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Mapping and Explaining the Emergence and Effectiveness of Climate Cooperative Initiatives

(Topic of thesis)

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Content

Figures

Tables

Abbreviations

CCS	Carbon Capture and Storage
CMP	Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol
COP	Conference of the Parties
CSD	Commission on Sustainable Development
DIE	The German Development Institute/ Deutsches Institut für Entwicklungspolitik
EU	European Union
GHG	Greenhouse gas
ICI	International cooperative initiative
IKI	Internationale Klimaschutzinitiative, specific to German Ministry for Environment, Nature Conservation, Building and Nuclear Safety
INDC	Intended Nationally Determined Contributions
IPCC	Intergovernmental Panel on Climate Change
IPIECA	International Petroleum Industry Environmental Conservation Association
IRENA	International Renewable Energy Agency
LSE	London School of Economics
Mio.	Million
MRV	Measurement, Reporting and Verification
NDC	Nationally Determined Contributions
NGO	Non-governmental organizations
NYDF	The New York Declaration on Forests
OECD	Organization for Economic Co-operation and Development
PCI	Portal on Cooperative Initiatives
TEA	Transnational environmental agreement
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WBCSD	World Business Council for Sustainable Development
WBGU	German Advisory Council on Global Change/ Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen

Summary

The adoption of the Paris Agreement in December 2015 constitutes the will of the international community to keep global temperature increase to "well below 2°C above pre-industrial levels". The formulation of Nationally Determined Contributions is the primary way for a country to communicate its national contributions to the Paris Agreement. Currently, the global pledges under the NDCs and the needed emission cuts to achieve the Paris Agreement don't align sufficiently, so that the United Nations Environment Programme estimated an emissions gap of 12 to 14 $GtCO_2e$ for the year 2030. The increasing diversification and interest of sub-national and non-state actors such as cities, businesses and environmental groups to participate in global climate politics in form of initiatives could help to solve this gap. Moreover, many actors have become frustrated by the little success that 20 years of climate negotiations have brought. Since the urgency of climate change has become prevalent to non-governmental actors as well, they have started to self-organize climate activities.

Especially, since President Trump came in office and has taken the view of declaring climate change as a hoax, stakeholders in the United States opposing this perception are engaging themselves on a voluntary basis to address climate change. The diversification of actors and the impact of their activities in international cooperative initiatives have not been researched yet in detail. However, the United Nations hosts an international platform – the Climate Initiatives Platform – gathering comprehensive data on various features of international cooperative initiatives which has not been evaluated extensively.

Against this background, this Master thesis aims at improving the knowledge about international cooperative initiatives by evaluating the Climate Initiatives Platform focusing on information about their development, impact and common features. The analysis shows that the first initiatives originate in 1980s. By today the database entails 218 initiatives. Most of them focus on reducing greenhouse gas emissions on a global level through international cooperation. International cooperative initiatives activities range from knowledge exchange and production to campaigning, policy recommendations and technical implementations in almost all sectors affected by climate change (transport, energy efficiency, agriculture, etc.). Initiatives focus on specific areas like the transport sector and energy efficiency measures. This could stem from the little achievements made and the high mitigation potential still not realized in these areas. The evaluation shows that initiatives are an instrument mostly coined by stakeholders of developed countries to

organize their climate action, even though a certain share of activities are directed towards saving emissions in developing countries.

While most initiatives present targets that they try to achieve, 7% of them lack conclusive goals. To estimate their impact and potential of closing the emissions gap, the initiatives with quantitative goals in form of emissions reductions were identified and their mitigation potential was calculated. If these initiatives are able to achieve their pledged goals they could save between 14 to 26 $GtCO_2e$ in 2020. Moreover, the analysis of the coded qualitative data concerning the impact of initiatives shows that cooperation as well as establishing monitoring and reporting measures are essential benefits of initiatives. Cooperation is central to many actors, because they need to exchange experience on the numerous amount of existing projects.

There are also several problems concerning the research of international cooperative initiatives. For example, currently 73% of initiatives are missing work plans so that is unclear how they are going to achieve their goals. Moreover, the Climate Initiatives Platform as central database providing information on initiatives should be adapted with regards to its level of content and concretization of categories.

1 Introduction

"I am fighting every day for the great people of this country. Therefore, in order to fulfill my solemn duty to protect America and its citizens, the United States will withdraw from the Paris Climate Accord - thank you, thank you -- but begin negotiations to reenter either the Paris Accord or a really entirely new transaction on terms that are fair to the United States, its businesses, its workers, its people, its taxpayers. So we're getting out. "

Donald Trump

(First of June, 2017 in Rose Garden on the Paris Agreement)

As Donald Trump, President of the United States, announced on the first of June in 2017 the withdrawal of the U.S. from the Paris Agreement, the rest of the world leaders reacted with disappointment but also reassurance towards their climate commitments. The reasons for President Trump's course of action originate in his perception that the Paris Agreement is "very unfair, at the highest level, to the United States" and it would lead to "vastly diminished economic production" (Trump 2017). Greenpeace USA declared that the decision of the U.S. President would only encourage their will to act on climate change (Leonard 2017). Even though, the United States isn't the solution to fight climate change, it is perceived as a dominant power influencing the engagement and priorities of the rest of the world. Under former President Obama, the United States showed leadership in prioritizing climate change as a fundamental issue for current and future generations. Additionally, the country represents one of the largest historic emitters of greenhouse gases and had been an essential money giver to international climate funds. The administration of former President Obama directed 500 mio. $ to the Green Climate Fund, just three days before President Trump entered his office (Slezak 2017).

Today, we know that the withdrawal of the United States from the Paris Agreement hasn't been the end of efforts on international level to take serious steps for climate ambitions, not even the end of the Paris Agreement nor the involvement of the United States. On the one side, the process of withdrawing from the international accord requires certain steps and time. The U.S. State Department announced in a press release

to continue participating in the climate summits and to comply with stipulated terms until this process will be completed. On the other hand, new international alliances as well as sub-national collaborations in the U.S. have formed to oppose the decisions of the President as to his approach on environmental issues. In response to President Trump's announcement, the United States Climate Alliance was initiated by several governors. The respective politicians aim at complying to the targets of the Paris Agreements within their states' borders (Nunno 2017). These two implications evoked through the withdrawal of the U.S. from the Paris accord – the regulatory procedures and the changing face of climate action – illustrate significant developments in the international climate system:

In general, many have heard about the withdrawal of the U.S. from the Paris Agreement, but not many know about the formal procedure accompanying this decision. For once, Article 28 of the Paris Agreement states that "at any time after three years from the date on which this Agreement has entered into force for a Party, that Party may withdraw from this Agreement by giving written notification to the Depositary. Any such withdrawal shall take effect upon expiry of one year from the date of receipt by the Depositary of the notification of withdrawal" (UNFCCC 2015). Since the Paris Agreement entered into force on the 4th of November 2016 and given that the administration of President Trump would turn in the written notification of withdrawal on November 4th in 2019, then the earliest point for an effective withdrawal would be November 4th, 2020. Ironically, this would just be one day after the 2020 U.S. President election. And there would be nothing stopping a new President from reentering the Paris Agreement in just 30 days.

There are two formal ways to join – by ratification/signature or by accession. When the U.S. first officially became part of the agreement, they joined through signature and ratification. However, the deadline for signature has passed on April 21st, 2017, so that accession is now the only option to join the agreement. Accession describes a legal term for entering a treaty after it has already been negotiated and signed by other nations. There is no rule prohibiting a party from joining by signature, withdrawing and then rejoining by accession. Plus, after rejoining the U.S. would be subject to the same conditions as nations that joined by signature. Reentering the agreement takes 30 days. Theoretically, the future President could do this right after the inauguration on January 20th, 2021 (Harvey 2017).

The U.S. administration stated their acceptance of the withdrawal terms since any other steps would contradict international law. Besides, President Trump has signaled his openness to renegotiations – which is of course taunting towards the fact that almost 200 nations have agreed on the terms of this treaty over the past years (Volcovici 2017). At the same time, it is highly questionable whether President Trump will win the race against the Democratic candidate in the U.S. 2020 election. Even though polls have exposed, that President Trump is the most unpopular president of all time, he is already talking about winning in 2020 (Kirk and Scott 2018). Due to the overlap of the presidential election and the withdrawal procedure of the Paris Agreement, the discussions about climate change might dominate the up-coming campaigns of the presidential candidates. The number of people in the United States denying the existence of climate change amounts to just 15%, so that there is still a large consensus in the population to take this issue seriously (Howe et al. 2015).

Internationally, the alliance between Europe and China has become central to uphold commitments and stimulate further endeavors for the global transition to sustainable practices. Moreover, the motivation for climate action is still large in the United States and internationally. The United States Climate Alliance represents one of the many examples of how non-state and sub-state actors such as businesses, cities, states and universities have organized their climate activities. For example, Microsoft made a pledge to reduce its operational carbon emissions by 75 percent until 2030 and New York's Major Bill de Blasio has started to divest public funds from fossil fuel trades (Sampathkumar 2017).

Not only in the U.S., but worldwide the engagement of non-state and sub-state actors to contribute to decarbonizing global processes has grown. The decision of the Trump administration to withdraw from the Paris Agreement might have put a new focus on local and civil climate action, but long before President Trump's decision actors like the state of California or the American technology company CISCO have adopted voluntary and ambitious climate strategies (Sampathkumar 2017). The development of self-regulation in so-called transnational environmental arrangements (TEA) has become of increasing interest to many researchers since these activities emerge outside to the institutionalized climate governance system. But how do transnational initiatives relate to the international climate regime? And are they a challenge to its authority?

Since 1995, the yearly sessions of the United Nations Climate Conference have taken place, also known as the Conference of the Parties (COPs) or meetings of the United Nations Framework Convention on Climate Change (UNFCCC) Parties. The UNFCCC's main objective is the "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system" (United Nations 1992). While the UNFCCC itself cannot set legally binding boundaries on greenhouse gas emissions, the protocols negotiated and adopted at the COPs can be binding. The COPs serve as yearly meetings to evaluate and discuss the progress in achieving the postulated objectives of the UNFCCC. The biggest milestones of the UNFCCC have been the Kyoto Protocol, the Paris Agreement and the development of the Intended Nationally Determined Contributions (INDCs). The UNFCCC is nearly universal with 197 member states (UNFCCC 2014d).

The UNFCCC and its protocols differentiate between developed and developing countries in terms of their burden to reduce emissions[1]. In recent years, discussions about this classification have increased. Critics of the international climate negotiations argue that countries like India, China and certain Arabic countries categorized as Non-Annex Parties have grown to fast emerging economies and cause considerable amounts of emissions. Explicitly, China and India rank in the top 3 of global cumulative greenhouse gas emitters, yet their emissions per capita are significantly lower than in many developed countries. For President Trump, this had been a critical cause to announce the withdrawal from the Paris Agreement: "The concept of global warming was created by and for the Chinese in order to make U.S. manufacturing non-competitive" (Trump 2012).

The responsibility of reducing emissions and the allocation of abatement costs is just one of the issues the international climate community is facing. Global environmental politics have long been coined by the UNFCCC and negotiations about multilateral treaties. But when we look at the outcomes of twenty years of international climate negotiations, many become disillusioned and frustrated at the little increments achieved to effectively reduce emissions (Ostrom 2008; Hoffmann 2011). As pointed out before, climate justice and the right of economic development play an important role in this

[1] The UNFCCC divides countries in three categories: Annex I Parties (industrialized countries), Annex II Parties (OECD members of Annex I without countries with economics in transition) and Non-Annex Parties (mostly developing countries). For a full lust, visit: www.unfccc.unt/parties_and_observers/items/2704.php

discussion. From a historical point of view, developed countries have caused the current high of emissions and profited from the ability to produce emissions for economic and technological development. One of the reasons China has denied its willingness to restrict emissions in the Kyoto Protocol in 1997 had been economic. Back then, economic development aced out climate concerns in China. However, in case China and India would follow the exact pathway of the industrialized countries, the climate crisis would be unstoppable. If the large populations of these two countries would adopt the same amount of CO_2 per capita and resource consumption currently prevalent in developed countries, the earth would exceed its limits to a point of 'no return'. Moreover, today China and India are facing increasing problems from air pollution, so that even though they used to be hesitative regarding the restriction of emissions, local conditions demand investments in cleaner technologies. But one of the fundamental issues with regards to climate change is the distribution of costs and benefits of impacts from climate change which vary extremely between regions (Riebeek 2010).

Yet, the classical dilemma of collective action has not been solved in the international climate arena and proposed solutions like multi-level governance or carefully managed policy coordination are only aspects of a comprehensive approach. Participating parties are locked in a 'win-or-lose' mindset (Rietig 2012). The need for emissions abatement is linked to the reform of traditional processes in many economic sectors and costs for transforming the global industry to sustainable practices are uncertain. Considering the fairly limited amount of notable achievements and the issues associated with international climate negotiations, the questions arise whether multilateral treaties are losing their legitimacy as dominant tool for climate action. How good is mankind in consequently tackling climate change?

Well, the upside of the UNFCCC climate negotiations is the fact that they actually bring together all countries of the world to exchange their positions on climate change. During the COPs, the whole world seems to be interested in sustainability and eager to do something about climate change. The protocols of the UNFCCC are a worldwide symbol for climate action unifying almost all countries of the world and legitimating more intensive and detailed research on climate change. Without the Paris Agreement, President Trump and other climate sceptics wouldn't face a closed front challenging their ignorance on environmental protection as publicly and prominently. Without the Intended Nationally Determined Contributions, there wouldn't be a comprehensive

roadmap outlining country-specific trajectories to reduce emissions. Internationally, climate change negotiations are a key component of global action, but their strength originates in the symbolic character of 'a unified world against climate change'.

If we look at the political constellation in the international climate politics as well as the humble success of climate negotiations, what else can be done to address climate change? From a perspective of 'how to solve the climate crisis efficiently', it makes sense that any actor who causes emissions, finds suitable means to reduce their carbon footprint. The previously described developments from Trump to China and the beginning of UNFCCC to the Paris Agreement have led to a mindset of 'climate change is everybody's business' (even Trump's) in a large part of the global population. Researchers have pointed out the recent diversification of actors and actions in international climate politics (Hoffmann 2011; Hickmann 2016; Roelfsema et al. 2015).

Initiatives like the city network C40 or the cooperation between the state of California and China have become prominent illustrations of new transnational arrangements for environment in the international context. The advantages they incur are apparent: Despite the political situation in the United States, climate change is considered serious by a wide range of actors and initiatives allow for cooperation with other international parties anyhow. In the context of addressing the collective action dilemma in international climate negotiations, initiatives offer voluntary commitments with little negotiation costs. As an answer to the frustration of not reaching considerable treaties and outputs, initiatives enable many parties in the world - business, cities, environmental organizations - to become active, to exchange ideas and to influence the global climate level.

Even though the emergence of first climate initiatives goes back to 1980s, little is known about the development of these transnational arrangements and their contribution to climate politics. At the moment, a strong focus of sustainable development is concentrating on the city sector. A growing share of people in many countries of the world are moving to cities and with a contribution of 70% of global greenhouse gases, cities are confronted with the need to transform to more sustainable places fast (Falk 2011). They are collaborating in networks to stay informed about innovative projects and learn about experiences from other partners. The rise of sub- and non-state actors on the international climate level has mostly developed outside of the established UN processes. In general, all climate initiatives follow the aim to

directly or indirectly reduce emissions, and their motivation is diverse but often linked to a personal urge to become active about climate change: “ICLEI’s diverse local government members share a broad desire to make their communities better places to live by making them greener, more efficient, healthier places and by taking action against climate change—because its impacts will be felt most tangibly at the local level” (ICLEI 2017).

But also, environmental organizations have been shaping the face of climate politics for a long time. For them, climate initiatives may be a mean to implement their idealistic driven ideas. Since globalization supports the spread of new technologies and communication methods, not only the possibility to cooperate between different actors has become significantly easier, but also the expansion of new knowledge can lead to technological leaps in developing countries. And in the end, more access to electricity and technology means more customers for businesses.

The debate behind the motivation of different actors to organize themselves in initiatives is an important one. While certain stakeholders may have genuine reasons to come together in climate initiatives, other may follow hidden motives, like businesses using voluntary agreements to greenwash their activities or gain a better reputation to increase sales (Engel, Orbach 2008). However, it is also possible that businesses have experienced the hesitation of politicians to restrict the industrial sector and therefore form initiatives to self-regulate their emissions in areas where long-term profits are expected, for example through energy efficiency measures. The Logistics Carbon Reduction Scheme is a transport initiative willing to reduce emissions from road freight and who wants to develop innovative solutions besides taxes to regulate freight transport. In general, there is little knowledge about the constellation of stakeholders involved in internaional cooperative initiatives (ICIs) and the targets they follow by participating in initiatives.

Moreover, the question arises how climate initiatives relate to current political developments and the institutionalized structure on the international climate level. ICIs seem to be an answer to the described problems of climate negotiations in terms of deferring collective action dilemmas and establishing measurable outputs. They allow ambitious stakeholders with similar targets to come together and embed their ideas in an overarching construct. It is not the first time that non-governmental or non-institutionalized organizations have developed outside the established frameworks and

taken over responsibilities of the government. Through globalization the world is better connected, and many large enterprises have become central players in world politics such as Elon Musk's Tesla or Marc Zuckerberg's Facebook. In general, one may wonder if governments are losing their fundamental power and centralized authorities are replaced by new, decentralized structures of influence.

Academic scholars argue, that climate initiatives are not a threat to the established international climate institutions, but rather take these as reference points and from there on develop further steps for climate action (Hickmann 2016; Hoffmann 2011). The international climate level is a complex and entangled system, ecologically- socially-economically, and the responsive solution from the organizational point of view may be as complex and entangled. Generally, climate initiatives are a (potential) contribution in form of direct and indirect emissions reduction and are mainly an attribution to the activities in the framework of the UNFCCC.

Since 2016, the United Nations have institutionalized climate action in form of initiatives in the Non-State Actor Zone for Climate Action (NAZCA) and Lima Paris Action Agenda (LPAA). These platforms offer guidelines, financial support and possibilities for exchange with other initiatives to spread ideas about projects and knowledge. Moreover, the UN-hosted Climate Initiatives Platform contains comprehensive information about various international climate initiatives all over the world. As the most extensive database on ICIs, it offers a great range of raw data to enhance the knowledge about the characteristics and impacts of initiatives. Voluntary forms of organizations certainly are susceptible to various threats from hidden motives to shortages in financing. ICIs must find a way to organize themselves and coordinate the activities of all participating partners, which can sometimes already be overreaching their capacities. Therefore, it is central to enhance the understanding of ICIs, the involved stakeholders and their impact.

While the goal of climate initiatives seems to be simple and clear 'reducing greenhouse gas emissions directly or directly', more research is needed to evaluate their potential and the work plans of initiatives. The U.N. institutions are working on establishing national pathways in the framework to enable large-scale transformations coherent with the Paris Agreement targets, the INDCs. But the pledged emissions cuts in the INDC are not sufficient to limit global warming to 2 degrees. In this context, international climate initiatives could become a key component in closing this emission gap.

However, more research should be directed towards the effectiveness of ICIs in terms of formulating and achieving their ambitious targets. Moreover, a large share of initiatives aims at indirectly reducing emissions through knowledge diffusion, policy recommendations or trainings. Qualitative goals are difficult to evaluate, but if many initiatives don't present measurable goals in form of greenhouse gas emissions savings, research should deal with this aspect.

Hence, this Master thesis puts a focus on improving the knowledge about international cooperative initiative in the climate regime and it will discuss the potential impact in terms of concrete emissions reductions and indirectly leading to other benefits such knowledge increase about climate change. The theory chapter will establish a framework synthesizing the key findings of academic research on climate change as a global common good. In the context of the typology of goods, the research about solutions to climate change in multi-level governance system and the dilemma of collective action, ICIs represent an innovative and voluntary approach for non- and sub-state actors to account for climate targets and overcome the locked-in mindsets or positions of institutionalized players.

The methods chapter will outline how the research questions have been translated to measurable variables. By a mixed-method approach, this Master thesis aims at comprehensively researching climate initiatives. The evaluation of the UN-hosted Climate Initiatives Platform will reveal characteristics of ICIs and a detailed analysis about the features will be executed, for example to point out the role of sub- and non-state actors in closing the emissions gap between INDC and the Paris Agreement. The fourth chapter will first present the results of distinctive attributes of ICIs and then illustrate the quantitative potential of ICIs to reduce greenhouse gas emissions as well as qualitative impact coded for different sectors. The discussion in the analysis chapter will focus on the topics actors, targets and issues regarding ICIs. The final chapter will summarize the stated findings of the Master thesis, connect these results to the larger context of climate change and indicate points for further research.

2 Theoretical Framework

2.1 Introduction to climate initiatives

2.1.1. International climate system

The Paris Agreement is considered to be a core achievement in the international climate community to strengthen the combat against climate change. It was adopted in December 2015 at the 21st session of the United Nations Framework Convention on Climate Change and states in its 2nd Article that the global governments come to the agreement to limit global warming to "well below 2°C above pre-industrial levels" and with the objective to stay below 1.5°C (UNFCCC 2015; Öko-Institut Berlin 2016b). To move on with the Paris Agreement, countries developed and submitted the so-called Intended Nationally Determined Contributions. INDCs are the foundation of the post-2020 climate action undertaken by each country and outline their steps towards reducing emissions at a national level (Climate Policy Observer 2017).

The commitments formulated in the INDCs are also indicators whether the UNFCCC parties are able to realize the described goals of the Paris Agreement - limiting the global average temperature increase to well below 2°C and in the second half of the 21st century accomplishing net zero emissions (Gardiner et al. 2016, pp. 6–8). The INDCs are the primary tool for a country to communicate its contributions to a carbon-poor future internationally. Once a country ratifies and signs the Paris Agreement the INDC is converted to the Nationally Determined Contributions (NDC). In most cases the pledged INDCs are directly translated into the respective NDCs but sometimes adjustments have to be made. In May 2016, Papua New Guinea became the first country to submit their NDC to the UNFCCC and until today, 162 parties have followed the footsteps of Papua New Guinea. In October 2016, the threshold for countries to ratify the Paris Agreement was reached, so that it entered into force in November 2016. With Syria's ratification of the Paris Agreement in November 2017, the U.S. became the only country worldwide to reject it (World Resource Institute 2017; Northrop 2016).

However, solely the efforts taken under the (I)NDCs will not be enough to accomplish the goals of the Paris Agreement. If the global community concentrates on limiting global warming to 1.5°C under medium probability (760 $GtCO_2e$ remain in the carbon budget between 2017 and 2100), there are only 6 months and 18 days or 22 $GtCO_2e$ left until the carbon budget is depleted under current average emission output (dated to 20-02-2018). Considering a 2°scenario, there would still be 17 years and 10 months (dated

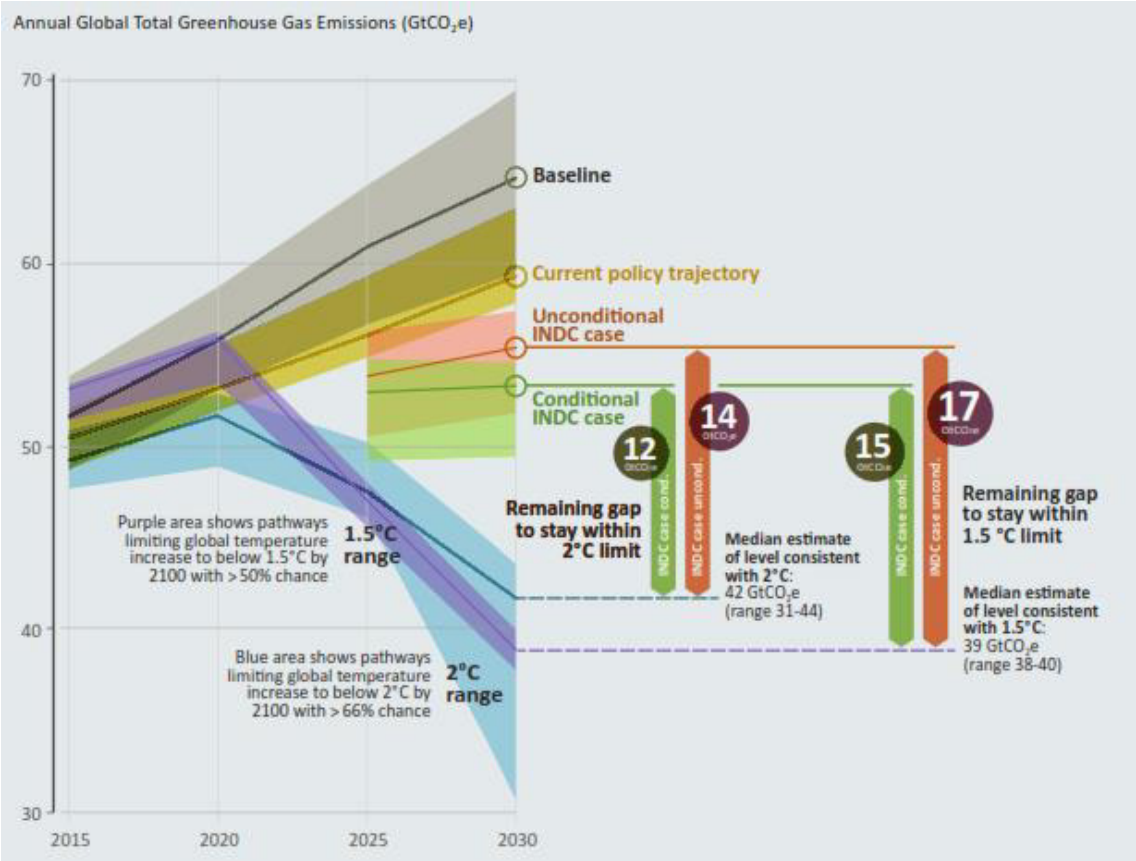


Figure 1: Global greenhouse gas emissions under different scenarios and the emissions gap in 2030 (source: UNEP 2016, p. 16)

to 20-02-2018), which gives decision leaders essentially more time, but also shows the small timeframe to reach net zero emissions (Mercator Research Institute on Global Commons and Climate Change 2017).

The United Nations Environment Programme (UNEP) Emissions Gap Report analyzes to which extent the pledged NDCs by the international community will contribute to achieve the targets of the Paris Agreement and further, it delivers an evaluation of additionally needed emission restrictions by 2030 to be successful in reaching the Paris Agreement (UNEP 2016, p. 13). The report states that the emissions gap for the year 2030 varies between 12 and 14 $GtCO_2e$, if one compares the INDCs to the modelled 2°C scenarios. To limit global warming to 1.5°C, the evaluation of the scenario suggests another 3 $GtCO_2e$ must be saved globally (see Figure 1). The emission cuts promised in the context of the current (I)NDCs would not be enough to drastically reduce temperature increase. The researchers estimate a rise of 3.2°C by 2100 highlighting the importance of additional efforts for greenhouse gas (GHG) emissions reduction (UNEP 2016, pp. 16–17).

In this context, international climate cooperative initiatives as a new form of organization for climate action could play an essential role. The Master thesis will show the global mitigation potential of ICIs and their potential contribution in closing the emissions gap. Against this background, this Master thesis plans to analyze the emergence and effectiveness of climate initiatives by examining the UN database 'Climate Initiatives Platform'. The following segment will present an introduction to the concept and definitions of ICIs as well as databases providing relevant information. Then the second segment will deliver an insight to the theoretical perspective of climate change in refence to the typology of goods and implications to ICIs. Before moving on to the methods used, the third segment will return to the research problem and highlight the relevance of this research. The analysis will conclude on the following proposed research questions:

- How did International Co-operative Initiative as an organizational concept for climate action develop? What are common characteristics?
- To which extent do they contribute to address climate change in regards of CO_2 emissions reductions and improving transnational governance structures? How effective are they as an organizational concept?

2.1.2 Definition of climate initiatives

Since 1992, negotiations in the context of the UNFCCC have taken place and led to important outcomes such as the Kyoto Protocol, highlighting the need for action against climate change. The obstacles of negotiating international agreements have largely been researched, but a real breakthrough to collective action dilemmas has not been found (Hickmann 2016; Keohane, Victor 2011; Hemmati, Röhr 2009). Multi-lateral treaties may still be an essential component in the climate policy context, but the UNFCCC parties' representatives are agents of their national governments. From the perspective of rational benefit maximizers, they try to achieve the best outcome for their country. The complexity of climate change and the regularly conflicting interests of the involved parties make multi-lateral treaties difficult. Hoffmann (2011) describes the lack of effective outcomes in international negotiations as an opportunity for experimentalism. New actors independent or loosely linked to traditional UN institutions organize themselves to catalyze a more effective answer to climate change.

In recent years increasing attention is directed towards the contributions and actions of non-state or sub-state actors and their role in the international climate regime (Engel, Orbach 2008; Gardiner et al. 2016; Hickmann 2016; Klinsky 2013; Pattberg, Philipp and Stripple, Johannes 2008; Roelfsema et al. 2015). While the UN-climate negotiations mostly focus on international action plans on a large-scale level, decentralized actors like businesses, non-governmental organizations (NGO) and cities propose an alternative way of governance in comparison to the institutionalized activities.

Bulkeley, and Castán Broto. (2013) researched the role of 'climate change experiments' in urban governance structures. Challenges imposed by climate change exhaust the institutional capacity of urban governance systems. At the same time, an increasing amount of initiatives and interventions are forming to address climate change mitigation and adaptation strategies. The authors argue that these kind of interventions or experiments have become a critical mean of urban governance. Within this context, Hoffmann (2011) explains that "actors are inspired to create and implement experiments on the basis of profit, out of a sense of urgency, through a desire to expand authority and claims to resource, and as a form of ideological expression".

The increasing emergence or recognition of the potential of climate action outside the UNFCCC framework is frequently discussed under the term 'transnational environmental agreement' or 'transnational climate partnerships'. In general, all of these approaches are linked to discussions about cooperation between heterogenous actors and their motivation to directly or indirectly reduce emissions. While the potential of TEAs, ICIs and other collaborations provide the chance to reduce additional GHG emissions, they are vulnerable to threats such low cost-impact efficiency or disingenuous motives (Hagen et al. 2016; Bäckstrand 2008). The interplay of centralized structures in the international climate system and the influence of decentralized actors such as initiatives has not been researched in detail. However, researchers like Elinor Ostrom plead that the solutions to climate change can't be found in just one single institution and one single governance form (see chapter 2.2.5).

Table 1: Overview of relevant definitions on ICIs

Author	**Definition**
1. Roelfsema et al. (2015)	International cooperative initiatives are defined as *"international activities outside the UNFCCC driven by non-state actors or national governments that have committed to reduce greenhouse gas emissions or take action by which emission reductions will occur as a co-benefit in concert with other policies*"
2. Climate Initiatives Platform (2016)	ICIs fulfil a set of general criteria: *"(1) includes several non-state actors taking voluntary action, and may also include states; (2) have as their objective to reduce greenhouse gas emissions or to increase resilience, or could bring about greenhouse gas emission reductions or increased resilience; (3) have an international scope or the potential for significant impact on a global scale; and (4) have a focal point"*
3. Öko-Institut (2017)	ICIs have the following characteristics: "*(1) ICIs involve stakeholders from different national or subnational governments and/or companies, academia and/or civil society; (2) ICIs have the aim of reducing greenhouse gas emissions directly (e.g. through implementation of mitigation actions) or indirectly (e.g. through knowledge sharing); (3) ICIs can be dialogues, processes for implementation of mitigation activities or official multilateral negotiations outside of the UNFCCC (e.g. Montreal Protocol).[…]; and (4) The geographic scope of ICIs is either international or covers a number of actors in one country and its activities have the potential to be replicated elsewhere."*

Until today, scientific research on international co-operative initiatives has been superficial. A clear definition of what is specified as an international co-operative initiative and what not is currently missing. Table 1 gives an overview of the current working definitions referring to climate initiatives. Roelfsema et al. (2015) describe international cooperative initiatives as "*international activities outside the UNFCCC driven by non-state actors or national governments that have committed to reduce greenhouse gas emissions or take action by which emission reductions will occur as a co-benefit in concert with other policies*".

There are three aspects of these definitions I would like to address here shortly and in more detail later on, since there is little transparency on how ICIs are categorized or defined (see chapter 4.2.1). First, according to the definition of Roelfsema et al. (2015) the activities to reduce emissions must be *outside the UNFCCC*. This opposes the conception of ICIs in the definition of the Climate Initiatives Platform (CIP) (2016) and Öko-Institut (2017). There are national governments and United Nations agencies perceiving and using ICIs to implement pledges from their NDCs. It is therefore unclear, if the activities of the ICI might be seen as a part of the implementation of the NDC. For now, this has not been made transparent in detail.

Second, the definition of Roelfsema et al. (2015) states that the action is taken by *non-state actors or national governments*. The involvement of certain actors as leading organization or participant in the ICI can be a critical aspect in the formulation of commitments and the ambitions of the ICI. However, ICIs are promoted as bottom-up organizations, so that it is questionable whether the involvement of the national government complies with this perception (Scholten et al. 2015).

And third, the definition of Roelfsema et al. (2015) states that the function of the ICIs originates in the *commitment to reduce greenhouse gas emissions or take action by which emission reductions will occur as a co-benefit in concert with other policies.* Therefore, the primary target is defined as emissions reductions or reductions as co-benefits. Regarding this definition, targets of ICIs do not have to be exclusively measurable (for example the reduction of 30% CO2e emissions from transport in Copenhagen from 2003 to 2010) but can also be qualitative, such as increasing knowledge about climate change and plans for a more sustainable lifestyle.

It is necessary to discuss these aspects in more detail, since there is a lack of a clear definition of ICIs in the scientific community. The definition proposed by Roelfsema

et al. (2015) already aims at concretizing criteria for ICIs. Whereas the UN itself is criticized for not proposing a clear definition (Widerberg and Stripple 2016). According to the Climate Initiatives Platform (2016), the main UN information source on initiatives, ICIs fulfill the following criteria: *"(1) their objective [is] to reduce greenhouse gas emissions or to increase resilience, or could bring about greenhouse gas emission reductions or increased resilience; (2) international in scope or having the potential for significant impact on global scale; (3) inclusion of several non-state actors taking voluntary action, and may also include states; and (4) having a focal point".*

Leaning on those criteria the Öko-Institut Berlin (2017) defines ICIs as *"(1) involving stakeholders from different national or subnational governments and/or companies, academia and/or civil society; (2) having the aim of reducing GHG emissions directly (e.g. through implementation of mitigation actions) or indirectly (e.g. through knowledge sharing); (3) […] being dialogues, processes for implementation of mitigation activities or official multilateral negotiations outside of the UNFCCC (e.g. Montreal Protocol) […]; and (4) […] is either international or covering a number of actors in one country and its activities have the potential to be replicated elsewhere.*"

All definitions agree on the objective of reducing GHG emissions directly or indirectly. However, the definition of the Climate Initiatives Platform neglects that the outlined action must be outside of the UNFCCC. The implications and differences of these definitions may lead to an ambiguous classification and understanding of ICIs. However, it should be noted, that there are proposed (working) definitions on ICIs and they agree on similar characteristics. For this Master thesis, the definition of the CIP is used, since the research is based on the data of the CIP.

Excourse: International Climate Initiatives outside the CIP

Besides the registered ICIs in the CIP, there is of course a large variety of climate initiatives which are not considered in the CIP and therefore not in this Master thesis. A prominent example would be the International Climate Initiative (IKI) Programme Office by the German Ministry for Environment, Nature Conservation, Building and Nuclear Safety. Since 2008, the Programme Office has been working in the field of climate initiatives in four different focus areas. The core areas of activity are (I) Mitigating greenhouse gas emissions, (II) Adapting to the impacts of climate change, (III) Conserving natural carbon sinks with a focus on reducing emissions from deforestation and forest degradation (REDD+) and (IV) Conserving biological diversity. The Programme Office IKI was founded in 2008 as a result of the German commitments under the UNFCCC and the Convention on Biodiversity.

It is a German instrument currently funding 308 bilateral, 209 transnational and 40 global projects. To a large extent, these initiatives focus on supporting developing countries in translating and implementing their NDC. However, the mainly bilateral projects are in most cases between the German Development Agency and an institution of the partnering country. Monitoring, Reporting and Verification is institutionalized in a conscientious manner, with measurable indicators for tracking progress, annual reporting and verification according to international law. However, the majority of the data is not available to the public (Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety 2017).

2.1.3 Introduction to the database: Climate Initiatives Platform

Name/Project	Abbreviation	Hosts	Year	Number of entries
Climate Initiatives Platform	CIP	UNEP	2014	222
The Non-State Action Zone for Climate Action/ Lima Paris Action Agenda	NAZCA/ LPAA	UNFCCC	2014	77
Portal on Cooperative Initiatives	PCI	UNFCCC	2014	60
Transnational Climate Change Governance Initiatives	TCCGIs	Bulkeley and colleagues	2014	60–78
The Global Aggregator for Climate Actions	GAFCA	DIE and LSE	2015	53
CSD Partnerships Database	-	CSD	2007	98/323

Table 2: Relevant Databases on International Co-operative Initiatives (Source: Adopted from (Widerberg, Stripple 2016)

In general, the CIP is the central database to retrieve information on ICIs. It is hosted by the UN Environment and the UNEP DTU Partnership (see Table 2). The original basis of the information on ICIs provided in the CIP was gathered in 2014 through a research project by Ecofys and the Cambridge Institute for Sustainability. The database entails information on starting dates, countries, funding, themes, participants, goals of the representative ICI and much more. Currently, the oldest ICI registered in the CIP was founded in the year 1973 and still operates today: Maritime Regions in Action against Climate Change. However, ICIs that have ended in the past are no longer included in the database. Therefore, no information can be traced back to what has happen to them and what their achievements were. The data provided by the CIP is continuously updated. Initiatives can register their efforts at the UNEP and are asked to provide a project homepage, which can be even more detailed than the information contained in the CIP. One limitation is that the fact that the data is provided by the initiatives themselves and not by an independent institute. The CIP may offer the greatest insights on ICIs, but is at risk of misinformation (Climate Initiatives Platform 2016).

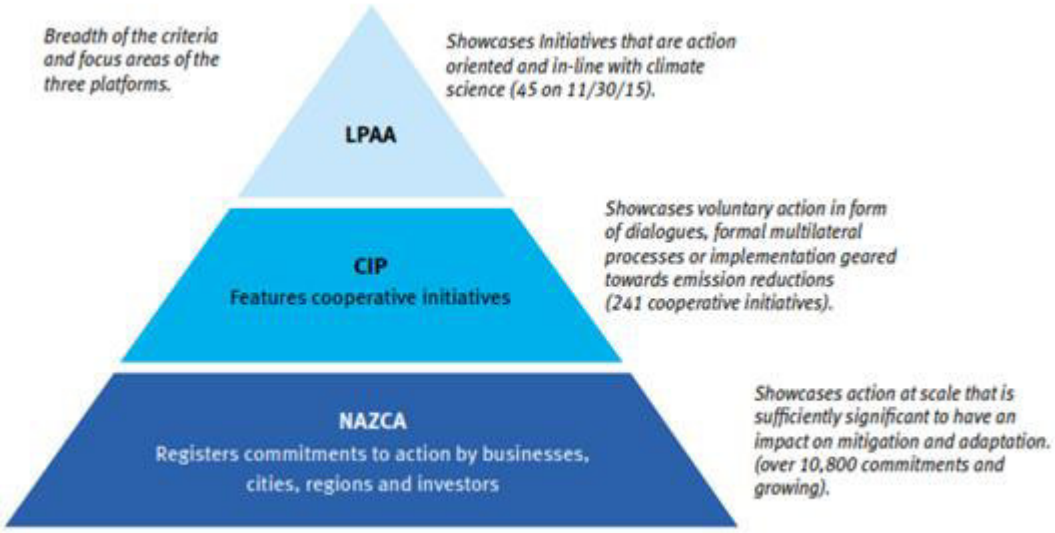


Figure 2: Focus area of the LPAA, CIP and NAZCA in comparison (Source: (Gardiner et al. 2016)

Additionally, the CIP distinguishes whether an ICI is associated with the Non-State Actor Zone for Climate Action (NAZCA) or the Lima Paris Action Agenda (LPAA). The LPAA, as a joint undertaking of the French and Peruvian COP presidencies, represents a showcase for cooperative climate action. Its goal is to strengthen commitments of state and non-state actors by providing guidelines and orientation in following ambitious ideas. The NAZCA was launched at the UN climate change conference in Lima. It lists actions by cities, subnational actors, and enterprises dealing with ideas on climate protection. The main notion behind both concepts is to gather information about climate activities and to facilitate exchange and support. The CIP contains 72 initiatives under the LPAA and 72 under the NAZCA. While the LPAA showcases innovative cooperative initiatives by state and non-state actors, the NAZCA solely lists commitments by non-state actors such as companies, cities, subnational regions or financial institutions. Besides ICIs, NAZCA has registered 12,549 commitments to action by respective actors. Once a non-state actor registers on the NAZCA platform it is encouraged to join any LPAA registered initiative. Therefore they greatly overlap: 66 initiatives in the CIP database are part of both frameworks (UNFCCC 2016).

There are also other databases for information on ICIs. A prominent example is the Portal on Cooperative Initiatives (PCI). This database was also initiated by the UNFCCC secretariat. It provides data on the type, geographical scope, thematic focus and participants for 60 initiatives. The PCI was the first public database which

included commitments by non-state actors. Entries in the database were submitted by countries and observer organizations leading to a great variety of initiatives such as the G20 Subsidy Reform, the G8, the International Energy Agency or the REDD+ Partnership. The initiatives featured in this database are not updated anymore and serve to direct public attention towards non-state action against climate change. However, they may greatly differ from the common perspective of bottom-up co-operative initiatives (for example in the case of the International Energy Agency). Moreover, the set of criteria is homogenous to the information retrievable from the CIP. If there is interest in the early-on perception and establishment of ICIs, this database offers a first insight into how ICIs were slowly gaining importance in the international context (UNFCCC 2014a, 2014d).

The Transnational Climate Change Governance Initiatives was a social science project. This database is also no longer updated. The aim of the project was to advance research on the role of transnational arrangements for climate change governance (Widerberg and Stripple 2016). The CSD Partnerships Database was launched in 2007 with 323 multi-stakeholder partnerships. Out of the 323 partnerships, 98 focus on addressing sustainable development. The difference between partnerships and initiatives – if it even exists – hasn't been made clear yet (United Nations Department of Economic and Social Affairs 2008).

Other databases could be checked to put the findings of the Master thesis into perspective. However, they often focus on partnerships than initiatives and the provided data is not updated anymore or only concentrates on a fraction of the activities by ICIs. Whereas the CIP is directly embedded in the UNFCCC framework and presents ICIs as an organizational form with comprehensive analytical data.

Since the CIP supplies such a great variance of information and hasn't been analyzed in detail, the analysis of this Master thesis is based on the CIP. For this Master thesis, the data from the platform was downloaded on the 22nd of September 2017. Thus, all graphs and evaluations date to that particular point in time. If future research is done in this area, the appendix presents the included initiatives for this Master thesis allowing for a comparison of changes in the data (see Appendix.).

2.2 Typology of goods

2.2.1 Introduction to the typology of goods

	Feasible Exclusion	*Infeasible Exclusion*
Rivalry	**Private good** (cars, books, haircuts)	**Open access good /commons** (lignite extraction, fishing)
Non-rivalry	**Toll good** (cable TV, tennis club)	**Public good** (peace, weather forecasts)

Table 3: Typology of goods (Source: adapted from Ostrom and Ostrom 1977)

The following chapter will present the theoretical discussions surrounding the governance of climate change. Hardin (1968) introduced the concept of the tragedy of the commons, describing the situation in which rational-acting individuals strive to maximize their benefits in a shared-resource system. In doing so a common good open to all users will be depleted through collective action. The original example has been an unregulated pasture on common land (Lloyd 1832; Hardin 1968). Commons – or open access goods – describe any good from which users cannot be excluded and where rivalry exists. In the case of the pasture this would mean that the access for herders is not restricted (non-exclusion) and the grass eaten by one sheep on the pasture cannot be eaten by another sheep (rivalry).

The cost-benefit analysis with regards to the tragedy of the commons illustrates that the costs for an individual herder adding another sheep are shared by all users of the pasture, whereas the benefits are obtained by the individual herder. Therefore, it becomes rational for each user to add sheep which leads to the overgrazing of the pasture and the use beyond its carrying capacity (Perman 2010, p. 561). The typology of goods differentiates between private good, public good, toll good and open access good and their attributes in rivalry and exclusion (see Table 3). While in a perfectly competitive market equilibrium marginal social costs of production would equal the marginal social utility of consumption, complications in the allocation of benefits and costs exit for certain resource goods (Perman 2010, pp. 561–562).

2.2.2 Environmental and resource problems

As explained above, open access good are usually linked to resource problems in environmental science, such as fishing in the open sea or limited availability of water in the Aral Sea (Ostrom 2008). In the context of the climate system, one can also argue that emitting GHG emissions entail costs which are shared by the global population, but only provide benefits for the actors responsible for the emissions. This is especially true if we have a carbon budget and limited possibilities for emissions absorption.

Additionally, environmental problems such as climate protection are perceived as public goods, where no rivalry exists. For example, climate protection will benefit all individuals, but no one can be excluded from these benefits. The benefits generated by climate protection are consequently not reduced for one individual when another individual receives them. As well for environmental problems as for resource problems, the issue of free-riding occurs, when one individual benefits at the expense of another without the usual cost or effort (Merriam-Webster 2017). Illustrated through the example of the herders on the pastures, the herders could come to a mutual agreement and allow every individual to feed a limited number of sheep on the pasture. If one of the herders does not comply with the agreement and still adds additional sheep to the pasture. Since nobody can be excluded from using the pasture, the behavior of the deviating herder cannot be stopped. There are possible solutions to prevent this outcome in a CPR (see chapter 2.2.5). Related to the issue of climate change, there is little incentive to reduce emissions or extractions, since these are private costs but public benefits. Therefore, climate change is the "exemplary global public good" (Grasso 2004, 2004, p. 1).

2.2.3 Climate change as global public good

As global public good, climate change poses different challenges and high uncertainty about its economics. Effective controls of emissions must contain all emitters, which is why (collective) actions concentrating on climate change should be coordinated at a supranational level. Each country would have to determine its optimal level of emissions. However, political and economic instruments are not strong enough to achieve these goals. Since GHG emission may stay in the atmosphere for many decades, the ambiguity about benefits from reducing emissions are high and distant in the future (Grasso 2004, pp. 2–3). Excessive anthropogenic emissions consolidate

themselves as economic issues or externalities, since the producers of emissions do not face the full consequences of their action and burden the costs of climate change on the whole world and future generations (market failure). Examples of economic effects from climate change may be the reduced capacity of agricultural land to produce food or increased risks to human lives from extreme weather events. There is currently no suitable incentive to stop the overexploitation of the atmosphere (Stern 2007, pp. 27–28).

2.2.4 Collective action theory

According to Ostrom, the notion of "collective action refers to settings where decisions about costly actions are made independently but outcomes jointly affect everyone involved" (Ostrom 2010, p. 551). In 1965, when Mancur Olsen first introduced his theory about groups and organizations, he was interested in the purpose of organizations. Usually a common interest would bring members of a group together and give incentive to organize themselves, because the individual would not be able to achieve the objective of his interest by himself. Through their membership, the individuals hope to advance their interests, a prominent example are labor unions striving for higher salaries and better working conditions (Olson 2002, pp. 5–10). Olsen's research concentrated on the challenges individuals face in trying to overcome a collective action problem and pointed out that essentially the costs of contributing to a public good are concentrated, but the benefits are diffused (Ostrom 2009, p. 8).

Under certain conditions social dilemmas arise, when the uncoordinated action by individual decision-makers pursuing their individual benefits leads to suboptimal pay-offs for others but high short-term payoffs for the individual. The socially optimal outcome for the joined group will not be reached, because of independent decisions by individuals seeking to maximize short-term benefits. Through cooperation the socially optimal outcome would be reached, but none of the involved parties is likely to change their behavior under the given conditions and choices of other parties. Similar to the tragedy of the commons individuals striving for self-benefit cause suboptimal outcomes for the joint group and enjoy benefits through other people's restraints or contributions to collective action (Ostrom 2009, pp. 6–7).

Assumptions of game theory/ conventional action theory	Relation to climate change
1. All participants have complete and common knowledge of the exogenously fixed structure of the situation and of the payoffs to be received by all individuals under all combinations of strategies.	1. Participants might not have complete information about their externalities, they have reasonable information about the benefits and costs they receive from emitting.
2. Decisions about actions are made independently and simultaneously.	2. States are sovereign entities following their self-interes.t
3. Participants do not communicate with one another.	3. Decisions regarding the emission of GHG - like the level of energy use or investments in building infrastructure – are often not communicated with other states.
4. No central authority is present to enforce agreements among participants about their choices.	4. On the global level, no central institution exists to enforce decisions or to sanction behavior.

Table 4: Similarities between game theory and its relevancy to climate change (Ostrom 2009)

Olson's logic of collective action is a crucial component to environmental studies, since it relates the governance of natural resources to the importance of human relationships. The conventional theory of collective action suggests that under the presented assumptions an uncoordinated group will not be able to organize themselves to achieve a public good, or in the case of climate change, to reduce a joint "bad" (see Table 4). Essentially, states follow their self-interest in economic development through emitting GHG emissions. Sovereign states will only communicate to a certain degree about their economic interests and possibilities of reducing GHG emissions to maintain strong bargaining power. On the international level, there is no supranational authority which could sanction non-compliance by sovereign states. However, the conventional theory of collective action is criticized for its lack of empirical evidences, especially on local- and medium scale for self-organized groups (Ostrom 2009, p. 14).

Essential elements influencing the provision of a public good may be trust and reciprocity of the involved parties. It is possible for a party to gain a reputation as trustworthy partner. This may lead to an overall increase in willingness of other involved parties to cooperate and it has a positive influence on solving the collective action dilemma. If the compliance to a policy increases, the stakeholders are more willing to accept short-term costs for a long-term benefit. Therefore, any policy directed towards solving a collective action problem should include measures to improve social trust between the involved parties (Ostrom 2010, pp. 551–552).

The establishment of certain international bodies or arrangements like the UNFCCC, the Kyoto Protocol or the IPCC have contributed to exchange and build trust between countries. Certain criteria can help foster the credibility of international agreements such as the participation of a dominant country (f.e. the US in the Montreal Protocol on Substances that Deplete the Ozone Layer), the awareness of common threat (f.e. increased co-operation after terrorist attacks) and self-interest (f.e. investment in reducing impact of climate change in developing countries to limit migration). A fundamental issue of international cooperation still remains: the desire of broad participation but the necessity of significant and long-term GHG emissions reduction from all sectors (Stern 2007, pp. 453–460).

2.2.5 Solutions and perspectives on solutions

First, I want to discuss some conceptual approaches to tackle climate change and then theoretical perspectives on possible solutions. There are many solutions to climate change debated. A milestone for international climate negotiations had been the Kyoto Protocol signed at the third Conference of the Parties in 1997. Its primary objective is the stabilization of greenhouse gas emissions and prevention of dangerous impacts from climate change by considering the underlying national differences with concern to wealth and access to technology. In the Kyoto Protocol, Annex I Parties[2] committed themselves to reduce their greenhouse emissions by an average of 5.2% from the level of 1990 to 2012 (Korhola 2014). Developing countries including China and India did not receive any constraints to lower their emissions. Primarily industrialized countries are accountable for the high level of emissions in the atmosphere today, because of

[2] Annex I Parties include the industrialized countries that were members of the OECD in 1992, plus countries with economies in transition (the EIT Parties), including the Russian Federation, the Baltic States, and several Central and Eastern European States (UNFCCC 2014c)

their past and current economic and industrial activities. Therefore, the Kyoto Protocol considers their role in causing the large share of anthropogenic emissions inducing climate change, and places a heavier burden on developed countries (UNFCCC 2014b).

The Kyoto Protocol is the primary example of a technical solution on a global level and is a crucial element of international advances to address climate change. Even though it was criticized for the weak commitments of many developed countries, low financial support to developing countries affected by climate change and limited possibilities of participation, environmentalists agreed that it was the "only game in town" (Aldy et al. 2003). Moreover, researches have designed international pollution taxes and emission. They inherit their charm by proposing cost-effective solutions under specific conditions and allow for collaboration between national governments on a larger scale. 'Command and control' policies are rather central to the legislation of national governments and - as discussed - before vulnerable to the issue of national sovereignty (no central global authority on the supranational level).

Voluntary agreements

Efforts for adequate protection of the environment in form of legislative and regulatory mechanisms have shaped the governance of pollution for a longtime. While voluntary agreements (VAs) are frequently the only mean for compromise in the international political system, the private sector has adopted VAs between polluter and regulator as alternative to mandatory regulation. Since the beginnings of the 1990's the use of VAs in the industry has become a common practice in environmental management of many developed states. VAs manage a broad range of domains such as waste management or air pollution (Segerson and Miceli 1998). According to Beardsley (1996) three potential benefits characterize the application of voluntary agreements in the industrial sector: (1) cooperative approach between industry and regulator to promote proactive commitments and reduce conflicts, (2) provision of the possibility to find cost-effective solutions suitable to the conditions of the business and its environment (greater flexibility), and (3) reduction of transaction, compliance and administration costs allowing for a stronger focus on the implementation of environmental targets.

These advantages presented in association with VAs might sound convincing, but the motives of the involved members or organizations are unknown. Little research has been presented on the compliance and effectiveness of VA for environmental policies. The risk of hidden motives exists, and the problem of greenwashing can arise. A circumstance in which an organization might spend more time to promote itself as sustainable than it actually invests into improving its environmental impact. These aspects are also true for ICIs, where a great number of business are involved. The motives of the other participating organizations of ICIs are just as well unknown, but present an important reference point to gain deeper knowledge about the effectiveness of ICIs. Additionally, sceptics may argue that VA are used by governments to avoid conflicts with the industrial sector and circumvent concrete targets for reducing emissions. On the other hand, ICIs are an alternative to the top-down approach and foster environmental governance characterized by collaboration and contextual management (Jiménez 2007). Encompassing these technical solutions, researchers have proposed different perspectives on the approach to solve climate change:

From privatization to self-management

When Hardin (1968, p. 1244) first published his perspective on the tragedy of the commons, he stated "freedom in a commons brings ruin to all." The fundamental issue in the governance of commons is the fact that a finite world can only support a finite number of people. As long as the international community is not able to deal appropriately with the issue of population growth, the exploitation of commons will rise and the pressure on CPRs leads to dramatic outcomes. According to Hardin, the answer to overexploitation is the privatization of commons or an alternative with similar outcome such as public authority. Also, for the allocation of these private property rights mankind must find suitable means. This would cause tremendous issues: Auctioning rights to exploit CPRs or regulations by the principle 'first come-first serve' may be common approaches but induce high transaction costs for their establishment.

Furthermore, Ostrom (1999) showed through extensive empirical research that on a local and regional scale groups have found ways to self-organize without degrading CPRs. Even though individuals may be selfish and maximizers of their short-term benefits, they can adopt reciprocity to solve social dilemmas. Central to this approach

is that the number of users defaulting and free-riding is not too high in the beginning of the exploitation of the CPR. Through interaction users can establish a reputation of honesty fostering cooperation with each other. The outcome of a large quantity of case studies on self-management in CPRs resulted in the establishment of norms and design principles facilitating cooperative behavior over free-riding. Central principles like trust and reciprocity may help to find successful self-managed solutions (see Appendix). Many ICIs build their ambition on cooperation with other organizations, so that trust and reciprocity may be essential components for the success of their goals.

Polycentric system approach

The issue of averting the negative effects of climate change is - as stated - a global public good. Its complexity is huge, and the ecological connections of different earth systems are difficult to entangle. But nevertheless, a lot of hope is pointed towards negotiations for a global solution supported by international, national and local institutions. Whether this solution will work is questionable, even more whether it exists. While the macro level is essential for the sustainable provisioning and production of public goods, findings have shown that also small- and medium-scale units are necessary components in governing public goods (Ostrom 1999; Ostrom 2012). In this context increasing attention is geared towards a polycentric approach defined as "one where many elements are capable of making mutual adjustments for ordering their relationships with one another within a general system of rules where each element acts with independence of other elements" (Ostrom 1999).

Extensive empirical research challenges the assumption that the international level will provide a global, universal solution to climate change. A polycentric approach is characterized by the interplay of various private and public institutions on different scales and offers a resolution to the collective benefits and costs by many actions on different levels. It encourages experimental action by recognizing the role and expertise of multiple actors on multiple scales as well as the potential of learning from each other's experiences (Ostrom 2009, 2012).

Nested externalities arise "when actions taken within one decision-making unit simultaneously generate costs or benefits for other units organized at different scales" (Ostrom 2012, pp. 355–356). For example, emissions reductions in households

through energy efficiency measures bring not only benefits on a regional scale but are positive externalities to a global level. All decisions taken in a household - from how to deal with its produced garbage and which transportation to use - lead cumulatively to small effects on the global level and larger effects on the small level. Face-to-face discussions about sustainability and necessary action on a small-scale level is a cornerstone for creating a common understanding of climate change. Solid commitments to reduce individual GHG emissions are essential in dealing with climate change and are more effectively achieved on small- and medium scale governance through informal information networks. However, discussions about global measures are and will stay crucial (Ostrom 2012, 2010).

ICIs as a mean to stimulate climate action on different scales can be an essential piece to the puzzle of organizational structures necessary to address climate change. In general, the polycentric approach suggests looking more closely at organizational structures that we currently have, and which structures are missing to deal with climate change. Renowned ICIs like the C40 Cities Climate Leadership Group or ICLEI - Local Governments for Sustainability - are excellent examples of how ambition on sub-national level is raised and nested externalities are created.

Social contract theory

Social contract theory has been a fundamental element of political science for many decades and studies the “view that persons' moral and/or political obligations are dependent upon a contract or agreement among them to form the society in which they live” (Friend 2017). Prominent representatives of the social contract theory such as John Locke, Jean-Jacques Rousseau and Thomas Hobbes have sought to identify principles that might support a legitimate political arrangement for government. The environment and the natural system have been exploited in the name of development and economic growth for many years and there is criticism towards current social contracts legitimizing this overexploitation (O'Brien et al. 2009, pp. 2–4). The transition towards a more sustainable lifestyle has found consent in many parts of the world and is seen as the long-term approach to deal with the increasing human population (German Advisory Council on Global Change 2011; Ostrom 2008)

The German Advisory Council on Global Change (WBGU) introduced the concept of "a new social contract for a low-carbon and sustainable global economic system" (German Advisory Council on Global Change 2011, p. 2). It deals with the challenges of transforming the current economic, technical and social systems towards a sustainable system in line with boundaries to support future generations. Behind this concept stands the idea, that civil societies and its members as well as states, economy and science share the obligation to avert the dangerous impacts of climate change and other menaces to mankind as part of the global community. Moreover, the social contract includes a culture of attentiveness (ecological responsibility), a culture of liability towards coming generations (future responsibility) and a culture of participation (democratic responsibility) (German Advisory Council on Global Change 2011, pp. 2–4).

Two elements should be included in a new social contract for sustainable development. First, there is a necessity for a voluntary cap on emissions to reduce the effects of climate change and allow future generations as well as third world countries to adapt. Second, a powerful state and political commitment fostering research and engagement to reduce the effects of climate change will be needed, counterbalanced by broad participation of the civil society (German Advisory Council on Global Change 2011, pp. 8–9). Already in recent years, the public attitude regarding the interaction with nature has altered. For example, Sweden has fundamentally transformed its social contract with the environment: More than 50 percent of its power production stems from renewable energies and the country is a pioneer in working towards becoming a fossil fuel free welfare country (Osborne 2016). There are also many challenges in developing such a new social contract, such as the issue of participating and hearing the voice of future generations which suffer the most from current developments but have little options to receive recognition today. ICIs as a voluntary agreement based on participatory mechanisms could be a useful element to implement a new social contract. Future generations can organize themselves in ICIs as well as bring their concerns to debates on the international level.

2.3 Research problem

From the perspective of polycentricism, ICIs may be an essential component contributing to lowering CO_2e emissions through cooperation. But as a voluntary

agreement, they are susceptible to the presented risks including hidden motives, free-riding, greenwashing and more. Participating members can overcome the issue of collective action through their cooperation. Since the knowledge about ICIs, their emergence, characteristics and effectiveness is still limited, this Master thesis aims at tackling this academic void.

The relevancy to gain better knowledge about ICIs may be explained through their potential contribution to lower GHG emissions, their organizational attributes to enable broad participation and cooperation and the necessity to improve knowledge about ICIs if funding and research is directed towards them. Their ability to tackle a broad range of thematic focal points and low transaction costs make them attractive to a number of parties. For this research, two variables have been chosen to be studied in detail: emergence and effectiveness of ICIs.

Emergence of ICIs

- How can international cooperative initiatives as an organizational concept for climate action be characterized?

For the research on the emergence of ICIs, the thesis will first present the retrieved and reground material of the CIP. By presenting background information about the development and features of ICIs, the basis for a common understanding about ICIs will be improved and activities associated with different participating members will be discussed. While this section is rather descriptive in its nature, it is necessary to establish a comprehensive picture of ICIs. Information about the leading institutes, the thematic focal areas, their geographical coverage and much more will be compiled. Moreover, a critical point to explain the emergence of ICIs is rooted in the personal motives of the participating member. Since this would however demand a different methodological approach than chosen in this thesis, motives cannot be addressed in detail. Research steering towards this direction is recommended. The thesis will look at the association of participating members and their activities to point out patterns of interest.

Effectiveness of ICIs

- To which extent do they contribute to address climate change in regards of CO_2 emissions reductions and improving transnational governance structures? How effective are they as an organizational concept?

While all initiatives aim at reducing emissions directly or indirectly, only 22 initiatives present measurable goals in the database. For the analysis of the effectiveness of ICIs, this Master thesis differentiates between the quantitative commitments of initiatives in terms of greenhouse gas emissions savings and qualitative goals in terms of knowledge diffusion, policy briefings or the implementation of local projects. In general, the level of information about their explicit goals, milestones and monitoring is extremely superficial. The database does not make any requirements towards the degree of commitment. For example, sixteen initiatives don not provide any information about their goals and 74% of the initiatives don not make their work plans available. This is linked to the use of the CIP as data source and does not mean that work plans do not exists. Since the database is based on the homepage of the initiatives, it is likely that many of them are not made public.

Moreover, it is interesting to understand which factors may contribute to making ICIs effective. For example, ICIs are perceived as a bottom-up organization and an alternative to governmental activities in the area of climate change. But different kind of actors participate in them and different constellation of members might influence the commitments of ICIs. The primary reason to study initiatives is to understand their potential to reduce emissions. If they contribute considerably to close the emissions gap, it would be important to evaluate how to strengthen their activities. If initiatives are not able to implement their goals, then research should focus in other directions. Addressing climate change is also a timely critical manner nowadays.

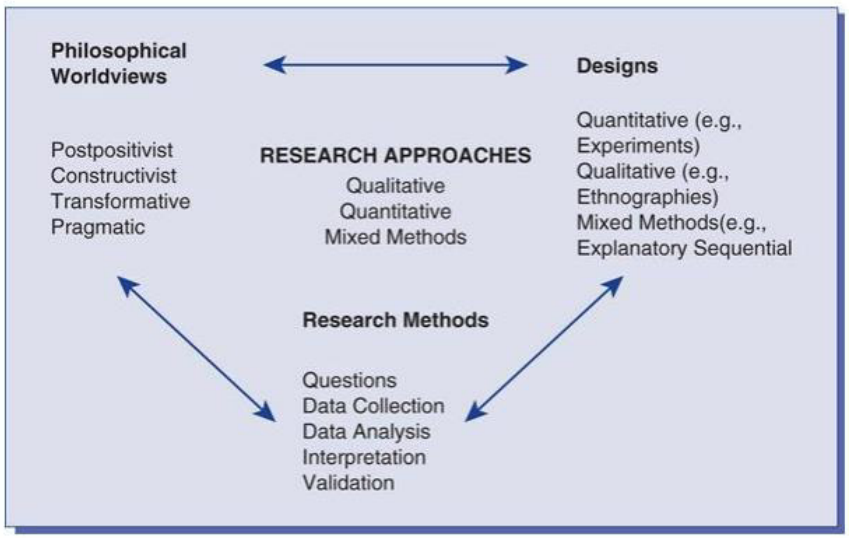
3 Methodological approach

3.1 Introduction

As explained before, the state of the art research on ICIs is superficial and academic studies to understand their contribution to and potentials for the climate system are limited. Therefore, this Master thesis proposes a mixed method approach to deepen the understanding on ICIs. The following chapter will explain the used methods to answer the proposed research questions in accord to the theoretical framework, the operationalization of the variables in the research questions as well as discuss methodological issues by choosing this specific approach.

A mixed-method approach is chosen for this Master thesis, because the extensive data in the CIP allows for a numerical evaluation, but the large amount of qualitative data with regards to the goals of the initiatives (effectiveness) needs to be considered as well. The core of the mixed method approach is to combine the statistical procedures of quantitative analysis with the qualitative methods and data encouraging the researcher to explore a research problem from a more holistic perspective (University of Southern California 2017; Creswell 2014). Creswell (2014) suggests to address the underlying philosophical worldview with regard to the research method and design to reason the choice of the methodological approach (see Figure 3). The pragmatic worldview draws focus on the relevant research problem instead of concentraing on a particular method. The goal is to use all available methods to derive further insights about the research topic. This worldview is often associated with mixed methods. Moreover, it is concerened about the postmodern theoretical lens representing the idea

Figure 3: A framework for research (source: Creswell 2014)



of embedding research in a social and political context as well as reflecting results with regards to social justice and political aim. In the context of this Master thesis, the reason for mixing qualitative and quantiaitve methods is rooted in the motivation of establishing a better idea about the emergence and characteristics of ICIs as well as discussing their potential contribution in the international framework aiming at reducing effects of climate change.

The field of mixed-method constitutes its origins in 1950es in the physchology studies. Moreover, the mixed method approach allows for certain features, for example it uses exisiting data while generating and testing a grounded theory to depict the research unit/problem. It enables the researcher to deal with weaknesses of one method by linking it to other methods providing more robust evidence for conclusions and recommendations. Qualitaitve statements can be rendered more precisely by numeric data. Finally, a mixed method approach can produce new information or expose hidden relationships which wouldn't be disclosed by a single methodological approach (Creswell 2014; University of Southern California 2017).

The challenges of the mixed-method approach include the design of the study: The researcher must be capable of using several methods to study a research problem but be coherent within his argumentations. Moreover, the mixed-method approach may increase the likelihood of finding confliciting results, for example the analysis of a database may contradict findings from conducted interviews. Another challenge arises in the issue of establishing an organized narrative of the academic work and following a clear writing style. Therefore, a methodological approach combining qualitative and quantiative research demands great attention towards the suitable sample size and comparability of these samples and the consistency in analysing them. While often mixed-method approaches are chosen for sequential designs, in this context the focus is to use the provided data from the CIP for a comprehensive insight on ICIs (University of Southern California 2017).

3.2 Methodological steps

For this Master thesis, the approach of combining qualitative and quantitative data and methods was translated into the following steps (see Figure 4).

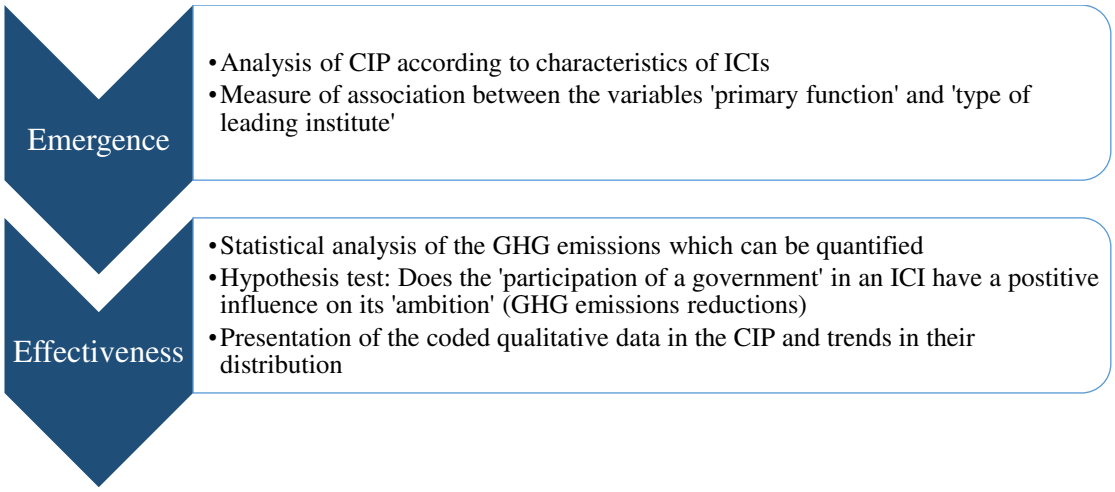


Figure 4: Research steps (source: author's own illustration)

First, the CIP was evaluated statistically for all included initiatives (N=218) by its characteristics such as 'type of leading institute', 'global coverage', 'primary function' and much more. Even though, this is a descriptive, but reground presentation of the raw data in the CIP, it constitutes the foundation to outline specific features of ICIs. This process hasn't been done yet in detail by academic research. Second, the level of association between 'primary function' and 'type of leading institute' will be calculated through x^2 as index of association for nominal variables (n= 154).

For the measurement of the effectiveness of ICIs, the database was scanned for the goals of the ICIs which could be translated to numeric data. With the support of the Öko-Institute Berlin the estimated potential benefit of reducing GHG emissions for a total number of 22 initiatives was calculated (n=22). In a second step, a hypothesis test for two variables was concluded: the participation of governments ICIs leads to higher outcomes in terms of reducing GHG emissions. In a third step, the rest of the goals in the CIP was coded via MAXQDA according to the thematic focuses of the initiatives, the benefits from the initiative and the potential co-benefits (N=218). The source of data is exclusively the CIP. As the database was already presented in the first chapter, I will restrict myself to pointing out the methodological issues arising from using the CIP. It is important to keep in mind that the data is directly quoted and sourced from the initiatives' websites or documents. It is regularly, but not systematically updated

and only represents a snapshot of information and its accuracy will diminish over time as initiatives' activities evolve.

3.2.1 Emergence: Descriptive statistics

The intention of using descriptive statistics is to provide information about the basic features and characteristics on ICIs through the data from the CIP. By analyzing and summarizing various variables and transferring them into simple graphical forms, the distribution with regards to activities, power-relations and geographical focal areas can be identified. In general, statistics is differentiated in descriptive and inferential statistics. While descriptive statistics simply tells us what the data shows in another way, inferential statistics tries to identify relationships between research units and goes beyond solely reorganizing data. For example, via inferential statistics estimations about the future are made and samples are used to make assumptions about the whole population (Trochim 2006). This step represents the basis for practically every quantitative evaluation of data and was done for all ICIs included in the database (N=218).

3.2.2 Emergence: Hypothesis testing: functions

Further, it will be explored how functions and organizational structures of the presented ICIs may contribute to their emergence. Different organizations from different backgrounds take over the leading position for ICIs like business, NGOs and research institutes. The CIP provides data on their primary functions representing their main area of activities such as campaigning or policy papers. This is interesting with respect to the underlying motives of why ICIs are emerging and why individuals are organizing themselves in ICIs. Since these questions can't be answered through the provided data, the focus lies on the macro-level to show if there is a relationship between the functions and the type of leading institute in an ICI.

Through the coding of the qualitative data in the CIP it is then also possible to describe discrepancies between the goals and activities stated by the ICIs and the ones they primarily describe they will follow. For example, business may refrain from name 'Lobbying' or 'Policy recommendations' as their primary function because of the claims of greenwashing or the allegation of using ICIs as a tool for political work and not real commitments. By coding the activities in the goals of ICIs it will be possible

to detect a relation between their proclaimed activities and their described activities. First, by this hypothesis test, it will be tested if there is an index of association between 'type of leading organization' and 'primary function'.

H0: There is no causal relationship between the type of leading organization and the function in fulfills in an ICI

H1: The type of leading organization has an influence on the primary function it fulfills.

Since both of the variables – 'type of leading organization' and 'primary function' - are nominal variables, a methodological approach in form of descriptive statistics was chosen. Benninghaus (2007) suggests a variety of different indices to describe the relationship between variables. The here presented approach was chosen with accordance to two criteria: the frequency of use in social science and its transferability to data analysis systems like SPSS, BMDP. Due to the nominal scale of the variables, it is not possible to make assumptions about the direction of a correlation. Since the category system for nominal variables is arbitrary, it is not possible to say whether the relationship is positive or negative. In the case of chi-square-based functions, the researcher compares an observed distribution of the output of the variables to an expected distribution of the variables when there would be no correlation. For the test of the H0 hypothesis, such a method has been chosen: the comparison of the frequencies in the contingency table compared to the frequencies in the indifference table to reach a chi-square (x^2) based evaluation. Since chi-square itself only is suitable for only small tables (2x2), Cramer's V and Pearson's Contingency-coefficient C were calculated as well.

The first step was to write the contingency table (B_{ij}) by extracting the variable 'type of leading organization' and 'primary function'. The total number of selected initiatives was n=154, some had to be excluded due to empty entries and others proposed a methodological issue. The value 'Network/ Consortium/ Partnership' was excluded from this evaluation, because it is unclear which kind of leading organization stand behind this frame. It is very likely, that this output is not selective but contains all of the other leading organizations in different constellations. After the development

of the contingency table, the indifference table was calculated (see appendix). The indifference table (E_{ij}) is an imaginary table calculated through the summarized frequencies of the marginal totals if we expect the variables to be independent from each other.

The next step is to compare the observed outputs in the contingency table with the indifference table. The larger the difference between the outputs of the both tables, the more likely is a deviation from the statistical independency and a degree of association. The third step is to use the calculated differences in a chosen association index: Cramer's V and Pearson's Contingency-coefficient C. After calculating both indices a chi independency test was conducted with a margin of error 5% and the respective number of degrees of freedom (Benninghaus 2007; Clauß et al. 2004). The value of the chi-square statistic lies between 0 (no association) and 1 (maximum association).

Chi-Square

$$x^2 = \sum \sqrt{\frac{(\mathrm{Bij} - \mathrm{Eij})^2}{\mathrm{Eij}}}$$

Bij=Observed value

E_{ij}= Expected value

Cramer's V

$$Cramer's\ V = \sqrt{\frac{x^2}{N\ min * (r-1; c-1)}}$$

with

r = Number of rows;

c= Number of columns;

min= Only the smaller number will be considered

N= Total number

Pearson contingency-coefficient C

$$C = \sqrt{\frac{x^2}{x^2 + N}}$$

Criticism is frequently geared towards indices based on chi square, because their numerical results are difficult to interpret. Moreover, it is not possible to make assumptions about the direction of the association (negative/positive). However, it is a common tool to understand the association between variables.

3.2.3 Effectiveness: Quantitative data and hypothesis testing: effectiveness

All initiatives were screened for their goals and the possibility to translate this goal to numeric GHG emissions reduction. This intensive process was done for 22 initiatives and the step of the quantification of each ICI's goals is described in the appendix. Unfortunately, many ICIs lack transparent information to calculate their specific contribution to reduce GHG emissions. It was assumed that ICIs will reach the target which they set themselves as goals. Since the tracking process in the CIP is very rudimentary, there is almost no information about how effective ICIs are in achieving these goals. In most cases the initiatives provided information about their yearly ambitions to cut emissions and this was extrapolated over their time of operation. In other cases, the initiatives presented a target year with a target amount of emissions saved and either provided a baseline year or the starting date of the initiative was used to estimate their yearly contributions in emission savings.

From the theoretical approach, we have learned that Ostrom endorses the perspective of self-management in CPRs. With ICIs, organizational structures have developed where cooperation is a central point to achieve their goals. However, the self-management process is difficult and not always successful with regards to the goals. Therefore, it will be tested, whether the involvement of national governments has a positive effect of the ambition of ICIs. The stated null hypothesis is:

H0: The share of governments in an ICI has no or a negative influence on the potential to reduce GHG emissions. $p=<0$

H1: The share of governments in an ICI has a positive influence on the potential to reduce GHG emissions. $p>0$

Pearson's correlation coefficient

$$r = \frac{\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{n}(x_i - \bar{x})^2} * \sqrt{\sum_{i=1}^{n}(y_i - \bar{y})^2}}$$

with

n = Sample size

x_i/y_i= Single samples indexed with i

$\bar{x}$/$\bar{y}$= Sample mean

After stating the hypothesis, the significance levels must be specified to account for type I and type II errors. A type I error (or error of the first kind) is the incorrect rejection of a true null hypothesis. A type II error (or error of the second kind) is the failure to reject a false null hypothesis. The typical value of α is 0.05, establishing a 95% confidence level.

The third step is to compute the probability value (also known as the p value). This is the probability of obtaining a sample statistic as different or more different from the parameter specified in the null hypothesis, given that the null hypothesis is true. Finally, the probability value will be compared with the α level. If the probability value is lower, then the null hypothesis will be rejected. The lower the probability value, the higher the confidence of rejecting the null hypothesis. However, if the probability value is higher than the conventional α level of 0.05, most scientists will consider the findings inconclusive (Clauß et al. 2004). Plus, Pearson's r will be calculated to measure the correlation between the two variables.

3.2.4 Effectiveness: Coding of qualitative data

Impact	Publicly available data?	Objective assessment possible?
Assumed beneficiaries	Yes, may be publically available.	Yes
Identification of clear benefits for participating	Yes, may be publically available.	Yes, can assess whether there is a statement on benefits to participants.
Assumed benefits/effects (If quantified state what the effect is)	Yes, may be publically available.	Yes, can assess availability of information on assumed benefits of the initiative, but comparability limited if common methods for assessing benefits are not used.
Assumed co-benefits (If quantified what the effect is)	Yes, may be publically available.	Yes, can assess availability of information on assumed co-benefits, but comparability limited if common methods for assessing benefits are not used.
Exclusive of benefits to participants. If not to whom?	Yes, may not be publically available.	Yes
Equal availability of benefits to all participants	Yes, may not be publically available.	Yes, can assess whether all participants have equal access to stated benefits.
Identification of potential risks identified; If so, which ones?	Yes, likely not publically available.	Yes, can assess whether risks have been identified, but will be necessary to define "risks" so data are collected in a similar fashion across initiatives.

Table 5: Criteria for the impact analysis (Norden 2015); the color code informs the reader about the likelihood of answering the overarching questions with yes (green), probably (yellow), probably not (orange) or no (red)

For the impact assessment, the framework of Norden (2015) was chosen which had been especially developed to evaluate the impact of initiatives but hadn't been applied in empirical research yet. **Assumed beneficiaries** may differ between actors and parties which receive benefits form the activities of the initiative. The **identification of clear benefits for participating** refers to the benefits members receive from participating in the initiative. **Assumed benefits/effects** concentrates on the aspect of where initiatives may cause benefits. For quantitative goals, this translate to saved emissions and for qualitative this translates to other effects such as information diffusion, political/institutional effects or technical development. **Assumed co-benefits** may emerge when the main goal of the initiative leads to further positive impact in other areas, for example the implementation of energy efficiency measures in the industrial sector in cities could have a positive influence on air pollution. The Master thesis will concentrate on gathering and clustering the information according to this framework and these four categories.

Since the **exclusiveness of benefits to participants, equal availability of benefits to all participants** and the **identification of potential risks** are most likely not publicly available, it is recommended to consider these factors in further research. It would be

necessary to find a suitable method to collect this information, for example through interviews or through in-depth case studies.

Saldaña (2016, p. 3) defines a code in qualitative inquiry "often [as] a word or short phrase that symbolically assigns summative, salient, essence-capturing, an/or evocative attributes for a portion of language-based or visual data." In qualitative research, data usually takes form of interviews, observations, journals, open-ended surveys, Internet sides etc. or in this case, qualitative passages on the objectives or goals of ICIs in the CIP. According to the four pre-defined categories for the impact assessment the information from the CIP is coded.

The first cycle in coding involves the search for patterns of repetition or regular rates. Patterns are characterized by frequency, sequence, similarity, difference, causation and correspondence. Further cycles will follow to match text passages to the predetermined categories to reach a more analytical perspective on the research problem. Through coding, the database will be reorganized and grouped in similar categorizes. For the execution of the coding process high attention was spent on the language and its meaning as well as reflected how the coded data could be integrated into the above described categories. For the database, three cycles of coding had been conducted, so that recoding occurred when the assignments of passages were changed (Saldaña 2016; Clauß et al. 2004). For coding the qualitative data, the software MAXQDA was used.

3.3 Methodological issues

3.3.1 Transparency

First of all, one methodological issue originates in the differences in which initiatives provide information about their targets to evaluate their impact. The content of information is highly dependent on the willingness of initiatives to share information and their compliance to share correct data. There are some themes where comprehensive and qualitative data is provided by the initiatives, in particular for the topics cities, renewable energies, forestry, agriculture and efficiency in buildings.

Nevertheless, many initiatives are missing fundamental details such as workplans and milestones to achieve their targets, and even baselines to compare their targets to are often not provided. Moreover, other initiatives stay very vague about the targets they want to archieve through the cooperation in their initiative, so that it is even impossible to include them in the qualitative coding. This certainly has influence on

the results and analysis of this Master thesis. For once, the lack of transparency leads to high uncertainty about the real mitigation potential of initiatives. Reference data for the established target and the progress in achieving the target are missing in most cases. As stated before, the Master thesis assumes that initiatives are able to achieve their goals. Therefore, the estimated mitigation potential calculated and presented in the next chapter should be portrayed through a skeptical lens.

3.3.2 Overlapping targets

While climate initiatives develop and present their own goals, the national governments work out climate action plans as well. From scanning the database, it is not possible to identify whether an initiative is overlapping with the climate pledges of a country or whether the initiative is even used to translate the NDC into practice. This would contradict the perception of additional benefits from ICIs outside of the UNFCCC. Therefore, it is recommended to compare the specific findings from evaluating the mitigation potential of ICIs to the measures of the country-specific NDC.

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4. Analysis

4.1 Presentation of the results

4.1.1 Emergence and Development of climate initiatives

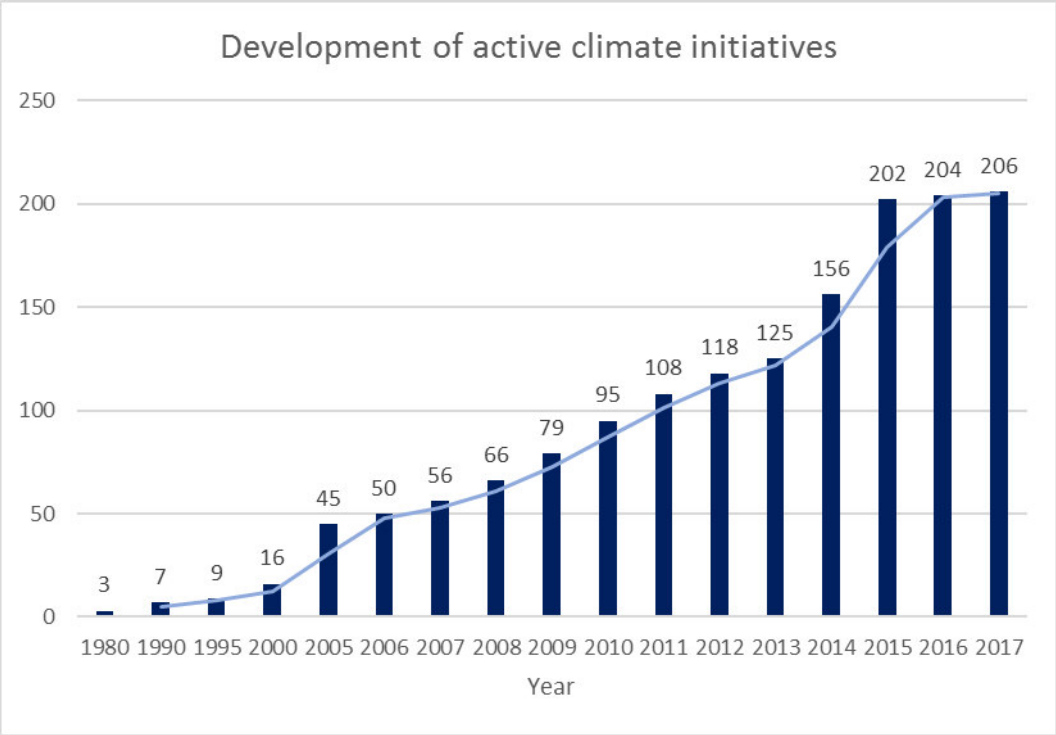

*Figure 5: Development of climate initiatives (author's own calculations based on CIP data)[3]; *note the change of time lapses on the x-axis*

The emergence of ICIs dates back to the 1970es, long before international cooperation in form of the UNFCCC to tackle climate change was founded. The three oldest ICIs in the database are the Alliance for Responsible Atmospheric Policy (1980), the International Petroleum Industry Environmental Conservation Association (IPIECA) (1974) and the Maritime Regions in Action against Climate Change (1973). All three of these ICIs cover different sectors: 'Fluorinated gases', 'energy supply and international transport' and 'cities/subnational governments'. Moreover, all three ones concentrate on reducing emissions in the Western World, namely in North America and Europe. While the IPIECA and the Maritime Regions in Action against Climate Change are partnerships focusing on technical dialogues, the Alliance for Responsible Atmospheric Policy is a political dialogue lobbying for the private oil and petroleum sector. They are all still in operation today and are relevant partnerships in their specific sector.

[3] No information about the starting date for 16 ICIs in the database

When looking at the development of ICIs one can see the relative steady increase of new initiatives registered in the CIP, but a relative peak in 2015. Since then the number of registered initiatives has been stable. The peak in 2015 may be explained by the establishment of declaration of the Lima Paris Action Agenda (LPAA) of December 13th, 2014. It provides strategies and orientation to state and non-state actors interested in the LPAA and advancing climate action (UNFCCC 2017). At the same time, the stagnation of the ICIs hasn't been researched in detail neither.

4.1.2 Coverage of ICIs

Most of the ICIs are aiming at reducing indirectly/directly GHG emissions at a global level or more precisely with no specific target area (52%), a large share of ICIs are directed towards emission cuts in Europe and North America (22%). Moreover, 2% of the registered ICIs are concentrating on one country only. One of the 'one country only' initiatives is for example the Vote Solar Initiative, which is a grassroot NGO in the U.S. aiming at reducing foreign energy dependency and increasing economic growth through mainstreaming solar energy. Their main activities are lobbyism and policy work and their activities are solely restricted to the U.S. This brings up the problem of differentiating between national and international initiatives. There are hundreds and thousands of initiatives working in the national fields of sustainability, unclear categorization makes it difficult to research ICIs more in detail (see chapter

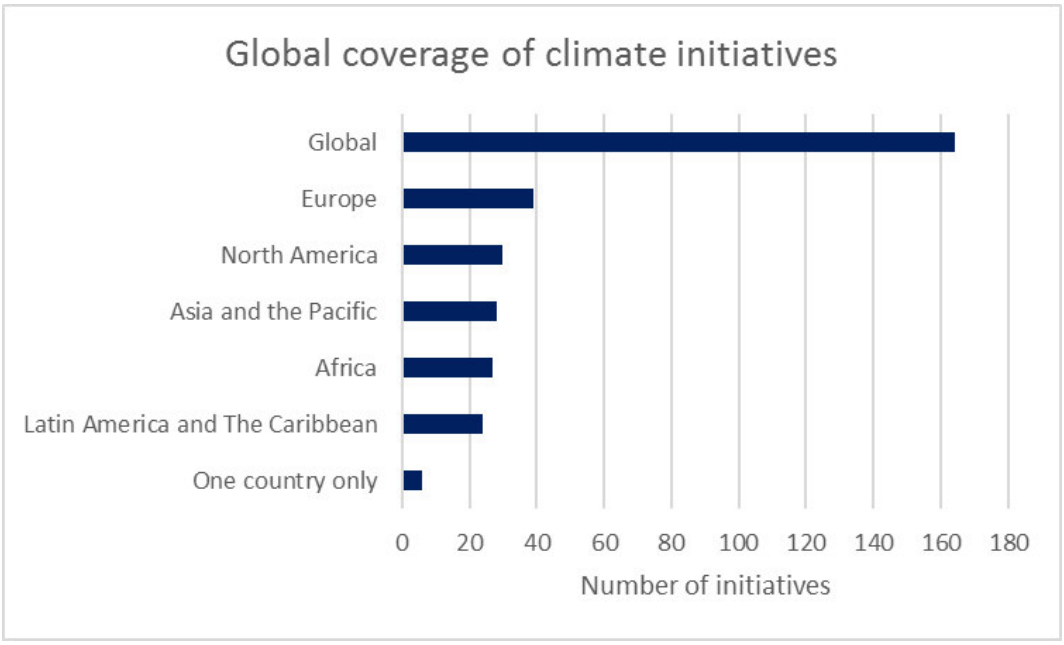

Figure 6: Global coverage of climate initiatives (author's own calculations based on CIP data)

4.2.1).

4.1.3 Type of initiative and primary function

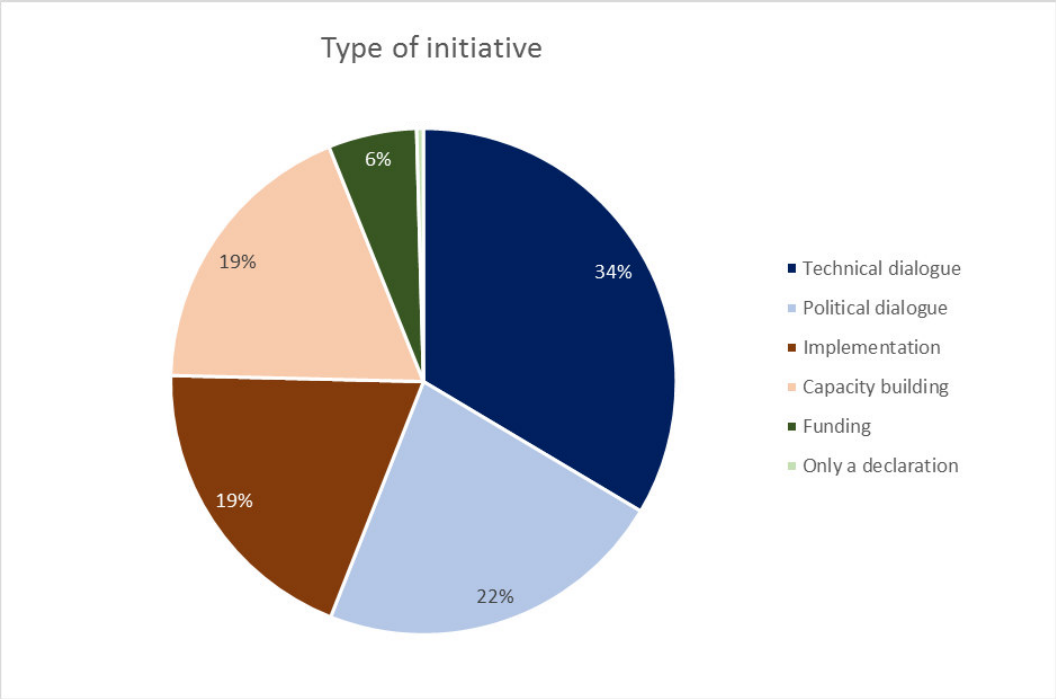

Figure 7: Type of initiative (author's own calculations based on CIP data)

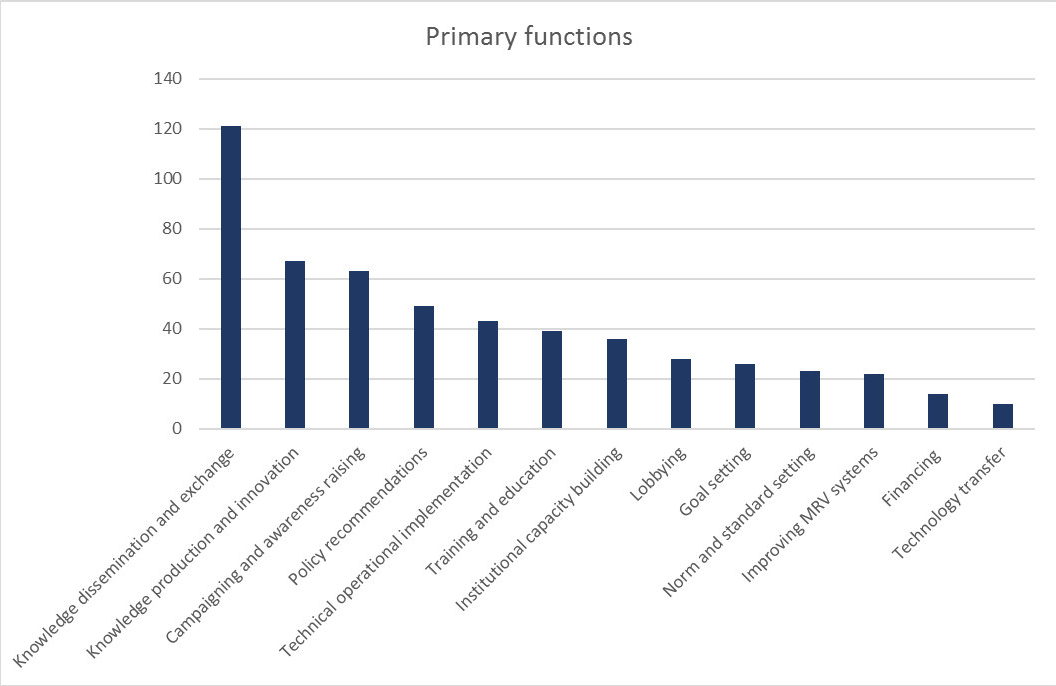

Figure 8: Primary functions (author's own calculations based on CIP data)

There is a strong focus on political and technical dialogues which corresponds to the primary functions 'knowledge production/exchange' as well as 'policy recommendation/campaigning'. This distribution explains the need for an organizational mean for cooperation between different stakeholders on an international level and strengthens the perception that exchange is an essential component of the characteristics of ICIs. Since technical and political dialogues are not clearly defined, they are also two variables encompassing a broad variety of activities by ICIs. There is little engagement in the area of technology transfer, the members of ICIs rather focus on the technical implementation. Since most ICIs focus on soft measures of influence rather than on technical proceedings, ICIs might not be the perfect instrument for technical development and research. Usually, these processes often happen in the protected shields of the private sector or in research institutes. However, after the R&D development they seem to be a useful mean to spread a certain technology.

For example, the CIP contains two initiatives focusing on the implementation and reputation of Carbon Capture and Storage (CCS) technology. CCS is a highly debated technology because it legitimates the reliance on fossil energy sources and it entails uncertainties regarding its cost-efficiency and operational risks due to possible leakages. The point whether it is a necessary technology for a decarbonized world should be debated, the issue might be that these two initiatives are solely founded to promote the implementation of this technology without a genuine public discourse. Moreover, there are little ICIs with focus on financing. Of course, this a complex area with various interests, but also great potential. The Portfolio Decarbonization Coalition (PDC) is a multi-stakeholder initiative that will drive GHG emissions reductions on the ground by mobilizing a critical mass of institutional investors committed to gradually decarbonizing their portfolios. But there is also an increasing number of insurances interested in the impact of climate change on their businesses and insurance have a big economic power.

4.1.4 Type and location of leading institute

Figure 9: Type of leading organization (author's own calculations based on CIP data)

Prevalently, the main leading organizations of ICIs are international organizations such as the World Bank, FAO or GIZ. Apparently, the database uses the term 'international organization' synonymous with the term 'intergovernmental organization'. These are experienced players in the international climate system and possess a large network of partners as well as financial and administrative resources. Moreover, Figure 9 shows that NGOs and partnerships take over the role of the leading organizations regularly. Players like the WWF or Fossil Free are represented in the NGO category as well as smaller and unknown NGOs. The large role of partnerships as leading organizations highlights the importance of cooperation in ICIs.

Yet, at the same time the category of partnerships doesn't differentiate between businesses, cities or the civil society but seems to be the remedy to categorize everything. Between thematic focuses, there are very little distinct patterns regarding the role or domination of certain leading organizations. For example, in the thematic focus 'supply chain emissions reductions' no business or corporate institutions are taking the position as lead organizations, only consortiums of them, but also international organizations and NGOs are regularly leading the theme supply chain. Initiatives with leading businesses are often interested in implementing energy efficiency measures and financial sustainability. Moreover, in the area of forestry and resilience predominately NGOs and international organizations lead the initiatives.

Figure 10: Location/Nationality of the leading organizations (author's own calculations based on CIP data)

Figure 10 shows the distribution of the location of the leading institutes and the domination of developed regions/countries strikes the eye. When looking at the organizations predominately from the United States, the picture is very diverse. It ranges from NGOs to international organizations and businesses as well as known institutions and smaller initiatives. Whereas the large share of organizations from France and Switzerland can be explained through he secretariats of large international organizations located in these countries. The World Business Council for Sustainable Development (WBCSD) as a central organization for corporate sustainability has its main secretary in Geneva, just like many other institutions of the United Nations as well. The United Nations Environment Programme operates a large division in France, which explains the large share of organizations from France. There are only a few initiatives which have the secretary of the leading organization in developed countries, even though for example the headquarter of the UNEP is in Nairobi. While there are only few initiatives from the developed countries some of them already exist more than 15 years. Most of them are linked to International Renewable Energy Agency IRENA, which has its headquarter in Abu Dhabi.

4.1.5 Thematic focus

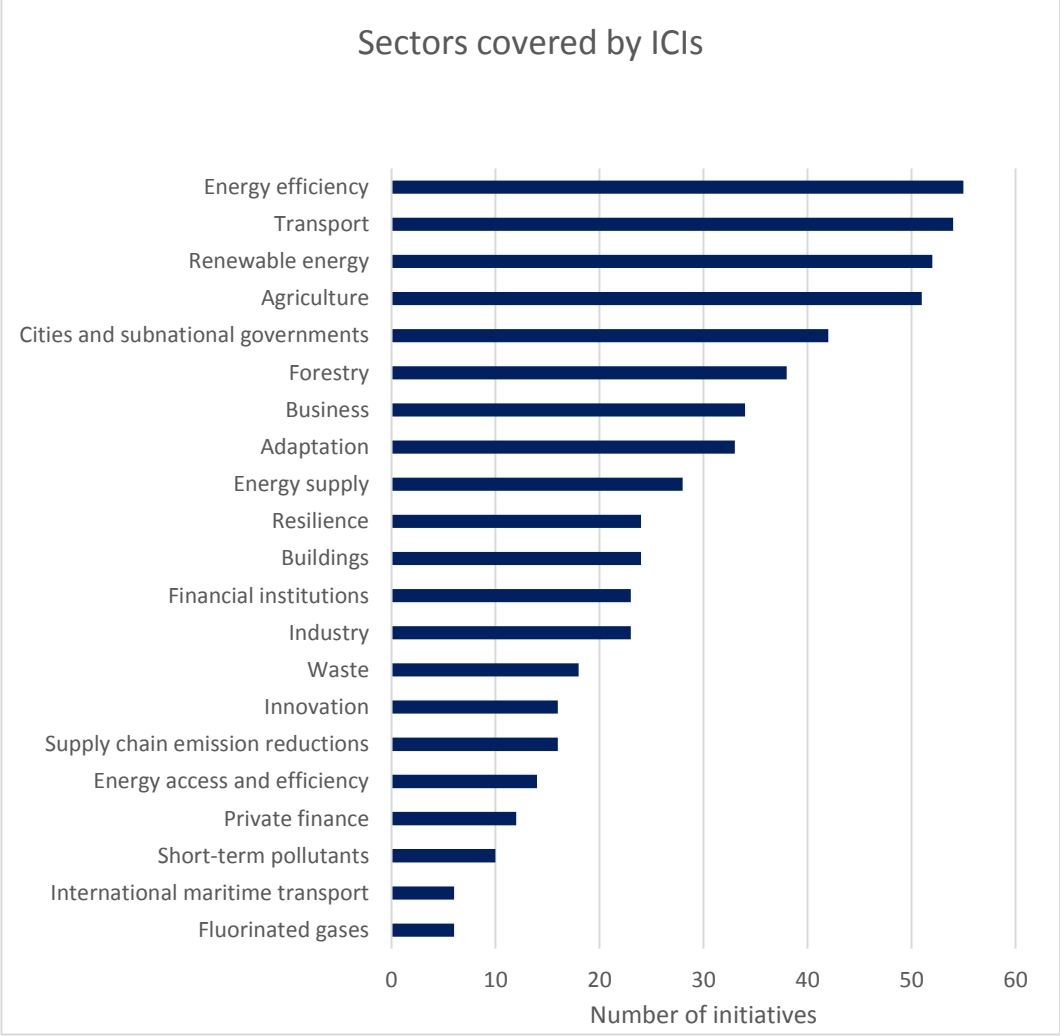

Figure 11: Thematic focus of ICIs (author's own calculations based on CIP data)

Most ICIs deal with the topic of energy efficiency and the transformation of the transport sector, which is interesting due to the circumstance that both areas still offer great potential to reduce emissions but are rather technical and linked to the industrial sector. Moreover, many initiatives deal with the topic of renewable energies, which could be expected since this a topic that many players are interested in. Implementing renewable energies brings economic benefits such as new jobs and independency from resource imports. Many initiatives also focus on ecology related aspects of sustainability such as agriculture, forestry and resilience. Plus, local governments seem to be underrepresented as leading organizations, but many initiatives deal with the issue of sustainability in cities. When recapitalizing the large domination of developed countries and the fact that many activities of ICIs concentrate on developing countries, then there is a certain asymmetry. For example, the large amount of initiative dealing with forests and resilience are dominated by developed

countries although the impact of these activities will concern developing countries. The thematic focus of ICIs is very broad and targets also particular problems of environmental protection such as short-term pollutants. Short-term pollutants include hydrofluorocarbons, black carbon and methane which have greater climate forces than CO2. There are six initiatives dealing with reducing emissions from international maritime transport, a great source of issue and a topic largely neglected by international politics because of diffuse responsibilities.

4.1.6 Funding and work plans

The database doesn't provide structured information about the funding of ICIs. The additional research for more detailed information revealed that the main funding source for ICIs is provided through their members/partners including governments, international organizations and companies. The amount of money turned over in ICIs is unfortunately not publicly available. Another source of funding may be foundations, in seldom cases ICIs receive considerable money from donations. Further research should concentrate on the factor of cost-efficiency by comparing the amount of money that is put into the activities of ICIs and the actual impact of their activities. Only 27% of initiatives have handed in official roadmaps to the CIP. This is very critical to the aspect, that it is unclear how their goals will be achieved and what activities will take place during their time of operation. It is possible that more initiatives have developed roadmaps and didn't include them. The availability of information on monitoring and reporting frameworks of the initiatives is unfortunately limited as well. From the description of the initiatives on their websites it is often not clear, whether they regularly monitor and report their activities or progress towards their targets.

4.1.7 Hypothesis testing: the association between primary function and type of leading organization

As stated, the development of ICIs has rapidly increased over the past years. But the reason for this development is unclear. Even though, this question can't be answered through this Master thesis, it is likely, that certain organizations follow specific goals in organizing themselves as ICIs. The question is therefore, whether a pattern can be found between the activities organized ICIs and specific organizations. As a reminder, the presented null and alternative hypothesis:

H0: There is no causal relationship between the type of leading organization and the function in fulfills in an ICI.

H1: The type of leading organization has an influence on the primary function it fulfills.

	Academic institution	Business/ Coporate	International organisation	Network/ Consortium/ Partnership	NGO/Civil Society	United Nations & other intergovernmental agencies	
Knowledge dissemination and exchange	8	9	39		23	12	91
Knowledge production and innovation	6	5	18		13	2	44
Campaigning and awareness raising	6	3	14		19	4	46
Policy recommendations	4	1	15		6	1	27
Technical operational implementation	0	4	20		6	4	34
Training and education	4	1	14		9	1	29
Institutional capacity building	2	2	5		6	7	22
Lobbying	3	1	6		7	0	17
Goal setting	1	3	7		7	1	19
Norm and standard setting	1	2	4		8	0	15
Improving MRV systems	1	1	3		9	1	15
Financing	1	1	6		2	0	10
Technology transfer	1	3	2		0	0	6
Sum	38	36	153	0	115	33	375

Figure 12: Inferrial analysis (primary function and type of leading organization (author's own calculations based on CIP data)

Cramer's V

$$Cramer's\ V = \sqrt{\frac{70.8}{375 * (5-1)}} = 0.2$$

Pearson contingency-coefficient C

$$C = \sqrt{\frac{70.8}{70.8 + 375}} = 0.4$$

The Shi independency test showed a significant correlation; however, it would only be considered small-medium. The interpretation of the strength of the correlation as well as the direction (positive/negative) is difficult for nominal scaled variables. This is an indicator that certain 'leading organizations' follow specific actions more often than others. For comparison, the Pearson contingency-coefficient C comes to a similar result.

4.1.8 Mitigation potential: assessment of quantitative data

For the assessment of the quantifiable goals, 22 initiatives could be included in the analyses since they either provided information about their goals in terms of reducing emissions or the information could be retrieved from other sources. The estimated potential savings of greenhouse gases from activities by climate initiatives amounts to 14-26 $GtCO_2e$ in 2020. Although this is a large amount of GHG emission savings and would largely contribute to closing the emissions gap, several things should be noted to interpret these findings correctly. First of all, and as stated before, it was assumed that ICIs are able to achieve their stipulated targets. Nevertheless, it is difficult to say whether ICIs are successful in translating their ideas to action. Moreover, the pledged emissions savings are partly contained in governmental action plans and therefore don't deliver savings outside of the UNFCCC or the NDCs. The share of initiatives affected by this aspect is assumed to be rather small, because the data from the Öko-Institute differentiated between pledges in the INDCs and ICIs. While it was a target for the research, to solely include initiatives outside the UNFCCC, it can't be guaranteed that some of the initiatives had been absorbed by their governmental climate action plans.

Figure 13 shows the lower and upper bound of possible emissions reductions. A few initiatives like the Bonn Challenge/New York Declaration on Forests (NYDF) vary highly in the amount of GHG saved through their activities, since this depends on the area of forest restored through the initiative. The Bonn Challenge/NYDF is also the largest contributor in terms of mitigation potential and is very likely going to achieve its target goal. In consideration of the target area of 150 mio. ha restored land, today 94 mio. ha land has been restored (63% of the targets from the Bonn Challenge) and 66 mio. ha will be restored until 2020. Another high contributor for potential CO_2e savings is the En.lighten initiative. The En.lighten initiative has been established to accelerate global market transformation to environmentally sustainable lighting technologies by developing a coordinated global strategy and providing technical support for the phase-out of inefficient lighting. The contributions of initiatives vary greatly between sectors but since there is just such a small sample of initiatives with goals which could be translated to actual GHG emissions savings, little assumptions can be made about the

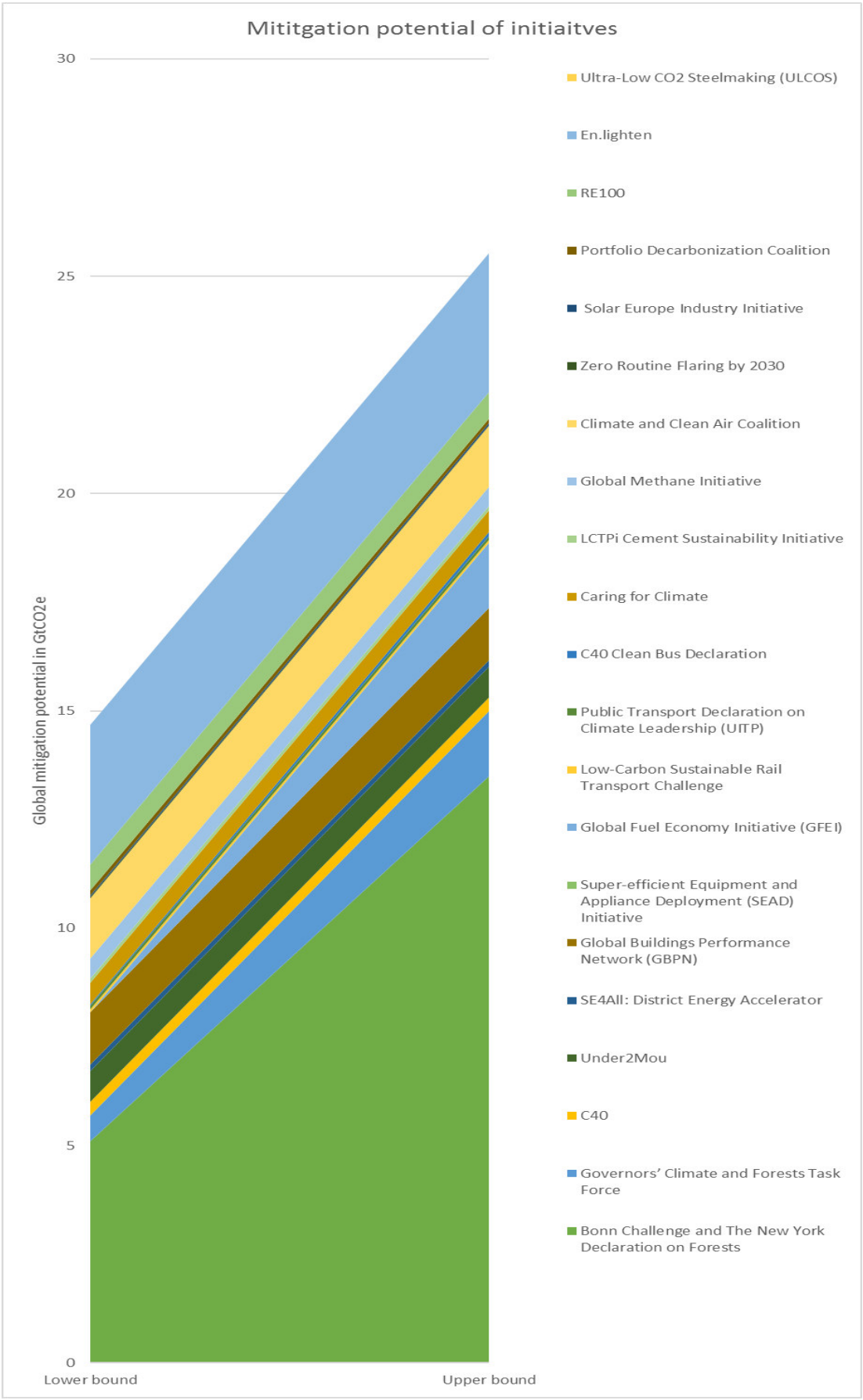

Figure 13: Global mitigation potential in reduction of GtCO2e (author's own calculations based on CIP data)

4.1.9 Hypothesis testing: Relationship between actors and mitigation potential

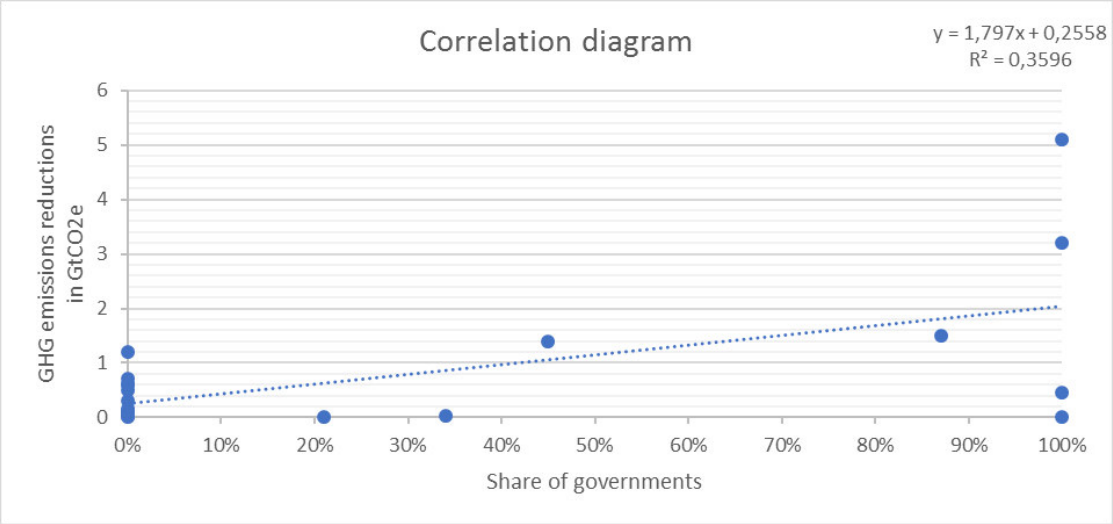

Figure 14: Correlation between share of governments in an ICI and its mitigation potential (author's own calculations based on CIP data)

Various parties participate in ICIs and formulate targets to reduce emissions. For the analysis, it was tested whether the involvement of certain actors leads to higher outcomes in ambition, explicitly when governments are involved. As a reminder:

H0: The share of governments in an ICI has no or a negative influence on the potential to reduce GHG emissions. p=<0

H1: The share of governments in an ICI has a positive influence on the potential to reduce GHG emissions. p>0

And indeed, the correlation analysis shows a positive influence for the share of governments in ICIs to reach their targets goals in 2020 (r = 0.5). The computed p-value amounted to 0.02 which less than 0.05. The H0 hypothesis may be rejected. The calculation was also conducted for the share of other organizations. For NGOs and businesses, there was no significant correlation between their share in the initiative and the level of emissions reduction. International organizations were neglected since they were only part in three of the 22 researched initiatives. The data for the basis of the hypothesis test can be found in the Annex.

4.1.10 Global mitigation potential: assessment of qualitative data

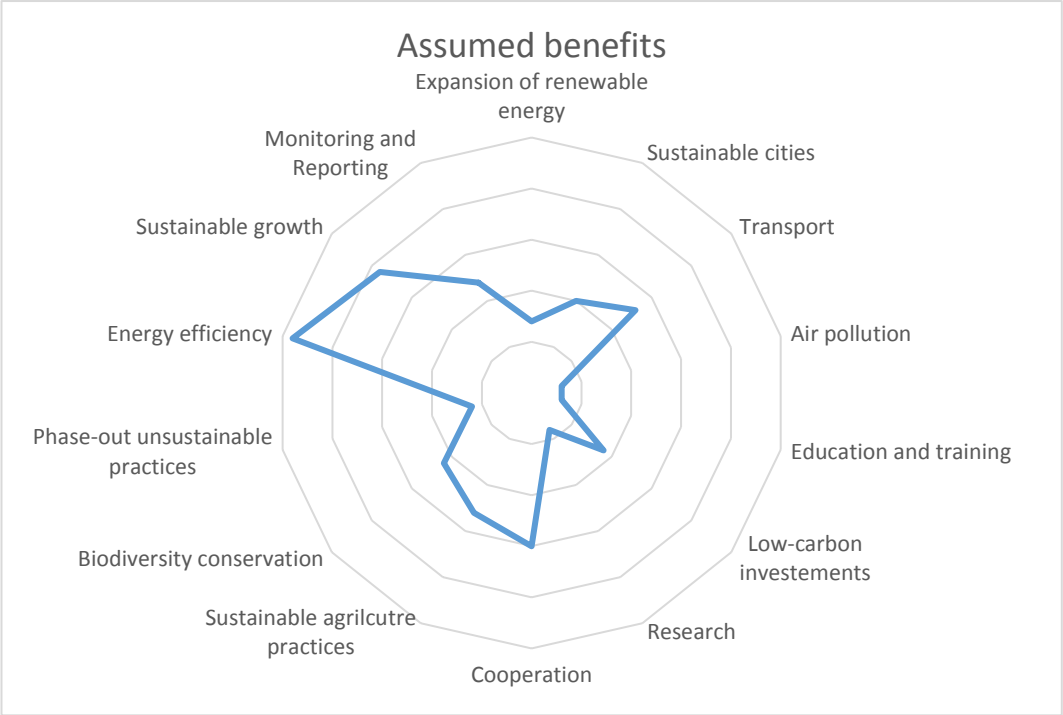

Figure 15: Assumed benefits (source: author's own calcuations)

As stated before for the qualitative analysis the database was coded with concern to the factors assumed benefits, assumed co-benefits, beneficiaries and clear benefit formulation. The next chapter will show this evaluation exemplarily for the transport sector. The content level through coding the goals and activities could be increased according to the following findings:

Assumed benefits:

First the assessment of the assumed benefits is shaped by the theme, since there the assumed benefits will occur. It would be recommended to repeat this evaluation per theme for initiatives. However, since there are 22 themes, it would have been to extensive in the process of this Master thesis. Yet, the overall coding of the assumed benefits from initiatives shows that besides the focus on energy efficiency and the transport sector, many initiatives deal with the development of reporting and monitoring systems. Another interesting aspect is that most initiatives are hoping to establish new cooperation and networks.

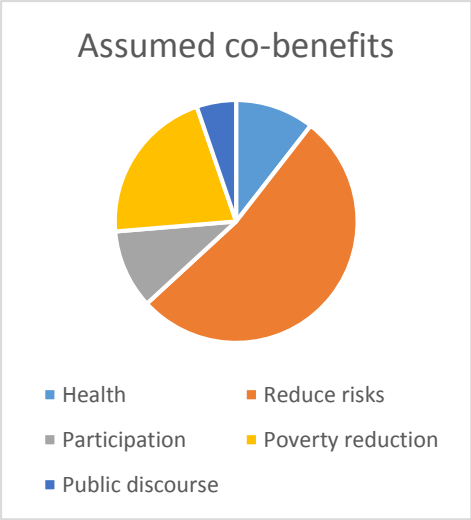

Figure 16: Assumed co-benefits (source: author's own calculations)

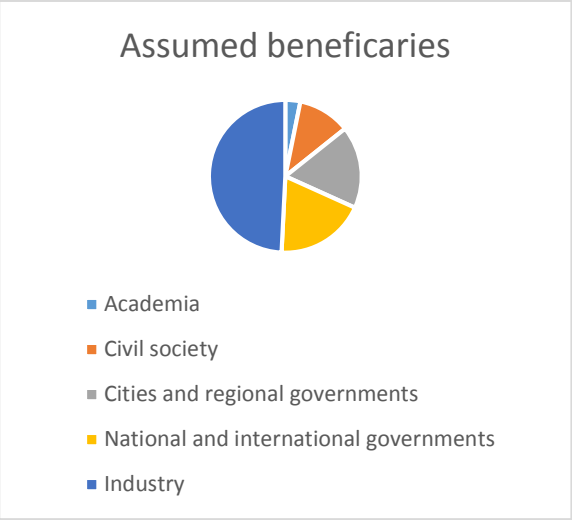

Figure 17: Assumed beneficiaries (source: author's own calculations)

Assumed co-benefits

Assumed co-benefits occurred when the primary target of the initiatives was not one of the above goals, but it likely occurred or was a benefit the initiative hoped for. The most often named co-benefit was reduced risks from climate change. Many initiatives work on biodiversity conservation and restoration of land or forests. Associated with the issues, some of the initiatives pointed out it could prevent and help in risk management. Another important aspect for many initiatives had been the aspect of poverty reduction. Growing cities working on sustainability measures have pointed out several times that they hope to reduce poverty through an overall more sustainable lifestyle in cities. Other benefits were health which is mostly related to reducing air pollution through energy efficiency measures; participation in the sense that relevant stakeholders have the opportunity to be invited to meet with the initiatives to discuss their activities; and public discourse meaning that some initiatives plan broad public events enabling the wide public to learn about climate change.

Assumed beneficiaries

The assessment of assumed beneficiaries deals with target group of initiatives or the group of stakeholders who will likely benefit from the activities of the initiative. It shows that many initiatives try to approach the industrial and business sector which are grouped together in the graphic (see Figure 16). From the previous descriptive statistical analysis, it was not clear that such a large amount of initiatives targets the

private sector. In most cases, business and the industrial sector are offered platforms or tools to reduce their emission budget. Plus, they are invited to learn about best practice projects which they could implement in their work field. The other two groups who benefit about the same from initiatives are cities/regional governments and national/international governments. The benefits for cities often stem from their own city initiatives which allow for exchange of ideas. For governments, it is usually other players that approach them with policy recommendations or policy plans.

Clear benefits: When it comes to clear benefits from initiatives for their participating members the level of information is diffuse. Many initiatives offer their members clear benefits in form of CO_2e footprint tools or platforms to exchange best practice projects. Yet other initiatives don't provide any information about the benefits their members receive. It might be the case, that they are not even interested in offering their members special benefits. For example, some initiatives aim at collecting signatures from relevant companies and stakeholders to gain reputation, but there are no consequences or activities resulting from this. An example of clear benefits from participating in an initiative is the Roundtable on Sustainable Palm Oil where organizations can receive a certification if they implement best practice in sustainable palm oil production as well as making commitments to continuous improvement. Whether this certification scheme itself is reasonable would be a different question.

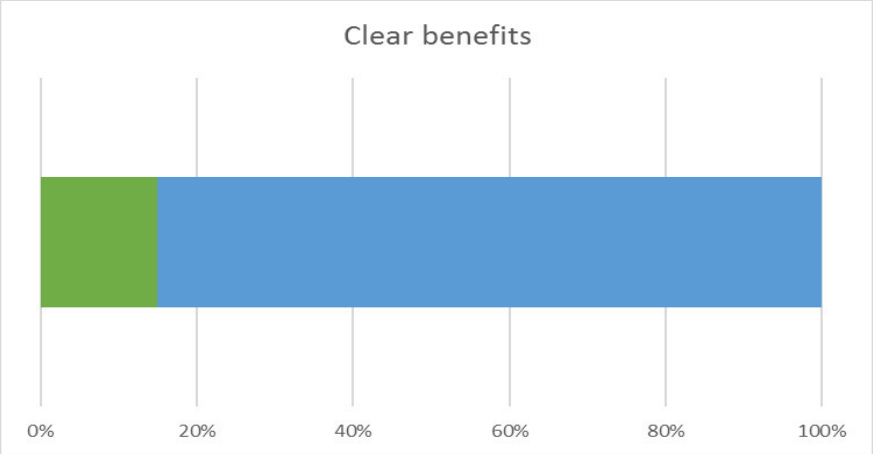

Figure 18: Clear benefits for participating members (source. author's own calcuations)

Transport

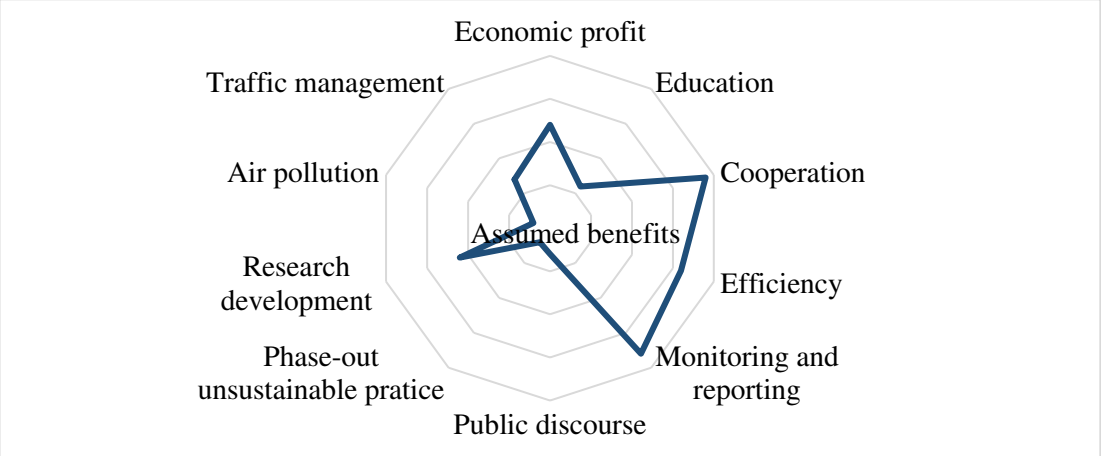

Figure 19: Assumed benefits (source: author's own calcuations)

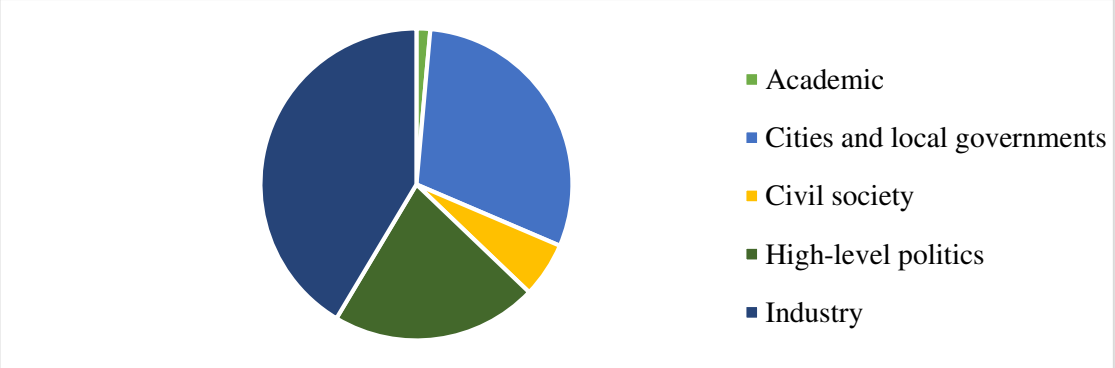

Figure 20: Assumed beneficiaries (source: author's own calcuations)

Transport initiatives address all sectors of transport: aviation, maritime, freight, fleets, cycling, walking, public transport and cars.

Assumed benefits: Most of initiatives aim at reducing emissions and increasing the efficiency of vehicles, for example by switching to electric cars. Initiatives focus also on enhancing cooperation to learn about innovative projects as well as to improve monitoring and reporting. They offer platforms and tools to measure emissions turnout.

Assumed co-benefits: Co-benefits are addressing climate justice (1), the decline of poverty (1) the reduction of climate risks (3) and improvement of health (6).

Assumed beneficiaries: In first line the industrial sector is supported and addressed through transport initiative. Various tools like online platforms to monitor their

emissions turnout are offered. Moreover, cities and regional players are supported in developing local and sustainable transportation plans.

Clear benefits for participating: In 80% of the transport initiatives members seem to receive clear benefits, even though they are often simple such as management tools, consultation and education. 20% of the initiatives don't provide information about the benefits from participating in their initiative

The transport initiatives are mostly concentrating on electrifying fossil fleets in the public sectors like in buses and but also in in commercial fleets, for example in taxis. Others are interested in encouraging a shift to public transportation to lessen street traffic.

4.2 Discussion of results

4.2.1 Definition

The presented results from evaluating the CIP have brought up many different aspects about initiatives which should be addressed more in detail. To structure the following chapter appropriately, the discussion will focus on the implication of the results on the actors, activities and the impact of ICIs. Further, recommendations are made towards the database.

At several points during this Master thesis, I have indicated that there is a lack of clear definitions and categories to cluster the activities surrounding ICIs. First of all, there is no clear scientific definition about the circumstance of counting ICIs and their activities to the United Nations bodies and the INDC or not. Both would have its advantages and disadvantages: Separating them from the INDCs would encourage the involved stakeholders to formulate a vision independent from the national climate plans. This could lead to considerable more outcome and ambition than integrating them into political processes.

Moreover, one of the reasons to create initiatives is to be independent from political negotiations. In the introduction the German program for climate initiatives was introduced – the IKI. Since recent years, more effort is being directed towards using IKIs as a mean to mainstream INDC and translate complex political frameworks to measurable mid or long-term goals. In this context, climate initiatives are tied to the political system of their country. Therefore the characteristics and activities of the initiative should be conforme with the line of policymakers. They lose their autonomy

and become just an instrument for policy implementation. On the other hand, the analysis has shown the essential role of governments to formulate ambitious targets. A tighter connection between initiatives and government activities could foster climate action on both sides.

Why define whether their activities are embedded in the UNFCCC or not? One could just leave it open to the climate initiatives and its founding members, but at least initiatives should provide this information when they register in the CIP. Not having a clear definition brings certain risks, such as the inconclusiveness about responsibilities and information exchange. But also with regards to climate change, activities should be registered and accountable for states or not. If they are part of an institutionalized political process, then their mitigation potential can be neglected regarding the discussions about closing the emissions gap. Moreover, the CIP might be comprehensive, but it doesn't entail information about every climate initiatives in the world. After dealing with climate initiatives intensively, my recommendation is to concretize the definition on ICIs by two points:

First, since bilateral and national initiatives are excluded from this research and since they are suitable instruments to implement the national INDCs, the focus of ICIs should stay on activities outside the UNFCCC. Otherwise they would vanish in the political context and lose an essential reason for their existence. Second, the definition should include the elements 'who', 'what' and 'how' to highlight the characteristics of ICIs. The aspect 'who' would include governmental and non-governmental actors, since we have figured out that governments play a crucial role in initiatives. 'What' they want to achieve has become clear during the analysis but has already been pointed out before through other definitions: reduce emissions directly or indirectly. However, since it is necessary to differentiate ICIs from national initiatives, it should become clearer that they cooperate on an international scope or at least between two countries ('how'). There are five 'one-country only' initiatives included in the CIP, which would then be excluded from the CIP. Many countries have national initiatives where stakeholders work together on national climate change goals. Those initiatives are also important but bear no relation to international cooperation. I would propose the following working definition:

International cooperative initiatives are defined as voluntary action by state and non-state actors which aim at directly or indirectly reducing greenhouse gas emissions in an international scope but outside of the UNFCCC.

4.2.2 Members: From motives to activities

Climate initiatives are founded and used by actors because of specific motives. The hypothesis test showed, that there is an association between leading organizations and the activities of an initiative. Even though no assumptions about the strength of the correlation and its causality can be made, it would make sense to research this aspect in a next step, so that we can gain a better understanding about the underlying motive of members and organizations involved in ICIs (micro- and macro level). Motives on the individual level may be the essential component in explain the reasons for emergence of ICIs.

Moreover, in the previous chapter it was illustrated that ICIs are an instrument particularly used by Western countries. There are only a few initiatives hosted by developing countries and the share of initiatives aiming at reducing emissions in developing countries is not as high as in developed countries, but it is significant. Similar to the discussions about climate change negotiations, there is a global North-South conflict. Organizations of developed countries dominate ICIs and developing countries are not given the same possibility to take responsibility in them.

Yet, the larger share of ICIs is concentrating on reducing emissions in the Northern hemisphere. For once, many emissions are caused by developed countries and therefore the urge to become active about climate change could be higher in these countries. Also, the economic status allows and reasons the interests of various stakeholders to from initiatives and cooperate to implement sustainable ideas. Additionally, it makes sense that the focus of climate initiatives lays on the reduction of emissions on the global level. This would support the assumption that ICIs are emerging because many stakeholders are frustrated about the little achievements of climate negotiations.

The qualitative impact assessment has identified a pattern which was not visible from the descriptive statistical analysis. Most of initiatives are aiming at reducing emissions in the industrial sector and offer tools or platforms to industrial partners to achieve this goal. XX % of beneficiaries from initiatives are industrial players. Since the industrial

sector is the primary source of emissions in many industrialized countries, it makes sense that they are the target group of initiatives. Besides the city initiatives, only XX initiatives concentrate on the collaboration with regional governments and the civil society.

4.2.3 From activities to initiative

From the evaluation of the database, it becomes clear, that ICIs follow a broad range of activities with large focus on knowledge exchange and production as well as campaigning. Moreover, many initiatives aim at establishing tools and support for the industrial sector to develop suitable monitoring and reporting mechanisms. However, most initiatives don't report about their activities. While most initiatives formulate their intended targets, only 27% of initiatives have handed in official roadmaps to the CIP. Therefore, it is unclear and highly uncertain how initiatives try to reach their goals. For example, the Airport Carbon Accreditation aims at making 50 airports carbon neutral in Europe by 2030, but there is no single information about how this will be achieved.

Another question one might want to point out at this moment is what the activities of ICIs tells us about the interests and needs of the involved stakeholders. If we assume that participating members of initiatives don't found initiatives for marketing reasons but from a problem-centric perspective than many initiatives focus on the diffusion of knowledge about the issues they are confronted with. Depending on the target group such as politicians, businesses and civil society it makes sense that there needs to be knowledge exchange about specific barriers of implementing sustainable transformation processes. Yet, most of the activities of ICIs are soft measures and vague. If the main goal of ICIs is to provide knowledge exchange, then their database should be accompanied by a corresponding tool for making knowledge public.

The qualitative analysis has shown that cooperation is a central concern of initiatives. As described in the previous chapters, initiatives enable stakeholders to become active about climate change, even if their government opposes these activities. Regarding climate change, many players have already made essentials experiences in developing low-carbon strategies, projects and tools. The possibilities to self-regulate private activities through tracking emissions, gain training and education to implement sustainable practices and gain access to new technologies are large. Climate change might also be at a point where many solutions exists, but they need to incorporated fast

and therefore the essential stakeholders need to come together at one table. In case of decarbonizating the transport sector, many companies have developed electric cars and buses which now need to be tested and refined in the real-world surroundings. To this extent, ICIs are able to overcome the collective action dilemma.

4.2.4 Impact of ICIs

Figure 21: Tracking Clean Energy Progress: 2017 (source: International Energy Agency 2017)

The analysis has shown that ICIs cover a broad spectrum of topics concerning the environment. There is a strong focus on the topics transport an energy efficiency, which is as already stated, surprising, since both issues are rather technical. Moreover, politics have neglected both themes for a long time. For example, the EU emission trading scheme is not covering the topic maritime and road transport. Regulations on the international transport sector are compared to the emissions it produces weak and the accountability to address this issue is diffuse, since international transportation is a

topic touching the responsibilities of several countries and the international level. Moreover, the International Energy Agency (2017) has indicated by a research evaluating the low-carbon transition pathways of various technologies that particularly in the area of transport and energy efficiency are not on track with a 2°C scenario with exception of the development of electric cars (see Figure 21).

In many cases initiatives are adopting targets that are more ambitious than those of their governments. On the one side, they don't have anything to lose in formulating goals they will not achieve, even the risk of blaming as sanctuary measure is extremely low, because the information about their activities is superficial. On the other side, particular ambitious goals of non-state actors might have a positive effect on the political system challenging them to a competition for investing into climate change measures.

Further research should concentrate on exploring whether there is a relationship between the topics primarily handled by initiatives like transport and energy efficiency and the inability of the international and national levels to develop coherent climate plans for these sectors. The emissions in the transport sector have been stagnating globally and many countries are facing large barriers to tackle this issue. For example, Germany as the leading country in automobile industry has not been able to increase the number of electric cars significantly in its country.

The analysis has shown that the involvement of governments has a positive influence on the ambition of the targets and the potential mitigation benefits. During the research other criteria, which have a positive influence could not be identified. It is most likely beneficial for an initiative to have a permanent secretary. Four initiatives don't have one, so that it is unclear how to get in contact with them.

Finally, it is important to address the issues of voluntary agreements in general. It is not clear whether voluntary agreements are good or bad news for climate change. They possess a lower social legitimacy than international climate negotiations, since they are not linked closely to legislative institutions. According to Ostrom's design principles smaller or medium sized groups are more successful in establishing commitment (Ostrom 2012). This could also be true for initiatives, but the success of VAs is difficult to analyze, yet, two factors might be of interest: cost-efficiency and environmental effectiveness for further research. Cost-efficiency would be realized through reaching a given target at minimum costs. To compare cost-efficiency

between sectors, all relevant emission sources must be uniformly. Moreover, the public access on the budgets and financing of ICIs is highly limited, this is why an analysis of the cost-efficiency wasn't conducted in this Master thesis.

If goals of initiatives are kept vague, the researcher and public receive the impression that there are no genuine interests in achieving measurable output by an initiative. Moreover, the goals of some initiatives are from time to time very superficial: The target of the Cement Sustainability Initiative is to explore what sustainable development means for the cement industry. Definitely, there are already actors in the cement industry who have researched this topic extensively and don't see why an initiative occupies itself which such as task.

4.7.4 Recommendation for the database

The data in the CIP should be better structured and more concrete. This could be established by providing examples for each of the category. Moreover, cities are badly represented in the CIP, the reason for that is the overarching themes cities work in. They are dealing with sustainable development from all kind of perspectives. The database should be updated more regularly, for example once per year and information about initiatives which don't exists anymore should be included. It would interesting to know if they just stopped their operations or if they facing certain barriers.

In general, there is a risk of misunderstanding the CIP, not only with regards to the generalized definitions of stakeholders and unselective exclusion criteria, but also with regards to the activities and interests of the stakeholder. Since it is not clearly stated, what the difference between f.e. 'policy recommendations' and 'lobbying' is, it might be more likely to evade the negative connotation of lobbying and select the term 'policy recommendations' or 'Knowledge dissemination and exchange'.

As pointed out before the category 'consortiums/partnerships' causes certain problems, since it is very generic and motives may differ greatly between parties. Especially in the context of cities and subnational actors, it is difficult to identify which kind of parties play a particular role since 27% of the leading organizations are consortiums/partnerships. Also, the distinction between the categories international organizations and UN/UNEP associated agencies is largely faulty used in the database. Finally, it has never been defined what a NGO is, which could be misleading. Most people associate with NGOs environmental organizations like Greenpeace or the

WWF, but the database doesn't concretize this point. The World Economic Forum is listed as NGO but doesn't share any substantial information about their activities, so that it is problematic for the public to evaluate their impact. Moreover, the Clinton Climate Initiative is listed as a NGO-led initiative, but similar no further information about their activities and targets are listed in the database or on their homepage. Local governments do not play a vital role as leading organizations as actually expected, probably because there are either regularly participating or because there are integrated in the category of partnerships/consortiums. Since the interest in cities as facilitators of climate action is large, it is surprising, that there is not extra category for them.

5 Conclusion

From a personal and academic point of view, I felt challenged by the topic of international cooperative initiatives in the climate system and their alternative mean to address the issues of climate change. Personally, and as many other young scholars might feel similar, I have been disappointed in the lack of progress from the international community to provoke substantial shifts in emission levels. To a large extent, climate change is not just a conflict about the responsibility of emissions reduction between developed and developing countries, but also a risk imposed by the generation of my ancestors on my and future generations. Nowadays, the knowledge about the implications of climate change is as comprehensive as never and young people all over the world are educated about the potential consequences they might face during their lifetime. Even though, every generation is confronted with the problems of their time, I wonder if climate change is an unacceptable and impermissible risk imposed on us due to its potential costs and effects on human life.

From an academic point of view, I am puzzled by the outcomes of allocating natural resources and the interaction of the environmental-human dimensions. Many scholars have dedicated their research to the conditions of solving collective action dilemmas and even though scientific progress has been made, the implications for the international level are still limited. No real solution has yet been found to deal with global environmental resource issues like biodiversity loss and climate change. While too many people still wait for a global solution from international climate politics, climate initiatives represent a response of non-state and state actors.

This Master thesis show, that the mitigation potential international climate initiatives could substantially contribute to close the emissions gap. However, most ICIs are missing the corresponding plans to translate their activities into action. While most initiatives present targets they try to achieve by forming this cooperation, 7% of them lack conclusive goals. To estimate their impact and potential to close the emissions gap, the initiatives with quantitative goals in form of emissions reductions were identified and their mitigation potential was estimated. If initiatives are able to achieve their pledged goals they could save between 14 to 26 $GtCO_2e$ in 2020.

Moreover, many initiatives are instruments of developed countries and try to target businesses by proposing suitable means to lower their emissions. Although many initiatives deal with monitoring and reporting efforts, little information is provided

about the concrete achievements of ICIs. Yet, cooperation is a central aspect through which members hope to overcome the issues of climate negotiations. The members share ideas and experiences about sustainable development in a large extent.

Since the mitigation of initiatives is high and there are best practice examples of ICIs such as the Bonn Challenge or the Global Fuel Economy Initiative, further research should be geared towards identify determinates that make them successful. Moreover, research should concentrate on understanding why ICIs are founded by the members to gain better insight about their motives.

For the international climate system, ICIs are probably the answer that solve climate change, because they are missing a fundamental monitoring and reporting mechanism, but they overcome central problems inherent in the international climate system.

Acknowledgment

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Hiermit erkläre ich, dass die Arbeit noch nicht für andere Prüfungen eingereicht wurde, dass sie selbstständig verfasst wurde und dass sämtliche Quellen einschließlich Internetquellen, die unverändert oder abgewandelt wiedergegeben werden, insbesondere Quellen für Texte, Grafiken, Tabellen und Bilder, sind als solche kenntlich gemacht sind. Mir ist bekannt, dass bei Verstößen gegen diese Grundsätze ein Verfahren wegen Täuschungsversuchs bzw. Täuschung eingeleitet wird.

Datum Unterschrift

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