zealand	1,6	9,25	12,00	42220	0,316	79
Norway	7	9,81	16,00	82500	0,267	69
Peru	1,7	6,53	62,00	6740	0,439	16
Switzerland	0	8,83	15,00	85490	0,27	68
Bhutan	2,2	5,71	32,00	3140	0,508	52
Costa Rica	0,8	8,16	43,00	11700	0,385	15
Ethiopia	4,4	3,38	62,00	850	0,559	20
India	2	6,61	60,00	2120	0,509	48
Kenya	1,1	5,05	69,00	1750	0,533	25
Philippines	0,7	6,56	66,00	3850	0,472	32
Morocco	0,3	5,04	60,00	3190	0,387	46
The Gambia	2,3	4,49	63,00	750	0,535	20

Table B.3 – List of threshold values of conditions (full membership, no membership, and cross-over point)

		Membership criteria		
Category	Condition	No membership	Crossover point	Full membership
Idea	IND	1	59	100
Interest	NAT	0	2.5	25
Institutions	DEM	0	6	10
	COR	0	57	100
Societal	GNI	130	4046	116430
	VUL	0	0.425	0.675

Appendix C – Configurational comparative methods & regression analysis

Table C.1 – The most important differences between configurational comparative methods and regression analysis (Kenworthy and Hicks, 2008: p.7)

Configurational comparative methods	**Regression Analysis**
Assessing deterministic causal relationships (logically conceived): adequacy and necessity	Assessing tendency relationships, visible in patterns of co-variation among variables
Useful for exploring causal configurations (combinations of causes)	Useful for assessing the net effect of a variable on the outcome
Useful for examining multiple causal paths to the same outcome (equifinality)	
Allows for formal estimation of the magnitude of impact of (the combination) a cause by means of coverage or consistency	Allows for formal estimation of the magnitude of the impact of a cause

Appendix D - Regression analysis

Assumptions ordinal regression

Before being able to perform an ordinal regression analysis, four assumptions must be tested. If the assumptions are violated, it means that the data cannot be analyzed using ordinal regression. However, if the data passes the four assumptions, the regression will likely be giving valid results. Assumption three and four are tested using the software SPSS. Assumption one and two are checked before assumption three and four.

Assumption 1

The dependent variable should be measured at the ordinal level, which is the case in this research. The dependent variable, NDC ambition, is a 6-point scale ranging from critically insufficient to role model. Because no country has been given the rating 'role model', only five categories are included in this research. An overview of the scale is shown in figure D.1.

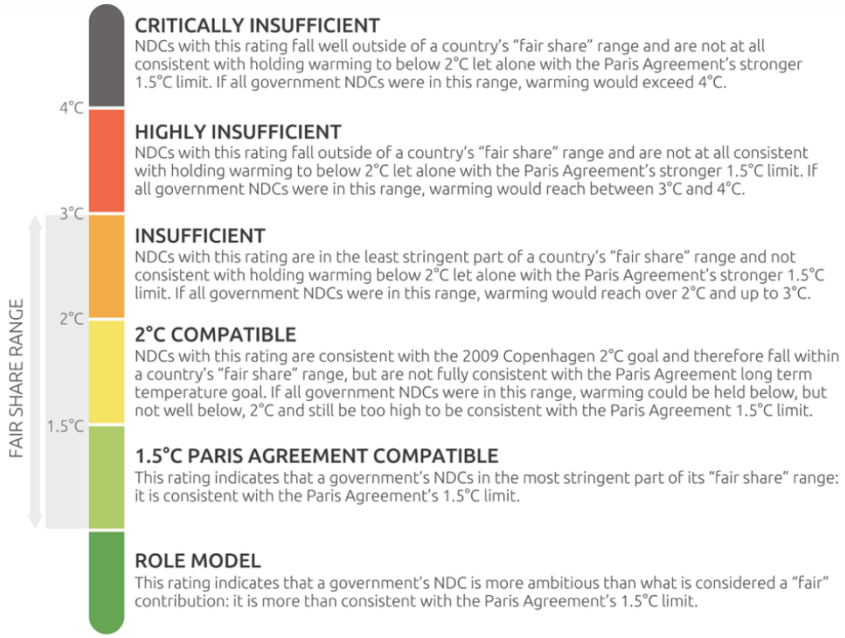

figure D.1 Country rating system (Source: CAT, 2021)

Assumption 2

The second assumption is that one or more independent are continuous, ordinal, or categorical, which is the case in this research. All the independent variables included in this research are continuous. For example, the corruption levels are measured on a scale from zero to hundred.

Assumption 3

The third assumption regards multicollinearity. Multicollinearity occurs when two or more independent variables are highly correlated. If this happens, issue will occur because it makes it hard to understand which variable contributes to the explanation of the dependent variable NDC ambition. This assumption can be tested in two ways: by checking correlation coefficient and variance inflation factor values. Both tests will be performed. First, the correlation coefficients. The correlation coefficients of this research are presented in table D.3, in which coefficient greater than 0.80 indicated that variables are strongly correlated. It is decided to use Kendall's tau to understand the strength of two variables, as the variables are not linear and normally distributed (suitable for Pearson), and Spearman's Rho is more sensitive to errors and discrepancies. Kendall's tau is being interpreted as indicating that a correlation is very strong if the value is greater than 0.50, strong if it is between 0.26 and 0.50, weak if it is between 0.11 and 0.26, and very weak if the value is less than 0.11 (Sen, 2012) and the correlations are significant at the 0.05 or 0.01 level. The table shows that there are exists quite a lot of multicollinearities between the conditions. For example, between Corruption and individualism, vulnerability, and gross national income. This leads to problems related to understanding which variable contributes to the explanation of the dependent variable, and technical issues in calculating an ordinal regression.

Table D.3 Correlation Matrix

Correlations

			IND	VUL	COR	DEM	NAT	GNI
Kendall's tau_b	IND	Correlation Coefficient	--					
		Sig. (2-tailed)	.					
		N	33					
	VUL	Correlation Coefficient	-.326**	--				
		Sig. (2-tailed)	.009	.				
		N	33	33				
	COR	Correlation Coefficient	-.326**	.459**	--			
		Sig. (2-tailed)	.010	<.001	.			
		N	33	33	33			
	DEM	Correlation Coefficient	.392**	-.402**	-.448**	--		
		Sig. (2-tailed)	.002	.001	<.001	.		
		N	33	33	33	33		
	NAT	Correlation Coefficient	-.056	.097	.162	-.230	--	
		Sig. (2-tailed)	.651	.429	.192	.061	.	
		N	33	33	33	33	33	
	GNI	Correlation Coefficient	.287*	-.684**	-.562**	.370**	-.141	--
		Sig. (2-tailed)	.021	<.001	<.001	.003	.251	.
		N	33	33	33	33	33	33

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Assumption 4

The fourth and last assumption is about proportional odds. This is a fundamental assumption for this specific type of regression as assuming proportional odds means that each independent variable has an identical effect at each cumulative split of the ordinal dependent variable. This assumption is tested with a full likelihood ratio test, that compared the fitted location model to a model with varying location parameters.

Table D.4 shows the test of parallel lines, which is referred to the proportional odds. When the result of the test of parallel lines indicates non-significance, then the assumption is satisfied. However, it can be seen that the assumption is not satisfied in this case as the test of parallel lines shows significance. It can be concluded that ordered logit coefficients are not equal across the levels of the outcome.

Table D.4 Test of parallel lines

Test of Parallel Lines[a]

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	85.032			
General	.000[b]	85.032	18	<.001

The null hypothesis states that the location parameters (slope coefficients) are the same across response categories.

a. Link function: Logit.

b. The log-likelihood value is practically zero. There may be a complete separation in the data. The maximum likelihood estimates do not exist.

Appendix E – Interview Guide

Introduction

This study examines the influence of six national factors (in combination) on the ambition of NDCs. The purpose of this study is on to identify the national factors that promote or hinder the ambition of NDCs, individually or in combination. The conditions examined in this study are: i) corruption, ii) democracy, iii) GNI (like GDP), iv) vulnerability to climate change, v) natural resource dependence, and vi) individuality of a society.

The countries covered by the study are those monitored by Climate Action Tracker, namely 32 countries (developing and developed) and the EU. To arrive at results, a QCA analysis was performed, combined with a correlation analysis.

To compare the results with this interview, more in-depth research is made possible, and the results are validated.

This interview consists of the following parts: general questions, the factors general, the factors research, and the countries. The interview is expected to last approximately 45 minutes.

Questions

Section A: general questions

1. In what ways are you involved in the Paris Climate Accord?

2. What are your views on the design of the climate agreement, which requires countries to review their NDCs every five years and expects rich countries to financially support developing countries in reducing their own emissions?

3. What is your view on making ambition measurable, how can this best be done?

Part B: Factors general

1. In your opinion, what are the most important national factors affecting the increase or decrease of the "ambition" of NDCs.

   a. Are the factors that make for high ambition the same as the factors that make for low ambition?

2. Which countries do you expect to show high ambition in their NDCs, and why?

3. Which countries do you expect to show low ambition in their NDCs, and why?

Component C: Factors Research

1. How do you think "being dependent on natural resources" affects the ambition of an NDC?

2. What do you think is the influence of a GNI (/GDP) on the ambition of an NDC?

3. What do you think is the influence of democracy on the ambition of an NDC?

4. What do you think is the influence of corruption on the ambition of an NDC?

5. What do you think is the influence of 'being vulnerable to the effects of climate disasters' on the ambition of an NDC?

6. What do you think is the influence of an individual (cultural) society on the ambition of an NDC

7. What combination of these 6 factors do you think would be the ideal combination to create ambitious NDCs?

Section D: Countries

1. To what extent do you think the combination of the following factors could explain ambitious NDCs for Kenya, Gambia, India, and the Philippines:

   a. No dependence on natural resources * vulnerability to climate change * no GNI * corruption

2. Which of the following combinations do you consider the most likely explanation for the absence of ambition in NDCs and why:

   a. Dependence on natural resources * no vulnerability to climate change * GNI * no individuality

   b. GNI * democracy * no corruption * no vulnerability to climate change

   c. GNI * corruption * no vulnerability to climate change * no individuality

   d. Dependence on natural resources * no democracy * no GNI * corruption * no individuality

Thank you for your time and attention! Your information will be treated confidentially.

Feel free to contact me in case of additional questions

0628812313

m.l.c.a.peeters@student.tudelft.nl

Appendix F – Test for necessity and sufficiency

Table G.1 – Test for necessary conditions (ambitiousness)

Condition	Consistency	Coverage
fsIND	0.846521	0.520832
~ sIND	0.483634	0.624460
fsNAT	0.864709	0.568389
~ fsNAT	0.517806	0.589437
fsDEM	0.597050	0.567388
~ fsDEM	0.759285	0.563465
fsCOR	0.768717	0.546572
~ fsCOR	0.628342	0.632533
fsGNI	0.779574	0.726780
~ fsGNI	0.685116	0.516225
fsVUL	0.715652	0.569502
~ fsVUL	0.800671	0.700388

Table G.2 Test for necessary conditions (non-Ambitiousness)

Condition	Consistency	Coverage
fsIND	0.792222	0.682300
~ sIND	0.443636	0.801831
fsNAT	0.742344	0.683045
~ fsNAT	0.530919	0.845993
fsDEM	0.579768	0.771244
~ fsDEM	0.674792	0.700971
fsCOR	0.739227	0.735745
~ fsCOR	0.544426	0.767174
fsGNI	0.541330	0.706441
~ fsGNI	0.790637	0.833912
fsVUL	0.755316	0.841377
~ fsVUL	0.613536	0.751266

Table G.3 Truth table for analysis of sufficiency for presence of NDC ambition

Row	*NAT*	*GNI*	*DEM*	*COR*	*VUL*	*IND*	Sufficient for presence of NDC ambition	Cases with membership in row
1	0	0	1	1	1	0	1	2
2	0	0	0	1	1	0	1	2
3	1	1	1	0	0	1	0	3
4	0	1	1	1	0	0	0	2
5	0	1	1	0	0	1	0	4
6	0	1	1	0	0	0	0	6
7	1	0	0	1	1	0	0	2
8	0	1	0	1	0	0	0	3
9	1	1	0	1	0	0	0	2
10	1	1	0	0	0	0	0	2

Table G.4 Truth table for analysis of sufficiency for absence of NDC ambition

Row	*NAT*	*GNI*	*DEM*	*COR*	*VUL*	*IND*	Sufficient for absence of NDC ambition	Cases with membership in row
1	1	1	0	0	0	0	1	2
2	1	1	0	1	0	0	1	2
3	1	1	1	0	0	1	1	3
4	0	1	0	1	0	0	1	3
5	0	1	1	1	0	0	1	2
6	0	1	1	0	0	0	1	6
7	0	1	1	0	0	1	1	4
8	1	0	0	1	1	0	1	2
9	0	0	1	1	1	0	0	2
10	0	0	0	1	1	0	0	2

Appendix G – Robustness Check

Robustness Checks Qualitative Comparative Analysis

To find out whether the data and results are robust, three types of robustness checks have been performed. Firstly, the adjustments are made to the thresholds that have been decided upon during calibration. Secondly, the frequency of cases that are linked to configurations is adjusted. During the main analysis, this frequency was equal to two. Thirdly, the consistency levels of configurations have been adjusted. During the main analysis, the consistency levels were equal to 0.75. During all three tests, the parsimonious solution for the outcome is compared to the main results, which have been presented in chapter four. The parsimonious solution which has been obtained during the main analysis equals

~NAT*VUL.

The parsimonious solution obtained for the negated outcome of NDC ambition equals

NAT+~VUL

Where * indicated an AND relationship and + indicates an OR relationship.

Test 1: Changing the calibration thresholds (raw data into set-membership)

The thresholds that were originally used during the calibration process are presented in table H.1. There are two methods of calibration used. During the direct calibration process, three values are defined: one for the no-membership, one for the full membership, and one for the cross-over point. For the calibration of the outcome NDC ambition, the indirect method is applied. This means that the calibration is done based on qualitative anchors.

Table H.1 – Overview of the original membership values and crossover points.

		Descriptive statistics of the uncalibrated values		**Membership criteria**		
Category	Condition	Mean	Standard Deviation	No membership	Crossover point	Full membership
Idea	IND	40	22.8566	1	59	100
Interest	NAT	3.890909	5.693184	0	2.5	25
Institutions	DEM	6.190909	2.207268	0	6	10
	COR	47	18.91448	0	57	100
Societal	GNI	23935.67	24459.34	130	4046	116430
	VUL	0.3992727	0.07247874	0	0.425	0.675

To test for robustness, three sub tests are performed. First, the outcome is translated into crisp-set values. This means that the outcome is dichotomized. Secondly, both the outcome and the conditions are translated into crisp-set values. Thirdly, the break-even points/cross over points are adjusted slightly to explore whether minor changes in the input conditions will result in major changes in the output. For all three analyses, the QCA will proceed as standard practice describes (Ragin, 2009), and that is like how QCA is executed during the main analysis.

Test 1.1 Calibrating the outcome into Crisp sets

In table H.2 and H.3, it is shown which outcome values are transformed into a one or a zero. The distinction is made based on whether the outcome value is enough to reach the PA goals. A score of one indicates that the country received one of the following rating by CAT: Compatible (<2°C) or Paris Agreement Compatible (<1,5°C) from CAT. A score of zero indicates that the country received one of these ratings by CAT: Critically Insufficient (4°C), Highly Insufficient (<4°C) or Insufficient (<3°C).

Table H.2 – How outcome variable is calibrated into crisp set

Fuzzy set	**NEW: Crisp set**	**CAT-rating**
0	0	Critically Insufficient (4°C)
0.25	0	Highly Insufficient (<4°C)
0.5	0	Insufficient (<3°C)
0.75	1	Compatible (<2°C)
1	1	Paris Agreement Compatible (<1,5°C)

Table H.3 – Calibration of outcome variable into crisp set

Country	AMB Crisp set	Country	AMB Crisp set
Argentina	0	Chile	0
Russian federation	0	EU	0
Saudi Arabia	0	Kazakhstan	0
Turkey	0	Mexico	0
Ukraine	0	New Zealand	0
USA	0	Norway	0
Vietnam	0	Peru	0
China	0	Switzerland	0
Indonesia	0	Bhutan	1
Japan	0	Costa Rica	1
Singapore	0	Ethiopia	1
South Africa	0	India	1
South Korea	0	Kenya	1
UAE	0	Philippines	1
Australia	0	Morocco	1
Brazil	0	The Gambia	1
Canada	0		

The analysis is performed, and a truth table is created, which is shown in table H.4. This is the truth table after logical minimization. The frequency cut-off point and the consistency thresholds that were used in the main analysis have been used, two and 0.75 respectively.

Table H.4 – Truth table

IND	NAT	DEM	COR	GNI	VUL	# Cases	Outcome	Consistency
0	0	0	1	0	1	2	0	0.366743
0	0	1	1	0	1	2	0	0.337196
0	1	0	1	0	1	2	0	0.27686
0	0	1	1	1	0	2	0	0.223377
0	0	0	1	1	0	3	0	0.211876
0	0	1	0	1	0	6	0	0.203459
1	1	1	0	1	0	3	0	0.174061
1	0	1	0	1	0	4	0	0.163337
0	1	0	0	1	0	2	0	0.163043
0	1	0	1	1	0	2	0	0.156646

Table H.4 shows that no combination of conditions leads to a positive outcome, as the consistencies are all below 0.75. It can be concluded that transforming the outcome variable from a fuzzy set into a crisp set has a major effect on the solutions. This is as expected and is in accordance with criticism regarding crisp set QCA: a lot of information is lost.

Test 1.2 Calibrating the outcome and the conditions into crisp sets

During this test, not only the outcome variable is transformed into a crisp set, also the data of the conditions have been transformed into crisp-sets. The cross-over points that were identified in the literature are used as threshold, to decide whether the value of a condition for a country equals zero or one. Table H.5 shows an overview of the crisp-set values that will be the input for this analysis.

Table H.5 – overview of the crisp set values of conditions

Country	**AMB CS**	**NAT CS (>2.5)**	**DEM (>6)**	**COR (>57)**	**GNI CS (>4046)**	**VUL (>0.425)**	**IND CS (>59)**
Argentina	0	0	1	1	1	0	0
Russian federation	0	1	0	1	1	0	0
Saudi Arabia	0	1	0	0	1	0	0
Turkey	0	0	0	1	1	0	0
Ukraine	0	0	0	1	1	0	0
USA	0	0	1	0	1	0	1
Vietnam	0	1	0	1	0	1	0
China	0	0	0	1	1	0	0
Indonesia	0	1	1	1	1	1	0
Japan	0	0	1	0	1	0	0
Singapore	0	0	1	0	1	0	0
South Africa	0	1	1	0	1	0	1
South Korea	0	0	1	0	1	0	0
UAE	0	1	0	0	1	0	0
Australia	0	1	1	0	1	0	1
Brazil	0	1	1	1	1	0	0
Canada	0	0	1	0	1	0	1
Chile	0	0	1	0	1	0	0
EU	0	0	1	0	1	0	0
Kazakhstan	0	1	0	1	1	0	0
Mexico	0	0	1	1	1	0	0
New Zealand	0	0	1	0	1	0	1
Norway	0	1	1	0	1	0	1
Peru	0	0	1	1	1	1	0

Switzerland	0	0	1	0	1	0	1
Bhutan	1	0	0	0	0	1	0
Costa Rica	1	0	1	0	1	0	0
Ethiopia	1	1	0	1	0	1	0
India	1	0	1	1	0	1	0
Kenya	1	0	0	1	0	1	0
Philippines	1	0	1	1	0	1	0
Morocco	1	0	0	1	0	0	0
The Gambia	1	0	0	1	0	1	0

Like test 1.1, a truth table has been established, which is shown in table H.6. This is how it looks after logical minimization (frequency threshold of two and consistency threshold of 0.75)

Table H.6 – truth table crisp sets

IND	**NAT**	**DEM**	**COR**	**GNI**	**VUL**	**# Cases**	**Outcome**	**Consistency**
0	0	0	1	0	1	2	1	1
0	0	1	1	0	1	2	1	1
0	1	0	1	0	1	2	0	0.5
0	0	1	0	1	0	6	0	0.166667
1	0	1	0	1	0	4	0	0
0	0	0	1	1	0	3	0	0
1	1	1	0	1	0	3	0	0
0	1	0	0	1	0	2	0	0
0	1	0	1	1	0	2	0	0
0	0	1	1	1	0	2	0	0

The truth table shows that in total, two configurations exist that have a consistency higher than 0.75 and a frequency of two. This means that solutions can be obtained and compared to the main solutions. The parsimonious solution, which is obtained after running the QCA, is presented in table H.7.

Table H.7 – parsimonious solution crisp sets

Model	**AMB = f (IND, NAT, DEM, COR, GNI, VUL)**
Consistency threshold	0.75
Frequency threshold	2

Parsimonious solution	~NAT*VUL
Solution coverage	0.625
Solution consistency	0.833333

When comparing this parsimonious solution with the original solution, it shows that no significant difference exists. The results are either the same or differ just a little bit, but since the difference is so small, this can be neglected. From this, it can be concluded that using fuzzy sets, versus using crisp sets, roughly result in the same solutions if the same thresholds are applied. However, it was also showing that when only the outcome was transformed into crisp sets, a lot of information was lost, which was expected.

Test 1.3 Changing the calibration thresholds

During the third test, the thresholds that have been used during calibration are adjusted slightly. Table H.8 shows both the original and the alternative threshold values that are used for the six conditions. Of course, a lot of adjustments are possible: you can increase the values, decrease the values, increase and decrease the values, etc. However, it is decided to align the new calibration thresholds closely with the original thresholds. By doing this, it is tested whether small adjustments in the input, have major effects on the output.

Table H.8 – original and alternative thresholds of conditions

		Original Membership Criteria			**New Membership Criteria**		
Category	Condition	No membership	Crossover point	Full membership	No membership	Crossover point	Full membership
Idea	IND	1	59	100	1	50	100
Interest	NAT	0	2.5	25	0	3	25
Institutions	DEM	0	6	10	0	5	10
	COR	0	57	100	0	50	100
Societal	GNI	130	4046	116430	130	5000	116430
	VUL	0	0.425	0.675	0	0.375	0.675

After the QCA is run with the new calibrated values, a truth table is generated. The truth table, after logical minimization is presented in table H.9.

Table H.9 – Truth table with adjusted calibration thresholds

IND	**NAT**	**DEM**	**COR**	**GNI**	**VUL**	**# Cases**	**Outcome**	**Consistency**
0	0	1	1	0	1	5	1	0.783333

1	1	1	0	1	0	2	0	0.737797
0	0	1	1	1	1	4	0	0.713593
0	0	1	0	1	0	3	0	0.711897
0	0	1	0	1	1	2	0	0.711722
1	0	1	0	1	0	5	0	0.697189
0	1	0	1	0	1	2	0	0.692308
0	1	0	1	1	0	2	0	0.661836

As can be seen, there are configurations which meet the frequency threshold of two and the consistency threshold of 0.75. Therefore, solutions can be obtained. The parsimonious solution is presented in table H.10.

Table H.10 – Parsimonious solution with adjusted thresholds

Model	**AMB = f (IND, NAT, DEM, COR, GNI, VUL)**
Consistency threshold	0.75
Frequency threshold	2
Parsimonious solution	~NAT*~GNI
Solution coverage	0.724306
Solution consistency	0.768518

This solution shows that small changes in the calibrated cross-over point do change the solution slightly. Where low GNI was part of the intermediate solution during the main analysis, it is part of the parsimonious solution in this analysis. This emphasized that GNI might be more important and helps to better interpret the results obtained in chapter four. It also shows that the data is sensitive to the calibration thresholds, especially the condition GNI.

Test 2: Changes in the frequency of cases linked to the configurations

Because the number of cases that have been included during this research is rather low, a standard frequency threshold of two was applied. In this test, the frequency threshold is changed from two to one for the outcome NDC ambition and the negated outcome of NDC ambition, to check whether major changes will occur in the solution. The parsimonious solution is obtained and is shown in table H.11.

Table H.11 – parsimonious solutions explaining outcome with adjusted frequency of threshold

Model	AMB = f (IND, NAT, DEM, COR, GNI, VUL)
Consistency threshold	0.75
Frequency threshold	1
Parsimonious solution	~NAT*~GNI*VUL
Solution coverage	0.658856
Solution consistency	0.768448

It can be noticed that low levels of GNI are now also part of the parsimonious solutions. As was mentioned earlier, this condition was part of the intermediate solution before. Again, the importance of this condition is emphasized, and it should be considered when discussing the results. The parsimonious solution for the negated outcome is presented in table H.12.

Table H.12 – Parsimonious solution explaining the negated outcome with adjusted frequency threshold

Model	~AMB = f (IND, NAT, DEM, COR, GNI, VUL)
Consistency threshold	0.75
Frequency threshold	1
Parsimonious solution	NAT+~VUL+~COR+DEM
Solution coverage	0.870642
Solution consistency	0.700038

This table shows that the results are slightly less parsimonious, which is as expected as the threshold is lowered from two to one, including more configurations.

Test 3: Changes in the consistency of the configurations

For the third test, the consistency threshold is adjusted. During the main analysis, a consistency threshold of 0.75 has been applied, where in this test, the consistency threshold was changed to 0.85 and 0.65. These tests are applied for both the outcome and the negated outcome, while keeping the frequency cut-off value of two constant. For the outcome NDC ambition, the higher threshold value of 0.85 led to no configurations meeting this value in the truth table. Therefore, no solution could be obtained. The less demanding threshold however, implied that eight configurations have a higher consistency value, and are assigned a value of one, therefore. The parsimonious solution that was obtained looked the following:

$$\sim NAT*GNI*VUL.$$

This solution is a superset of the baseline result, which is as expected. These results were expected because during the test for necessity of the individual conditions, no condition met the threshold of 0.9. With no necessary conditions, it is rather logic that no configuration meets the high consistency.

For the negated outcome, no NDC ambition, the more demanding threshold of 0.85 resulted in eight configurations that were assigned a positive outcome value. The parsimonious result obtained from this analysis is identical to the parsimonious result

obtained in the main analysis in chapter four. The less demanding threshold of 0.65 results in ten configurations that are assigned a positive outcome value. As these ten configurations comprise the entire set of sufficient configurations, there is no parsimonious result obtained. As a conclusion, it can be stated that the results for the negated outcome, no NDC ambition, are more robust, as consistency levels on average are higher, and the results remain the same when increasing this level.

Appendix H – Overview Correlations

Table I.1 – Overview correlations (Kendall's Tau)

Correlations									
			AMB	COR	FOS	DEM	GNI	VUL	IND
Kendall 's tau b	AMB	Correlation Coefficient	--						
		Sig. (2-tailed)	.						
		N	33						
	COR	Correlation Coefficient	-.021	--					
		Sig. (2-tailed)	.873	.					
		N	33	33					
	FOS	Correlation Coefficient	-.083	.162	--				
		Sig. (2-tailed)	.533	.192	.				
		N	33	33	33				
	DEM	Correlation Coefficient	.146	-.448**	-.230	--			
		Sig. (2-tailed)	.271	.000	.061	.			
		N	33	33	33	33			
	GNI	Correlation Coefficient	-.308*	-.562**	-.141	.370**	--		
		Sig. (2-tailed)	.020	.000	.251	.003	.		
		N	33	33	33	33	33		
	VUL	Correlation Coefficient	.171	.459**	.097	-.402**	-.684**	--	
		Sig. (2-tailed)	.196	.000	.429	.001	.000	.	
		N	33	33	33	33	33	33	
	IND	Correlation Coefficient	.006	-.326**	-.056	.392**	.287*	-.326**	--
		Sig. (2-tailed)	.962	.010	.651	.002	.021	.009	.
		N	33	33	33	33	33	33	33
*. Correlation is significant at the 0.05 level (2-tailed).									
**. Correlation is significant at the 0.01 level (2-tailed).									

Strong correlation

*FOS=NAT

Appendix I – Eliminating DEM & IND in fsQCA

Eliminating the condition DEM

Table K.1 and table K.2 present the solutions (parsimonious and intermediate) for the presence of NDC ambition and the absence of NDC ambition. When comparing these results with the main findings of Chapter four, it shows that the same core conditions are identified. Only for the denied outcome, the intermediate solution is a little different from the main solution. Instead of four solution pathways, there are now three solution pathways. The solution pathways are almost identical to the main solution pathways that have been obtained, except for the condition democracy, which is not included.

Table K.1 - The solution for the presence of NDC ambition, without democracy

Model	**AMB = f (IND, NAT, COR, GNI, VUL)**
Consistency threshold	0.75
Frequency threshold	2
The solution	~**NAT*VUL***COR*~GNI
Solution coverage	0.558501
Solution consistency	0.744186

Table K.2 - The solution for the absence of NDC ambition, without democracy

Model	**~AMB = f (IND, NAT, COR, GNI, VUL)**
Consistency threshold	0.75
Frequency threshold	2
Solution pathway 1	~COR*GNI*~**VUL**
Solution pathway 2	~IND*GNI*~**VUL**
Solution pathway 3	~**IND*NAT***COR*~GNI
Solution coverage	0.76103
Solution consistency	0.832803

Eliminating the condition IND and DEM

Table K.3 and K.4 present the solutions (parsimonious and intermediate) for the presence of NDC ambition and the absence of NDC ambition. When comparing these results with the main findings of chapter four, it shows that the core conditions and the peripheral conditions are the same as the main results identified in chapter four. In explaining the absence of NDC ambition, it is shown that the core conditions are similar and did not change after eliminating both DEM and IND. However, the solution set not only consists of two solution pathways, having the exact same solution coverage and solution consistency as when only DEM was eliminated.

Table K.3 – The solution for the presence of NDC ambition, without democracy and individualism

Model	**AMB = f (NAT, COR, GNI, VUL)**
Consistency threshold	0.75
Frequency threshold	2
The solution	~**NAT*VUL***COR*~GNI
Solution coverage	0.558501
Solution consistency	0.744186

Table K.4 – The solution for the absence of NDC ambition, without democracy and individualism

Model	**~AMB = f (NAT, COR, GNI, VUL)**
Consistency threshold	0.75
Frequency threshold	2
Solution pathway 1	GNI*~**VUL**
Solution pathway 2	**NAT***COR*~GNI
Solution coverage	0.76103
Solution consistency	0.832803

Appendix J – Solution pathways & theoretical framework

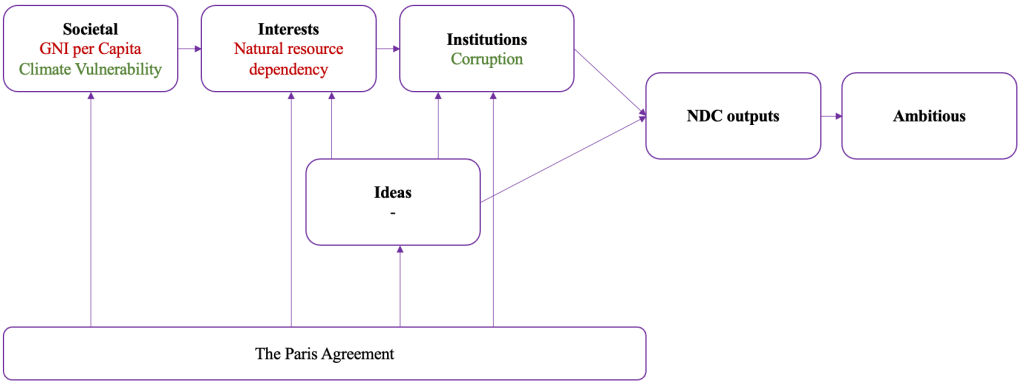

Figure J.1 Solution pathway one

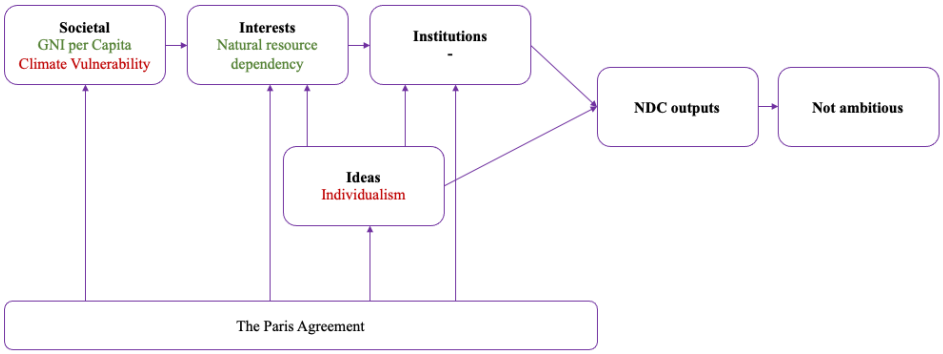

Figure J.2 - Solution pathway two

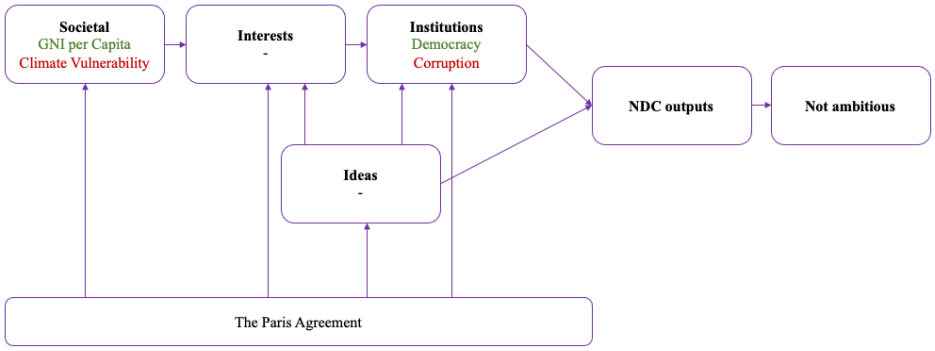

FIGURE J.3 - SOLUTION PATHWAY THREE

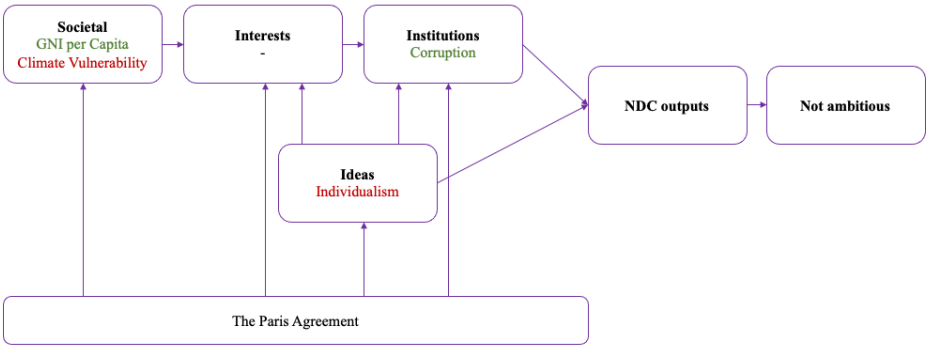

FIGURE J.4 - SOLUTION PATHWAY FOUR

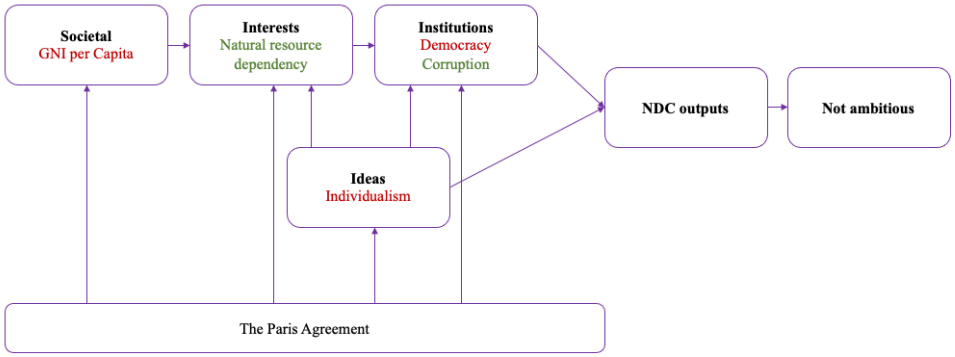

FIGURE J.5 - SOLUTION PATHWAY FIVE