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Factors Affecting Climate Change Mitigation Policy Implementation

A Thesis

Presented to

The Faculty and the Honors Program

Of the University of San Diego

By

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Department of Political Science & International Relations

2016

Literature Review

Introduction

In 2011 the International Energy Agency issued a report projecting that the global atmosphere is on track for 6 degrees Celsius of warming, representing abrupt, unpredictable, and potentially irreversible changes in environmental feedback systems (IPPC 2001, 2007), causing consequences such as shifting weather patterns that threaten food production through increased unpredictability of rainfall, rising sea levels that will have a range of impacts on coastal environments and infrastructure, and extreme weather events, predicted to become more frequent and severe. Therefore, it is essential for individual states, and the international community, to engage in climate change mitigation policies, which the United Nations defines as “efforts to reduce or prevent the emission of greenhouse gases,” including using new technologies, renewable energies, improving equipment efficiency, or changing management practices or consumer behavior (UNFCCC).

Unfortunately, climate change mitigation policy suffers from a paradox: Climate change is generally regarded as a low national security priority, yet the international scientific community stresses human-contributed climate change as a very serious problem (IPPC 2001, 2007). Since the year 2000, numerous public opinion polls in the United States “demonstrate that large majorities of Americans are aware of global warming (92 percent), believe that global warming is real and already underway (74 percent), believe that there is a scientific consensus on the reality of climate change (61 percent), and already view climate change as a some what to very serious problem (76 percent)” (Leiserowitz 2003). However, according to a 2014 Gallup poll, the majority of Americans worry “only a little” or “not at all” about global warming (Gallup

2014), viewing it as less important than nearly all other national or environmental issues (Lorenzoni 2007). This phenomenon is not only confined to the United States. Over 99 percent of the English public have heard of either “climate change,” “global warming,” or the “greenhouse effect” and, most people say they are aware of the main causes of climate change and are concerned about it, yet a small minority of democratic citizens demand climate change mitigation policy from their legislators (DEFRA 2002, 2005). What explains the discrepancy in public perception about the severity of climate change and the willingness to solve the problem? And how can this explanation be utilized to effect changes in policy?

The literature explaining environmental policy implementation points to an extensive list of contributory factors, but generally fails to pinpoint a select few that are the *most* influential in affecting policy outcomes. I argue that the many variables identified in the literature merely influence the public’s *perception* of environmental policies, and that a positive perception, one that understands environmental regulation to be economically beneficial in the long-run (Bovenberg & Smulders 1996), is a significant determinant of a state’s ability to implement regulatory environmental policy.

I will examine which of these factors within the international and national communities most affect public perception of environmental regulatory and climate change mitigation policies, thereby creating guiding principles that states might reference in order to move toward improving public perception and enacting mitigation policy. I will hypothesize that these factors, or precursor variables, contribute to a public perception of climate change mitigation that ultimately allows for the success or failure of policy implementation.

A Brief History of International Climate Conferences

The principal forum for international climate change action is the United Nations, specifically the Framework Convention on Climate Change (UNFCCC), which oversees international climate conventions, one of the first being the 1997 Kyoto Protocol¹. Kyoto began an international discussion on cooperative solutions to climate change, yet its mandatory language failed to achieve meaningful resolutions. It hoped to reduce greenhouse gases substantially, but today the world has over 60 percent more greenhouse gases than it did in 1990, as opposed to the five percent reduction its signatories sought (BBC News 2014). The top-down approach of the United Nations, and subsequently of the Protocol, imposed generic and internationally legally binding pollution reductions on participating countries. Most responsibility for emissions reductions was shouldered on wealthier developed nations, “recognizing that developed countries are principally responsible for the current high levels of GHG emissions in the atmosphere as a result of more than 150 years of industrial activity,” under the principle of “common but differentiated responsibility” (UNFCCC). Some of the key participating countries, and largest emitters, including the United States, did not meet their Protocol commitment. Thus the Kyoto Protocol is largely regarded as empty international legislation, lacking the enforceability its strategy required (CBCNews 2012).

The Copenhagen Peace Talks signified another global commitment to curb the effects of climate change. The talks allowed individual states to submit and commit to their own reduction strategies to achieve the “long-term goal of limiting the maximum global average temperature increase to no more than 2 degrees Celsius above pre-industrial levels” (UNFCCC). The provisions of the accord called for 186 states to reduce emissions, invest in clean energy technology and practices, and help people adapt to the effects of climate change. All

¹ The first was in Berlin, Germany in 1995 (UNFCCC). A Conference Of the Parties meets every year beginning with this date, and thus I will only highlight the most notable meetings.

participatory parties to the Copenhagen Accord submitted their respective emission reduction goals in January of 2010. The final accord included 141 countries, including the 27-member European Union, representing 87.24 percent of global emissions (U.S. Climate Action Network 2014). This agreement was both more successful at a participatory level and less effective than the Kyoto Protocol. While the Accords allowed individual states to determine their own policies, which allowed them to set realistic and achievable goals, it was ultimately ineffective, as emission levels are currently approaching the increase in global temperatures toward Kyoto's "2 degrees Celsius" magic standard, which was an arbitrarily set standard in the first place (UNCCC).

In December of 2015, an unprecedented 195 states agreed upon another internationally binding climate change reduction strategy at the COP21 Paris Climate Conference. The agreement acts as a "parent treaty" to the Kyoto Protocol, committing participating countries to submitting climate action plans, or National Determined Contributions, every five years, that will immediately begin to decrease emissions so that global atmosphere temperatures will increase no more than 1.5 degrees Celsius. The plan also increases economic support for developing countries, both in mitigation and in climate impact loss and damage (UNCCC). While a participatory commitment of this level is unprecedented, it remains to be seen if these states will follow through on their commitments, especially in the scope of the vast history of unsuccessful environmental policy cooperation.

Much of the literature attempting to analyze the lack of success of these international agreements fails to prescribe a comprehensive solution. Perhaps these meetings are not the solution at all, given the specificity of different environmental issues, political differences within each country, lack of international enforceability, and difficulty in balancing industrial

development and emissions controls. I argue that only through a more localized approach, one beginning from the public level up through the national political level, will countries be able to achieve the emissions reductions they work towards in international climate conferences.

To understand how a country might achieve these reductions, we must begin to understand what national factors inhibit these achievements. A major inhibitor of public support for climate change mitigation policy is the argument that it prevents economic development or hinders international trade competition with nations that choose not to implement the same policies. While there is some conflict on this issue in the literature, the most recent conclusion states that while environmental regulation may negatively inhibit employment and productivity in the short run, that in the long run, these effects are negligible, if at all present (Raupach & Marland 2007). Older research points to an irreconcilable discrepancy between international competitiveness and environmental regulation because it would necessarily impose higher costs upon private producers, discouraging economic growth. For example, a simulation of the growth of the U.S. economy with and without regulation that analyzed the repercussions of environmental regulations upon industries found that the cost of emission controls is more than 10 percent of the total cost of government purchase of goods and services between 1973-1985. However, the simulation did not attempt to assess the benefits resulting from a cleaner environment and did not include the modern clean energy innovations that are more cost effective than their dirtier alternatives (Jaffe et al. 1995) (Bovenburg et. al 1996).

Current literature pays greater attention to the social benefits, such as improved health, of environmental regulation, which often outweigh any immediate economic costs (Dechezlepretre & Sato 2014). A focus on long term social benefits rather than immediate economic benefits better encompasses the full scope of impacts upon society as well as upon the environment. One

study found that long run income growth, and/or long run output of the economy as measured by Gross National Product, increases² as a result of environmental policy implementation (Bovenberg & Smulders 1996) (Jorgenson & Wilcoxon 1989). Environmental regulation also stimulates innovation in clean technologies. For example, recent low-carbon technology development induces greater economic benefits than do the “dirty” technologies that it replaces, encouraging greater and greener economic growth (Dechezlepretre & Sato 2014). Several state-level studies found positive correlations among state rankings on economic and environmental indicators and conclude that the states that do the most to protect their environment also have the strongest economies (Hall 1994; Meyer 1992).

Whether these findings are correlative or causal, or due to other economic factors, it appears that the key for significantly lower rates of environmental degradation may be the existence of compensation for potential losers of policies that promote conservation as well as long term economic growth, as was the case in a study focusing on Brazilian deforestation solutions (Carmen Lemos et. al 2008). If actors such as ENGOs are able to communicate the economic and social benefits of regulatory policies to the greater public, I argue that they may be able to correct public misconceptions of environmental regulation and move toward policy that mitigates the effects of climate change.

Factors that determine perception

Environmental Non-Governmental Organizations

Non-Governmental Organizations represent a potentially powerful tool in environmental policy creation and implementation. While NGO effectiveness is determined by a wide variety of

² at an annual rate of .728 percent

logistical factors, such as funding, staff availability, accessibility to office space, relations with government representatives, access to means of communication, lobbying capability, and already-existing public support for the issue (Nasiritousi et. al 2014) (Gough & Shackley 2001), the literature suggests that the presence of strong and numerous environmental non-governmental organizations (ENGOS) within a state contribute to an ENGO's ability to influence environmental policy outcomes. For example, Najam et. al identify ENGOS as "*demandeurs* of more and better environmental governance" that nurture public concern through the decisions of environmental non-governmental organizations (2004, 23). The study correctly concludes that ENGOS have become a principal vehicle of global environmental policy monitoring; they also contribute to the "drafting and implementing of national strategies and regulations; serve as technical advisors to governmental negotiators, especially in developing countries; and are a primary vehicle for environmental capacity building" (Najam et. al 2014, 27).

Non-governmental organizations in general have unique access to intellectual, membership, political, financial bases, transnational networking, and mobilization capacity, which comprise a set of power sources that allow NGOs to gain authority in national governance. ENGOS are no different. A review of literature identifies five sources of ENGO powers, an understanding that clarifies the ways in which they can be most effective: cognitive, symbolic, social, leverage, and material powers (Nasiritousi et. al 2014). Material powers, represented by funding levels, provide leverage and lobbying capacity toward formal governmental institutions. ENGOS draw strength from their cognitive and social powers because of their issue-specific focus and large membership capacity. An ENGO can employ symbolic power if it is *perceived* to represent public opinion that is not represented elsewhere, such as adding a voice for the environment or for future generations (Gough & Shackley 2001). A focus on perception is useful

in understanding the success or failure of the causal path between ENGO advocacy for a policy and that policy's failure or success. For example, an analysis of 4 periods of environmental policy-making in the Amazonian region of Brazil found that pro-environmental policy plans must be *perceived* as a potential source of economic or other type of resource for that policy to reach successful implementation (Carmen Lemos et. al 2008). This insight on perception will be greatly useful in my theoretical framework.

International and Political Elite Support

Several studies point to the type and level of support a policy receives as important factors in its outcome. Since there are hundreds of different theories about how elites affect the political opinions of citizens, I simply describe the general form by saying that some form of elite communication is hypothesized to affect a specific aspect of individual opinion. This hypothesis can be thought of as occurring, and being supported, at two levels of interaction. At the upper level, the world's governments interact strategically, each seeking to benefit from the global climate change regime while reducing their costs, as exemplified in the series of COP international meetings previously discussed. Since there is no international authority with strong sanctioning power, this can be considered a "game" of voluntary contributions toward a public good: climate change mitigation and adaptation ("Climate Change Governance: Understanding Agency through Governance Profiles" 2014). The upper level, international context, will affect how, and if, governments approach climate policy. For example, the COP21 meeting in November of 2015 sparked significant media attention, which may generate greater public support for climate change mitigation policy. Several studies indicate that during one of these international conferences, environmental regulatory policies are more likely to be implemented in the participatory nations (Meadowcroft 1999). Alternatively, or in addition, political elites in

attendance at the meeting may directly advocate for policy implementation within their own national governments.

While the upper level certainly begins an international discussion on the need to reduce emissions, political elite support at the lower level can have a larger effect upon public perception of environmental policy (Lorenzoni et. al 2007). At this level, climate policies are formulated and implemented within each country by national governments once the international level is settled. This level is more difficult to quantify and to define because of the many elite political players that could advocate for or against environmental policy.

One study demonstrates how both levels of support can work together to affect policy implementation through the analysis of a coalition for sustainable development in the Amazon forest, which included international and domestic ENGOs, supportive officials within the World Bank, western developed countries, Brazilian governments, epistemic communities of scientists, and grass-roots groups such as rubber tappers and indigenous people. After a COP summit, political elites and other groups began to organize and attempt to implement legislation preventing Amazonian deforestation. The different actions of each group of people were not separated out by the study, likely because it is so difficult to do so.

A Nepalese study tracking political elite commitment to the environment after its democratization in 1992 found that elite members identified political and economic problems before those of environmental degradation, and that “the precarious ecology of the country cannot be improved without tackling economic hardships” simultaneously. The study, like that of Carmen Lemos et. al, cites the polarized nature of politics as a likely harmful cause to environmental policy development, although the two articles diverge in their conclusions in regard to the effect of elite support. The Nepal case study regrettably does not measure the

likelihood that greater environmental support by the elite politicians would contribute to policy implementation (Steel & Pandey 1999)³, and thus is not as useful as it could be for my theoretical approach.

International and political elite support play an important role in policy outcome, but is very difficult to measure. Carmen Lemos et. al recommend an approach in which international support for and pressure upon opposing interests advocate for concrete benefits that “compensate for what is perceived as forgone opportunities for development and strongly shift economic incentives and provide local social development,” but does not specify a concrete method in which to measure political elite support. The study concludes that developmental policies in the Amazon depended upon, along with resources and international support, political elite member support (Carmen Lemos et. al 2008). This approach simultaneously overcomes the economic argument most often used to impede policy implementation and employs one of the major factors that influence public perception, making it a useful study for my theory. Similarly, Brulle et al. identify elite political cues as “the most important influence on public concern about climate change” in the United States between 2002-2010, both originating from Democratic and Republican sources, “which led to a heightening and diminishing of public concern respectively,” although again, does not provide a formula for quantifying these political elite “cues” that is applicable on an international level (Stewart 2015).

Media Cycles

³ Although the Nepalese government did establish a Ministry of the Environment in 1992 under the direction of the Prime Minister. An Agriculture, Forestry, and Environment Division was also established within the national Planning Commission, the most important government development and economic agency. The creation of an environmental sector within such an important development and economic body represents an early recognition of the interconnectedness of these issues by the Nepalese government.

Media has the ability to draw public attention to particular issues; to shape and inform public opinion. If media cycles inform and focus upon the potential for policy action, a public is more likely to support climate change mitigation policy (Capstick 2015). The literature about the effect of media representations of climate change have mostly centered upon Western and developed states, likely due to characteristic media freedom that this group of countries enjoys, and is also confined to small regions within Western states. One of the only comprehensive studies in the field that analyses the effect of media cycles upon public perception of climate change on a variety of countries, distributed geographically throughout the world, still only provides case study data for 27 countries. The study concludes that media attention levels on climate change increased in all countries between 1996 and 2010, although to varying degrees, with media attention on climate change being especially high in carbon-dependent countries, with those most affected by climate change, and those with commitments under the Kyoto Protocol (Schäfer et. al 2012).

More polling data from non-Western regions, as well as regional data specifically focused upon African and South American regions, would be desirable to conclusively state the causal relationship between media and public perception of environmental policy. However, a greater amount of literature resoundingly relates media attention to public opinion in general (Capstick 2015), and I believe that this relationship partly fills, if not completely, any gap that exists for specific issues, such as environmental policy.

Summation

A survey of the literature points to a variety of variables that influence environmental policy implementation, however I identify the most common three and propose that instead of

directly influencing policy, that these factors influence public perception of environmental policy, and that a positive perception is the key to successful implementation in a variety of states. The existing literature does not present a practical set of goals that actors could attempt to achieve if it were interested in improving its climate change mitigation policies, and it is my hope to provide this to the existing body of literature. A bottom-up focus, one that begins with public perception, corrects for the unenforceability and generality of international accords, which certainly influence policy, but cannot function as a complete solution for the destructive effects climate change will bring. Once negative perceptual barriers are removed, namely the false idea that national environmental regulations create economic stagnation, countries have a greater likelihood of implementing climate change mitigation policy. Of course, confounding factors such as war or political conflict within a country would also impede the potential for positive perception building. Further analysis of the effects of these confounding factors, specifically upon environmental policy, would better inform this review.

Although it seems over-simplistic to identify two factors that determine environmental policy perception, it is important to note the complexity existing both within the relationships between the factors as well as in the world of environmental policy governance, of which any literature review cannot hope to comprehensively encompass. Rather, it is my goal to review the previous failures of global environmental policy implementation, and to provide a concise solution. I formulate the most important explanatory components within a new framework of perception, providing a potential pathway for actors within this complex system to follow in order to mitigate the damaging effects of climate change.

Theoretical Framework and Design

This paper will explain the presence or absence of climate change mitigation policy by constructing a series of precursor variables that build a positive public perception of climate change mitigation policy. These variables include: the number of environmental non-governmental organizations (ENGOS), and media attention upon climate change. I hypothesize that positive or strong values in these variables contribute to a positive public perception about climate change mitigation, which in turn results in policy implementation within democratic states.

I will operationalize and analyze the relationship between a series of precursor independent variables and my overarching variable, public perception of environmental policy. I will then analyze the relationship between this variable and environmental policy implementation. The first precursor variable is environmental non-governmental organizations. ENGOS shape public opinion by accruing and organizing public perception, through its direct lobbying and organizational tools. The second is media issue attention, which draws positive or negative attention to issues such as climate change, and have the power to create a positive discourse and to circulate either facts or myths about a topic. These factors contribute to an overarching independent variable, that of public perception of environmental policies.

It is possible that the presence of strong and numerous ENGOS is a product of a positive public perception of climate change policy, rather than a precursor. Some studies point to intrinsically more civically minded populations within democracies, such as the United States, that allow it to have relatively successful climate change mitigation policy. Thus a public that already favors climate change mitigation policy could form ENGOS, thus reversing the causal chain of my argument for this particular dependent variable. However, the long-term existence of

NGOs in the United States predate data showing public concern for climate change, and thus I conclude that this is unlikely. Instead, the literature understands NGOs to shape public opinion through and around perception, or directly through lobbying (Nasiritousi et. al 2014).

In addition, alternative causal relationships could exist between and among my precursor independent variables. It is possible that the presence of a strong ENGO and lobbying force could explain frequent climate change articles published.

I will build a theory by focusing on three cases, intentionally selecting cases with climate change policies that vary maximally, in quality and quantity, according to my scale. I will focus on democracies in order to best measure public perception on climate change mitigation policies and media attention to climate change, both of which might be inaccurately measured or influenced by an authoritarian regime. Based on a review of the literature, I will build a theory by analyzing the United States, Germany, and India, as cases because they represent the greatest variety in environmental policy efforts, as well as a wide arena of emissions sector emphases.

Variable Operationalization

To operationalize the actual implementation of these policies, I will create my own ranking system that will assign numerical values, from one to five, one being assigned to the state with the most effective climate change mitigation policies, based upon the qualitative and quantitative merits of the state's policies. Based on the below criteria, I will identify and evaluate the most recent climate change mitigation policies from three different nations that vary maximally.

Implemented Climate Change Mitigation Policy Scale

1. Presence of multiple climate change mitigation policies in effect, in all emissions sectors identified by the United Nations (transport, buildings, manufacturing, tourism,

agriculture, forestry, waste, energy supply/renewables), specifically focusing upon those sectors for which the state has particularly high levels of emissions.

2. Some climate change mitigation policies in effect, covering at least 4 of the sectors previously identified, specifically focusing upon the sector in which most emissions for that state occur. Multiple policies within each sector are present.
3. Some climate change mitigation policies in effect, covering at least 3 of the sectors previously identified. At least one area of policy that addresses most emission-intensive sector.
4. Some climate change mitigation policies in effect, at least 2 of the sectors previously identified. Possibly only one policy present in each sector represented. No focus upon most emission intensive sector.
5. Lack of climate change mitigation policies in effect. Represented sectors only have one policy. Little or no variety in sectors. Lack of policy focus upon most emission-intensive sector(s).

I will track the number of ENGOs in a state, adjusted per capita, in order to operationalize this precursor independent variable. States with high numbers of ENGOs may also have highly ranked climate change mitigation policies. The most complete data set that measures the number and type of NGOs is the *Encyclopedia of Associations: International Organizations*, using search terms “climate change,” and “conservation,” or “environment”. The ENGOs are easily searchable and quantifiable by country, and the *Encyclopedia* accounts for the greatest number of ENGOs present in any accessible preexisting data set surveyed in the literature.

I will operationalize media attention by utilizing the data set compiled in the Schäfer study previously mentioned, which measures the number of media attention cycles in primary

national newspapers that focus upon climate change. This study compares the percentage of issue attention given to climate change in 27 countries over a time period of 15 years and provides the most comprehensive set of preexisting data available from all the literature reviewed. The study defines a reference to climate change in the media as existing when

- a) The keyword 'climate' appears in connection with words indicating change (i.e. change, development, warming, cooling);
- b) The article includes word synonymous to climate change, such as 'greenhouse effect' or 'global warming'; or
- c) When a global change of temperature is discussed. These conditions were operationalized by broadly defined search-strings, which subsequently were employed for full-text searches in electronic databases (Schäfer et al. 2012, 11).

This study gathered data from the largest number of countries in all of the literature surveyed, and surveyed the largest amount of media sources. It also focuses on three countries as case studies, some of which will be used for this study. (Schäfer et. al 2012, 26).

The presence of political elite support or international support is difficult to operationalize. The only coherent way to do so in a quantifiable manner seems to ascertain if support exists, or not, for the climate policy in question. No systematic quantitative system exists within the literature, and therefore I can see no way of going around this problem other than to ignore this variable in my study, despite the likelihood that it in fact does influence perception of climate change and policy implementation.

I will measure public perception about climate change regulation, to which I hypothesize the precursor independent variables contribute, using World Values Survey data concerning responses to whether protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs. This question assesses public support for policies that protect the environment, thereby mitigating climate change, in the face of the greatest ideological and practical challenge to these policies. I expect to observe that the previously

mentioned contributory independent variables will cause positive public perception of climate change mitigation policy.

Based upon my case data, I expect to observe that the cases which have high levels of most or all precursor independent variables, i.e., high numbers of ENGOs relative to population, and high relative climate change media cycles, will significantly contribute to my primary independent variable, public support for climate change mitigation policy. Next, I hypothesize that states with high levels of public support will achieve high rankings in their climate change mitigation policies.

Confounding variables that could disrupt my causal flow include state regime type, its political conditions, and conflict in the state. An authoritarian state is unlikely to enjoy the same sort of public support for environmental policies, or attempt to achieve it, as do democracies. An authoritarian regime may also be less likely to collect data on public support for any issues. Thus I will focus only upon democracies for the cases in my study to control for regime type.

Political conditions, such as political instability, could disrupt my causal relationship between my dependent and independent variables because it can create public insecurity, a situation which may deemphasize public concern for policies other than those that directly increase personal security. Thus, media, ENGOs, and political elites or the international community deprioritize climate change policies in order to handle what they perceive as a more immediate threat. To control for political instability, I have selected cases with a democratic regime that has been in existence for at least fifteen years.

Similarly, conflicts such as war or drone attacks in a state are likely to divert public and political elite attention away from other national security issues such as climate change, and can disrupt the infrastructure of a state to the point that climate change mitigation is not a feasible

priority. Media cycles might focus more prominently on war or other violent conflicts instead of climate change mitigation policy, decreasing the media cycle quantity. ENGOs might not be as popular or have the ability to generate as much support in war-torn states. Likewise, political elites and the international community might focus less upon climate change mitigation policy in a country with constant violence. Therefore, war will be controlled for by selecting cases in which it is not present (directly in that country) to prevent it from skewing the results of my study. My study will be limited to democratic countries in which data for public support for climate change mitigation policy is available, however I would argue that if my hypothesis is correct, that it could even help guide authoritarian regimes interested in reducing their emissions. I am excluding them purely due to a lack of data availability.

While it would be desirable to assess the environmental literacy, defined as “the number of individuals capable of making informed decisions concerning the environment...in order to improve the well-being of other individuals and societies” of a population (Environmental Literacy | NAAEE), this data is extremely limited on an international level. It currently only appears to exist for small populations or communities on a regional or local level, and even at that it usually centers upon a short range of particular educational levels. Therefore this variable is not assessable at this time and will be ignored.

Data Findings

South Africa

South Africa has relatively high emissions for a developing country, largely due to its coal-intensive energy structure and dependence on mining and minerals processing. A leading international assessment of the effects of climate change on the global economy, the Stern

Review, estimates that national economic damages from unmitigated climate change could range between 5 percent and 20 percent of South African Gross Domestic Product (GDP) annually by 2100. If South African emissions remain unchecked, they could quadruple by 2050 (*National Climate Change Response White Paper 2011*, 26).

South African climate change mitigation policy was evaluated based upon its ability to target its most intensive emissions categories, being electricity, transportation, and industry. For example, average energy use emissions for a developing country usually comprises 49 percent of its total emissions, whereas South Africa's energy use emissions sit just under 80 percent of its total emissions. Electricity generation constitutes half of South Africa's energy emissions and just under 40 percent of total emissions in 2000. Transportation and energy used in industry contributed just under 10 percent, while industrial process emissions constituted around 14 percent of total emissions. Agriculture and land-use change in South Africa make up 5 percent of its emissions (*National Climate Change Response White Paper 2011*, 25-29). South Africa's mitigation policy identifies opportunities for mitigation in the "energy efficiency, demand management," and moving to less emissions-intensive energies. It also expresses interest in incentivizing economic growth in sectors with lower energy intensities (*National Climate Change Response White Paper 2011*, 30). To achieve these, South Africa established a benchmark National GHG Emissions Trajectory Range, which details that South African emissions will peak between 2020 and 2025, remain stable for up to a decade, and then decline thereafter. Additionally, the policy implements a voluntary carbon budget program that would outline desired emission reduction outcomes for each sector of the economy, with emphasis on the major energy supply (electricity and liquid fuels) and use (mining, industry, and transport) sectors (*National Climate Change Response White Paper 2011*, 25).

However, the White Paper also emphasizes “equity and the common but differentiated responsibilities and respective capabilities of all nations” and commits to making a “fair” contribution to the global effort to reduce greenhouse gas emissions (*National Climate Change Response White Paper 2011*, 27), indicating that the South African government may expect more developed countries to assume greater responsibility for atmospheric emissions reductions. Additionally, the White Paper requires “companies and economic sectors... [to] submit mitigation plans that set out how they intend to achieve the desired emission reduction outcomes” without setting up a timeframe within which these companies will be required to submit their plans and without establishing consequence for not doing so. Based on my scale, I gave South Africa’s mitigation portion of its policy a 3, because it covers several emissions sectors, and addresses two of its most emission-intensive sectors, being electricity, and industry, but fails to address transportation emissions or set definitive consequences or deadlines for failing to follow legal regulations.

According to the *Encyclopedia of Associations*, South Africa has a total of 24 environmental non-governmental organizations, with a combined membership base of 14,125 people, representing .03 percent of the South African population that is directly and actively involved in an ENGO.

Based on the media study conducted by Schäfer et al., the South African newspapers Sunday Times and The Star, saw increases in media attention on climate change-related issues increase from 1997 to 2010, with spikes in attention occurring during international climate conferences like COP meetings (Schäfer et al 2012, 20). Of the articles that were published by these newspapers from 2001-2009, .49 percent were focused on climate change, lower than the overall average of 27 countries of .6 percent (Schäfer et al. 2012, 20).

I utilized 2010-2014 World Values Survey Data measuring perception of the environment as a priority, namely

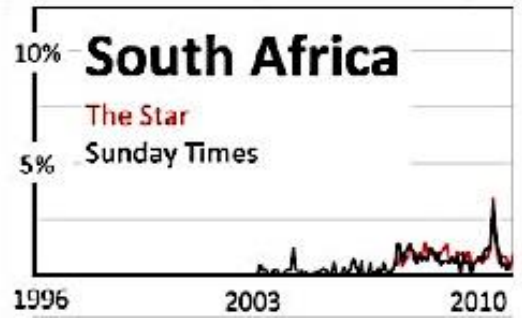


Figure 1 (Schäfer et al. 2012, 20)

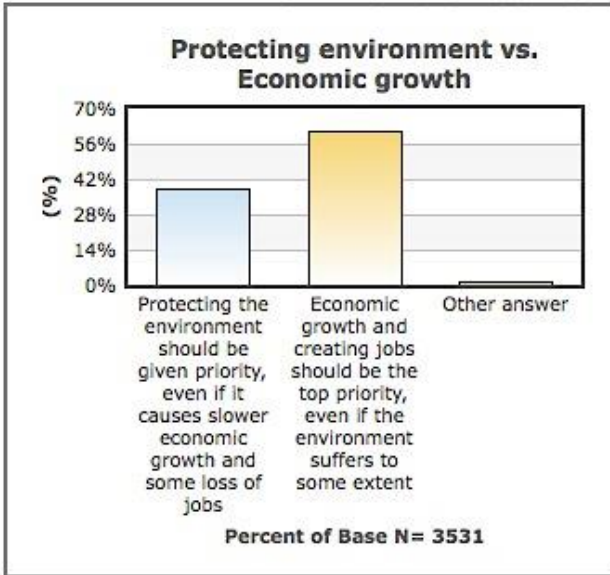


Figure 2 (World Values Survey)

whether the environment should be given priority, even if it causes slower economic growth and some loss of jobs. I used this comparison as an indicator of support of environmental policies in general because, as discussed earlier, arguments against environmental protections are often made because they slow economic growth. Thus, a population that disagrees with this statement is more likely to support climate policies. Of 3,531 cases in South Africa, 38.3 percent

agreed that the environment should be given priority over economic growth, and 60.6 percent said that economic growth should be the top priority, even if the environment suffers to some extent. See Figure 2.

Germany

The 2014 Climate Action Programme is one of the most progressive pieces of climate change mitigation policy in the world. It commits to reducing greenhouse gas emissions by at least 40 percent on 1990 levels by 2020. The policy lays out reductions in the public electricity and heat supply, agriculture, industry transportation, commerce/trade/services sectors (2014, 15). Germany's energy sector is the most greenhouse gas emissions intensive sector, at 40 percent of all Germany's emissions in 2012, which the Climate Action Programme identifies as the sector with the "greatest technical and economic potential for reduction" (2014, 19). It includes

measures involving emissions trading, renewable energy expansion, and demand reduction to remedy its most emissions-intensive sector. Germany will engage in emissions trading, incentives to invest in higher energy, increases in regulations for reducing fluorinated greenhouses gases, and increases in renewable energy to target its industry sector (20). Germany will tax fuels used for heating purposes within households, and implement grant programs to promote renewable energy use in its heat market to reduce household consumption of energy (21). The policy sets concrete timetables and definitive reductions goals for each sector mentioned. It also places great emphasis on “responsibility towards future generations” (2014, 9). The policy does not however include measures to reduce international aviation and maritime shipping emissions. It acknowledges the need for future reductions in the forestry and timber sector (due to the carbon sink function of forests), but does not set concrete reductions goals for this sector. Germany also highlights achievements in its “other” sector, such as its closed cycle and waste management program that made it illegal to landfill organic degradable municipal waste, which resulted in emissions reductions of 67 percent between 1990 and 2012 (23). (“Climate Action Programme 2020”, 2014). Because the policy targets all emissions sectors identified by the United Nations, those being transport, buildings, industry, tourism, agriculture, forestry, waste and energy supply/renewables, and because it specifically targets Germany’s most emissions intensive sectors, The Climate Action Programme 2020 policy received a “1” on my policy scale.

Of 80.62 million Germans, 436,738 of them are staff or members of an environmental non-governmental organization, meaning that .54 percent of the population is directly and actively involved in an ENGO.



Figure 3 (Schäfer et al. 2012, 19)

change an average .41 percent of its total media coverage over time (Schäfer et al. 2012, 21).

See Figure 3.

To measure perception of climate change mitigation policy in general, I used 2010-2014 World Values Survey Data measuring perception of the environment as a priority, namely whether the environment should be given priority, even if it causes slower economic growth and some loss of jobs. Of 2046 cases, 47.7 percent of Germans surveyed agreed that the environment should be given priority, while 39.1 percent believed that economic growth was more important than environmental protections. Interestingly, 10.4 percent had an “other” answer. See Figure 4.

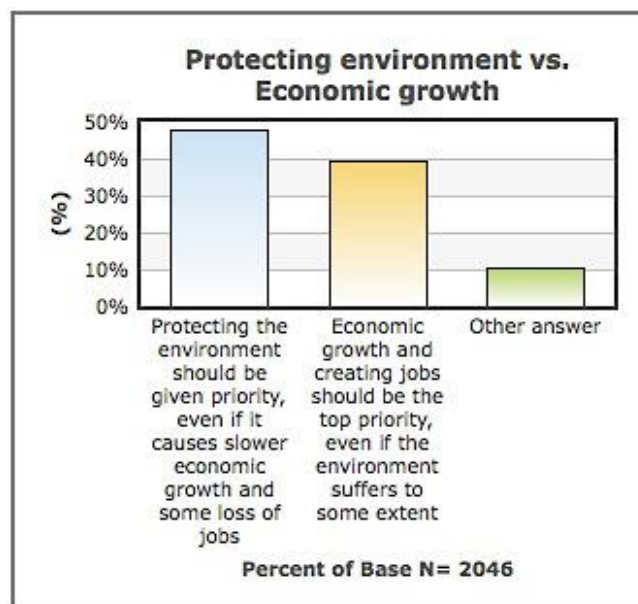


Figure 4 (World Values Survey)

United States

While the United States has recently enacted several climate change mitigation policies, they all selectively target a single emissions sector. The most recent policy that works to target multiple emissions sectors is the 1990 Amendments to the Clean Air Act of 1963/1970. The amendments, which this study will focus upon, require the issuance of technology-based standards for major emissions sectors (that have the potential to emit 10 tons per year or more of

a hazardous air pollutant or 25 tons per year or more of a combination of hazardous air pollutants). The Amendments focus on reducing the effects acid rain, which is of course a symptom of polluted air rather than a cause. They also eliminated some ozone depleting substances. They focus on the United States' transportation sector, which is its most emissions intensive sector, by setting up flexible performance standards that combine cleaner fuels and more fuel-efficient technologies to reduce car and truck emissions, but also include measures in the industry sector. They also promote low sulfur coal and natural gas use and encourage the use of market principles like emission banking and trading, however do not set definitive timeframes or penalties for not utilizing these programs. The Amendments to the Clean Air Act, therefore, receive a "2" on my policy scale because it does not target all UN emissions sectors, though it does target the United States' most emissions-intensive sector, being transportation.

The United States has a much higher number of ENGOs than most other countries, at 311, yet has a membership and staff population much lower than others, at 637,063 people. Adjusted per capita, .2 percent of the

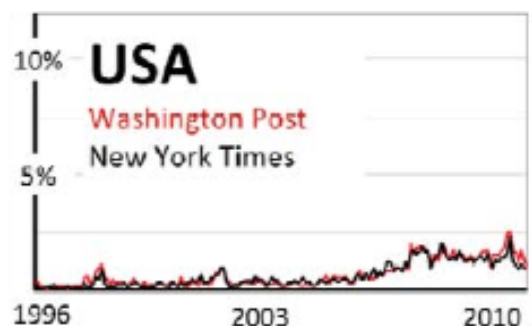


Figure 5 (Schäfer et al. 2012, 19)

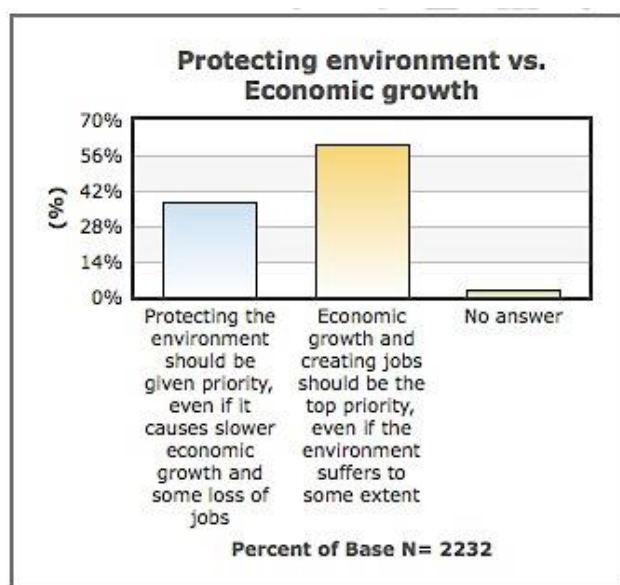


Figure 6 (World Values Survey)

U.S. population is directly and actively involved in an ENGO (*Encyclopedia of Associations: International Organizations*). Approximately .67 percent of media attention from the New York Times and The Washington Post mentioned climate change between 1997 and 2009,

with a gradual increase over time and then a spike in attention from 2006 to 2009 (Schäfer et al. 2012, 21).

The World Values Survey found that 37.2 percent of Americans value protecting the environment over economic growth, compared to 60.2 percent of Americans who value economic growth over environmental consequences based on 830 total cases.

Findings Discussion

Although conclusions are difficult to make based on the results of only three case studies, my original hypothesis was incorrect in some respects, and may hold true in others. I hypothesized that media attention on climate change and environmental non-governmental organization membership per capita are contributory factors to a public's perception of climate change. I also hypothesized that a public who has a positive perception of climate change, that is one who preferences emissions-reducing policy over growing the economy, is more likely to see climate change mitigation policy implemented in their democratic governments.

Media appears not to influence mitigation policy perception nor the implementation of that policy. Both the United States and South Africa had higher media attention on climate change, yet the populations of both countries still perceive economic growth to be more important than environmental protection. Therefore, media attention does not lead to public support for climate change mitigation policy nor does it effect the implementation of that policy, and seems to have the opposite effect in my case studies, though further cases would be necessary to definitively conclude this.

However, Germany, with its dramatically higher rate of ENGO membership and staff support based on population also had a public that favored environmental protection over

economic growth. It also had the strongest climate change mitigation policy based on my scale. Based on these findings, in Germany, ENGO support may lead to this perception and policy reality, or it may merely be a reflection of the policy existence and other factors within German society. As Schäfer et al. explains,

The situation in *Germany* is quite different. It seems that climate change has been early established in the media and in politics as certain, serious problem about which science agrees by and large (Grundmann, 2007: 419; Weingart, et al., 2000: 274f): Peters and Heinrichs (2008: 14) e.g. find that the analyzed national and North German media coverage “closely mirrors the position of the scientific community as documented in the IPCC reports”.... Climate change has, at least since the mid - 2000s, become a central topic for organizations of this environmental movement. Business and industry organizations, in contrast, seem to have retained from massive intervention into the debate – unlike the situation in Australia or the United States... Thus, we suppose that both international and national political factors strongly affect issue attention cycles in Germany (Schäfer et al. 2012, 23).

Additionally, the majority of Germans support climate change mitigation policy, which has translated to, or reflects, the implementation of one of the most progressive pieces of climate change mitigation policies in the world, though the direction of causal flow here is unclear. Although the scope of my study does not cover an explanation

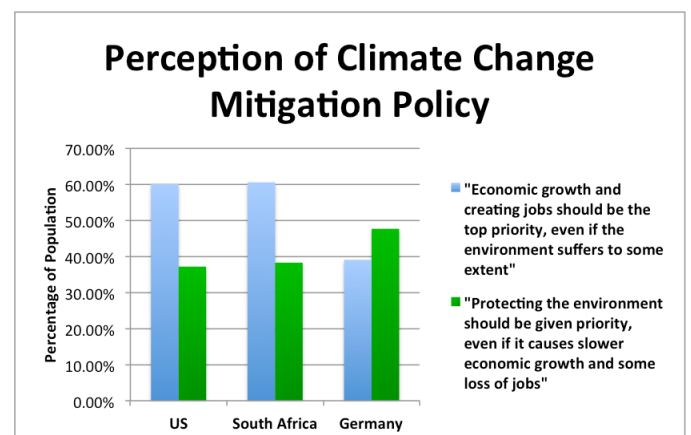


Figure 7 (World Values Survey)

of other factors beyond media and ENGO membership that might result in the unique German situation that seems to most closely be supported by my hypothesis, the topic clearly deserves greater research and further analysis in order to provide a model for other countries to strive toward if they are interested in reducing the impacts of climate change.

Furthermore, the similarities in perception of climate change mitigation policy between South Africa and the United States (see Figure 7) is noteworthy, especially considering the large differences in data for all other variables studied. Both South Africa and the United States have similar histories of racial inequality and discrimination, however the ways that this factor may affect the variables is also beyond the scope of this study.

Future studies would benefit from incorporating greater numbers of cases in order to concretely explain the statistical significance of the variables surveyed. They would also benefit from a more detailed analysis of the history of climate change mitigation policies in regard to the variables studied in order to more fully understand how national and international events impact media coverage, ENGO support, and policy perception.

While it appears the causal chain I initially hypothesized does not flow in a simplistic single direction, the states studied that have higher population membership in ENGOs have more positive perceptions of environmental policy, which seems to translate into more comprehensive policies. Though these findings are not conclusive, perhaps they can provide a doorway in which states may step into as they move toward mitigating the damaging impacts that climate change will bring.

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