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Laura Wagner, BA

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Abbreviations

ACCA:	Administration Center of China's Agenda 21
ACCC:	Adapting to Climate Change in China Project
CA21:	China's Agenda 21
CBD:	Convention on Biological Diversity
CDM:	clean development mechanism
CE:	Critically Endangered
CER:	certified emission reduction credits
CFC:	Chlorofluorocarbon
CITES:	Convention on International Trade in Endangered Species
CO ₂ :	Carbon Dioxide
CP:	Cleaner Production
CSD:	Commission on Sustainable Development
DBU:	Deutsche Bundesstiftung Umwelt
EFEC:	Environmentally Friendly Enterprises Certification
EIA:	Environmental Impact Assessment
EIAL:	Environmental Impact Assessment Law
EMEP:	Environmental Monitoring and Evolution Program
EN:	Endangered
ENGO:	Environmental Non-Governmental Organization
EPB:	Environmental Protection Bureau
ESIEMO:	Endangered Species Import and Export Management Office
GEF:	Global Environmental Facility
GHG:	Greenhouse Gas
GKU:	Green Korea United
HCFC:	Hydrochlorofluorocarbon
IEI:	International Environmental Institution
IESD:	Institute of Environment for Sustainable Development
IMF:	International Monetary Fund
KFEM:	Korean Federation for Environmental Movements
LCA:	Life-Cycle Assessment
LMO:	Living Modified Organisms
MBI:	Market-based Instruments
MEA:	Multilateral Environmental Agreement
MEP:	Ministry of Environment Protection (of China)
MOE:	Ministry of Environment (of South Korea)
MOFERT:	Ministry of Foreign Economic Relations and Trade (of China)
MOST:	Ministry of Science and Technology (of China)
MLF:	Multilateral Fund
NATO:	North Atlantic Treaty Organization
NBDAP:	National Biodiversity Action Plan (of South Korea)
NBSAP:	National Biodiversity Strategy and Action Plan (of China)
NCSD:	National Council on Sustainable Development
NEPA:	National Environmental Protection Agency (of China)
NGO:	Non-Governmental Organization
ODS:	Ozone Depleting Substances
OECD:	Organization for Economic Co-operation and Development
PMO:	Project Management Office
PRC:	People's Republic of China
ROK:	Republic of Korea

SARS:	severe acute respiratory syndrome
SEPA:	State Environmental Protection Administration (of China)
SMEs:	small and medium-sized enterprises
SO ₂ :	sulfurdioxide
SPC:	State Planning Commission (of China)
SSTC:	State Science and Technology Commission (of China)
TCM:	Traditional Chinese Medicine
UN:	United Nations
UNCED:	United Nation Conference on Environment and Development
UNCHE:	United Nation Conference on the Human Environment
UNDP:	United Nation Development Program
UNEP:	United Nation Environmental Program
UNESCO:	United Nation Educational, Scientific, and Cultural Organization
UNFCCC:	United Nation Framework Convention on Climate Change
UNIDO:	United Nation Industrial Development Organization
WACA:	Wild Animal Conservation Act
WB:	World Bank
WHO:	World Health Organization
WTO:	World Trade Organization
WWF:	World Wildlife Fund

1 Introduction

China's capital Beijing covered by smog, with visibility down to only 20 meters has turned into a familiar picture that is going around the world.

More and more frequently alarming reports and pictures reach us showing catastrophic consequences of the degradation and destruction of the natural environment on earth. Although the number of environmental institutions and organizations has strongly increased during the last decades, the dimension of environmental problems seems to grow instead of shrinking. Thus, these developments lead to the questioning of the effectiveness of environmental institutions and their issued treaties.

The environment has evolved into a significant factor in politics, economics, and the social life of people. Especially with the appearance of environmental problems and their recognition as lifestyle-threatening or even life-threatening issues, the world has come to attach greater importance to them. These environmental problems have further motivated the establishment of environmental institutions that operate at a global scale and seek to improve the environmental situation on earth. As science evolved and environmental challenges were increasingly acknowledged, the desire and will to protect the environment to ensure livable conditions for future generations developed at the same time. Nonetheless, the literature of scholars and scientists concerning environmental politics and its conservation was not expanded before the 1970s, when a growing maturity of the field could be observed. Prior to that movement, taking place especially between 1978 and 1988, many scholars deplored the incompleteness and availability of information on environmental politics (Lester 1989). As a consequence, our current understanding and knowledge on environmental politics and policy-making dates back to this period of time, when basic contributions were made about the necessity to integrate the environmental issue into politics. Generally speaking, environmental institutions were created in order to address environmental issues and thereby impact on individual countries, since the terrestrials who live in these countries are responsible for changing the environmental situation. Thus, the overall question of 'what does this impact look like' emerges followed closely by the question of 'how effective this impact is'.

On numerous occasions the significance of International Environmental Institutions (IEIs) is debated and there exists a large community that ascribes rather low relevance to these

institutions. However, throughout the twentieth century the number of environmental problems has soared dramatically and possible responses were discussed. Along with that process first conventions, agreements, and protocols were developed to assure the commitment by contracting different parties through the signing of treaties. Given the considerable expansion of IEIs, the issuing of treaties, and the critique regarding their relevance, the question of whether their expansion and increase is significant and expedient arises. Encouraged by the skeptical approach toward this debate the aspect of the relevance question emerges as particularly interesting. It concerns the effectiveness of IEIs and their conventions and protocols. Since the environmental responsibility of humans is connected to IEIs, noteworthy efforts are dedicated to IEIs and great amounts of money are spent on this matter, the question about their effectiveness deserves to be analyzed and answered if possible. Therefore, the overall question of this paper that will guide the research is the assessment of the effectiveness of International Environmental Institutions, or more precisely, the effectiveness of conventions representing IEIs. The core element of this research together with the previous theoretical approach will be an empirical analysis of two countries, in order to assess the effectiveness of IEIs on the national level at a later stage. The two respective countries are the People's Republic of China and the Republic of South Korea. Additionally, it needs to be added that the IEI's effectiveness will be judged in relation to environmental governance in China and South Korea to define criteria to assessing the influence of IEI's work. In case only the general impact on these countries is measured, the topic is not limited since effectiveness can comprehend all parts of the environment. Thus, it is necessary to restrict it by using environmental governance as a reference and thereby comprising the mode of directing the country both in a governmental and a social sense.

China and South Korea are both East Asian countries sharing a large degree of their historical benchmark data but having developed in different directions. Both states have experienced colonialism and invasion by foreign countries, have attacked each other and have officially normalized their relations in the first years of the 1990s. Apart from sharing a common history, China and South Korea are characterized by great economic growth and social advancement throughout the last decades. It is highly interesting to investigate the effects on China and Korea's environmental governance as both countries are struggling with enormous environmental challenges. In short, the intention of this research paper is to assess the effectiveness of International Environmental Institutions with respect to environmental governance in China and South Korea by reviewing previously gathered information. To

formulate a question: Are IEIs effective and how do they affect national environmental governance in the corresponding countries? As the number of institutions and relevant conventions has increased and many people dedicate their work to environmental institutions, it is assumed that these do have an impact, which leads to the formulation of the hypothesis that conventions and protocols are created for a purpose and are effective in the majority of cases to a certain extent. The general motivation to work on this topic has been the impression of and disappointment about the incapacity of IEIs to affect and improve environmental governance in East Asian countries.

To clarify the significance of this paper, it needs to be mentioned that in case the extent of effectiveness can be identified and the sections where they are effective can be specified, additionally assessments about deficiencies and areas where catching up is required can be clarified.

In terms of the structure and organization of this research paper, it will start with the task of making the state of the art explicit and giving the necessary theoretical background information for the subsequent elaboration of methods. Firstly, an approach of the evolution of IEIs and conventions will be created, followed by an analysis of environmental governance, its origins and its relevance. In continuation the methodological framework will be constructed, adapted from the given theoretical approaches and the introduction of the ‘effectiveness component’. After having explained the necessary methodology, relevant criteria are extracted in order to assess effectiveness. The criteria correspond to both conditions and judgment of effectiveness and can subsequently be applied to the empirical analysis of China and South Korea.

With reference to the application of the criteria it seems important to address the *modus operandi*. Since a general assessment of IEIs seems rather imprecise and less significant, five conventions and protocols taken from different areas have been selected to be judged in consideration of the elaborated criteria. In order to offer a wider scope of fields, the particular areas are the conservation of biodiversity, endangered species, ozone depletion, climate change, and general protection of the environment, meaning in particular the integration of the concept of sustainable development.

The assessment will mainly address institutional arrangements, social changes and movements, governmental development, and the interplay of government and society observed in the environmental realm. As the abstractness of the term ‘effectiveness’ already

indicates, this research is undertaken in a qualitative form based on the previous findings of scholars and scientists operating in the environmental field and all other fields related to environmental politics. Thus, secondary literature will be essential for this work's results. In addition, it needs to be mentioned that due to the personal linguistic inaccessibility, Chinese and Korean literature will not be utilized. As a consequence, there is a primary focus on English and German literature throughout the research of this paper. Furthermore, since the work will center environmental conventions and protocols, the original texts of these treaties will also be included and cited on occasion.

The five conventions serving as starting points to analyze the influence on China and South Korea's environmental governance are the Convention on International Trade in Endangered Species, the Convention on Biological Diversity, the Montreal Protocol, the Kyoto Protocol, and Agenda 21. It has been agreed on the application of the criteria of effectiveness for the different conventions and protocols respectively, since the overview and order would suffer in case the organization was vice versa, i.e. if the conventions were assigned to the different criteria.

State of the Art

As literature on the exact research topic is not available, first of all steps were taken away from the question; instead a broader context referring to environmental politics and environmental governance as a theoretical framework has been identified. The following research paper draws especially from the work of Evans (2012) on 'Environmental Governance' and Connelly and Smith's (1999) 'Politics and the Environment' as well as Kütting's (2011) 'Global Environmental Politics: Concepts, Theories and Case Studies'.

Generally speaking, it needs to be explained that various authors have been engaged in investigating institutions' effectiveness, or as it is referred to by many scholars, effectiveness of regimes or organizations. The overall assumption, especially opined by Haas, Keohane, and Levy (1993), sees the International Environmental Institution as an umbrella term comprehending the different elements of organizations, regimes, and conventions. One of the most known representatives for analyzing regimes and their effectiveness is Oran Young (1989, 1999), who speaks of regimes as "a set of rules, decision-making procedures, and/or programs that give rise to social practices, and govern their interactions" (Young 1999:5). In continuation, Breitmeier, Young, and Zürn (2006) take a further step and gather different approaches for the assessment of effective international environmental regimes in their work

‘Analyzing International Environmental Regimes’. Although they agglomerate various categories to measure environmental regime effectiveness, they rather draw the attention to methods judging a regime while effectuating their tasks. As a consequence these authors neglect to include conditions for a regime to be effective. At this point, again Haas, Keohane, and Levy (1993) come into play as they identify three conditions for an effective IEI. In the light of environmental regime effectiveness an additional approach needs to be mentioned, as Young and Levy (1999) intended to capture all possible methods to determine their effectiveness and list a number of points of view. In ‘Environmental Regime Effectiveness’ Miles et al. (2002) differentiate between three possible consequences of a regime trying to find a way of ascribing values to outcomes. Ronald Mitchell (2010) concentrates on the effectiveness of International Environmental Agreements (IEA) in ‘International Politics and the Environment’. Beside a discussion on the aspect of achieving goals, he emphasizes the different elements influencing the effectiveness of an IEA. A similar approach is presented by Weiss and Jacobson (1998), who analyze environmental accords and argue that effectiveness is only an additional factor to compliance. Nonetheless, this research seeks to analyze the effectiveness of environmental institutions and their conventions on environmental governance; therefore environmental governance needs to be incorporated into the theoretical framework. Research in the field of governance is abundant, though, it is limited when it comes to domestic environmental governance in particular countries.

Evans (2012) offers a modern discussion on environmental governance and specifies different governance modes and constructs a relation between said modes and IEIs. However, he leaves out the effectiveness component. Due to the overall goal of prompting a good style of national environmental governance, Glasbergen (1998), Meadowcroft (1998), and Lockwood (2010) have elaborated approaches to distinguish the desired way of governing from bad governance. Nevertheless, these investigations are not targeted to address environmental governance of individual countries.

In relation to China, Oksenberg and Economy (1998) have analyzed the influence of different factors on the country’s environmental governance however they only consider the Convention on International Trade in Endangered Species and the Montreal Protocol. Zhang (2011) and Zhao (2005) have touched upon the effectiveness of climate protocols; McBeath and Tse-Kang (2006) contribute to biodiversity conservation through the identification of the international impact on biodiversity in China. Kent (2007) provides a general analysis on China’s compliance with international organizations and also concentrates on environmental institutions. With regard to South Korea, even less English literature can be found on the

subject. As environmental protection is a rather modern phenomenon in Korea only a few contributions are available in English on this topic. Chung and Kirkby (2002) take a short look at areas such as climate protection and biodiversity conservation in South Korea, whereas Shim (2010) examines Korea's new strategies to address environmental degradation, encouraged by the international community.

As a result, it becomes clear that literature and research on the different elements of the guiding question is available. However, by merging these elements to one research question a niche becomes visible, since little research has been undertaken on national environmental governance in China and South Korea and even less on the effectiveness of IEs concerning China and South Korea's environmental governance.

2 Theory and Methodology

2.1 International Institutions/Regimes and Conventions

The creation of institutions dedicating their activities in order to combat environmental degradation can be observed since the emergence of environmental consideration and concern. For their part, International Environmental Institutions (IEIs), as they are mainly referred to in this thesis, and their conventions have received a series of different names throughout the last decades, reaching from Environmental Regimes to International Environmental Organizations and Intergovernmental Environmental Organizations. Their products, commonly termed conventions, have also been named agreements, accords or other. To start from the very beginning of the theories on international environmental institutions, the concept of an international regime must be clarified. Speaking in general, there have been various approaches to define an international institution. Thus, Krasner presents a definition that utilizes the name 'regime' and he states: International regimes are "principles, norms, rules and decision-making procedures around which actor expectations converge in a given issue-area" (Krasner, 1983:1). To Krasner, regimes matter and stand between causal variables and related behavior and outcomes, for which they are considered an independent variable that induces behavior and produces outcomes (Krasner, 1983).

To give another example, Young introduced the term regime as mentioned above. He states, "regimes can and certainly vary along a number of dimensions, most obviously in their functional scope, geographic domain, and membership" (Young, 1999:5). Therefore, the basic assumption of rules and principles persists, though Young adds the consequence of social practices. According to Connelly and Smith, who go one step further, stable regimes "may provide the condition for actors to exchange information and understandings of environmental problems. As such, social learning is promoted" (Connelly and Smith, 1999:188). While this definition integrates the component of knowledge in terms of environmental problems, Young's systematic approach assumes that a number of variables can have an impact on governance, while Connelly and Smith in particular focus on interaction regarding the exchange of ideas. All these elements are important when it comes to making a regime or institution work and produce effective outcomes. Haas, Keohane, and Levy also speak of a set of rules and practices which "may take the form of bureaucratic organizations, regimes (rule structures, that not necessarily have organizations attached, or conventions (informal

practices)” (Haas, Keohane & Levy, 1993:4-5). The following work will focus on IEIs and their ‘informal practices’, referring to the usage of conventions as case studies. Since conventions are a substantial part of International Environmental Institutions, firstly, it is necessary to clarify the significance of international relations for the effectiveness of IEIs.

2.1.1 IEIs and International Relations

In general, the formation of those institutions in relation to their aim may be considered from different points of view in the same way that the perception of ecological problems is not always equal. An overall categorization distinguishes between an optimist and pessimist attitude in terms of addressing environmental issues. The field of environmental politics is strongly shaped by this tension between pessimists and optimists since the former ones think of international environmental problems as a common issue but of the possibility of their resolution as rare (Mitchell, 2010), whereas optimists believe in the potential chance of finding solutions.

In terms of the IEI’s relevance, a realist assumes the prevailing condition of war and the potential keeping of peace because of the balance of power between powerful states. Neo-realism puts an emphasis on the states’ position as self-interested egoists who only seek to maximize their welfare without considering others’ needs. According to neo-realists there is no organization that has authority over states (Connelly & Smith, 1999). Realists would position a scenario of transnational governance within global capitalism wherein states seek to expand their power and seek global control in political and economic terms. A liberalist would consider this assumption as an abuse of international institutional mechanisms. Thus, the concept of an international institution directing and regulating global environmental issues seems irrational for neo-realists. Liberalism, on the other hand, has traditionally emphasized the ideas of freedom and democracy. These ideas have been altered by neo-liberalism, emerging as newer thoughts and challenging harmonious green thinking. However, liberalism generally highlights the extension of rights of future generations and other living creatures (Connelly & Smith, 1999). According to the liberal discourse about a global governance of IEIs, transnational activism has to be intensified aiming for a powerless state in the globalized world. In addition, the democratization of global governance should be strengthened (Ford, 2011). Neo-liberal institutionalists are convinced that there exists the possibility that problems of collective action can be solved and institutions or regimes are able to work in a successful way. Although they accept the realist ideas of anarchy and egoism, they add that powerful

countries are capable of establishing regimes and acknowledge the benefits of cooperation. Usually the United States are regarded as being in this powerful position especially in military terms, whereas in the environmental field their influence seems to be diminishing (Connelly & Smith, 1999).

Power, especially in international relations, is regarded as a ruling and determining component in terms of hegemony and cooperation. According to Keohane (1984), distributing power entails the construction of property rights and within these patterns wealth is created and distributed. In the concept of wealth and power the individual state plays the most important role. There is no ruling authority located above the states. This approach to power relations leads to the theory of hegemonic stability that argues that a single dominant power establishes order in global politics. Thus, international regimes are usually created according to hegemonic structures, which keep order and stability. To integrate cooperation in this concept, cooperation is found in the mutual adjustment of state policies, but also in hegemonic stability (Keohane, 1983).

As far as this approach is concerned and in regard to international environmental institutions, power constellations always matter and strongly affect activities concerning the environment, not only in the international arena but also domestically. In terms of the state's function, it is assumed that it can either act as a cooperative character with other states, or a more egoistic character, particularly interested in its own benefits. According to this assumption the limitations of a realist, liberalist or institutionalist view are not as definite as they used to be. This, of course also leads to the critical aspect, that states may only cooperate when it benefits them (Weiss, 1999), which is further important concerning the effectiveness of international accords.

2.1.2 The environmental problem and the evolution of IEIs

The first recognition of the existence of environmental problems can be traced back to the end of the nineteenth century. Actual measures to protect the environment started with the protection of fish, whales and seals shortly before the Second World War. By 1950 new measures were taken to combat marine pollution, habitat degradation and the disappearance of various species in danger of extinction. At that time the field of international environmental politics was still at the political margin and in the 1970s did it become a subfield of the area of international relations, only present in the United States at that time (Mitchell, 2010). The 1972 United Nation Conference on the Human Environment (UNCHE) in Stockholm marked

the beginning of the recognition of environmental degradation and the emergence of the will to protect the environment. At the end of the twentieth century the North Atlantic Treaty Organization (NATO) published a study providing scientific evidence for climate change, which had become increasingly obvious at the beginning of the twenty-first century. NATO put it in relation with security policy (Vogler, 2011). 1992 UN Conference on Environment and Development (UNCED) was later interpreted as the watershed in international environmental politics hence transnational actors were involved in global environmental politics for the first time. In addition, 1500 existing non-governmental organizations (NGOs) gathered to support environmental conservation processes (Ford, 2011).

Aside from approaches made by international relations theorists, at a very basic level, the establishment of an IEI and the following elaboration of environmental accords and agreements must have responded to at least one environmental problem, which motivated actors to form the institution in the first place. Thus, attention primarily has to be drawn to the environmental problem itself to see for which reasons IEIs were established and why agreements have been issued. The basic idea of the emerging problem of individuals making use of scarce resources was captured by Garrett Hardin (1968), who developed the concept of environmental degradation as a consequence of human behavior (Hardin, 1968). The nature of environmental challenges often assumes transnational forms and can be connected with the phenomenon of economic globalization (Vogler, 2011). Although international relations of the environment can be traced back to the formation of international co-operations, it was originally not about war and peace. According to Vogler (2011) the only exception might be the implementation of nuclear weapons, which can have tremendous environmental consequences.

On the other hand, Karns and Mingst emphasize the importance of people and organizations stepping up for the environment since much broader dimensions are affected including human rights and security matters. Environmentalists, such as Chica Mendes, a Brazilian leader of the rubber trappers, have been murdered because of their activities. Concerning security, Karns and Mingst argue that the lack of resources has motivated a number of wars, like petroleum led to Japan's aggression in China and Southeast Asia. Therefore, in their opinion, issues concerning the environment can have important implications for the fields of economy, security and human rights (Karns & Mingst, 2004).

Speaking in general, according to Mitchell "environmental degradation is, to be sure, caused

when each of a large number of people has access to large amounts of resources and has technological options that are pollution intensive or otherwise impose significant environmental damage” (Mitchell, 2010:78). Thus, environmental degradation occurs due to the usage of natural resources and the environment by human beings.

Although a major issue is still the overall conscious ignorance towards environmental degradation, the global community has mostly recognized its existence, which means, that it is not any more a question of whether states act but how they respond. A supplementary problem in the light of environmental protection is that not even among “greens” there is a consensus about the “right” solution and responses to environmental degradation (Connelly & Smith, 1999). In the environmental field and regarding the treatment of environmental problems a number of challenges emerge when it comes to addressing the problem in an adequate manner. Among those issues there is still a scientific uncertainty about many major challenges, as is the case with scientific foundations for the reasons of greenhouse gas emissions (GHG emissions). Another significant issue is the transboundary character of environmental problems that often are not limited to the territory of one country and requires international cooperation (Evans, 2012). Thirdly, the role of the values that are attached to environmental issues is still particularly small, since a great part of the international community has no interest in the environmental situation. A factor resulting from the previous aspect is the role of law that is characterized by a non-existence of sufficient or efficient laws and an appropriate legal structure for the integration of environmental issues, both on a national and international level (Mitchell, 2010). Moreover, a trend can be observed that the current system of nation states prefers competition to cooperation (Evans, 2012). There exist many other aspects that challenge environmental protection; for instance the role of incentives (since the usage of natural resources is not appropriately priced) or the role of power (due to the dominant position of powerful players) (Mitchell, 2010). All these obstacles emphasize the relevance of international institutions and their conventions to overcome them and jointly engage in environmental protection.

Having mentioned power as determinant for addressing environmental challenges, it has to be noted that especially in the international arena power appears to be an important variable for the position of states. In international relations the power of certain countries plays an important role, which can also be applied to environmental politics. A stronger state may be able to push a weaker state into being held responsible for some environmental problems that actually occur on a global level. A powerful state is in a position to either take the lead in

opposing or supporting an action (Mitchell, 2010). The whole concept of power and states can be transferred to the domestic level where different actors assume different roles in terms of environmental protection. Some are more powerful than others (mostly the government as a player) and the weaker ones may not have a say in environmental policy-making. In terms of developing countries, they have always been invited to international environmental meetings. However, usually the agendas are directed to western issues and ideas. As a consequence, often developing countries participate but without adequate preparation (Gupta, 2005). Therefore, environmental protection faces a number of challenges and restrictions. Out of the unwillingness or incapacity to take action, the idea of creating institutions responsible for coordinating and improving environmental protection was born. In addition, environmental conventions have been introduced to agree on a set of joint responses that include measures to prevent the environmental situation from degrading.

2.1.3 Environmental Conventions and Agreements

As indicated in the beginning, IEIs are understood as a set of rules, regulations, and practices, and can act by generating conventions to ratify. The typical multilateral environmental agreement (MEA), or International Environmental Agreement (IEA) subordinate to conventions, are commonly used to record the necessary procedures and provisions accepted by the respective participants.

Especially during the 1980s and 1990s MEAs experienced a great development and during this period more than a hundred agreements were signed (Kütting, 2011). In most cases, environmental agreements are established on a voluntary basis and not always consist of binding targets. On the one hand, they are easier accessible and address potential participants that are willing to show commitment; on the other, the non-binding character can also decrease the possibility that the different members follow the accepted regulations. Furthermore, there is a persistent problem of freeriding, which means having the work executed by others and only enjoying the benefits of the outcome. Therefore, the more parties join the agreement, the more beneficial it is.

In particular, the environment is an area where universal membership is necessary due to the global character of many environmental problems. Not only international and national borders and the lines between public and private are becoming blurred, but also the limitations between binding and non-binding tools are not that clear any more (Weiss & Jacobson, 1998). Since the social, political, and economic circumstances in a country affect the absorption and

incorporation of an IEA, these aspects need to be taken in account. Thus, there are various reasons for the failure of IEAs such as incapacities of the state to comply with the treaty targets, or a traditional background that inhibits the effectiveness of an IEA (Mitchell, 2010). Moreover, the agreement itself might have deficiencies or for instance unreasonable goals that are unrealistic to reach.

For their part, international environmental conventions are linked to organizations and have been identified as a set of rules. Due to the complexity and merging of effects resulting from organizations and their conventions, the umbrella term “institution” (Haas, Keohane & Levy, 1993:2) will be predominately used and therefore, the effectiveness of IEs will be judged. Before going deeper into the analysis of environmental governance, the relevant institutions resulting from, or being linked to the United Nations have to be discussed, as they will be an essential part of the empirical analysis.

2.1.4 The United Nations and environmental protection

After the United Nations arose from the former League of Nations and environmental concerns were formulated, the organization adopted a key role in environmental protection. In general, the UN has six primary organs, the General Assembly, the Security Council, Economic and Social Council, the Secretariat, the International Court of Justice and the Trusteeship Council. At the moment there are seventeen specialized agencies and twelve additional bodies (Evans, 2012). As mentioned above, first steps towards an apparatus against environmental degradation were taken with the 1972 Conference on the Human Environment in Stockholm. Due to the amplitude of conferences, accords, programs, and agreements, only a selection will be presented in this analysis. Speaking in general, the Stockholm Conference is regarded as having been effective in the sense that it made clear the need of introducing environmental issues in the agenda setting of the UN and the political agenda of governments (Karns & Mingst, 2004). The soft-law statement of twenty-six principles, published in the course of the Stockholm Declaration, sought to give “a common outlook (...) to inspire and guide the peoples of the world in the preservation and enhancement of the human environment” (UNEP, 1972). In summery, UNEP appealed for coordination and cooperation in terms of activities against environmental degradation.

During the 1972 Conference on the Human Environment, the need of a special program designed for environmental issues became clear and subsequently the United Nation

Environment Program (UNEP) was brought into being. The UN-Governing Council consisting of 58 nations was credited with the assessment of the global environment and thereby decided on UNEP's priorities. In Nairobi, a UNEP Secretariat was established to coordinate activities within the UN system and a voluntary environmental fund was installed, supplemented by the UN budget. UNEP itself declares the 1987 Montreal Protocol of the Vienna Convention for the Protection of the Ozone Layer as its most relevant achievement of the time (UNEP, Organization Profile). The Montreal Protocol on Substances that Deplete the Ozone Layer entered into force in 1987 and was signed by 167 states, which implemented national policies against ozone-depleting chemicals (Fisher, 2004). During the same period, the Report of the Brundtland Commission, with the title *Our Common Future*, was published and for the first time gave a clear definition of what is meant by sustainable development. It included politics, economics, technology and other fields and presented concrete measures of how these systems should be altered to provide the foundations for sustainable development (Report of the World Commission on Environment and Development, 1987). The main statement therefore was to balance environmental concerns with economic growth.

Speaking in general, the central importance of UNEP is its ability to coordinate and monitor international action. In addition, it assumes a pivotal role in raising awareness, organizing conferences, staying in contact with other organizations and fostering research. To give an example, concerning air pollution UNEP has taken a key role in gathering and managing scientific knowledge. Measured by its limited budget and staff it has an important influence on environmental governance (Connelly & Smith, 1999). According to Evans, the three most important duties in terms of environmental protection and international decision making processes for environmental governance are the provision of a global framework for environmental politics, the development of international databases and the establishment of a number of agreements (Evans, 2012). Thus, at the beginning of enhancing environmental protection through an administrative body, it was especially significant to put environmental issues on the table, both globally and domestically, and integrate them into international negotiations. One aspect that especially limits UNEP's activities is the problem of funding, since only a poor amount of money is allocated to it. On many occasions the idea of upgrading UNEP to agency status and thereby giving it more power, in particular legal and political powers, was proposed, as well as elevating its governing body to general assembly status (Biermann & Steffen, 2005).

To be found among the earliest conventions is the **Convention on International Trade in Endangered Species (CITES) of Wild Fauna and Flora**. The initial idea for this convention emerged in the 1960s but the completed text of the convention was signed in 1973 and entered into force in 1975. This international voluntary agreement seeks to protect animals and plants that are threatened or even in danger of extinction as a consequence to being traded. Each of the 178 parties is expected to implement the agreement and take necessary measures at a national level. CITES has a Secretariat in charge of administration and coordination and it is generally financed by the CITES Trust Fund (CITES, 2013). The Convention covers about 5000 species of animals and 29000 species of plants and is closely related to the International Union for Conservation of Nature (IUCN) that periodically publishes a Red List where endangered species are registered and grouped according to their status and degree of threat.

As mentioned above, the **Montreal Protocol** was originally designed to eliminate substances that deplete the ozone layer (ozone depleting substances or ODS); it was completed by September 1986 and entered into force in 1989. The Protocol was then amended several times, through the London Amendment 1990, Copenhagen Amendment 1992, Montreal Amendment 1997 and the Beijing Amendment in 1999. Additionally, the Multilateral Fund (MLF) was installed to financially support Article 5 countries (developing states whose annual per capita consumption and production of CFCs and halons is less than 0,3 kg per capita when agreeing to the Protocol) in reaching their provisions and targets. In 2007, special attention was drawn to the ODS of hydrochlorofluorocarbons (HCFCs) and it was decided on the target to freeze and phase them out in Article 5 countries, starting in 2013 (UNEP, 2013).

The next important cornerstone was the **1992 UN Conference on Environment and Development (UNCED)**, or Earth Summit in Rio de Janeiro. The UNCED outcomes were more complex than the Stockholm results, but marked the starting point for a new era of environmental governance. In addition, the permission for membership was broadened for NGOs, which led to the participation of 14.000 NGOs (Biermann & Bauer, 2005). At this Conference the concept of sustainable development was implemented and a series of international treaties, in particular for climate change and biodiversity were signed, amongst others, Agenda 21. In order to implement Agenda 21 the Commission on Sustainable Development (CSD) was introduced since UNEP was restrained in its resources for environmental issues and there was no place for the implementation of all agreements of the

UNCED (Soroos 1999). Apart from Agenda 21, the UN Framework Convention on Climate Change (UNFCCC), the Convention on Biodiversity, the Rio Declaration, the Forest Principles, and the Convention to Combat Desertification were elaborated and signed in Rio (Evans, 2012). After UNCED, overall criticism about its limited success surfaced. However, one evident achievement was bringing together that many representatives of governments, Non-governmental organizations (NGOs), civil society, and others. It also attracted great attention from the media. Another interesting action during the Earth Summit was the formation of campaigns (led by NGOs) that sought to direct international economic institutions into greening, for instance, the World Bank (WB) or the International Monetary Fund (IMF), and World Trade Organization (WTO, more precisely at that time General Agreement on Tariffs and Trade GATT) (Soroos, 1999). Moreover, a parallel event was the Global Forum, which attracted 30.000 NGO representatives (Connelly & Smith, 1999).

As mentioned, the **Convention on Biological Diversity (CBD)** was additionally signed during UNED but prepared long before the conference. As the diversity of natural resources and ecosystems had been decreasing, a countermeasure needed to be developed and the Ad Hoc Working Group of Experts on Biological Diversity started researching the issue in 1988. About three years later, the Intergovernmental Negotiating Committee, as it was referred to by then, presented the text for the convention, which was accepted in May 1992 and opened for signing during and after the Conference in Rio (until June 1993). The CBD entered into force in December 1993. In 2000, the Cartagena Protocol on Biosafety to the CBD was ratified to promote the safe handling as well as transport and use of living modified organisms (LMO) evolving from biotechnology. Since LMOs affect biodiversity, the Cartagena Protocol was attached to the CBD. Furthermore, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity, adopted in 2010, is another extension to the CBD and, as the name already indicates, it addresses the share of benefits resulting from genetic resources (CBD, 2013). By implementing the CBD, many states have taken important steps to ensure the survival and continuity of biodiversity on earth.

For its part, the agreement of the **Kyoto Protocol**, linked to the Framework Convention on Climate Change (UNFCCC), was adopted in Kyoto in December 1997. This agreement set binding emission reduction targets for its participants, noticing the larger responsibility of developed countries and therefore burdening them more. According to the rules, implemented

in Marrakesh in 2001, the Kyoto Protocol entered into force in 2005 (UNFCCC, Kyoto Protocol). After the announcement of the United States not to ratify the Kyoto Protocol, Japan also considered not supporting it, depending on the States' decision under President Bush (Fisher, 2004). Despite being an international law, after the treaty's ratification, an enforcement body was absent so that countries could exit the treaty any time (Evans, 2012). Thus, although forty industrial countries (listed as Annex I countries) had to adopt the necessary policies to reduce their anthropogenic emissions of greenhouse gases (GHG) to the levels of the year 1990, the result was rather unsuccessful, since only a few could respond in an efficient way to the commitment and reach the targets by 2001 (Fisher, 2004).

Then, in 2002, the World Summit on Sustainable Environment (WSSD) was held in Johannesburg and it transcended the Rio Summit by thousands in terms of participants. During this second Summit a focus was placed on the role of society and the aspect of the way of implementation concerning sustainable development. The overall achievement of Johannesburg is the foundation of many new partnerships such as the European Union being allied with partners for renewable energy (von Frantzius, 2004). Biermann and Bauer (2005) on the other hand highlight the Johannesburg Plan of Implementation that especially stresses the significance of good governance and institutional changes in the UN system.

As already indicated, **Agenda 21** is considered the Rio Conference's major outcome, which sought to declare the principles for working with the environmental sector. However, Agenda 21 involves no legally binding rules, it works on a voluntary basis. A significant aspect of Agenda 21 was that its designers wished to combine political, social and economic interest groups. Obviously, in many cases contradictory aspects can be found such as the need of population control in some areas (opposed by the Vatican) or the reduction of fossil fuel usage (offensive for states that live on oil production) (Connelly & Smith, 1999). A special emphasis has been placed on better integration of environmental activities and monitoring the agenda of UNCED. Besides other functions, it was meant to work with the whole UN system and particularly important, to manage and coordinate the exchange of information between governments and NGOs (Haas, Levy & Parson, 1992). Agenda 21 composes 40 points separated into four different sections. The first section concerns social and economic dimensions that include the topics of poverty, health, consumption, demographic constellations, and its connections with environmental issues. Section number two treats conservation and management of resources for development and contains environmentally friendly management and the management of fragile eco-systems. In the third section the

strengthening of major social groups is stressed, for instance the role of partnerships, women, indigenous people and NGOs. The final section composes the means of implementation, including the role of governments and non-governmental agencies for technological transfer (UNCED Agenda 21, 1992). In the case of Agenda 21 and the Rio Summit in general, it is less helpful to only consider the documents but it makes more sense, since it is non-binding, to look at the effect on the awareness and consciousness of the public and the governments (Connelly & Smith, 1999). A breakthrough was the fact that Agenda 21 and its implementation form Local Agenda 21 especially focused on the national and local level. It takes into account local conditions and realities; cooperation of local authorities with each other and the national government is regarded as being particularly important.

2.1.5 Other institutions and NGOs

Besides from Environmental Institutions found and maintained by the United Nations, there are many other institutions that have connections to IELs or act in order to protect the environment. Some of these institutions exercise mainly economic functions and despite some initiatives to combat environmental damage have been criticized for their lack of environmental consideration. For a long time especially the World Bank (WB) has been observed critically since it only considered the environment when its projects were hindered by natural resources such as soil erosion provoked by forestry projects. During the 1980s and due to various controversial projects that included large deforestation or pesticide-intense agricultural measures, the WB's reputation began to degrade (Reed, 1997). Although WB has undertaken attempts of 'greening' its system, a major shift in its policies and the recognition of the limitation of environmental resources for the human being is still due to occur. In the 1990s, though, WB became the leading agency in the Global Environmental Facility (GEF), a multilateral funding agency that supports environmental projects financially, especially in developing countries. However, the GEF has earned similar criticism as the World Bank (Clapp, 2011). Originally the GEF was established in 1991 as a \$1 billion pilot program to invest in environmental protection. The GEF was foreseen to fund supplementary costs that arise when a project with national benefits is transformed into a project with global environmental benefits (GEF, 2011). The Facility is closely linked to UNEP, which is in charge of providing scientific knowledge and selecting support of the projects. Furthermore, it integrates NGOs in planning and implementation processes (Karns & Mingst, 2004). Although in 1994 the GEF turned into a separate institution and the integration of developing

countries in decision-making and implementation of projects was promoted, WB still plays the role of the Trustee of the GEF Trust Fund and manages administrative services (GEF, 2011).

Non-governmental Organizations (NGOs) have experienced a great rise in the last decades. Especially in the 1970s and 1980s the number of NGOs increased and the whole NGO sector was extended in total. To give an example, the African NGOs Environmental Network was created in 1982 and twenty-one NGOs were among the founding members. The number of members of Greenpeace jumped from 1,4 million in 1985 to 6,75 million in 1990 (Doyle, 1998:81). NGOs such as Greenpeace are also known as pressure groups that operate either at an international or national level, or both. Pressure groups are interpreted as social movements and besides Greenpeace, Friends of the Earth is considered the most famous one (Ford, 2011). Speaking in general, NGOs have been seen as the main protagonists of environmental politics since they appear as the most visible characters. They not only operate within the non-institutional dimension of social movement politics but also within institutionalized areas of political parties, the administration or the government (Doyle, 1998). Although there is a range of effective measures taken by NGOs, the mechanism of acting is mostly informal and does not work according to official rules, which in turn could over-represent interest groups (Evans, 2012).

2.2 Environmental governance at the domestic level

International Environmental Institutions have been established to improve environmental quality. Within this system, however, all depends on the national level and the implementation and enforcement by states. An environmental regime has no chance of success if the domestic laws and regulations are not implemented. Thus, domestic governance forms the basis of international environmental policy-making (Fisher, 2004).

The governance concept has recently emerged as a popular field for research and ideas such as ‘global governance’ or ‘global government’ offer an alternative to the traditional concept of a nation state.

The governance concept has its origins in the Cold War period. At that time, the question about how to govern the world and a more global thinking emerged. In general, the government concept differs from governance, since the state or the government has its foundations in an authority that gives security and maintains order to implement policies (Rosenau, 1992). Governance on the other hand, is a term used for a broader concept, includes more actors (Ford, 2011) and is supported by shared goals, not assured by authority powers such as the police (Rosenau, 1992). Thus, governance is a complex of rules that can only be successful in case it is supported by most of the actors (Rosenau, 1992). Kooiman (1999) presents a series of approaches in terms of defining governance, e.g. he explains the governance concept as an interactive action to enhance effectiveness as well as an approach that is open to new ideas and goes beyond the traditional concept of state.

In addition, governance is regarded as a mix of efforts to exercise governance and solve societal problems or create societal opportunities, in a private or public way, at different levels, in different forms of governing. Although the government still is the main actor in domestic governance, it seems more and more important to interact with societal actors. Moreover, it attends to institutions as contexts for these governing interactions (Kooiman, 2003). Therefore governance always involves action and interaction, and comprises a variety of actors. What Kooiman calls societal opportunities seek to make people understand that governance is not only a way of political ruling and directing of countries but it takes a step further and include a more social dimension; in this dimension interaction is most relevant. As far as Evans (2012) is concerned, governance in his view is a third way between the two extremes of market and state. It is also considered as a means to achieve common goals by governmental and non-state actors (such as NGOs, public, business etc.).

New styles of governing imply that the boundaries between private and public, national and

international have been blurred (Stoker, 1998). The governance concept has enjoyed growing popularity since the government in many cases is not able any more to overtake all political and economic functions due to the expansion of the economy in recent decades. For instance, parts of the infrastructure have been privatized hence the national government lacks financial or human resources (Evans, 2012). However, governance is only the umbrella term due to the development of various forms of governance decades, reaching from corporate to environmental governance. Thus, environmental governance can further be explained as a “set of regulatory processes, mechanisms and organizations through which political actors influence environmental actions and outcomes” (Lemos & Agrawal, 2006:289). Those elements explicitly refer to actions that are undertaken by a variety of parties, which form the essential part of the governance concept. Therefore the participating actors need to be discussed.

2.2.1 Relevant actors

As demonstrated, the major elements of governance are the actors that participate in the governance process. Since governance not only encompasses governmental actors but also social and public participants, a closer look at those different actors is necessary, also in regard to the following part discussing effectiveness of environmental institutions concerning governance. Keohane and Nye (2000) identify three primary actors in three different areas within national governance, namely firms in the private sector, the central state in the governmental area and in the third non-profit sector.

The role and intensity of participation of the state depends on the form of governance. Although the government’s performance can be decisive, or a number of its responsibilities can be taken away and distributed among business, the public and the society in general. In other forms of governance autonomous stakeholders work together and the number of involved actors is larger, the state plays a limited role and is regarded as being one of the stakeholders integrated in the governance process (Evans, 2012). Another reason for the state’s declining role is the fact that it lacks the necessary resources for the environmental sector, which enables other actors to support the government in the management of the environment (Lemos & Agrawal, 2006). In terms of environmental governance, especially important was the emergence of political parties targeting environmental protection and giving an alternative to the prevailing political concepts.

Another significant player in environmental governance is the corporate sector since business and industry appear as the most visible challengers of the environment. In particular the linkage between economic growth and environmental damage has held responsible the corporate sector. However, tendencies of business can be observed in order to adopt the concept of sustainable development although little has changed in the social attitude towards environmental problems (Ford, 2011). The essential problem in terms of business targets is that their coexistence with the environment results as a zero-sum game. In addition, a state's preference, especially concerning developing countries, mostly is economy before sustainable environment. During the last decades the issue of environmental degradation became more and more evident and the greening of business emerged as an idea to combat the damage (Evans, 2012).

In regard to the market and due to increasing capitalism around the world, the concept of command-and-control mechanisms, that set direct consequences and constraints for environmentally unfriendly actors, has been challenged by the appearance of market-based instruments (MBIs). These operate through economic mechanisms or incentives (Sprenger, 2000). Market-based environmental reforms have been devised and have strongly affected not only the corporate sector but also the political dimension. Those instruments may be classified in four types of tools: Producer mechanisms (environmental accounting, industrial ecology and others), publicly or privately managed administrative tools (for instance environmental certification), financial instruments (eco-taxes), and consumer-oriented tools (such as consumption of green goods) (Sonnenfeld & Mol, 2002).

A decentralization trend is also visible in environmental governance, which led to the attempt on the part of the government to reclaim its leading role in governance through partnerships with local organizations. Recently a shift of better integrating lower administrative levels and social groups into environmental governance has occurred (Lemos & Agrawal, 2006). An ideal form of environmental governance would involve all political actors in the policy-making process as well as a fostering partnership between heterogeneous participants. Keohane and Nye (2000) list 'nonprofits' as party number three in the governance process. They therefore unite Non-governmental Organizations and social actors representing civil society. NGOs, for their part, are able to either compete with the government or support, possibly even complete governmental actions.

Since they appear as independent organizations, they are in a position to pressure the state to engage, for instance in better environmental protection. In terms of NGOs operating at the

national and local level and in doing so shaping environmental governance, great differences in their size, geopolitical origins, political ideology, funding sources, and in their relationship with the state can be found (Doyle, 1998). NGOs have experienced a great development in the last decades. The number of NGOs has grown to a vast extent and the admission to international environmental conferences (such as UNCED) has given them more legitimacy. Environmental NGOs (ENGOS) are capable of altering the environmental discourse, especially in the public arena where a constituency can be formed. This process was originally the basic idea of ENGOS since they evolved from environmental movements whose intention was to make society aware of the importance of a good human-environment relationship (Jepson, 2005). Civil society and social movements have always played a relevant role in national governance, hence in many cases significant and often more practical knowledge is added by the society concerning the environmental situation in specific areas (Evans, 2012). As mentioned above, there are cases in which partnerships are established, especially popular among NGOs to ally with transnational corporations that receive services from intergovernmental organizations (Keohane & Nye 2000). Since national governance is the bar by which effectiveness will be measured in the following chapter, it becomes clear that it is necessary to analyze the parties acting and operating in the domestic process of governance.

2.2.2 Good governance

The concept of governance evolved many decades ago and often serves as guideline for governments that seek to integrate other actors. Interpreting governance as a positive, effective approach that enables a greater number of actors to participate in the governing process relates to the idea of good governance. Nonetheless, since it makes a difference whether global or national governance is concerned, the basic principles are considered the same. Regarding the national level, good governance means that the government remains in a dominant position, though it invites other actors, profit and non-profit actors, to contribute and take part in the governance process and solve (social, environmental) problems. However, it strongly depends on the actor, organization or institution how 'good governance' is defined. The following examples seek to emphasize this argument.

The Organization of Economic Cooperation and Development (OECD) (1995) states that conditions for good governance are political authority and exercise of control in society and in

economic development. According to their definition the public authority is in charge of forming the environment that functions as an arena for economic activities as well as for distribution of benefits, and determines the relations between dominators and those to be ruled.

The United Nation Development Program on the other hand, defines governance as “the exercise of political, economic and administrative authority in the management of a country’s affairs at all levels. Governance comprises the complex mechanisms, processes and institutions through which citizens and groups articulate their interests, mediate their differences and exercise their legal rights and obligations. Good governance has many attributes. It is participatory, transparent and accountable. It is effective in making the best use of resources and is equitable. And it promotes the rule of law.” (UNDP, 1997:2)

According to United Nations’ principles and objectives, this approach captures good governance from a more social-political angle that places an emphasis on ethic and participatory elements.

Generally speaking, activities see their prevailing goal in diminishing the representation of the government and making non-market systems inefficient (Weiss, 2000). While analyzing good governance it becomes clear that this must, at some point, include the democratic component, since good governance in a sense that it refers to a common system of governing meets with limitations when it comes to authoritarian regimes. In addition to democratic elements, good governance further comprises economic liberalization. Due to the fact that governance usually implies a certain extent of interaction between the parties, situations where the government is challenged or pressured by other actors may occur ; this may also indicate good governance.

The societal component of governance thus integrates voluntary institutions or organizations, which in turn shape the type of governance and the relationship between the acting parties (Kooiman, 2003). Kooiman (2003) describes interaction as a method to integrate diversity and dynamics of modern society.

Nevertheless, good governance goes beyond the necessity of a parliament, a judiciary, democratic elections and encompasses human rights, transparent public agencies, accountability of public decisions made by officials, as well as devolution of resources and rapid judicial processes and others (Weiss, 2000). Other approaches see good governance as a synonym for high governance quality, which is determined by the factors of governance effectiveness, ethics and rationality. Ethics, consisting in anthropocentric and eco-centric values, human rights and duties, together with rationality provide a basis for the principles of

good governance (Lockwood, 2010).

In short, the essential note about good governance refers to the right of participation and transparent activities on the part of the actors contributing to governance. Thus, cooperation is one of the most crucial imperatives for national governance. 'Interactive' forms of governance have been promoted, in particular concerning a positive relationship between private and public parties (Glasbergen, 1998:1). A type of cooperative environmental governance and management must comprise different sectors in order to comprehend all relevant interests to create an environment of consensus (Meadowcroft, 1998). Within those sectors another actor emerges as a potentially powerful opponent to the corporate sector that is mostly responsible for environmental degradation. The modern consumer is able to make use of collective action and take measures such as pressuring polluting firms, boycotting poor labor practices or choosing environmentally friendly produced goods over others (Liverman, 2004). Thus, many issues can be managed more easily if cooperation is pursued, resulting in following essential consequences, for instance, a shared definition of the problem, a common sense to address it and the disposition of the parties to engage in solving the problem (Glasbergen, 1998). The pluralist input in cooperative environmental management transforms policy-making into a fairer action (Meadowcroft, 1998).

At this point the form of and opportunity for governance need to be discussed since (environmental) governance strongly depends on the political system of a state. In a liberal democratic regime, people are free to join environmental organizations, protest against governmental decisions or take part in decision-making procedures. In authoritarian regimes for instance, there is no openness for governance or collective decisions where civil society participates. There are scholars who argue that democratization can have a positive impact on environmental protection through good environmental governance and management. Chile and Poland are examples, where democracy, indeed, improved environmental governance (Lim & Tang, 2002). The transformation into a democratic system eases control and participation mechanisms and gives the civil society a better chance to express their opinion in the policy-making process (Glasbergen, 1998). Although participation and freedom are existential rights that must be given to humans and form the basics of a democratic system, it may also complicate some processes, like solving transnational dilemmas (Hempel, 1996) or environmental problems; hence it usually involves the need to make compromises, make changes in living standards or for example renounce several goods or actions. Thus, a global democratic future might not necessarily lead to better environmental governance. However, at

present time, environmental governance is more effective in a democratic system as different interests are mostly acknowledged and considered. Since the aim of this paper is the assessment of IEI's effectiveness on domestic environmental governance, the approach is initially disputing the term effectiveness and afterwards generating a connection between the three variables to find criteria and judge IEIs' effectiveness.

2.3 Effectiveness of IEIs at the level of national environmental governance

The meaning of the word ‘effectiveness’ changes with the respective field, however, in principle it indicates the degree to which targeted problems can be solved. International Environmental Institutions, such as all other international institutions have been created for special purposes and in order to improve a situation. The very basic assumption of this purpose is that it has to respond to a problem and does not exist in a vacuum but always has to be considered within a specific (social) setting. An IEI’s formation has a reason and it seeks to have an effect either globally or nationally, or on both levels. This leads to the question of whether an IEI and ratified agreements can be effective in terms of having an impact on national environmental governance. Although institutional effectiveness thus has two dimensions, the success of an institution is most affected by the national area of states (Young, 1999). One of the scholars dedicating their work in particular to regime effectiveness is Oran Young, who suggests that, “effectiveness is a matter of the contributions that institutions make to solving the problems that motivate actors to invest the time and energy needed to create them” (Young & Levy 1999:3). An important question, many scholars of regime effectiveness emphasize, is, how an outcome or consequence of an institution differs to what would have occurred without the regime. Would the situation be worse?

With respect to environmental governance observed on the domestic level, IEIs need to address an environmental issue. However, IEIs or International Environmental Regimes often have multiple objectives, and their effectiveness can be assessed by various approaches since effectiveness means different things to different scholars and institutions.

Levy and Young (1999) present five possible approaches and mention ‘problem-solving’ as their first approach. It is related to the fundamental explanation for an institution’s formation and means solving, elimination or alleviation of the reason why the regime has been created. The degree to which this can be realized determines effectiveness. However, the limitations of this approach are given by the fact that the regime is not always and only responsible for problem solving. Secondly, the legal approach refers to the measurement of fulfilling the obligations set by a regime. Nonetheless, there is also the possibility that all legal obligations are met but the problem itself is not solved. According to the economic approach, the legal variable remains and is supplemented by efficiency (which is hard to measure in IEIs). Thus, it involves not only the fact that the legal obligations are achieved but also that this happens at costs as low as possible. The normative approach measures effectiveness by assessing fairness, liability, participation and so forth. Since these values are difficult to measure, it is

suggested to adopt this approach only as an additional variable (Young & Levy, 1999). Concerning the normative approach, it must be added that effectiveness actually does not always imply fairness since the problem might not be a problem for non-members of the regime (Underdal, 2004). Finally, the political approach is also focused on special problems and highlights the actions and functioning of specific actors, their interests and institutions. Effectiveness refers to the degree to which changes in the behavior of actors and in the interests occur. Although this approach includes the consideration of compliance and normative targets, merely successful actions that only give the system a push in the desired direction are already considered effective (Young & Levy, 1999). Although the economic approach is mainly built on efficiency, meaning best results at lowest cost, efficiency is not on par with effectiveness, hence an agreement can be effective independent from its expenditure. The GEF adds another variable and further differentiates between “effectiveness, efficiency and relevance” (GEF, 2011:77) regarding the assessment of the funded projects, which will be discussed in detail below. Nonetheless, efficiency is related to effectiveness since it also refers to the costs of governmental resources that are necessary to implementing policies or making decisions. Moreover, it must be considered that compliance, for instance following the rules and obligations of an environmental treaty, saves transaction costs (Chayes & Chayes, 1995).

2.3.1 Change of behavior, goal achievement and counterfactuals

For their part, IEIs are usually designed to improve the quality of the global environment (Haas et al., 1993) and thus changing some kind of behavior. In terms of the question what would have been the consequences without an IEI or more precisely, without an International Environmental Agreement (IEA), it is particularly important to pose the question whether a state would have acted differently without an IEA (Mitchell, 2010). This also is connected to costs of action or inaction. If a specific environmental problem remains unaddressed great costs could emerge and in case there is a chance to solve the problem before it gets worse, the costs for addressing the problem might be much lower. On the one hand, there are still many officials and people in charge that refuse to acknowledge environmental degradation and the resulting need to engage in environmental protection. Nonetheless, on the other hand, people accepting the threat spare no efforts to prevent those issues from degrading and cause even larger costs (Mitchell, 2010). While applying the concept of counterfactual thinking it is reasonable to use indications about the effectiveness of IEIs, however it seems little helpful to

only measure effectiveness by counterfactuals since it can lead to speculation (Helm & Sprinz, 2000). Breitmeier, Young, and Zürn (2006) identify two essential elements to prompt effectiveness, which are goal attainment (as goals in legal agreements) and problem-solving. According to Andresen and Hey powerful countries participating in global environmental protection and taking on the role of pushers increase effectiveness (Andresen & Hey, 2005). The whole process of provoking the willingness of states to engage in environmental protection has strong ties with international relations theories since often an IEI is more effective in case countries cooperate and, by doing so they prompt each other to pay more attention to environmental governance. Benefits and costs are usually weighed and form the behavior of states. According to the realists' assumption, IEIs or IEAs have little influence on behavior, whereas institutionalists believe in the country's concern about their economic, political and social position within the international arena. In their view, an IEI can alter behavior and therefore its decisions about choices and interests. Speaking in general, IEIs influence decisions and behavior, already by the presentation of a picture about what is 'right' and 'wrong' (Mitchell, 2010). In light of the studies of international relations forms of institutional bargaining emerge, for example free-riders and prisoners' dilemma. The prisoners' dilemma has been important in a sense that two parties might benefit from circumstances of suspicion and a lack of information (Vogler, 2011). The latter presents a challenge to collective environmental action, since if a group engages in the combat of climate change, and one party abandons the others, it nevertheless enjoys the benefits created by the others (Evans, 2012).

In regard to environmental governance behavior must be changed to achieve better cooperation, enforcement and implementation of environmental policies presented by IEIs. As recognized IEIs also consist of human actors, which need to effectively change the behavior of representatives of nation states, meaning that through negotiation and knowledge behavior can be changed. While observing the issue from a broader view, Underdal (2002) stresses the fact that environmental objectives can be accomplished by changing the human behavior that led to the emergence of the problem. Thus, the state of the environment must be improved or at least made stable. Differing interests on the side of the states, which are asked to change their behavior, often challenge the process of improvement. Interests matter and need to be taken into account since at the time a treaty is signed it is clear that it complies with the parties' interests (at least to a certain degree). Here, especially the national governance component comes into play since interests strongly depend on environmental governance and

the domestic analysis of benefits, impacts, or disadvantages (Chayes & Chayes, 1995). Interests are significant for changing behavior as well as for the matter of compliance, which will be discussed in the subsequent section.

2.3.2 Environmental projects and funds

The GEF, as one of the most important funders of environmental projects, bases its ratings on the outcomes of projects by judging relevance, effectiveness and efficiency. Relevance, as far as the GEF is concerned, indicates whether project outcomes are consistent with the area of special focus, the country specifics and the strategy, whereas efficiency refers to the cost-time and cost-effectiveness aspects and looks at delays of the projects, bureaucratic, administrative and other problems that have an effect on cost-effectiveness. Nonetheless, the most relevant factor for this analysis is effectiveness, which according to GEF gives insights about the addressing of the intended problems and achievement of the expected outcomes (GEF, 2011). Since the GEF is concerned with project assessment and funding, its value distribution must integrate the efficiency component, which is not primarily relevant for this paper's aim as the research is based on qualitative indicators. To be effective in terms of environmental protection, also means to achieve a goal. Although problem solving and goal achievement are reasons to create an IEI, it does not necessarily lead to effectiveness since the goal itself might not contribute sufficiently to solve the problem. Nevertheless, the achievement of a goal per se is regarded as a success (Mitchell, 2010).

Cost-effectiveness, or the economically most efficient method to achieve an objective, is also a significant variable for the European Commission and its funding instrument for the environment, the LIFE-program. Every couple of years the European Union elects the best LIFE-Environment Project, judging them by the following criteria: Firstly, the contribution to immediate and long-term environmental, economic and social improvements; secondly, the degree of innovation and transferability is assessed, followed by the relevance to policy and the mentioned cost-effectiveness (European Commission, 2013). Funding associations in charge of supporting environmental projects of the European Union, United Nations, NGOs or others assess their projects according to different values, also involving the degree of governmental influence or independence. However, since this qualitative research analysis is assessing the effectiveness of IEIs and their conventions, cost-effectiveness and efficiency will not be relevant criteria for the analysis due to the overall goal of the protection and improvement of the natural environment. Although for many institutions efficiency and costs

are essential concerning their budget, this work measures effectiveness in terms of outcomes that either prevent the environment from degrading or improve it.

2.3.3 Compliance

According to Weiss and Jacobson, “international accords are only as effective as the parties make them” (1998:1). In their view, contrary to legal and regulating mechanisms, referred to as implementation, compliance is an indicator of the observance of the regulations (Weiss & Jacobson, 1998). Compliance is an important factor in environmental governance since, mostly the states are required to follow the rules, regulations, restrictions, prohibitions or obligations that have been agreed on in a conference and through a treaty or agreement. However, while assuming that accords or commitments are determined by their establishment by states, much has to do with configurations of power. Powerful countries such as the US are in the position to pressure and sanction other states, thereby inducing engagement in environmental protection. On the other hand, it is uncommon that a strong state gets sanctioned itself. Thus, several scholars argue that agreements are always shaped by interests and are never neutral or independent. As a consequence, although compliance often seems mandatory for weaker states, it does not have a coercive effect on powerful states (Victor et al., 1998). Although it is only one stage in the policy process, much depends on exactly this stage. Aggarwal-Khan (2011) defines six stages of policy process in international institutions, which are policy definition, policy negotiation, adoption of the policy by nation states, implementation, compliance and evaluation. The disposition and willingness to compliance of states and its contribution to effectiveness is however determined by a number of factors, such as domestic institutional arrangements, traditional approaches to policy formulation and implementation, interest groups, parties and the politics in general etc. (Connelly & Smith, 1999). Supplementary to the need of changing the behavior of states, a certain degree of compliance is required, which also depends on the IEI and how many violations are bearable to remain effective. In case the necessary level of compliance is higher, the IEI operates in more difficult conditions and is challenged stronger (Young, 1999). Enforcement can be considered a condition for compliance and depends on domestic environmental governance. In general, enforcement needs a public authority or a government. Under certain circumstances a government is not as necessary and enforcement mechanisms operate effectively without it (Young, 1999). Furthermore it has to be considered that compliance is not able to claim an equal level of effectiveness hence there might be situations in which a

state complies with an accord but it is not effective in regard to reaching its targets (Weiss & Jacobson, 1998). A serious problem and challenge to the effectiveness of IEs are occurrences of non-compliance. There exist multiple reasons for non-compliance, such as deliberation of behavior, unreasonable treaty provisions or a lack of understanding (Chayes et al., 1998). It has to be noted though that non-compliance is not necessarily a sign for a lack of institutional impact, since it may occur that despite great intentions of a state to reach certain standards it nevertheless fails to reach them and fulfill the commitment (Mitchell, 2010). Above, it was emphasized that effectiveness is not equal to compliance. To give an example, the nonbinding standards in the North Sea have not achieved complete compliance but have reached more effective results than former binding standards, where compliance was higher (Victor et al., 1998). Speaking in general, there is a broad zone between perfect compliance and non-compliance, since in a number of cases a certain level of compliance is achieved, which is considered acceptable.

2.3.4 Outcome, output and impact

In order to measure effectiveness, its consequences can be separated into the three dimensions of outcome, output and impact. Output involves programs, regulations and other arrangements that put the institution's provisions into practice (Young, 1999) and is based on the norms and principles of the institution (Underdal, 2002). Outcome, on the other hand refers to the change in behavior among the members provoked by an international institution. Impacts, in Young's (1999) point of view, refer to final problem-solving consequences for which the institution has been created, while Underdal (2002) designates an impact in environmental terms as a change in the state of the biophysical behavior. According to Underdal's examination, analyses of environmental issues rather correspond to the dimension of impacts. In general, it can be observed that the shorter the causal chain linkage between a regime and its effects is, the easier to demonstrate causal effects, though, the less significant the results will be for further global processes. Therefore, in order to investigate effects, it is easier to draw on outputs than on impacts (Breitmeier et al., 2006).

2.3.5 Conditions for effective IEs

Haas, Keohane and Levy (1993) suggest the concept of the "three Cs" in order to make agreements and provisions of effective IEs. These three conditions comprise, firstly, high

levels of governmental concerns, more precisely, the disposition of governments to offer scarce resources in order to help solve the environmental issue. Clearly, this process needs the cooperation and networking of individuals and groups, linked to the political system. The second condition is a hospitable contractual environment in which agreements can be made and kept, especially in terms of transboundary and common problems. Thus, states must be willing to engage in reliable accords as well as enacting laws or bans to create a feasible environment to make and keep commitments. Finally, a certain political and administrative capacity, with respect to the ability of governments to construct and enforce laws and regulations, but also to civil society in policy-making processes, must be given. The implementation of those (international) regulations demands domestic adjustments on the part of the government. Additionally, civil society is in charge of responding in a critical way to governmental action or inaction (Haas, Keohane & Levy, 1993).

In particular, the first condition of raising concern among government and civil society is strongly connected to domestic governance and involves actors such as NGOs as well as scientific support. Generally speaking, concern, capacity and contractual environment favor effective management and let IEIs succeed easier. IEI's effectiveness therefore can be measured by assessing the extent to which they perform functions and push the three Cs (Haas, Keohane & Levy, 1993). Since they strongly involve the respective actors and depend on the level of national environmental governance, the presence of NGOs, business, society and other pressure groups play an important role for the three conditions. In terms of the extent of concern, it can be observed, that for instance an IEA is more likely to be realized if more states participate and the number of willing actors increases, both at the national and international level (Mitchell, 2010). The number and accessibility of actors that show concern determine the probability of a country to engage in environmental protection. Environmental movements are also a consequence of increased concern and a response to governmental actions or inactions. In several countries environmental movements are considered a reflection of the state's social situation or general cultural or economic pursuits of civil society (Doyle, 1998). Regarding the three Cs, IEIs appear as potential players for strengthening public and diplomatic pressure through fostering competition among governments as well as linking issues of environmental protection and economic benefits (Haas, Keohane & Levy, 1993). Here scientific pressure can be added since experts provide the basic work that indicates environmental degradation and its reasons. A contractual environment may be supported by IEIs through monitoring methods, creating bargaining forums and to share information, and reduce transaction costs of negotiating commitments.

Finally, national capacity can be increased by IEIs in the form of helping to develop effective policies as with the provision of technical assistance (Haas, Keohane & Levy, 1993). Thus, there is a high bandwidth of measures an IEI can take to support states in their environmental protection. The better an IEI achieves this the more effective it can be considered.

2.3.6 Science and epistemic communities

Environmental problems become evident to civil society at the point they affect, impact or interfere with their actions or menace their common environment. The other possibility is the findings of scientists and experts that function as creation of knowledge. In the realm of environmental protection the issue of unequal and differing insights is common and complicates the mode of addressing a problem due to missing consensus. Therefore, an epistemic community is needed. According to Haas “an epistemic community is a professional group that believes in the same cause-and-effect relationships, truth tests to assess them, and shares common values” (Haas, 1990:55). To understand an environmental problem a scientific fundament is necessary to grab international attention. An epistemic community shares a special vocabulary, common political objectives and a network that allows them to share and exchange issues (Haas, 1990). Additionally, for IEIs the scientific component is also a relevant political resource since it determines the approach to the problem by defining the problem and the necessary obligations (Jasanoff, 1998). This establishment of cognitive setting (Breitmeier et al., 2006) has strong ties with the concept of concern building. In general environmental processes, either on a national or international scale, if epistemic communities agree on a problem and the potential measures to take, the following (political) process will be much easier (Karns & Mingst, 2004). Thus, the change of certain behavior can be modified by expert knowledge and further causal relationships. A state might change its distribution of resources according to an epistemological warrant. Considering the whole picture, usually the responses assumed by a state are not results of objective aspects (Haas, 1990). Joint research by experts makes a state aware of its interests and scientific evidence can contribute to taking action and alter a form of behavior, considered a threat to the environment (Mitchell, 2010). Although scientific work is impacted by certain objectives, though its central focus is to provide a basic framework of the environmental problem and its possible solutions. In Aggarwal-Khan’s (2011) point of view, ideally the epistemic community converts expert and scientific knowledge into policy. Since a scientific community is also asked to present innovative outcomes, especially concerning new

technologies in the environmental realm. In many occasions, a criterion for funding institutions to permit funds is the innovative component of a project, as well as a model function (GEF, 2013; DBU, 2013¹). In terms of the necessity of an epistemic community, Haas identifies prompting a learning process (which varies in the degree of learning) as its major task. The simplest form involves the search for new policies and calculation of the most efficient way of getting to the pursued objectives. In the second stage new objectives are identified and errors are corrected. Often actors recognize that they are unable to realize more objectives at the same time since they have competing values. The even more sophisticated form of learning accepts new modes and policy makers can adopt new patterns of reasoning. The most sophisticated learning is a way learning that corrects historical approaches and develops new objectives for a state (Haas, 1990). Therefore, ideally, the epistemic community is completely integrated in the process of developing policies. This on the other hand strongly depends on the form of governing of a state.

IEIs and its programs, such as UNEP, have the function of building scientific consensus. This consensus is especially relevant for the further step of political negotiation that needs a cognitive fundament. If there is one dominant opinion about an environmental problem, an IEI is likely to work effective (Connelly & Smith, 1999). Thus, for domestic environmental governance an epistemic community has a crucial function, if it is established and accepted as a legitimate provider of information and proposals for solutions.

In summery, there are many different possible approaches and views how to assess effectiveness of international institutions. Depending on the background of the approach, in some cases the actual outcome and change of behavior is considered an effective consequence of institutions; in others (especially regarding IEAs) the factor of compliance matters most. For environmental funds, a project is effective if it also reaches cost-effective targets and implies the element of efficiency; in terms of many IEIs the aim to draw awareness to environmental issues and raising concern seems more important. Out of the variety of possible approaches towards the measurement of effectiveness in the following methodological part, the relevant criteria for this analysis are discussed and the modus operandi explained.

¹ This was the answer on the part of Deutsche Bundesstiftung Umwelt (DBU) to the question which criteria are decisive to decide about the (financial) support of a project.

2.4 Methodological Framework

Having discussed the basic theoretical approaches made in order to measure effectiveness of IEIs concerning national environmental governance, the forthcoming task will be the elaboration of the necessary criteria and the procedural method. Since in the subsequent section the empirical analysis will be carried out to assess the effectiveness of IEIs in terms of China and South Korea's environmental governance, first of all the relevant categories need to be explained. Despite the separation of criteria, it needs to be noted that they are on no account mutually exclusive and it might occur in some cases that they simply overlap. As indicated, a number of analytic choices appear in terms of judging an institution's effectiveness. The following example seeks to highlight this complexity: According to an IEA a country is required to reduce pollutant levels by 10 percent, coordinate research with other countries, and contribute to a pollution reduction fund. The result is that the country manages to reduce its emissions by 5 percent, is not able to coordinate any research but contributes greatly and even more than expected to the fund. This case should demonstrate that often it makes more sense to analyze each point separately (Mitchell, 2010) and assess them according to different targets. Afterwards, an overall picture can be created that reports the effectiveness of IEIs. While judging an institution's or commitment's effectiveness, it proves more valuable to previously analyze the institutions ultimate goal in order to see in which direction the whole operation should lead in the end.

The major and overall goal concerning effectiveness is a certain *change of behavior* that is taken as the first criteria and general target in the measurement of effectiveness of IEIs. Thus, the main question is, if and to what extent an IEI achieves to improve the quality of the environment by acting through national governance in a specific country. The change of behavior must therefore occur within the form of governing a state in environmental terms. A rather trivial example in this matter would be the general banning of environmentally harmful firms for a special region. In addition, every environmental institution has a basic reason and motivation for its establishment in the first place. As a consequence, a prescribed goal needs to be reached, for instance reducing GHG emissions to meet, again, the levels of the 1990s and doing so by prompting the system of national governance to alter a law for pollutant firms that demands more responsibility and payments for polluting activities. This criterion is also closely connected with the approach of distinguishing between measuring effectiveness by a country's performance in terms of outcome, output and impact. However, especially for

assessing the change of behavior and its consequences, the judgment of impact is most promising for this matter. Thus, behavior of actors in environmental governance has to be changed and the goal that led to the creation of the IEI has to be attained.

To reach a goal and present an opportunity for effective actions on the part of IEIs, certain conditions must be given at the national level. The three conditions discussed above are concern, contractual environment and administrative and political capacity (Haas, Keohane & Levy, 1993:19). Although the issue of concern is listed among these three conditions, it will be part of the subsequent category since in this case it belongs to the formation of an epistemic community and its task is making the government and society aware of environmental degradation. Thus, the second criterion comprises the necessity of a *contractual environment* to make and keep policies and agreements and on the other hand the national *political and administrative capacity* to engage in environmental protection. For their part, IEIs per se have to be effective through their activities; nonetheless, certain domestic conditions determine the effectiveness and claim to be involved in the assessment of environmental institutions.

As indicated, the requirement for effective IEIs and governance is a certain degree of *concern and awareness* for environmental issues. Scientists are in charge of analyzing environmental problems, their origin, the resulting threat to nature and human beings, measures to address the issues and potential solutions. By revealing and demonstrating those challenges not only the government but also civil society should be conditioned to recognize environmental degradation and take action in order to improve environmental quality.

Therefore, the promotion of *epistemic communities* (Haas, 1990:55) at a national level is absolutely necessary for effective environmental institutions. If scientific research is seen as a common process, where coordination of information and knowledge is provided, the following elaboration of effective national policies is immensely eased. Domestic environmental governance strongly relies on expert information given by both national and international epistemic communities. As a result, the formation of an epistemic community that gathers knowledge and identifies the problems and their origins is considered another criterion for effective environmental institutions.

Furthermore, and linked to goal attainment is the variable of *compliance* that indicates whether a state responds adequately to provisions and agreements of an environmental institution. However, compliance is a rather elastic term demanding a certain extent of observance, conformance and response to contribute to institutional effectiveness. The measurement of compliance can be undertaken best by comparing treaty provisions and the actual implementation and enforcement of the relevant policies. Nevertheless, due to the fact that an IEI may be effective despite a lower level of compliance, an acceptable degree of compliance that correlates with original targets of the institution needs to be identified. On the other hand, it can also occur that compliance with a treaty is attained, though the institution is not effective, since the treaty itself lacked in different aspects. Thus, agreements also have several requirements that need to be fulfilled. As a matter of fact, compliance depends on the willingness of the state to engage in environmental protection, which in turn can be raised by the creation of environmental consciousness among governmental and non-governmental actors in environmental governance. In the empirical part, attention will be drawn to the necessary level of compliance (with respect to IEA) and whether it was fulfilled. In case a country succeeds in reaching those levels, this also contributes to the effectiveness of IEIs.

	Contractual environment	Administrative & political capacity	Epistemic community	Concern and awareness	Level of compliance	Change of behavior
Absent or only marginally given						
Generally given, but with deficiencies						
Acceptable to high						

Table 1: Matrix for evaluation of effectiveness

Table 1 gives a summarized matrix of the gathered criteria that serves as a basis for the following case studies to assess the effectiveness of different environmental conventions. Having elaborated the relevant criteria to measure the effectiveness of an environmental

convention of the respective IEI, in the following part of this paper an empirical analysis of the influence on China's environmental governance will be conducted to compare the outcomes with the case of South Korea later. The five conventions that are used as indicators are the Convention on International Trade in Endangered Species, the Convention on Biological Diversity, the Montreal Protocol, the Kyoto Protocol, and Agenda 21. Finally, an analytical conclusion will summarize the results gained from the two countries' cases to give insights about the effectiveness in those areas.

3 China's Environment

The People's Republic of China (PRC) comprises the world's second largest population, is one of the biggest countries on Earth, and has demonstrated astonishing economic growth throughout the last decades. Along with this development and the particularly rapid industrialization process, it becomes clear that one of the fundamental components for this development is the rich environment of the Chinese territory. The country's opening and environment have enabled the Chinese to soar in economic terms by providing the necessary environmental capital. As a consequence of this fast growth, the environment has to suffer similarly to other parts of the world. Today China faces multiple environmental issues such as acid rain (affecting one third of China's territory), scarcity and pollution of water, air pollution, biodiversity loss, soil erosion, desertification, extraction of natural resources and others. More than three decades ago, the PRC opened its doors to the outside world and entered the global community to benefit from international relations and commitments. Having said that, it is especially interesting to assess the influence of IEIs on Chinese environmental governance and whether they are able to effectively improve environmental protection in China. Due to the great variety of international agreements and organizations that China has joined, for the empirical analysis a selection of different areas will be used and judged by applying the elaborated criteria of effectiveness.

Prior to that some benchmark data will be provided in order to give an overview of China's function within the international environmental community. Originally as the Republic of China (ROC), China was among the founding members of the United Nations and kept this membership through Taiwan until the year 1971 when the PRC was found the only representative of China. The ROC is also one of the founders of the World Bank and IMF (1949) whereas the PRC assumed membership of WB and IMF by 1980. Generally speaking, China has officially acknowledged international law and the doctrine 'pacta sunt servanda'; therefore treaties must be obeyed (Kent, 2007). Returning to environmental issues, China attended the 1972 United Nation Conference on the Human Environment and was for the first time confronted with environmental degradation and the need for national responses. Even though China assumed a rather reluctant role in UNCHE negotiations (Schreurs & Economy, 1997), according to Economy (2011) UNCHE "planted the seeds of environmental change in China". Since 2003 UNEP has an office in Beijing and cooperation has become more intense. China has signed a number of agreements and attended various congresses in the last thirty

years, which makes it rather unrealistic to cover them all within this thesis. The following selected areas of environmental protection are not mutually exclusive, since for example Agenda 21 contains articles also dealing with biological diversity and climate change. Therefore, the announced selection will firstly comprehend the effectiveness of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the related Convention on Biological Diversity (CBD).

3.1 China and CITES

One of the first conventions concerning the environment the PRC agreed to was CITES. Even though China not instantly entered and had to be encouraged by the International Union for Conservation of Nature (IUCN) and other parties, it then signed the document. Most probably Taiwan's admission contributed to China's final decision of acceding the convention by 1981.

3.1.1 Administrative, political capacity and contractual environment

Altogether a committee of seven agencies (Ministry of Forestry, Ministry of Foreign Affairs, Ministry of Foreign Trade, Ministry of Agriculture and the Chinese Academy of Science) was selected to prepare and coordinate admittance (Oksenberg & Economy, 1998). As an overall judiciary and administrative basis, China established its first version of an Environmental Protection Law in 1979 and the National Environmental Protection Bureau under the responsibility of the Ministry of Construction in 1984. The Bureau was transformed into an Agency by 1988 (Jahiel, 2000) and was elevated to be the Ministry of Environmental Protection (MEP) in 2008. Additionally, an Environmental Impact Assessment Law (EIAL) was passed by 1981 and was amended four times, most recently in 2002 (Lopez-Pujol et al., 2006). Thus, the basis was constructed a while ago, however, the development of an independent ministry and a legal foundation is considered a rather recent phenomenon.

This already leads to the assessment of the administrative and political capacity. In order to implement CITES the Chinese government established the Endangered Species Import and Export Management Office (ESIEMO), located in the building of the Ministry of Forestry, that took over the negotiations, matters of benefit sharing and the resources on the principles of sovereign rights. Further, ESIEMO branches were installed in the provincial forest administrations and municipalities (MEP, 2008). Nonetheless, a fact that tends to be criticized

is the exclusion of the Ministry of Foreign Economic Relations and Trade (MOFERT) and Public Health. Apart from that, obstacles of coordination arose and various questions emerged such as the leading role in the process, the status of the leader and what benefits would arise and where (Oksenberg & Economy, 1998).

Since CITES is closely connected with IUCN, the publishing of the IUCN's Red List of Endangered Species is particularly important to CITES and its strategy planning. The World Bank notes, that out of the 640 species listed in CITES about 150 are found in Chinese territory (World Bank, 2001). According to calculations from 2008, 138 (10,45 percent) of China's birds are registered on the Red List, as well as 107 (18,45 percent) of mammal species, 81 (8,87 percent) of fish species, and 167 (0,47 percent of the total) higher plant species (Xu et al., 2009). It was recognized that the situation of endangered species was much worse than estimated in an earlier stage and in particular the circumstances for plant species were more dramatic (CBD, 2013).

In order to address the deteriorating conditions for traded species, a number of laws have been passed by the Ministry of Forestry and its local units (Oksenberg & Economy, 1998).² Among those, the most important ones for CITES are the Forest Law (1984), the Wild Animal Protection Law (1989), and the Regulation on Administration of the Import and Export of Endangered Wild Fauna and Flora Species (2006) (Yu, 2010). Although with the introduction of these laws a legal basis was built, the traditional posture and Confucian postulate to make use of nature and its reserves for individual benefit and wellbeing were still deep-seated in Chinese minds. Furthermore, in Confucian philosophy of social harmony, the concept of laws is not regarded as a variable to influence the behavior of human beings since they rather disturb the order of society (Beyer, 2006). Consequently, for Chinese often law does not have an equal position as in the western world, which explains the frequent incident of non-compliance with laws.

A series of management measures for the use of wildlife resources was installed, involving licensing the hunting of protected animals, pharmaceutical manufacturing producing medicine with plants and the domestication of protected wild animals. Concerning the marine environment, the PRC has established a fishing licensing system, a fishing ban season, a plan for 'zero or negative increase' in marine fish catching, and a non-fishing area system (CBD, 2013). Moreover, in the case of protecting animals and plants from being purchased and sold the trade for Chinese Traditional Medicine contributes immensely to the process of extinction

² At that time, a Ministry of Environment has not yet been established.

of many species, mostly through the usage of tiger bone and rhino horn. An increasing ambition was demonstrated to address this issue and close the respective manufacturing firms, but the period to reach a consensus on these matters were extensively long. Another obstacle for proper implementation of conservation policies was the wrong use of funds, hence many ended up as cars of members of the Ministry of Forestry (Oksenberg & Economy, 1998). Thus, during the first years of the implementation of CITES, huge lacks in the administrative and political capacity are identified, which could be erased to a certain extent when adapting the Convention on Biological Diversity.

3.1.2 Epistemic community and awareness

Shortly after implementing CITES, China faced various obstacles regarding technical skills and lack of knowledge with respect to protecting endangered species. Incidents occurred where baby pandas fell ill and died during transport due to the lack of knowledge of veterinarians (Oksenberg & Economy, 1998). Concerning the improvement of scientific research and support to install a database that is kept up to date, providing information about the status of flora and fauna, China has been aided by the World Wildlife Fund (WWF), IUCN, and the US Department of the Interior. They helped with the training of Chinese officials, the development and elaboration of data and wildlife studies (Economy, 2011). As already indicated the PRC composed a special Red List for China, generated by 100 scientists and conservation experts, including a high number of non-Chinese experts (McBeath & Leng, 2006). It has to be noted that the involvement of international experts, also appointed by IUCN, contributes to a reliable report about the wildlife situation in China. Although, officially CITES is located under the responsibility of the Ministry of Foreign Trade and Economic Cooperation, the Ministry of Education was integrated in order to carry out trainings. The number of involved ministries has also impacted the scientific and technological field since no clear primary agency has been identified to take the lead in formulating a scientific statement about the position of endangered species (McBeath & Leng, 2006). In terms of raising concern about the precarious situation of several animals and plants, TRAFFIC East Asia, WWF and The Rufford Foundation initiated an awareness campaign to encourage people to consume wildlife in an adequate and sustainable manner. One of the initiatives involved the broadcasting of a movie with the title “Don’t let this be the end – end of tiger evolution” on all Air China flights (about 4420 flights) in 2008 around the Spring Festival. Furthermore, after Chinese New Year 20.000 multimedia short messages treating the

protection of the wild tiger were sent to mobile phones in Beijing, Shanghai, and Guangzhou. Additionally postcards about the conservation were designed and for the Olympic Games in Beijing a 'Beijing Green Guide' concerning sustainable development was spread in hotels and travel agencies (TRAFFIC, 2008). Therefore, movements in this area are taking place and have increased in quantity.

3.1.3 Compliance

In terms of China's compliance with the provisions of CITES, China has definitely responded to the convention and has taken measures to prevent endangered species from being traded. For instance, since 1998 a policy was introduced to increase the proportion of forests and grasslands by transforming farming land. By 2008, it was reported, that 26,86 ha have been converted into forests and grasslands and that in some cases the number of endangered species could be increased, such as the crested ibis, the giant panda, the Yangtze-alligator, the golden monkey, and the Tibetan antelope (Yu, 2010). Measures taken by the Chinese government include for example artificial breeding areas for endangered species that are close to extinction. Through those actions animals such as the wapitis or mustangs could be saved and were rehabilitated in their original environment (MEP, 2008). However, the number of animals and plants on the Red List is large, including species like the Mongolian gazelle, the tiger, the pangolin, the yellow croaker, or the reeves shed (Yu, 2010). In legal terms, finally, China has officially announced the illegality of purchasing, selling, trading, transporting or using rhino horn or tiger bone for Traditional Chinese Medicine (Oksenberg & Economy, 1998).

In China's case, initially a rather poor compliance record was identified. Major problems have occurred due to the reluctant position of rangers informed about poaching since they would be held responsible and argue that the people living in villages need to hunt for food (Oksenberg & Economy, 1998). As a consequence IUCN, CITES and other international actors exerted pressure on the PRC to engage more actively in order to comply with the provisions of CITES. Although China emphasized that this pressure had no impact, Oksenberg and Economy (1998) see promising effects at the point when economy comes into play and could be threatened. International pressure has prompted China to move in the desired direction of more willingness to commit to CITES. On the other hand, it has been criticized that international actors often only put emphasis on the conservation of the panda and have ignored many other endangered species (Schaller, 1998).

Regarding the enforcement of laws, harsh punishments in case of violations of these laws have been established, which led to the execution of 30 people between 1980 and 2003, accused for killing and trading body-parts of elephants and giant pandas. Alone in 2005, 455 cases were prosecuted and 736 suspects were arrested (Yu, 2010). Despite the strict control of import and export of species supervised by the Regulation on the Administration of Import and Export of Endangered Animals and Plants (MEP, 2008), and a number of achievements, by 2007 10.818 cases of illegal hunting and trading activities were registered, about 11 percent more than in 2006 (Yu, 2010), which begs the question of effective deterrence. With regard to trade, supplementary fees are imposed for import and export of wildlife products depending on whether they are wild or artificially bred and cultivation (MEP, 2008). Thus, the PRC has responded to CITES requirements and has taken measures in the legal area as well as established an institutional framework to carry out the obligations. Despite those measures a lack of coordination between the responsible agencies persists, although it has been improved in the last decade.

3.1.4 Change of behavior

The first but at the same time also final question that needs to be answered is whether a change of behavior has been achieved. China's manner of governing the environment has indeed appeared out of almost no governance at all. Before UNCHE the environmental concern on the part of the PRC was less than minimal, but since then, a number of agreements have been signed and an institutional framework for environmental protection has been elaborated. In terms of CITES, a general change of behavior has been recorded, from hardly any consideration of the trade of endangered animals and plants to laws, policies and campaigns. Even though during the initial period of CITES, China lacked in addressing the challenge of conserving endangered species, this attitude has changed and China undertook activities to engage stronger in the name of CITES. Thus, the PRC has addressed the fundamental problem that induced the creation of CITES.

	Contractual environment	Administrative & political capacity	Epistemic community	Concern and awareness	Level of compliance	Change of behavior
Absent or only marginally given		x	x			
Generally given, but with deficiencies	x			x	x rising	x
Acceptable to high						

Table 2: CITES and China

3.2 China and the Convention on Biological Diversity (CBD)

The People's Republic of China was the first major country to sign the Convention on Biological Diversity, which was signed in 1992 and the PRC became a party of it in 1993 (CBD, 2013). China is one of the twelve mega-diverse countries in the world, which makes protection of its biodiversity, especially its forests and wetlands even more significant. The causes for biodiversity loss in China are several, for instance deforestation, desertification, air/land/water pollution, overfishing, invasive plants and animals, climate change etc. (McBeath & Leng, 2006).

The Convention on Biological Diversity and CITES have several provisions and tasks in common, since activities that protect endangered flora and fauna from being traded illegally are also an interest of CBD, which seeks to combat biodiversity loss and for this matter conserve the species' natural environment. Although China hesitated to sign CBD immediately and acknowledged its resulting constraints for underdeveloped regions, it nevertheless took the lead in signing it, as the overall development would not suffer. After approving, Premier Li Peng highlighted China's commitment as the first developing country to sign CBD (Ross, 2000). The PRC became particularly important to the CBD due to the country's vast territory and the high degree of biodiversity loss in some areas. The People's Republic of China itself has identified the major obstacles for effective biodiversity conservation: Overconsumption of wildlife resources, loss in genetic resources, pollution, invasion of alien species, no proper technical tools, insufficient funding (MEP, 2008).

3.2.1 Political and administrative capacity and contractual environment

The dwindling number of forests, which form the habitat of many species, presents a serious problem. Already by the mid-1990s local officials documented that of 140 forest bureaus 25 had exhausted their woods and 61 were convinced that logging was executed at unsustainable extent (Economy, 2011). Although, in 1988 the Wild Animal Conservation Act (WACA) already listed 1300 species as protected and differentiated between I and II species (I means stronger need of protection), an effective approach was not made until the adoption of CBD (McBeath & Leng, 2006). In order to address the serious problem of massive deforestation, the Chinese government has launched a number of conservation projects that seek to limit deforestation, plant new trees and simultaneously manage the remaining resources (Xu et al., 2009). In this dimension, the IUCN recommended the new concept of 'protected areas' that

sought to replace 'nature reserves' (Greiber & Schiele, 2011). The number of protected areas rose from 799 in 1996 to 2.640 by 2011 (CBD, 2013a). Most of these protected areas are owned by the state and frequently met with criticism concerning deficiencies in management structures and effective protection.

As a response to CBD, the State Council of China announced its Biodiversity Conservation Action Plan in 1994 (CBD, 2013a). In order to create a contractual environment, the Group on Establishing Biodiversity Conservation was entrusted with the preparation and formulation of the Biodiversity Conservation Action Plan (Ross, 2000). Most recently China amended its National Biodiversity Strategy and Action Plan (NBSAP) (2011-2030) that consists in three goals, eight strategic tasks, ten priority actions, 35 priority areas and 39 priority projects for implementation (CBD, 2013a). In order to implement the CBD, the Chinese government installed a Coordinating Group that involved twenty departments and a system for technical support (McBeath & Leng, 2006). Despite the active response to the CBD a variety of factors were cited that have not appeared in China's action plans, more precisely in its indicator framework. Among those are trends in biosphere, distribution of species and habitat conservation as well as technological transfer (Xu et al., 2009). For administrative matters, it is significant to note, that by 2008, when a number of enterprises had to be closed as a consequence to the financial crisis, the government launched a stimulus package that also foresaw US\$50 billion for biological conservation and environmental protection. However, in 2009, funds were reduced to US\$20,5 during the National People's Congress (Economy, 2011). Nonetheless, to prompt China's compliance with the CBD by supporting the country more in financial terms, US\$52 million were given to the PRC by the GEF. However, natural reserves in protected regions are to be funded by the government and reserves on the provincial and local level fall under the responsibility of the provincial and local governments. This in turn has often led to the misuse of funds (Yu, 2010). The issue of money being spent for the wrong purposes is a rather widespread phenomenon throughout the PRC, in particular in the environmental sector, and limits the capacity to accomplish the goal of bringing biodiversity loss to a halt.

The tendency since the reform and opening policies to decentralize politics and administration has complicated biodiversity conservation efforts. To give an example, now each province has its Environmental Protection Bureau (EPB) in charge of forestry issues; however, there are also forestry offices integrated in the local governments (McBeath & Leng, 2006). This leads to confusion and bad coordination between the different levels of government. Even though

China has advanced the process of decentralization, the powerful center of the state is still visible and therefore could create a strong basis for providing the necessary political and administrative capacity, managed and coordinated by the center.

Although China has avidly supported the establishment of a legal and institutional framework to conserve biological diversity, the basis of a good administrative capacity was restrained by the high frequency of ill-defined and ineffective laws and poor training opportunities for advocates and the judiciary (Economy, 2011). Interestingly, China has acknowledged the supremacy of the international law over the Chinese law (Hui, 2008). Therefore, in theory China prioritizes international conventions and aligns its legal body with international law. In other respects, the vagueness of laws is expressed by general formulations without any specific regulations or consequences in case of violation (Yu, 2010). According to Beyer this becomes evident by the frequent usage of the words ‘should’ (yingai) instead of a stronger term such as ‘must’ (dei) or ‘shall’ (bixū) (Beyer, 2006). Therefore, the prevailing legal status in China has strongly limited the contractual environment to keep the agreement.

3.2.2 Epistemic community and awareness

China’s Fourth National Report on Implementation of the Convention on Biological Diversity stated in 2008: “Building on the successful experience of over 30 years of reform, opening up and modernization, and drawing upon the experiences and lessons of other countries, during their development, China has put forward the Scientific Development Concept, a “people-oriented, coordinated, balanced, and sustainable approaches for development” (MEP, 2008:8). The Scientific Development Concept not only is responsible for creating a scientific community in charge of research, but also for creating multiple approaches coming from urban, rural, economic, social and environmental areas. Speaking in general, the environmental component should be implemented in the social and economic development (Greiber & Schiele, 2011). This epilogue demonstrates that China is at least eager to learn.

In terms of epistemological communities, as previously mentioned, China has been encouraged to draft a national Red List of Endangered Species and it subsequently received international support to comprise 10,000 plants and animals. Specifically for plants, the Chinese Academy for Science designed a project to save the plants most critically threatened from extinction (Yu, 2010). In addition to the Chinese Academy of Science a Biodiversity Working Group and a Biodiversity Information System was generated being in charge of studying and assessing the current status of biodiversity providing the necessary scientific

basis to design action plans upon this knowledge. In supplement to the Biodiversity Information System, that designated further 90 subcommittees and produced one million records, a China EcoRegional Assessment was constructed by SEPA (as this happened before its elevation to MEP), the Academy of Science and foreign NGOs (McBeath & Leng, 2006). Environmental data gathering has been improved greatly in the PRC; the number of data collection programs has increased strongly, and is now available and easier accessible for the public (via Internet). This development can also be traced back to the SARS (severe acute respiratory syndrome) incident in 2003, when the government was harshly criticized for restraining the spread of information on health data and misreporting (Mol, 2009). Even though it still occurs that the Chinese government can be held accountable for concealing information about environmental problems, a tendency to make more knowledge public can be observed.

Regarding people's awareness of the degrading situation of China's biological diversity, the Fourth National Report on Implementation of CBD listed the raising of concern and consciousness among society as one of their final targets (MEP, 2008). Concerning environmental problems in general, a survey conducted in 1998 found that, by then, 62 percent of respondents (in 31 provinces) were convinced that there is a need for the human being to make use of nature and to try to benefit from using its resources (Wong, 2006). However, the participation of the public has been improved during the last decade. Although public participation in EIA (Environmental Impact Assessment) is still at an early stage, it has been officially emphasized by MEP and the Ministry furthermore stressed the necessity of including public participation in the EIA process. Nonetheless, it is rather curtailed and only government members are welcome for EIA (Greiber & Schiele, 2011). Environmental awareness among civil society can only be raised by education about the issues and current situation, for instance biodiversity loss and its consequences. In the majority of cases environmental NGOs took over the task of educating the Chinese population. Despite the more tolerable position of the Chinese government in media concerns for example, there are still notable constraints, such as the complex and restricted process of registration for NGOs and Internet censorship (Zhan & Tang, 2011). As a consequence the number of operating NGOs in China is difficult to estimate. Economy assumes about 2000 registered and about the same amount of unregistered NGOs (Economy, 2005). Often unregistered NGOs engage in informational and educational work rather than in accusing political institutions of environmental violations. In terms of biodiversity conversation government-organized non-governmental organizations (GONGOs) are a common phenomenon and include more

popular organizations such as the China Wildlife Conservation Association or the Chinese National Committee for Man and the Biosphere (responsible for implementing China's UNESCO) (McBeath & Leng, 2006).

3.2.3 Compliance

Concerning the matter of compliance China has definitely responded to the general measure for conservation and sustainable use (Article 6 of CBD) that calls for the development of strategies and plans on the national level by the contracting states, as well as the implementation of conservation and sustainable use of biological reserves into sectoral or cross-sectoral plans or policies (CBD, 2013c). One such strategy is the Scientific Sustainable Concept, mentioned above; with respect to plans and programs the PRC has integrated the concept of sustainable development in its respective Five Year Plan for National and Economic Development. The major objectives are emphasized in the China Biological Conversation Action Plan (issued under Article 6), amongst others, the intensification of research in the area, protection of wild animals and plants and the construction of a national network with reference to biodiversity conservation. Integrated in those and additional objectives are 26 actions and 18 key projects (MEP, 2008). Beside the Biological Conversation Action Plan a number of other programs and plans have been implemented including the National Program for Nature Reserves, National Ecological Environment Plan, National Master Plan for Land Use, National Ecological Functioning Zoning Plan, and many others in the fields of forest biodiversity, agricultural biodiversity, wetland biodiversity, marine coastal biodiversity, grassland and desert biodiversity, and other sectors (MEP, 2008). In regard to actual implementation and effectiveness of these plans, the assessments diverge and a mixed picture emerges. For instance Schaller (1998) argues that the policies to address biodiversity loss had little effect, especially in Southwest China, where the lack of personnel, funds, management and infrastructure inhibited sustainable biodiversity conservation actions. Apart from deficiencies in the physical, political and economic infrastructure, the monitoring apparatus as well as insufficient transparency in the decision-making system (Economy, 2006) limit effective environmental governance in terms of biodiversity protection.

As indicated above, China has addressed the issue of deforestation in the last decades. Although it could report that it was able to increase land covered by forest (by about 25 percent between 1990 and 2005), critical voices accuse China of having created plantations

rather than forests since only two tree species have been used (Economy 2011).

A variety of concrete measures have been taken to conserve biodiversity, to give an example, the establishment of 250 bases for breeding wild animals and 400 centers for cultivation of wild plants. Despite the number of activities, the situation is still assessed as becoming worse, highlighted by the fact that 40 percent (of the area) is constantly degrading. It is estimated that about 15 to 20 percent of fauna, as well as flora is close to becoming extinct (Yu, 2010). This consequently leads to the assessment of China's Red List Index that allows insights in terms of endangered species' population trends. Until 2004 the population of mammals decreased while threatened bird species and the rate of critically endangered birds rose (CBD, 2013a).

A domestic environmental monitoring system was established involving 4800 stations, though it lacks significantly in the provision of accurate information and has a time lag of management measures to come into effect (Xu et al., 2009).

A protocol that grew out of the CBD, the Biosafety Protocol (also referred to as Cartagena Protocol), foresaw the safe transfer and use of biotechnological products such as the so-called 'living modified organisms' and entered into force in 2003. China has committed to the Biosafety Protocol and allocates about US\$3 million per year for activities in the field of agricultural biosafety (Huang et al., 2008). Despite the large number of scientists employed for research in this area, a poor record of compliance on the part of the People's Republic is reported. The main reason for this is the fact that China is one of the largest importers of genetically modified organisms, which are targeted to be curtailed by the Biosafety Protocol (McBeath & Leng, 2006). It becomes clear, that in many cases, even though the PRC has responded to prescriptions, the actual implementation and final action often lacks in effective outcomes. Therefore, there is a strong need for IEs to present and define clear incentives in case of high compliance with the agreement or convention. Since China engages in environmental protection as long as the economic development would not be decelerated, the CBD not only should demonstrate the environmental threats and necessary actions, but it needs to highlight the benefits of biodiversity conservation and its consequences as well.

3.2.4 Change of behavior

With reference to change of behavior, a leading member of SEPA stressed the importance of the CBD and its effects on national policies that have been developed. Moreover, he added that more research is done, mostly in the form of surveys and studies (McBeath & Leng,

2006). CBD obligations first and foremost comprise, apart from integrating the concept of sustainable consumption of biodiversity in domestic policies, the development of national strategies, programs and plans in order to conserve biodiversity. China has established a number of policies and programs to address biodiversity loss. It has additionally formulated a strategy (NBSAP) and changed its behavior of neglecting the threat of biodiversity loss. However, and similarly to the issues of the implementation of CITES, a lack of effective management, misuse of funds and other problems weaken the CBD's effectiveness in China. Thus, generally speaking, although an overall change of behavior has occurred, nevertheless, there is still a great need to improve the taken actions and make them more effective. In order to achieve better outcomes, IUCN and the UN in general have to enforce the CBD and prompt China to engage more in biodiversity conservation and include environmental NGOs in the policy-making process to achieve better environmental governance.

	Contractual environment	Administrative & political capacity	Epistemic community	Concern and awareness	Level of compliance	Change of behavior
Absent or only marginally given	x					
Generally given, but with deficiencies		x	x	x	x	x
Acceptable up to high						

Table 3: CBD and China

3.3 China and the Montreal Protocol

Beside the great threat of biodiversity loss, other environmental problems present a challenge to the People's Republic of China. Among those climate change (air pollution) is considered one of the most urgent and problematic ones. Despite the transnational character of climate change and the resulting depletion of the ozone layer, by now every state individually feels the consequences of climate change one way or the other and therefore also needs to address it. Since China comprises a vast territory, and is partly also responsible for those issues, it will (and already does) affect the PRC more intense than many other countries. By 1995 China turned into the world's largest producer and consumer of ozone depleting substances (ODS) (Kent, 2007), such as chlorofluorocarbons (CFC), halons, methyl chloroform methyl bromide (often referred to as 'first generation ODS') and a series of other industrial substances. Around 2007 China overtook the United States in being the world's largest carbon dioxide (CO₂) emitter (Kopra, 2012) and a great part of its territory is affected by acid rain.

The Montreal Protocol on Substances that Deplete the Ozone Layer was among the most significant agreements and one of the first international accords concerning climate change. However, in terms of raising the government's awareness for the first time, it was professor Tang Xiaoyan who published scientific research about the depleting ozone layer in 1984. In the wake of her publication instructions followed to carry out more research, especially on the effects for China (Oksenberg & Economy, 1998). After having recognized the threatening situation and the potentially bad consequences for economic and social life, the PRC decided to send observers to the upcoming meeting of the Montreal Protocol. The prevailing attitude at the meeting was to prompt China to participate in the Protocol, though China would not sign until various modifications of the Protocol were to be confirmed. This was the consequence of calculations executed by the State Planning Commission (SPC) that identified costs and benefits, and possible implications for China's trade in case it would not sign (Oksenberg & Economy, 1998). Thus, China refused to sign the Montreal Protocol until the London Amendment was elaborated and established the Multilateral Fund (MLF), especially to support developing countries (Zhao & Ortolano, 2003). In case a developing country's level of ODS consumption per capita was below 0,3 kilograms it was allowed to delay the process of adequately addressing the Protocol for ten years. On the other hand, developed states were obligated to phase out 95 chemicals, control the trade between parties and non-parties, report data and transfer technology (Kent, 2007). The fact that China was regarded as

one of the so-called Article 5 countries, that fall under the mitigation of the Protocol (UNEP, 2000), made it bearable for China to sign it in 1991. The Multilateral Fund was in particular created to collect money from developed countries (which, in China's opinion were mainly responsible for the depletion of the ozone layer) and assist economies of scale that needed financial and technological support. The MLF has four agencies in charge of implementation, namely the UNEP, UNDP, the United Nations Industrial Development Organization (UNIDO) and the World Bank (MLF, 2011). China's position in regard to binding emission standards was enormously reluctant since it feared they could get into the way of economic growth and the necessary energy use (Schreurs & Economy, 1997). This leads to the assessment of the administrative capacity and whether China is able to create a contractual environment to engage in climate change.

3.3.1 Political, administrative capacity and contractual environment

During the first years of implementation of the Montreal Protocol, China's commitment was rather limited. As indicated, the PRC refused any binding regulations and would only engage in climate protection when funded by the international community. Furthermore, at that time (when the Montreal Protocol was signed) environmental issues rarely made it to be actively examined by the leadership and most of the time remained at a low level of interest, in particular for senior Chinese officials (Schreurs & Economy, 1997). Therefore, at the beginning the necessary political capacity to commit to climate protection was not present and made it hard for the Montreal Protocol to receive the required attention. Although many ministries assumed a skeptical position, out of trade reasons the Ministry of Light Industry advocated the adoption of the Protocol. In the opinion of this Ministry, it would not bring harm to the economy if CFC was phased out and substitutes were used (Zhao & Ortolano, 2003). Due to the increasing importance of foreign trade since the reform and opening up, China intended rather not to disturb the established trade relations. This action indicates that diplomatic and economic reasons have been the basic drive to sign the Protocol.

Rapidly after the ratification of the Protocol, the PRC started to form a body responsible for its implementation. As the leading organization, the National Leading Group for Ozone Layer Protection was designated, consisting of 18 ministries and commissions. The Group's coordinating function overtook the SEPA, which additionally established a Project Management Office (PMO), and the Group's overall task was to implement the Protocol.

Final decisions about the ratification of an amendment, however, were up to the State Council (Zhao, 2005). About US\$100.000 were given to the office for ozone protection in order to work on the implementation of the Protocol and in terms of personnel, by 1992, seven full time and 34 part-time staff were installed and three full time staff were added by 1994. Since the PRC put emphasis on its position as a developing country and stressed that it had other important duties such as poverty reduction, the World Bank's Ozone Trust Fund supported China with US\$15,6 million and Chinese Banks added on US\$10 million (Oksenberg & Economy, 1998). China has demonstrated an engaging attitude in terms of establishing an institutional and administrative framework, and reached to receive assistance from various institutions. Especially the MLF favored China as developing country and supported it with the provision of technology and huge sums to cut out ODS. The other side of the coin was a number of serious deficiencies such as failures in management, a lack of funds and limited knowledge, especially on the part of the PMO in charge of the implementation of projects. To give an example, during the first years of the Protocol's implementation and when China firstly applied for the MLF's assistance, there were no clear instructions and systematic processes for enterprises to register for funds. At that time, not even NEPA or ministries in the industrial area were able to provide support (Zhao & Ortolano, 2003).

A challenging issue again arises due to the lack of coordination and precise definition of task areas between the central and local governments. It is foreseen that the central government appoints targets of energy intensity and passes them on to the provinces, which then set the goals for the prefecture and county levels. However, in many cases this shift of responsibility to the local level often empowered polluting enterprises (Zhang, 2011). Even though the process of decentralization may enable local governments to contribute to the combat against climate change by providing practical information from local and regional areas, primarily, there is a need of education and training for the respective officials to explain the importance of climate protection. Decentralization problems affect the creation of a contractual environment for further implementation of the Montreal Protocol. On the other hand, in contrast to former postures, the PRC was then willing to release concrete information on its production, import and export of ODS from 1991 to 2001. The data was transmitted to the Ozone Secretariat as well as to the MLF Secretariat (Ozone Secretariat, 2002). In terms of a contractual environment to make and keep agreements, China has been assiduous to demonstrate its capacity to participate in the international community and be a respected and coequal player. Benedick even writes: "(...) China has also been from the beginning one of

the most cooperative and conscientious parties of the Montreal Protocol, notwithstanding the needs of its large and rapidly expanding economy” (1998:264). If observed from another angle, one can argue, China was indeed cooperative; however, this was mainly because of the emerging costs in case of opposing international intentions and the risk to trade opportunities. Among the strategies and programs, a Country Program was developed that was to work as a guideline for the operation of phasing out ODS and was initiated after its update in 1998 (Zhao, 2005). In regard to the creation of a contractual environment, in 1999 China was selected to host the Montreal Protocol Meeting of Parties, which led to the Beijing Amendment. In this matter it is significant to add that in diplomatic terms China was especially strived for an unobstructed holding of the meeting, also concerning the involvement of youth groups and NGOs (Porter & Andersen, 2013).

3.3.2 Epistemic communities and awareness

As indicated above, it was a professor that primarily raised the government’s awareness and provided scientific evidences of climate change and its implications for China. Subsequently, in 1986 Song Jian, Director of the State Science and Technology Commission and a member of the Politburo, organized Chinese participation (as observers) at the Ozone Layer Protection Working Group meeting, executed by UNEP (Zhao & Ortolano, 2003). Altogether, six working groups were organized (for instance a halons working group and a foam working group) (Kent, 2007). Other actions like the establishment of a five-year research program for climate change were initiated and foreign assistance was pursued (Schreurs & Economy, 1997). When it came to ratifying the Montreal Protocol, China already comprised a scientific community dealing with the ozone layer; however, foreign assistance and equipment was necessary for further research. Apart from the ministries that have been responsible for the assessment of chlorofluorocarbons (CFCs), a scientific working group was established (Kent, 2007). The elimination of CFCs was one of the first and fundamental goals of the Montreal Protocol.

Shortly after China had acceded the Protocol, foreign experts, chosen by the MLF, were sent to China in order to manage the program for the elimination of ODS (Kent, 2007). Furthermore, the MLF, World Bank, UNDP and Asian Development Bank delivered new technology. Nevertheless, a Chinese scientist complained that this process was not favorable and no assistance was provided for developing indigenous Chinese technologies (Oksenberg & Economy, 1998). In addition, Chinese scientists protested against the foreign method, since

according to them they had no say in the development of the program. Consequently, they warned about their inability to reach the targets in case the command was not transferred to Chinese scientists (Kent, 2007). On the other hand, Economy (2011) argues that in many occasions scientific research and training for Chinese scientists and officials was funded by these institutions and contributed to changing the way of thinking about climate change and the protection of the ozone layer.

The first years of implementing the Protocol present a mixed picture of the ability of an IEI to create an epistemological community, were Chinese work together with foreign experts and support each other to achieve better targets. As indicated, Chinese scientists were not comfortable with the domination by foreigners, which limited the effectiveness of the IEI to establish a scientific community in the initial period. Contrary to the overall perception of the Chinese society, being almost exclusively interested in the growth of their economy, recent polls have shown, that concern about climate change is rather high (78 percent) compared to other developing countries (Kim, 2011). Due to the recently rather euphoric position of UNEP concerning China, in 2011 it agreed on a HCFC Phase-out Management Plan. Zhang Shigang, UNEP Coordinator in China, stated “We at UNEP are very enthusiastic in assisting the government of China in their capacity-building and public awareness campaign on the phase-out of HCFCs. We very much appreciate the strong political commitment made by the Government of China in the implementation of the Montreal Protocol (...)” (UNEP, 2011).

3.3.3 Compliance

The first step for China with reference to the procedural obligations of the Montreal Protocol for Article 5 states was the establishment of an institutional framework, which was initially pursued by the Chinese government. Thus, the PRC complied with it by installing the National Leading Group for Ozone Layer Protection, a PMO, and involving several ministries in this process. In addition, by introducing the Country Program, China created a concrete phase-out plan and the reporting of data (Zhao, 2005), through which the procedural obligations were reached. The PMO took the position of China’s National Ozone Unit, as prescribed by the Protocol (Zhao & Ortolano, 2003). Although the general obligations were therefore fulfilled, the system has lacked in coordination and experienced staff, presenting obstacles for effective environmental governance. Moreover, as a measure to reduce ODS, both command-and-control policies as well as market-based instruments were used. Nonetheless, especially market-based instruments were used much more frequently under the

provisions of the Kyoto Protocol, discussed in the following section. In addition to these tools, a labeling program was initiated by 1993, also for trade reasons, as for instance refrigerator manufacturers pursued a labeling system for being able to sell their goods on the European market as well. This program was similar to the German labeling program and by 1994 a China Certification Committee for Environmentally Labeling Products was created to coordinate it (Zhao & Xia, 1999).

Concerning non-compliance, an Implementation Committee was formed by the international community in order to inform about the non-compliance of respective parties, which involves the freedom of one party to report about another party that is not complying with certain obligations of the Protocol. In case non-compliance occurs, the state's support, cautions, or privileges are withdrawn (Kent, 2007). It is nevertheless criticized that the measures against non-compliance are far too weak and do not prevent violators from neglecting certain obligations. Observed from a later point of view, when China acceded the Copenhagen Amendment (2003) of the Montreal Protocol, it was considered to be in accordance with the obligations of the Protocol, since national emissions had decreased since 1996, and the Air Pollution Prevention and Control Law was agreed on by 1987 and amended in 1995 and 2000. Also the legal framework was elaborated, though it presented a lack of concrete agendas of emission reductions (Kent, 2007). In terms of amendments, China has only ratified the Montreal Protocol, London Amendment and the Copenhagen Amendment. The Montreal Amendment and the Beijing Amendment have merely been accepted by China. However, it is often argued, that those Amendments basically emphasize the same provisions as the Montreal Protocol, which does not make much of a difference for China.

Concerning the achievement of set goals, China reached its overall target of freezing. By 1998, it could freeze the production and consumption of major halons and by 1999 of CFC. The use of CFC was banned in the aerosol sector by 1993 and for air conditioning (in cars) by 2001. Even though a number of good results could be realized, the targets defined in the Country Program were not reached (Zhao, 2005). One of the reasons, that China could not reach its 1996-targets, was that the Ministry of Public Security (in charge of production and sale of halons for fire extinguishers) was not willing to use substitutes (Kent, 2007). However, after 1996 an improvement of compliance mechanisms on the part of the PRC could be recorded.

Speaking in general, already by 2001 the PRC had succeeded in phasing out the largest amount of ODS (Kent, 2007). China's emission of the primarily listed ODS has further declined in comparison with the year 2001, which highlights the fact that the phase-out

strategy has been followed (Vollmer et al., 2009). Registered in China's compliance record is its commitment to create a strategy to phase out methyl bromide (a fumigant), which was funded and supported by UNEP and the Victorian State Government in Australia in 1998 (Porter & Andersen, 2013). Then, in 2005 China missed its ODS reduction targets and was threatened with non-compliance measures by the Protocol. Hydrochlorofluorocarbon (HCFC) has also evolved as an important ODS to be eliminated, though it was not among the first generation ODS. As a means to address its phase-out in China, the MLF's Executive Committee has decided to provide US\$385 million in order to eliminate HCFC by 2030. The PRC has agreed on this and has set the goals of emission prevention of over 4.3 million metric tons of HCFC and 8 billion tons of CO₂, which is considered the biggest project undertaken by the MLF (MLF, 2013).

China's acceptable compliance record concerning the Montreal Protocol, compared to many other agreements is also a result of tolerable costs and the fact economic growth is not estimated to suffer. In addition, valuable technical equipment and financial assistance was provided by the MLF (Zhao & Ortolano, 2003). Therefore, in general China's compliance is acceptable since it has fulfilled most of the tasks cited in the Montreal Protocol. There is still a need to employ more staff in order to improve enforcement mechanisms. Concerning the Protocol itself, stricter non-compliance measures have to be implemented to create incentives in case of complying with the agreement.

3.3.4 Change of behavior

As discussed, scholars have intended to measure effectiveness of institutions by assessing counterfactuals. According to UNEP's calculations in 2007, a tenfold rise of the levels of ODS in the atmosphere would have occurred in the absence of the Montreal Protocol. This in turn could have caused around 20 million more cases of skin cancer and 130 million more eye cataracts relative to 1980 (UNEP, 2007). Dan Wan et al. (2009) state that also for China, the Montreal Protocol has had an effect, since due to its economic growth the emissions would have increased unrestrainedly. Without the Protocol the ozone layer would have been much more damaged by now. Thus, not only in a global sense, but also specifically for China's governance, the Montreal Protocol has been effective in terms of helping protect the ozone layer. A certain change of behavior definitely has occurred since about two decades ago the terms ODS and global warming were rather considered foreign words and only some years later the freezing of the first substances could be recorded by the PRC. Clearly, there is still

much work to do, however, China changed its behavior from zero to a certain level of protection of the ozone layer. Given that China has recently agreed on many other targets concerning ODS elimination, especially those with the deadline of 2030, it will be interesting to follow China's path in addressing climate change. Speaking in general, the Montreal Protocol has achieved various benchmarks in the combat against global warming.

	Contractual environment	Administrative & political capacity	Epistemic community	Concern and awareness	Level of compliance	Change of behavior
Absent or only marginally given						
Generally given, but with deficiencies	x rising		x	x		
Acceptable up to high		x			x	x

Table 4: Montreal Protocol and China

3.4 China and the Kyoto Protocol

Along with the growing threat of climate change and global warming, the United Nations has put an emphasis on a necessary comprehensive accord in order to develop a framework addressing those challenges. The international treaty of the UN Framework Convention on Climate Change was created in 1992 and about three years later it became clear to the member countries that an elaborated agreement was necessary for combating climate change in an adequate manner. By December 1997 the Kyoto Protocol was adopted but did not enter into force before 2005, with its first period in force lasting from 2008 until 2012. China signed the Protocol in 1998 and approved it four years later. The PRC was not categorized as an Annex I country, meaning that it was not obligated to reduce its greenhouse gas (GHG) emissions by 5,2 percent from 1990 emission levels (UNFCCC, 2013). In connection with Kyoto, subsequent conferences were organized, amongst others in Copenhagen, Cancún, Durban and Doha and China was assisting all of them, being distinguished as the leading nation of developing countries, along with India. China's position has also been strengthened by the fact that the US has only signed the Protocol but has not adopted it yet, which already limits the Kyoto Protocol's effectiveness since in 1990 the US was responsible for about 36 percent of GHG emissions. In addition, Canada has withdrawn its membership.

Since China and India vehemently stressed the fact that developed countries were mainly responsible for environmental degradation, in particular global warming, their notion was, that primarily those countries were in charge of addressing the issue. Recently China has been pressured to adopt legally binding standards; however, the People's Republic has responded with the following conditions for agreeing on a binding treaty after 2020. In summary, the Chinese conditions involved the definite accordance on the Protocol itself and the second commitment period, the introduction of the Green Climate Fund, the establishment of tools concerning technological transfer, transparency and capacity building, as well as an evaluation program for developing countries' compliance and the implementation of the concept 'common but differentiated responsibilities' (Hu & Monroy, 2012:3244). The principle of 'common but differentiated responsibilities' deserves an extra note since it has turned into the Chinese manual concerning climate change negotiations. More precisely, it refers to the PRC's opinion that climate change needs to be addressed by universal cooperation, however, every country should engage in climate protection corresponding to their economic capability, meaning that developed countries need to contribute more.

3.4.1 Political, administrative capacity and contractual environment

As discussed in the theoretical part, an accord's signification not only depends on the domestic basis where it has to be implemented but also on the accord itself. In the Kyoto Protocol's case a number of issues has already emerged long before its entering into force, such as the excessive delay of this process and the great disagreement among the parties (and non-parties).

Besides China's policy of 'common but differentiated responsibilities' and its eager position to prevent developing countries from a binding treaty, it also worked on the acceptance of international trade mechanisms in terms of the environment (Harris & Yu, 2006). China has especially focused on a clean development mechanism (CDM) and has accomplished good results regarding this method. The government has favored it since its evolution and was therefore also eager to create a contractual political basis for dealing with CDM. Regarding international climate negotiations and CDM concerns the Ministry of Foreign Affairs is the primary authority. As institutional framework for CDM, a National CDM Board, consisting in seven ministries, was established to coordinate the respective agencies (Zhang, 2006). Another reason for the intensification of climate protection work was the elevation of SEPA to the independent Ministry of Environmental Protection by 2008, with broader ranged possibilities and more power.

However, during the Kyoto Protocol's initial period, China's administration and politics encountered a number of challenges since the Chinese economy was not properly prepared for reducing GHG emissions. Furthermore, the Protocol targeted the modification of whole economies (Kent, 2007), in contrast to other conventions such as the Montreal Protocol that foresaw specific targets concerning the protection of the ozone layer. This, in turn made it more difficult for China to create a favorable environment and build up the necessary administrative fundament. As mentioned, the PRC became the world's largest GHG emitter and its share of renewable energy was minimal. In 2009, coal constituted about 77 percent of China's energy production, 10 percent oil, and 4 percent natural gas, whereas hydro, nuclear and wind power only accounted for 8 percent (Hu & Monroy, 2012). The usage of coal is preferred by developing countries because of its large availability and its relatively low price. This also explains China's excessive coal consumption; for example in 2010 usage reached around three billion tons (Hu & Monroy, 2012). As a consequence China urgently needs to increase its share of renewable energy.

After the UNFCCC was acceded by China, it organized its first representation in order to

address climate change, beginning with the establishment of a National Coordination Committee on Climate Change and in order to respond to UNFCCC's instructions China's National Climate Change Program was introduced (NDRC, 2007).

GHG emissions were not considered especially relevant up until 2006 when they were firstly included in the national Energy Plan, which in turn was part of the Eleventh Five-Year Plan (2006-2010). Supplementary to the Eleventh Five-Year Plan's initiatives concerning global warming, a National Action Plan on Climate Change was elaborated and installed by 2007 (Hu & Monroy, 2012). In its National Action Plan, China particularly emphasizes the need for assistance in technological terms, for monitoring, observation, mitigation of GHG emissions, and for the adaption to climate change (NDRC, 2007). Given that in almost all Chinese regions a lack of technology is reported it is further important to strengthen technological coordination. Again, institutional weakness on the part of local Environmental Politburos was a serious problem for effective environmental protection. To overcome this obstacle regional environmental supervision bureaus were established which had a direct connection with MEP and should also improve the administrative basis. However, the number of staff continues to be far too low (Economy, 2011).

One of the issues in connection with the Kyoto Protocol is the definition of the provisions that often remind of descriptions full of vagueness. Thus, the actual implementation depends on the national interpretation and a country's legal framework (Ma, 2010). Amongst other measures to create a contractual environment to comply with the Kyoto Protocol has been a new governmental initiative known as Disclosure of Environmental Information for more transparency introduced in 2008 (Economy, 2011). This process refers to the publishing of a 'black list' of enterprises not following the mandatory emission standards.

3.4.2 Epistemic community and awareness

Following the instructions of the Kyoto Protocol, a research program for examining GHGs in China was developed with international financial support (Kent, 2007). Another response on the part of the Chinese government comprised an agenda of various statements regarding climate change related scientific research. Besides the improvement of the macro-management in climate change science, a general promotion of scientific research in crucial domains, the creation of highly educated experts and scientists for scientific research in the field of climate change, as well as financial assistance for research and technology were designated as focus areas by the government (NDRC, 2007). The strategic planning of

scientific research was strongly necessary, hence during the initial period of the implementation of UNFCCC and then the Kyoto Protocol only a very limited number of experts concerning climate science were found in China (Harris & Yu, 2006). In order to strengthen international cooperation and learn from other countries' experiences the Adapting to Climate Change in China Project (ACCC) has been introduced. The project was initiated in 2009 and was a collaboration of UK, China and Switzerland, funded by British and Swiss institutions. The focus areas of the project were capacity building, adaptation planning, climate modeling and risks, research, socio-economic information, data and observation, and a range of other elements (UNFCCC, 2013b). China had to fill the research gap on climate change science and urgently needed to carry out assessments on China's status.

In 2008, the central government took an important step in the fight against global warming and towards the inclusion of civil society. It established a program named Open Government Information Regulation that made it accessible for citizens and organization (NGOs) to ask and receive information on environmental issues from the government (Economy, 2011). Additionally a list of the ten most polluted cities was published in order to pressure local governments (Zhang, 2011). Contrary to common practice of the Politburo and other ministries to avoid the dissemination of any information, this trend demonstrated more environmental responsibility and the willingness to include the public in the process of environmental protection.

Another piece of evidence for the raised concern in China is the fact that in the Eleventh Five-Year Plan GHG emissions were only marginally mentioned in form of a short annotation, whereas the Twelfth Five-Year Plan contained a complete discussion of the plans and objectives concerning the reduction of GHG emissions (Hu & Monroy, 2012). Thus, also in China's policy framework a tendency towards serious integration and concern in regard to climate change has been observed. A positive example with respect to awareness rising is the case of Benxi, an industrial city in Liaoning Province. Benxi has been considered a threatening example of air pollution and was frequently covered completely with smog. Moreover, the mortality rate of lung cancer had increased by 2,3 times from 1971 to 1982 and the rate was still rising in polluted, industrial areas after 1986. As a consequence Liaoning Province's director of EPB, the mayor, deputy mayor and other officials started a campaign to make people aware of the connection between pollution and lung cancer or other diseases in the form of educating the civil society, installing a 'Green School' campaign and calling for financial support from governmental institutions and international donors (Koehn, 2008).

There are a number of examples that highlight China's tendency to abandon the notion of climate change being an insignificant challenge. Thus, although the Kyoto Protocol has contributed little to form a Chinese epistemological community, research has been improved and the overall level of concern has been enhanced.

3.4.3 Compliance

China has responded to the institutional and administrative instructions of the Kyoto Protocol, and since the PRC is considered a non-Annex I country, the remaining provisions are marginally significant for the contribution to climate change prevention.

As indicated the CDM concept has had a special relevance for China since 2005; this is stressed by the fact that, with comprising 44 percent of all CDM projects, it has emerged as the greatest beneficiary of this mechanism. Through reducing GHG emissions, set in relation to a 'business-as-usual' scenario, China received 'certified emission reduction credits' (CER) that can be acquired by developed countries (Schmidt & Heilmann, 2012). In 2010, in total the PRC hosted 2284 CDM projects; however, it is criticized that CDM is not making much of a difference for China (Zhang, 2011). The Chinese Ministry of Science and Technology (MOST) plays an important role for CDM processing since it is in charge of providing the necessary expertise (Zhang, 2006). China has turned into a role model for other developing countries in respect of CDM projects, though the overall significance and effectiveness of CDM is highly questionable since it gives developed countries a chance to act environmentally unfriendly in case they purchase enough CER.

With respect to other measures, China has realized a number of attempts to reduce GHG emissions. As in many cases the command-and-control approach has yielded little valuable results, the PRC has engaged more in market-based instruments that are considered to be more effective. Although China has implemented those instruments already before the ratification of the Kyoto Protocol, it has intensified them ever since. The Chinese government has continually increased the costs for sulfurdioxide (SO₂) emissions from coals (Zhang, 2011). In connection with emission reductions required by the Kyoto Protocol and the Eleventh Five-Year Plan different energy saving goals were set, though the PRC has not reached them (Zhang, 2011). A persisting problem for all the tools to be effective is the low fees in case of violations of regulations or standards. Often it is cheaper for enterprises to pay the fees than acting and producing in conformity with certain standards. In 2009 a research

program examined 621 cities and found that 107 of these did not meet the domestic air quality standards (MEP, 2010). Since industries are mainly held responsible for air pollution, in 2010 the central government of China has given out a blacklist of state-owned enterprises that clearly violated emission standards or other regulations. This process is often referred to as ‘naming and shaming’ of pollutant enterprises. Moreover, the government has introduced environmental performance ratings; however, more incentives for the production and action in an environmentally friendly way need to be established (Zhang, 2011). With reference to ‘naming and shaming’, it can be assumed, that even if the Chinese government identifies the polluting state-owned enterprises, there must still be an estimated number of unreported pollutant cases of private enterprises.

Furthermore, the new Vehicle and Vessel Tax Law have been added in the transport sector imposing charges for owners of vehicles with engines sporting a volume of above 1 liter. The range of the tax reaches from RMB 300 annually for small cars up to RMB 5400 for vehicles with engines over 4 liters. Excluded from this tax are electric cars as well as cars working with hybrid technologies (Taxation International News and Information, 2011).

Apart from taxation a more voluntary approach is eco-labeling that should encourage higher environmental responsibility by offering an environmentally friendly alternative to other consumption goods (Zhang, 2011). In general, the Kyoto Protocol is often regarded as being relatively weak due to the absence of strict punishment mechanisms and resulting low compliance among member countries (Ma, 2010). Even though, China has introduced a number of measures and has satisfied procedural provisions, its compliance record lags behind and China continues to be the world’s largest CO₂ emitter as well as of many other harmful substances.

3.4.4 Change of behavior

Although the Kyoto Protocol has prompted China to develop and commit to a number of programs and initiatives, it has not modified Chinese thinking in terms of the ‘economy-first’ concept. The greatest obstacle for the Kyoto Protocol is its soft-law character and the unfulfilled need of universal membership. One of the dilemmas with China’s climate protection is that the PRC itself continues to have troubles with the formulation of its position. On the one hand, it wants to be seen as a responsible actor, not losing face and ready to engage in climate change. On the other, it presents itself as the poor developing country and victim of global warming, not being able to invest large amounts by itself (Kopra, 2012). It

seems important to pressure China and all other countries to engage more in climate protection; nonetheless, the Chinese argument concerning industrialized countries' responsibility in the struggle against climate change is not an assertion without substance. In diplomatic terms, China's desire not to lose face has strongly contributed to keeping it in the game and prompted it to address climate change. Therefore, not necessarily the Kyoto Protocol itself has changed Chinese behavior, but by acting in accordance with a number of provisions given by the Protocol, its integration into an international community pursuing similar aims has been intensified. While at the international climate negotiations in Copenhagen (2009) China's position was rather reluctant regarding a legally binding accord (Economy, 2011), in Cancún the PRC has taken a major step towards a binding UN resolution, as it offered to engage stronger in climate protection and voluntarily set itself carbon emission targets (Remais & Zhang, 2011). Thus, since China is listed as non-Annex I, there was no need to follow binding reductions and therefore its compliance record refers to the establishment of an institutional framework which has been accomplished by China.

From 1990 to 2005 China's share of the global energy-related CO₂ emissions has accounted for 8 percent, while the US comprised 30 percent and the EU 23 percent (Zhang, 2011). Thus, even though China's governance has been improved, for instance in terms of society involvement and accessibility of information, the Protocol needs the active participation of countries like the United States to have any global effect.

	Contractual environment	Administrative & political capacity	Epistemic community	Concern and awareness	Level of compliance	Change of behavior
Absent or only marginally given	x					x limited
Generally given, but with deficiencies		x	x	x	x	
Acceptable to high						

Table 5: Kyoto Protocol and China

3.5 China and Agenda 21

At the UN Conference on Environment and Development in Rio de Janeiro (1992) the international community outlined the foundation of Agenda 21 giving the necessary guidelines for the states to integrate the concept of sustainable development into their policy-agendas. Generally speaking, Agenda 21 was compiled according to the four principles sustainable development, economically sustainable development, socially sustainable development, and rational use of resources and environmental protection. The individual countries were asked to elaborate their own national Agenda 21, which was primarily put into practice by the PRC that published China's Agenda 21 by 1994. It is though important to take into account the circumstances and the broader context of Agenda 21. Hence at UNCED China's officials assumed a less reluctant posture as in Stockholm in 1972. Aside from Agenda 21, it signed the CBD and Commission on Sustainable Development and showed more willingness to be part of the international community. A key agency in the process of formulating China's Agenda 21 was the UNDP that provided financial and other sorts of help, which led to the creation of a document counting about 120 thousand Chinese characters and 40 chapters finished by 1993 (China's Agenda 21, 1994).

Event though after presenting Agenda 21 many observers categorized it as 'another soft international agreement', it nevertheless deserves a closer look and consideration from a broader angle, as its general framework has prompted China to engage more in environmental protection. For China the international context in this matter plays a significant role.

3.5.1 Administrative, political capacity and contractual environment

For a project's realization such as Agenda 21, in particular China's Agenda 21 (CA21), a strong fundament as well as an environment where treaties can be followed and programs can be executed is necessary. Thus, the allocation of tasks is a crucial part right from the beginning. In consideration of the document's non-binding character it becomes even more relevant to construct a stable and structured administrative framework at the domestic level in order to give a basis for further strategies and programs.

In 1992, at the twenty-third session of the Environmental Protection Committee, the rough framework of responsibility assignment was drafted and the State Planning Commission (SPC) and the SSTC were designated to be the leading agencies in organizing the elaboration and implementation of CA21. Adequate ministries, non-governmental organizations

(only to a minimal extent) and other departments worked out the 'White Paper on China's Population, Environment and Development in the Twenty-first Century'. The two deputy ministers of the responsible ministries were selected as the chairs for the leading group and in total 52 ministries and agencies, and about 300 experts formed this group (China's Agenda 21, 1994). The paper was embedded in China's Ninth Five-Year Plan of National and Social Development to assign legality and more importance to it (Palmer, 2000). In order to implement CA21, SPC and SSTC installed an administrative agency referred to as the Administrative Centre for China's Agenda 21 (ACCA) (UN Department for Policy Coordination and Sustainable Development, 1997a). Concerning financial expenditures, during the first years of implementing CA21, approximately US\$70 billion were spent in favor of CA21 between 1998 and 2002 (Kent, 2007). Over the years of the Ninth Five-Year Plan (1996-2000) the ratio was 0.93 percent of China's GDP, while in 2003 it had added up to 1.39 percent of the GDP (Wang, 2010). Generally, only about one fifth of the budget foreseen for environmental protection comes directly from the PRC, whereas large parts of the budget are given by the World Bank and the Asian Development Bank, of which China has become the largest borrower (Harris & Udagawa, 2004). Thus, to a great extent (especially in financial terms) the creation of a favorable environment for complying with the agreement was the contribution of capital providers.

The White Paper was elaborated as a master plan and schedule to balance economic, social and environmental development, the use of resources and educational matters that concern various areas of the state such as national, regional, ministerial and local levels (Gan, 1999). The different provinces were requested to form special Leading Groups until 1996, which was fulfilled by 21 provinces, autonomous regions, and municipalities that organized their Leading Groups and local offices. In continuation many of them have additionally worked out their own Agenda 21 or other action plans (UN Department for Policy Coordination and Sustainable Development, 1997a). The agenda further encompasses 78 program areas; a number of priority projects were agreed on, and for its completion it was approved at the Executive Meeting of the State Council in March 1994. The whole paper is organized in accordance with the four principles and each of them has about five chapters (China's Agenda 21, 1994). Contrary to many other countries, China took the establishment of an institutional framework for Agenda 21 seriously and tried to pioneer the implementation of the agreement. In addition, due to the emerging will of being considered a respected player in world affairs, China's diplomatic and political performance at UNCED was more committed than at former conferences. Although, the overall environmental concern was not equally high compared to

Scandinavian countries at that time, the awareness of Chinese officials had been increased and they were eager to demonstrate its political capacity to engage in implementing agreements such as Agenda 21.

Although numerous environmental governance actions have been taken to build a basis for good compliance, the following passage makes China's predominant perception obvious: "Because China is a developing country, the goals of increasing social productivity, enhancing overall national strength and improving people's quality of life can not be realized without giving primacy to the development of the national economy and having all work focused on building the economy" (China's Agenda 21, 1994:n.p.). This statement clearly puts economic growth before sustainable development and environmental protection, which in turn limits the dimension of a contractual environment as most efforts are saved for the economy. On the other hand, Palmer (2008) argues, that although in China economic growth continues to be the focus of attention, through Agenda 21 concerns like population control, EIA, public consultation or environmental planning have evolved on the political agenda as well. Additionally, in some cases, such as a more efficient use of resources, China was forced to create an action plan due to its insufficiency regarding the supply of natural resources. There are various examples where the natural environment revolted against Chinese exploitation and therefore compelled measures by China's government.

3.5.2 Epistemological community and awareness

Chapter 31 of Agenda 21 requests the formation of a scientific and technological community and in chapter 35 the necessity of science for sustainable development is emphasized. As science and technology are regarded as fundamental issues to be strengthened, the UN highlights the need of forming and sufficiently funding a scientific community.

The Chinese Science and Technology Society has established more than 10,000 branches in provinces and prefectures, 50,000 municipality offices, and 2,000 community groups. China declares that in 1995, US\$9.265 billion were spent for scientific research and experimental development (UN Department for Policy Coordination and Sustainable Development, 1997a). To give a comparative value, the United States allocated about US\$5,3 billion for environmental research and development in 1995 (UN Department for Policy Coordination and Sustainable Development, 1997b). The Conference in Rio and Agenda 21 introduced environmental vocabulary to China's officials and prompted the PRC to establish and support a scientific community that was intended to provide the necessary knowledge to policy

makers and integrate the idea of sustainable development in China's planning (Economy, 2011). In this case, Rio and Agenda 21 definitely had an effect on China since, supported by UN institutions such as UNDP, the number of experts was increased and scientific work intensified. Moreover, research and training education was provided regarding the incorporation of Agenda 21 and for better exchange of experiences and knowledge, China held the First (1994) and Second (1996) International High-Level Round-Table Conferences on China's Agenda 21 (UN Department for Policy Coordination and Sustainable Development, 1997a). Nonetheless, critical voices argue that Chinese research strongly lags behind, personnel are insufficient, and efforts in innovation are limited. This also explains the lack and little effective provision of training and information (Niu, Jiang & Li, 2010).

In terms of education and awareness, after Rio more efforts were taken to introduce the public to the concept of sustainable development and prompt the training for researchers in this field. Amongst others some of the actions taken are the development of curricula and material for ten universities, the implementation of post-graduate courses on sustainable development in three to five universities, or the introduction of training institutes for those students. To give an example for more recent projects, the BELL Project has been launched at Beijing University in 2004, in order to gather students from different fields to bring together areas like business, environment and leadership by discussing topics like 'Climate change and our future' (Niu, Jiang & Li, 2010). Hence, the level of public awareness and knowledge on sustainable development was rather low, since 1993 and the establishment of China's International Training Centre for Sustainable Development concern and capacity building have been intensified (UN Department for Policy Coordination and Sustainable Development, 1997a). Furthermore, Huanjing Bao (Environmental News) in cooperation with NEPA started a program that gave insights about environmental contamination and problems, even including the location of errors of specific local bureaus and officials. In addition, a radio show was introduced that invited Chinese to call and inform themselves about animals that are threatened for instance (Economy, 1998). Thus, although the level of concern was still at a lower point than in many other states, measures were taken to integrate the population.

Another important step for promoting environmental protection was the establishment of the UNEP-Tongji Institute of Environment for Sustainable Development (IESD), inaugurated in Shanghai in 2002. This establishment was realized by the Tongji University and UNEP shortly after the introduction of the IESD, a Master's Program in Environmental Management and Sustainable Development was added as well as a PhD Program by 2008 (Niu, Jiang & Li,

2010). Although such academic educational institutions are still in an early stage, students in China have the opportunity of turning environmental studies into their career and therefore not only raising their own awareness but also the awareness in their surroundings.

3.5.3 Compliance

Elaborating a record of compliance concerning Agenda 21 is challenging, since the agreement is not based on binding resolutions but rather recommendations. In addition, it has to be acknowledged that due to the all-embracing character of the document it is difficult for a country to comply with each detail of the agreement, since it encompasses almost all areas of environmental protection. Furthermore, the guiding principles are not very specific, so that the responses stated in the country profiles are often also rather vague. However, by drafting its individual CA21, the PRC fulfilled the most basic procedural instructions followed by establishing the respective institutions, in charge of implementing it, and introducing fundamental laws (such as the Law of Promoting Cleaner Production and many others). Nevertheless, with reference to complying with the individual chapters and the listed provisions it looks quite different.

Primarily, China's statement at the beginning of its profile regarding its position as a developing country and the need for it to place economic concerns before others emphasizes the PRC's perception of Agenda 21. While observing closely Agenda 21's general concept, the priority of sustainable development, it becomes clear that in some countries' view, 'sustainable development' may refer to the form of development that rapidly increases the wealth of people (Economy, 1998). Thus, China has accepted the concept of sustainable development but still favors economic growth before environmental conservation. Agenda 21 is considered an opportunity to show engagement and to perform a role as a responsible member of the international community, even up to a model function, at least for other developing countries. On the other hand, clearly, the country has no interest to invest in environmental protection at the expenses of its economic growth. Thus, although a number of measures have been taken, the statement (cited above) depreciates China's engagement in the promotion of sustainable development understood as directing the economy in an environmentally sound way.

Chapter 2, for instance, stresses the relevance of prices reflecting the real cost to the environment as well as to the civil society and the country's supply of natural resources (UNEP, 2013b). If it was like this in China, the costs of water, coal, and wood would have to

be much higher to be in harmony with environmental and societal needs (Harris & Udagawa, 2004). In another chapter the protection of the atmosphere and efficient use of energy is stated. Though, China has become the world's largest CO₂ emitter and still imports and consumes huge amounts of coal. In general, global consumption of energy continues to rise. Environmental governance is specified as a method of ruling that includes not only the government but also organizations and civil society. Apart from other objectives the conference in Rio opened the doors to a new political era, in a way that it sought to involve governmental as well as non-governmental bodies. At UNCED, NGOs were also given a voice and were consulted in the decision-making process. Section III of Agenda 21 highlights the importance of integrating all groups of society and recommends the discussion and consultation of non-governmental groups (UNEP, 2013b). In terms of China, although the formation of environmental NGOs was permitted after UNCED (Economy, 1998) Palmer (2007) argues that at the time of Rio and several years after, its institutional framework was still conservative and especially skeptical of NGOs. Although the formation of NGOs has not been banned any more, they still face a government that constrains NGOs, as well as a lack of skills, and budget (Wang, 2010).

3.5.4 Change of behavior

The relevant outcomes of Rio and Agenda 21 are limited, however, they fueled environmental discussions again and gave new spirit to the issue, which is definitely an important factor in environmental protection. Nonetheless, UNCED is considered as having had a substantive effect on environmental policy-making and concern in China. The fundamental action of being the first state to publish its own Agenda 21 can be regarded as a major step in China's environmental maturation. Even though the action may not have been undertaken out of pure environmental commitment, but also out of many other considerations such as diplomatic objectives or the search for financial aid, it still prompted China to deal with the issue and make relevant calculations about potential benefits of environmental protection. In contrast to the prevailing Chinese assumption, the environment was an 'internal issue' and not debatable for everyone (Palmer, 2000); in Rio a new vocabulary with respect to environment conservation was adopted by China, mostly because of its cooperation with the international community, which connected national and international policy-making (Economy, 1998). Regarding the outcome of UNCED and Agenda 21, Harris and Udagawa argue that even though "China's actions and policies are more sustainable than they would be, they are far

from what is necessary to protect the environment” (2004:628). Thus, although Chinese environmental governance behavior, especially in terms of negotiating and the involvement of the whole society (at least to a limited extent), has changed throughout UNCED negotiations and with the implementation of Agenda 21, many actions have remained rhetoric and demonstrated the soft-law character of commitments such as Agenda 21.

	Contractual environment	Administrative & political capacity	Epistemic community	Concern and awareness	Level of compliance	Change of behavior
Absent or only marginally given						
Generally given, but with deficiencies		x	x	x	x	
Acceptable to high	x					x

Table 6: Agenda 21 and China

4 South Korea's Environment

South Korea, or the Republic of Korea (ROK), has experienced a period of political, economic and social advancement. In particular in economic terms, enormous success could be recorded and the average standard of living of Korean people was elevated to a higher level. The ROK was entitled as an Asian Tiger, and after a late but rapid process of industrialization and economic growth period (except for the years during the Asian Financial Crisis in 1997-98), South Korea has turned into a newly developed country. Nonetheless, such a fast economic development entails a number of problems in the environmental realm, due to the exploitation of nature for industrial, economical and other needs. Today's South Korea faces a variety of environmental issues such as air pollution in all major cities and resulting climate change consequences, water pollution because of the discharge of effluents from industries, extinction of wildlife, acid rain, deforestation, soil pollution, desertification, rain forest reduction, and others. The number of challenges is high, and even more difficult to resolve in consideration of a territory of about 100.032 square kilometers.

During the 1970s, 1980s and 1990s the ROK has experienced a protest wave especially in the political area. In the 1970s first environmental movements took place, though they were rather localized, unsystematic and unstable, explained by the much greater importance that was attached to political concerns (Kim, 2000). Around the same time, the South Korean chaebol (big business conglomerates) evolved and a primary focus was placed on economic growth. In the 1980s a welfare plan involving environmental protection and the National Constitution stated that a citizen of the Republic of Korea had the right to live in a clean environment. In continuation, an Economic and Social Development Plan stressing the necessary balance between economic development and environmental conservation was established (Lim & Tang, 2002). An Environmental Administration in charge of dealing with environmental issues was installed; however, public participation in the decision-making process was almost non-existent until the first environmental organizations appeared (about a 133 by 1993). One rather outstanding movement was the Korean Anti-Pollution Movement that encompassed anti-nuclear actions as well (in particular after the Chernobyl catastrophe in 1986) (Kim, 2000). The Environmental Administration subordinated to the Ministry of Health and Society opened its first six regional monitoring offices by 1986, and was elevated to ministry status in 1990. In 2004 more responsibilities and higher authority were given to the Ministry of Environment of South Korea (MOE) and staff was increased (MOE, 2013a).

In order to compare the international environmental institutions' effectiveness in China with South Korea, the same conventions used for China will be applied to South Korea to assess the grade of effectiveness in the respective countries.

4.1 South Korea and CITES

The Convention on International Trade in Endangered Species of Wild Flora and Fauna has been acceded by the ROK in July 1993 and entered into force in October of the same year. South Korea was ranked state number 120 in the register of accession. Nevertheless, the implementation of CITES took South Korea a while and real efforts were not undertaken before 1996. Since the ROK is also considered a great importer as well as exporter of Traditional Chinese Medicine (TCM) a number of species have been poached and hunted in order to satisfy needs concerning the provision of medicine. Similarly to China, South Korea also has traded much with rhino horn, and additionally with the Asiatic Black Bear, also referred to as Bandalgom.

4.1.1 Administrative, political capacity and contractual environment

At the time of the signing of CITES, in terms environmental issues the ROK was already operating through a ministry and for all agreements to approve, the fundament was given by the Basic Environmental Policy Act, adopted in 1990. The Basic Environmental Policy Act has been in charge of forming a legal framework for regulations in terms of air, water, noise, and chemical pollution (Lim & Tang, 2002). In terms of the legal framework, after agreeing to CITES (and subsequently also to CBD), a general structure for the protection of endangered species was created and an increasing protection was attached to fragile living spaces. In various regions public funding was supported by fees (OECD, n.d.). At the end of the first decade of the twenty-first century, South Korea stated in its country report that the CITES-relevant legislation had been implemented, in particular by the notification of the list of internationally endangered species, which had been put into effect. Additionally, the ROK indicates the in the areas of 'trade, taking, possession, and transport' more severe measures had been taken (CITES biennial report, 2010).

In Korea a total of about 30,000 species has been discovered, involving 221 species that are threatened, and some that count as extinct such as the tiger, Siberian leopard, fox, and the

sitka deer. Amongst the endangered animals are the goral, musk deer, otter, or for instance the Eurasian flying squirrel (Kim, 2001). In order to differentiate between the different grades of threat, usually species are registered as either Critically Endangered (CE) or Endangered (EN), noted under the Protection of Wild Flora and Fauna Act and released by the Ministry of Environment. To give an example with respect to mammals, 12 are considered CE and 10 EN (MOE, 2009). Although in South Korea the tradition of poaching is not regarded as an especially distinctive activity, a number of animals are seriously threatened due to poaching and trading of animal parts. Among the highly endangered species the Asiatic Brown Bear is found, better known as Bandalgom, whose the natural habitat is the region of Mount Chiri as well as the Demilitarized Zone between North and South Korea. The Bandalgom is of particular interest to poachers since its market value is projected at US\$67-133 thousand (Hio & Hee, 1999). This bear is mainly hunted with snares and traps for use of its gallbladder in TCM. Its high market value is explained by the overall assumption of the gallbladder as being a universal remedy to cure all diseases. Starting in 1996, a protection program was initiated that installed great increases in fines and more severe punishment in case of poaching (CBD, n.d.). Three years passed after the adoption of CITES until first regulations were conducted which appears to be a rather long period until something happened in the conservation of the most threatened animal from poaching. In this case, the legal and administrative framework featured deficiencies that have been corrected during recent years; however, they still need better enforcement.

In continuation, not before 2006, South Korea elaborated the Comprehensive Plan for Propagation and Restoration of Endangered Species that sought to restore 54 of the 221 species in danger until 2015. Furthermore, export of native species has been limited in order to conserve animals and plants from being traded in massive quantities (MOE, 2009).

4.1.2 Epistemological community and awareness

Although the importance of scientific authorities in export and import is already stressed in Article III and Article IX of the Convention (CITES, 1986), scientific research is strongly lacking in South Korea. To give an example, it is estimated that a great number of insect species is also in danger of extinction, nevertheless, research into the current and specific status in this area has not been carried out in the ROK (Kim, 2001). Further, the number of gorals (small goats with long tails) has decreased sharply and research on their population in South Korean territory was never completed, although it has been listed as EN (Choi, 2009).

Although IUCN encouraged scientific research on the status of flora and fauna through publishing the Red List, research into Korea's plant stocks studies and assessments have only been conducted on qualitative input and subjective opinions, but not on quantitative data. Scientific data would involve population numbers, rates of diminishment, or the grade of threat of extinction (Chang, 2005). The limited availability of data further restricts actions and the possibility to address concrete or urgent problems since problems are not necessarily identified.

In terms of the Bandalgom, MOE and local ecosystem protection groups engaged in making the public aware of the threat and the need to protect the black bear. Moreover, since 1996, these protection groups supported by the MOE identified and removed thousands of traps (CBD, n.d.). Even though general awareness of biodiversity problems and the trade with endangered species was rather low at the time when CITES entered into force in Korea, in the same year (1993) the Korean Federation for Environmental Movements (KFEM) was formed and evolved into South Korea's biggest group dedicating their work to environmental protection. NGOs though continue to be unsatisfied with the low investment in the protection of, for instance, the Bandalgam, and endeavor to prompt the government, but at the same time make the society aware of illegal poaching. Speaking in general, the knowledge with reference to poaching and conservation is considered insufficient (CBD, n.d.). The limited concern is also ascribed to the responsible agencies, due to almost non-existent activities, since apart from distributing leaflets and brochures nothing has been undertaken in this area. CITES for instance suggests telephone hotlines, press releases, newspaper articles, broadcasting information, or other presentations (CITES biennial report 2010). Since wild flora and fauna are also threatened by deforestation or exceed the bearable use of pesticides, the public needs to know about the consequences of these actions hence they can negatively impact the natural balance. Thus, there is a strong need for South Korea to involve its citizens and explain to them the relevance of ecosystem conservation.

Another aspect to be criticized is the fact that South Korea has not exchanged any valuable information concerning wildlife protection, or has cooperated in investigations or technical support. Despite Korea's report claiming a scientific authority has been established in response to the provisions of CITES, it then only lists a few areas of expertise. For instance, it is noted that related to forestry and welfare no skills are available. Additionally, the requested number of staff of the scientific authority is not provided (CITES biennial report, 2010). As a consequence of the lack of expert personnel and the inadequate communication with the

neighbor states and other import/export states trading with illegally poached animals, accurate data and knowledge is not sufficient.

4.1.3 Compliance

As a consequence of signing CITES and of introducing international law, it is generally acknowledged that trade with endangered species has decreased. However, various failures and deficiencies have occurred with reference to wildlife protection in the ROK, which led to the extinction of at least six species since records have been kept. The degrading situation can partly be ascribed to the limited knowledge and information on those species, but it can also be explained by the lax enforcement mechanisms. Although several measures have been taken, including the amendment of the Natural Environmental Conservation Act by the MOE with an increase of fines, heavier punishment and the introduction of laws banning distribution, law enforcement is considered low and compared to the possible trading value, fees and punishments continue to be far too mild (CBD, n.d.). Compliance with the respective laws is difficult to achieve since, for example, the market value of rhino horn in South Korea soared up more than 400 percent within only two years. It goes without saying that rhinos, more precisely black rhinos, were poached to a great extent and trade in rhino horn flourished (Rivalan, 2007). NGOs further complain about the limited number of staff responsible for the control of poaching and reporting violations. Additionally to the Natural Environmental Conservation Act, the Birds and Mammals Protection Act and a Cultural Property Act were established around the same time (CBD, n.d.). With regard to administrative provisions, the ROK has generally complied with Article IX. Beside the establishment of a scientific authority, a management authority was to be formed, however, the skills offered by the staff are limited to administration and others, but are not given in the field of biology, law, or economics, meaning primarily trade (CITES biennial report, 2010). In addition, according to CITES each participating country is asked to submit annual reports, which was not put into effect in 2010 by the ROK.

In South Korea's profile of 2009 it is stated that legislative and regulatory measures have been fulfilled; however, referring to compliance and enforcement measures, it is reported that border controls and administrative mechanisms in the form of fines, bans or others have been introduced, while for instance inspections of traders, producers, or markets have not been realized (CITES biennial report, 2010). Furthermore, the ROK, similarly to China, is

experiencing a decentralization process that on the one hand transmits more power to local governments but has posed difficulties in controlling the enforcement of laws and in systematically addressing ecosystem loss. The lax enforcement can be attributed to the missing incentives provided for local municipalities (CITES biennial report, 2010) to engage in wildlife protection such as arresting offenders in case of violating poaching bans or committing illegal trade with animal parts.

In spite of low enforcement, several actions have been taken by the Korean government to respond to CITES:

“Action 1	Introducing incentive measures
Action 2	Formation of ecosystem protection groups and their financial support
Action 3	Strengthening penal regulations
Action 4	Constructing an eco-corridor ³
Action 5	Removing facilities that disturb wild animals’ freedom of movement
Action 6	Control of hiking routes
Action 7	Strengthening gun control
Action 8	Providing food for wildlife”

Table 7: Compliance of CITES in South Korea (CBD, n.d.:10-11)

The actions and measures taken demonstrate that something has happened in South Korea concerning wildlife protection; however, there is a lack in effective implementation and the strictness in its measures (e.g. mild punishments). Therefore, the compliance record of the Republic of Korea has only satisfied the basic requirements of CITES and needs to be improved strongly to reach an acceptable level of compliance in order to combat trade in endangered species.

4.1.4 Change of behavior

Apart from the 800 species listed under Appendix I to the convention threatened of extinction, another 32.500 species are regarded as being in danger of extinction without CITES’ regulations on trade (Appendix II) (CITES, 1986). Thus, assuming that CITES succeeds in banning the trade in the respective species, a great number of them can be conserved and CITES does make a difference. However, this is only theory and in reality CITES has provoked little change of behavior in South Korea. A major problem in changing South

³ An eco-corridor refers to an area where flora and landscape features create a niche for wildlife to life and thrive.

Korea's behavior in terms of trading endangered species is, as in most cases, the financial incentive for those who act unlawful but reap great profit. Although basic measures were taken, enforcement is considered low and a general rethinking has not yet occurred. This can mainly be traced back to scientific research on the topic since not much has been realized in this field. Environmental governance in Korea has not really been affected by CITES and also will not be in the future if South Korea is not willing to invest more in scientific research to create a dedicated community of capable experts and additional enforcement mechanisms. There is a need to appoint a greater number of officials to observe poaching and trading according to the rules. Moreover, the national government is required to systematically set up a body in charge of implementation of CITES and equip them with the necessary competence and authority. Even though, through the introduction of various laws and activities it is highlighted that Korea is engaging in ecosystem conservation, but the number of issues and wrongdoings exceeds the success stories. Clearly, a Red List of Endangered Species is not effective if a state has not enough knowledge about the actual condition of its animals and plants. The goal of banning trade in endangered species has not been attained in South Korea nonetheless it is still a note on the agenda regarding the conservation of biodiversity.

	Contractual environment	Administrative & political capacity	Epistemic community	Concern and awareness	Level of compliance	Change of behavior
Absent or only marginally given		x	x		x	x
Generally given, but with deficiencies	x			x		
Acceptable to high						

Table 8: CITES and South Korea

4.2 South Korea and the Convention on Biological Diversity

The CBD emerged within the context of the UNCED held in 1992, was inaugurated in 1993 and was signed by South Korea in 1994. The Republic of Korea finally ratified it by in January 1994. Biological diversity is especially challenged by deforestation, urbanization, and air/water/soil pollution. The situation most notably degraded during the Korean War that drew on vast forestry resources for timber and demanded great quantities of coal. Thus, not before 1960, scattered programs for reforestation were initiated (Chung & Kirkby, 2002). Altogether Korea possesses a forest area of 6.394.000 ha, which means forest coverage of 64 percent of the total land territory (CBD, 2013d).

It has to be taken in account that Korea signed CITES around the same time and in some cases laws and policies were implemented for both purposes since in various aspects they are not mutually exclusive. For instance Article 8(f) of the convention stresses the importance of the conservation of endangered species, which is one of the central points of CITES. Additionally, it is significant to consider the surroundings in which CBD was elaborated and adopted, since the UNCED had an effect on South Korea's environmental politics. Even though, already before Rio, between 1987 and 1989, Korea assumed the position of a council member of the UNEP, South Korea's government was skeptical about environmental commitments, which changed with the preparations for the UNCED, at least to some extent. Therefore, due to the foreignness of such agreements concerning ecosystem conservation to the ROK, it was not among the first states to implement all necessary policies and laws. Nevertheless, these years also mark a period of first close contact between South Korea and environmental accords, and the concept of sustainable development.

4.2.1 Administrative, political capacity and contractual environment

With reference to South Korea's political capacity and administrative body it needs to be said that the Korean War, the following restoration, and rapid economic development were phenomena that happened quite recent to the environmental conferences of the 1990s and continued to have an effect on the capabilities of the ROK (Yoon, 2006). Criticism concerning conventions such as the CBD is generally related to the unclear distribution of competences. In Korea the tasks of environmental protection have usually been arranged and given out to many different ministries before a Ministry of Environment was established. At the time the CBD was adopted by the ROK, the MOE was already installed; however, in

many cases the allocation of tasks was still an issue and intensified the need of better coordination. The foreseen financial support for environmental protection of a little more than 1 percent of the ROK's total budget has been considered far too low for the environment's needs and because of the limited budget Korea falls behind nations that are environmentally more developed (Kim, 2001).

In order to respond to the CBD's Article 6 that requests the adoption of policies, programs, and plans, Korea released its National Biodiversity Action Plan (NBDAP) that contains all the different strategies necessary for biodiversity conservation through sustainable consumption of nature. The NBDAP was further created to coordinate the different sectors that needed to play a role in the conservation process. This strategic plan sought to include sectors such as agriculture, forestry, fisheries, tourism, and genetic resources (CBD, 2013d). The task of elaborating the National Biodiversity Strategy, as it is referred to by the MOE, was realized by the National Biodiversity Committee, which consisted of members of involved ministries but also of participants of different NGOs. At the end it was passed on to the National Cabinet Council, which gave its approval by 1997 (MOE, 1997). By now a Second National Biodiversity Strategy has been released (completed in 2009). The major blocks addressed in this strategy are preserving Korea's ecosystems and protected areas, as well as the promotion of international cooperation and greater contribution of stakeholders (MOE, 2009).

It took South Korea a period of time to accept all listed provisions, engage in finishing the necessary strategy for action, and revise it; however, a basic framework was constructed and the ROK was eager to present a contractual environment for CBD. Moreover, Korea's performance at UNCED, and in further negotiations concerning agreements, is considered far more dedicated and the country was willing to participate actively. This environment to make and keep agreements is strengthened by the relatively high activity of environmental NGOs.

Apart from the NBDAP, the Natural Environment Conservation Act is significant in relation to its task, supported by the President to designate ecosystem conservation areas. Many protected areas have been decided upon; in particular protected forests, which constituted about 862 cubic meters in 2009 (OECD, 2012). The total number of protected areas is 1.119 accounting for about 1.562.000ha of Korea's territory, encompassing ecosystem preservation zones, natural parks, natural conservation areas, wetland conservation areas and others (CBD, 2013d). The Natural Parks Division was managed by the Ministry of Domestic Affairs when it was positioned under the control of the MOE in 1998.

Subsequent to the adoption of CBD and prompted by the Convention, the ROK's MOE

worked out a Master Plan on Natural Environment Conservation, requested by the Natural Environment Conservation Act that covered the period from 1994 to 2003. The major objectives of the Master Plan included targets and mechanisms for protecting the ecosystem. Beside goals and practices, the Plan puts emphasis on better coordination between the responsible agencies (MOE, 1997). By introducing plans, programs and constructing a legal basis, the Republic of Korea sought to demonstrate a willingness to respond to the Convention and thereby offering an institutional body to improve coordination and operations concerning the protection of biodiversity. In this respect it needs to be added that South Korea's vivid environmentalism also played a role in this process and the fact that the ROK was among the first Asian countries to bestow the Environmental Administration ministry-status (1990). On the other hand, other Asian states such as Japan, Thailand, or China (2001, 2002, 2008 respectively) elevated environmental agencies to ministries much later. Furthermore, in 2012 the Fourth World Congress of IUCN was held in Jeju, South Korea with the outcome of the Jeju Declaration agreed on by 10.000 representatives of governments and NGOs (IUCN, 2012).

In 2008, the former President of the Republic of Korea, Lee Myung-bak announced the transformation of Korea's development strategy into a green growth strategy. Although, this new direction is more concerned with the postulate to become a low-carbon economy and therefore mainly deals with energy issues, a few listed initiatives are also dealing with the conservation of the ecosystem, especially with reforestation objectives (OECD, 2012). Since Green Growth programs still need to gather experience, much can be expected from future developments, since it provides a better and more contractual environment to keep the agreements of the CBD.

4.2.2 Epistemological communities and awareness

Considerable input by the scientific community in South Korea was firstly given in the 1980s relating to the protection of biodiversity and wildlife (Jang, Lucas & Joo, 2003). In particular, Article 12, 16, 18, and 20 of the CBD ask for the establishment of scientific and technical education and training, the general promotion of scientific research, cooperation in technological transfer, and the provision of financial resources (CBD, 2013c). Concerning wildlife conservation and its protection from illegal trade, research was found to be insufficient. In regard to biodiversity conservation, especially during the last years (2009-2012) the importance of scientific research has been highlighted more intensely. A separate

section was dedicated to research on invasions of alien species that threaten the balance of Korea's ecosystem. The total of naturally or human introduced species from abroad is calculated to reach about 900. Starting in 2006, the Marine Biodiversity Conservation Measure Project discovered 25 alien flora and fauna species that interfered with the Korean ecosystem and destabilized it (MOE, 2009). Amongst other strategies, information-sharing systems have been established (CBD, 2013d) to improve the quality of protected areas by exchanging knowledge on ecosystem conditions and other preserved regions.

At the beginning of the twenty-first century approximately 450 environmental non-governmental organizations were in operation (40 percent of all NGOs). They have taken on the task of educating the public about the environment, making them aware of environmental issues, doing research and conducting campaigns on different topics. Therefore, they are responsible players and very important, especially in terms of concern building in South Korea. Given these relevant tasks, they have to make do with a lack of staff as well as an inadequate budget (Kim, 2001). Although, the government showed a certain willingness to include NGOs in the policy and decision making process, they are not always heard and have to make do with little in order to survive.

Other intentions to increase the Korean people's awareness was the publishing of the National Trust Act on Cultural Heritage and Natural Environment Assets during 2006, which encompassed economic tools and tax relief to encourage the society to engage more in biodiversity protection (CBD, 2013d). In terms of protected areas, South Korea's affirmation on the part of the public has been assessed as demonstrating an especially positive tendency (Heo, 2010). Thus, on the one hand, NGOs still experience certain restrictions by the government concerning inadequate funding and limited political support. Despite this lack of assistance they have performed an important role and public awareness has increased in the past years.

4.2.3 Compliance

The Convention on Biological Diversity emerged out of a conference that paid great attention to the concept of sustainable development and the necessary transformation of the economy and people's lifestyle towards more environmentally sound practices. Article 1 of the Convention drafts the general objectives of the CBD agreed on in Rio. Broadly speaking, the target consists in the conservation of biological diversity and a sustainable consumption

thereof. Moreover, the product evolving out of this consumption needs to be used in a way that lets everyone profit equally (CBD, 2013c).

Related to procedural requirements, which involve the construction of an administrative and legal body, South Korea acted by introducing a number of laws and policies; however, it took the ROK quite a while to build a structured and wide reaching institutional framework for biodiversity conservation. Various plans and programs were elaborated in order to respond to provisions, first and foremost the National Biodiversity Strategic Action Plan. Furthermore, in Jakarta the Republic of Korea was prompted by the second CBD Conference of Parties, held in 1995, since rapidly after the Conference a national assembly was convoked to find adequate strategies to conserve the ecosystem for South Korea. Subsequently a task force and a committee headed by the Nature Conservation Director of the MOE were appointed, in addition to a public hearing, which was undertaken by 1997. On the basis of all this information, domestic strategies were gathered and handed in to the Secretariat of the CBD in 1998 (Kim, 2001).

With regard to the National Biodiversity Strategy, a number of other plans have been drawn up, of which most are in line with the strategy. Among the plans, Korea has issued for biodiversity conservation are for instance Comprehensive Biological Resources Conservation Plans, Basic Plans for Environmental Conservation, or the Master Plan for National Forest Biodiversity (MEO, 2009). The variety of plans seems impressive; however it has to be considered that most of these plans, and also most of other initiatives almost exclusively address the national level and disregard the regional and local dimension. Since this research seeks to encompass domestic environmental governance, it is further relevant to assess the work realized at lower levels. Along with the CBD's Program for Work on Protected Areas it was discovered that the commitment of the community on the local level was far from effective (Heo, 2010). Thus, campaigning for the increasing awareness regarding the need of protected areas and respecting them has to be intensified and conducted more frequently in municipalities and villages.

Speaking in general, there are some laws connected to the utilization of genetic resources involving laws on agriculture and rural areas, pasture and livestock laws, and development laws in rural regions. In terms of controlling the use of genetic resources, as requested in the basic objectives of the Convention, a law on the conservation and management of resources is being elaborated (CBD, 2013d). The Natural Environmental Conservation Act was worked out and amended several times until its completion in 2008. It provides a number of

regulations that need to be followed and defines different forms of punishment as response to environmental violations. Chapter 3 refers to biodiversity protection and is filled with many details, while in Chapter 7 penal provisions are discussed and are set in relation to the previous chapters. To give an example, in case of a violation of Article 15(1), which captures the general damage of wild flora and fauna, or the laying of snares, tracks, nets, or other harming tools, the punishment can either be a prison sentence for up to two years, or paying a fine up to ten million won (Korea Legislation Research Institute, 2008). According to Jang, Lucas and Joo (2003) animal and plants are relatively well protected by the legal body, in case they inhabit a protected area or an area designated as conserved ecosystem. Concerning South Korea's protected area system, a new impetus was given by the Conference of Parties in 2004 through the Program of Work on Protected Areas. This Program was initiated in order to measure the states' success in the conservation of declared areas. 39 areas were selected for the assessment that was then executed by international research teams. In summary, Korea's protected areas were found to be well managed compared to the international standard, while the relation of resource management and biodiversity conservation is assessed rather disappointing since organizational matters and coordination seem to be poorer in comparison with other countries. Apart from the management of protected areas, planning is added to South Korea's strengths. Above all, the ROK's good record on administration in protected areas, contrary to weak community engagement is reflected by the allocation of staff and budget in these fields (Heo et al., 2010).

Thus, South Korea's compliance record concerning the CBD is acceptable with respect to procedural provisions, as it initiated a number of plans, policies and programs in order to address the tasks presented by the CBD. In addition, a legal framework concerning biodiversity protection was established and corresponding punishments in case of violation of laws were set up. The overall assessment of the administrative body is very positive, whereas conservation has to be improved for local mechanisms.

4.2.4 Change of behavior

The target is a sustainable and fair use of ecosystem resources, which may be considered a rather idealistic aim, though it is imperative for the future perspective of the world. In terms of the effect of the CBD in the South Korean dimension, environmental governance was improved to a certain extent. The Korean government was especially prompted to engage in biodiversity conservation and highlighted its commitment during the Conferences of Parties.

Generally speaking, the public has mostly been appealed to by non-governmental organizations and through public hearings, as previously. The publishing of the national strategies for the protection of biodiversity tended to involve them in the decision-making process. Nonetheless, there is still much work to do, as there are more deficiencies identified on the local level. Furthermore, a change of behavior not only needs to be provoked in the national governmental sphere but also at lower levels of administration. Provincial government responsibilities as well as mayors should receive more training and education in regard to general conservation of biodiversity. A stronger rethinking on the government side is still necessary in relation to coordination and allocation of assignments. While observing South Korea's development in terms of biodiversity conservation since the signing of the CBD, various initiatives have been realized and the overall concern, of the government and the civil society, has been increased. Despite some remaining deficiencies, at long sight and in consideration of the introduction of the ROK's Green Growth strategy, a further improvement in its biodiversity protection can be expected.

	Contractual environment	Administrative & political capacity	Epistemic community	Concern and awareness	Level of compliance	Change of behavior
Absent or only marginally given						
Generally given, but with deficiencies	x	x	x			x
Acceptable to high				x acceptable	x acceptable	

Table 9: CBD and South Korea

4.3 South Korea and the Montreal Protocol

Climate change and the depletion of the ozone layer are increasing global issues, and have been more and more acknowledged as crucial problems in the countries that have ultimately and rapidly developed in the last decades. South Korea is found to be one of them and is facing an enormous struggle against those issues. In the 1960s it was considered an agriculture-oriented country in a poor condition and a GDP of US\$ 200 per person on average. As the Korean economy began to grow and living standards started to rise, citizens could afford housing and cars, of which the number increased greatly up to more than 13 million. Besides the increase of the number of cars, industries have grown as well, and induced a dramatic rise of the level of emissions and substances that deplete the ozone layer. To give an example for Korea's fast energy consumption growth, coal usage doubled within one decade (from 10 to 20 million from the mid-1960s to the mid-70s respectively) (Moon & Lim, 2003).

Compared to other agreements, South Korea's relation with the Montreal Protocol is barely reflected upon and analyzed in the available literature. For example, it is evident that compared to the Kyoto Protocol the Montreal Protocol has received much less attention, although its effects are much more substantive than those of the Kyoto Protocol. It has to be considered that at the time the Montreal Protocol on Substances that Deplete the Ozone Layer was issued, the ROK favored economic development and clearly not environmental treaties that sought to reduce industrial emissions; although the 1990s were a turning point in South Korea's relationship with international organizations, in particular with environmental institutions of the United Nations.

At the beginning of the 1990s a range of those sorts of treaties, initiated by Korea's announcement in 1990 to be the 'First Year of Environmental Preservation' was signed and additionally emphasized through the UN Conference on Environment and Development. South Korea was not among the countries to sign the Protocol right after its introduction, but waited until February 1992 to approve the agreement. It further adopted the London Amendment of the Protocol by December of the same year, though it has still not acceded any subsequent amendment (such as the Copenhagen Amendment). Due to the overall positive assessment of the Montreal Protocol's outcomes, it is an interesting issue to what extent the Protocol had an effect on South Korea's handling of ozone depleting substances.

4.3.1 Administrative, political capacity and contractual environment

First of all, it has to be mentioned that even though being registered as an OECD country and being generally accepted as (newly) developed country, since the adoption of the Montreal Protocol the Republic of Korea has insisted in being listed as an Article 5 country, i.e. a developing country. Clearly it was an important step to have Korea on board in the negotiations concerning ODS; however, at least by now, the political and administrative capacity exists to transform Korea into a non-Article 5 country. Nonetheless, being listed as Article 5 state allowed the ROK to request assistance in funding from the Multilateral Fund, specifically introduced under Article 10 and for supporting the implementation of the Montreal Protocol. On the other hand, the ROK acceded to the Global Environmental Facility to which it contributed about US\$17 million between 1994 and 2002 (MOE, 2005). Thus, Korea was categorized as a country that could delay the reduction and final phase-out period for ten years, whereas other OECD countries were forced to cut out in particular the two most common ODS, halon and CFC. Nevertheless, after primary calculations about costs and benefits of the Protocol, South Korea came to the conclusion that the support presented by the MLF would clearly not make up for its losses in the growing electronics industry. Consequently the ROK was pressured by the international community to accede the Protocol and threats concerning trading issues were raised so that Korea signed in 1992 (Brack, 1996). In terms of financial assistance, after the first period of implementation about US\$0.7 billion were accumulated in the MLF, while South Korea's estimation on incremental costs added up to approximately \$1,9 billion around the same time (Swanson & Mason, 2002). Since a number of countries were neither registered developing nor developed countries, but still listed as Article 5 states, they were asked not to pledge for financial assistance by the MLF. On the other hand, they were also not requested to pay into the Fund, but could seek support in technological matters. South Korea counted as one of those states (Brack, 1996). With regard to Korea's growing economic position, this agreement constructed a rather convenient fundament for the ROK's further operation in the Montreal Protocol.

Another move that encouraged the South Korean government to add its signature to the Montreal Protocol was the transformation of the Environmental Agency into the Ministry of Environment in 1990. The following Basic Environmental Policy Act created a fundament for agreements like the Montreal Protocol since it constructed a legal framework regarding air,

water, noise, and chemical pollution (Lim & Tang, 2002). In addition, the Clean Air Conservation Act was enacted in 1990 and amended in 2007, and was one of the first documents that highlighted the necessity to protect the ozone layer and acknowledged the degrading situation with respect to the ozone layer. Moreover, in total 61 air-pollutant substances were identified and out of those 35 were registered as specifically air-pollutant substances, containing dioxin or benzene, which can harm people, animals and the flora (MOE, 2011). Aside from the Clean Air Conservation Act, in 1990 the Air Quality Preservation Act was established and contributed to the development of a policy framework to protect the ozone layer. This Act was in charge of coordinating and managing the efforts to preserve air quality, as well as publishing standards and the organization of air preservation zones (OECD, n.d.). Therefore, the legal basis for the adoption of the Protocol's regulations was given, though it had little experience in the field and only provided a fundamental construct. A number of issues have been criticized by the ROK and Russia, in particular concerning the installations for the production of alternatives to ozone depleting substances. Both countries reported difficulties in developing adequate possibilities for the production of substitutes (Kaniaru, 2007).

Related to the background surrounding the signing of the Protocol, it has to be noted that only a few years before South Korea experienced a major transformation towards a democratic state after a long period of authoritarian rule. This means that on the one hand, international environmental cooperation offered an opportunity to enter the international arena and engage stronger in foreign relations. On the other hand, the political scene of the Republic of Korea was not yet well established and had to clarify and deal with a great number of issues, of which the protection of the environment, or more concrete the protection of the ozone layer, was not coercively a priority. Moon and Lim regard the pre-1992 period (from 1987 to 1992) as “takeoff stage of environmental movements” (2003:57) and the time since 1992, around the time when the Montreal Protocol was put into practice, as “environmental maturation” (2003:60). Clearly, the maturation process did not take place overnight and needed a period of time to evolve. However, the political and administrative condition for the implementation was basically given, though it was still in the early stages.

4.3.2 Epistemological community and awareness

In terms of the promotion of an epistemological community by the Montreal Protocol, it has to be mentioned, that only a short note is dedicated to scientific research and the need of a

community of experts. While in other agreements and conventions the aspect of scientific research and data collection occupies a large part, in the Montreal Protocol Article 9 covers not only research and development but also public awareness and the exchange of information. Even though the Protocol only asks for general measures, such as the search for ODS substitutes, cooperation between parties, installing of new technologies, and for the submission of a report concerning Article 9 (UNEP, 2000). By means of the Clean Air Conservation Act, South Korea introduced an Air Pollution Monitoring system responsible for equalizing and managing the different components of the observation network. Those Air Pollution Observation Networks have different sections that are supervised by the Ministry of Environment. The sections are for instance suburban atmosphere monitoring, hazardous air pollutant monitoring, and earth atmosphere observation. There exists an observation network in the region of Jeju, which is specifically in charge of the investigation related to ozone depleting substances (MOE, 2013). For further analysis of the data a National Atmosphere Pollution Information Management System has been adopted in order to recognize trends in air quality and calculate causes for humans (MOE, 2013). The expansion of observation networks has provided important insights about the actual status of air quality and the atmosphere, though, these activities are relevant concerning observation mechanisms but not for scientific research on the development of alternatives to ODS. In terms of education, technical assistance for enterprises, and research a great part of the expenditures for these areas was funded by revenues earned by introducing ODS tax. The Republic of Korea was one of the first states to install this mechanism (Kaniaru, 2007). Although Korea was more active in the observation area, it was also eager to launch market mechanisms.

In regard to environmental concern and public awareness about the threats resulting from the emissions of ODS, as indicated in the previous paragraphs, in 1992 South Korea adopted a new line with respect to environmental politics. The public was more and more accepted to join the decision-making process, albeit only to a limited extent. This whole process of the public participating in environmental politics is strongly affected by the accessibility of information for civil society. In the 1990s and especially after the 1992 UNCED, the Korean government increasingly unfolded environmental insights to the stakeholders; however, the public and from time to time also NGOs have only had limited access to concrete information, pollutant release, or for instance possible health problems caused by air pollution (OECD, n.d.). Nonetheless, public awareness campaigns have improved which can also be traced back to the modification of the position of NGOs, since they developed as respectful organizations and experienced a qualitative transformation towards better-funded institutions that are

capable to prompt the environmental movement and create new strategies for environmental politics. Clearly, this evolvement can be mainly ascribed to the UNCED and the general democratization process in Korea.

4.3.3 Compliance

The Montreal Protocol has been praised as the most effective international environmental agreement and has recorded various successful attempts to phase out ozone depleting substances. South Korea and its rapid industrialization and economic growth process emerged as an important member to the Protocol, since its emission of ODS has exceeded the emissions of numerous other countries. The Montreal Protocol, as well as many other protocols with similar targets, is more effective if universal membership with good compliance records can be achieved. Article 8 of the Protocol addresses the non-compliance and more accurate and explicit non-compliance procedures were elaborated at the following Meetings of Parties. At the Third Meeting of Parties a general body for measures was constructed, though, it merely provided general responses to non-compliance such as the identification of the concrete area (UNEP, 2010). In terms of South Korea, it must be considered that it is not a member state to the Copenhagen, Montreal, or Beijing Amendment, which decreases the list of provisions to comply with. Due to its insufficient reporting, the ROK was prompted to provide information regarding its licensing system around 2010. According to Article 4B, this system should license imports and exports of old, new, recycled, and reclaimed ODS mentioned in the Protocol. Additionally, the Ninth Edition of the Handbook of the Montreal Protocol referred to South Korea's failure to report data of the year 2008 (Ozone Secretariat UNEP, 2012).

At the beginning of the 1990s most of the ODS designated by the Protocol experienced an increase of emissions. CFCs, halons, and carbon tetrachloride escalated at that time and were reduced at the second half of this decade. The polluters-pay-principle played an important role in this reduction and contributed to the overall improvement of air quality since then. On the other side of the coin the physical and social infrastructure was found to be inadequate (Chung & Kirkby, 2002). Moreover, the WHO measured air quality in cities and came to the conclusion that the ROK failed to meet national and WHO standards. It further expressed concerns on public health risks provoked by the stratospheric ozone depletion (OECD, n.d.). Compliance on the part of South Korea was also enforced by the threat of being excluded from Western markets due to its increase of CFC emissions in the first half of the 1990s

(Brack 2003:220). In the final years, the majority of the listed ODS could be phased out by Korea and resulted in a generally acceptable compliance record, although various deficiencies, such as its reporting provisions have not been fully realized.

4.3.4 Change of behavior

The general issue in terms of South Korea's tasks is its position as Article 5 country, which has instigated further discussion after its accession to OECD. The fact that South Korea's economy has turned it into one of the fastest growing economies in the world is seen as an issue by other member countries of the Protocol. In addition, Korea's decision to join the Protocol has not been made out of commitment to the global environment but rather because of costs that could arise due to trade issues and the closure of Western markets for Korea in case of non-accession. Nevertheless, circumstances that contributed to its decision to participate were primarily the ongoing democratization process and the Conference in Rio. Thus, a certain change of behavior occurred in the general thinking of South Korea to make concessions for being part of the international community and at the same time being able to benefit from this constellation.

Even though, this change of behavior has mostly been triggered by the fear of losing affiliation to relevant trading partners, it has still induced the desired effect. In South Korea a number of ODS have been phased out and through tools like the ODS tax which indicate a change in the government's behavior to use market instruments in order to achieve the set goals. Since in environmental governance an important role is assumed by the civil society and non-governmental organizations, it needs to be added the signing of the Montreal Protocol occurred at a time when the quantity and quality of NGOs was increasing significantly and they in turn improved environmental policy-making in Korea through their contribution. Furthermore, they tried to involve the public, which was more engaged in the environmental movement. Thus, the behavioral change regarding the usage of ODS can only partly be attributed to the Montreal Protocol itself but more to Korea's political environment and strategic reasoning.

	Contractual environment	Administrative & political capacity	Epistemic community	Concern and awareness	Level of compliance	Change of behavior
Absent or only marginally given			x rising			
Generally given, but with deficiencies	x	x		x	x	x
Acceptable to high						

Table 10: Montreal Protocol and South Korea

4.4 South Korea and the Kyoto Protocol

The Kyoto Protocol has primarily been created to address the degrading situation concerning climate change mostly due to greenhouse gas (GHG) emissions. The present situation of great pollution of the atmosphere can also be traced back to the immense increase of energy generation when Korean cities dramatically expanded their coal and oil fired power production. A huge jump occurred between the 1970s and the 1990s as power generation grew about five times (Chung & Kirkby, 2002). Since South Korea has needed large quantities of energy during its economic takeoff, its GHG emissions have also doubled from 1990 to 2008 (Park, Yun & Jeon, 2012). Most of these emissions are produced by the intensive electricity generation of the ROK, responding to huge electricity consumption per citizen even exceeding Japan's and the EU's average consumption. These statistics are also interesting since the average income per capita in these countries is higher than in South Korea (Park, Yun & Jeon, 2012). In addition, Korea's CO₂ emissions have more than doubled between 1990 and 2004 with a short interruption in 1998 when it dropped quite strongly but soon recovered (OECD/IEA, 2006). These insights about the ROK's large energy consumption emphasize the necessity of integrating a more ecological handling of energy resources, addressed by the Kyoto Protocol. Furthermore, the need to regulate emissions already became evident when the Korean population started to show symptoms such as headaches, eye, throat, and lung infections in increasing numbers, particularly in Seoul, according to medical data (Chung & Kirkby, 2002). Another problematic aspect is Korea's proportion of renewable energy, which is considered to be particularly low.

The United Nations Framework Convention on Climate Change was created in 1992 and joined by Korea in 1993. After a certain consideration time South Korea acceded the Kyoto Protocol (originally completed and opened for ratification in 1998) in 2002 and it entered into force by 2005. Along with the adoption of the Kyoto Protocol a few years after signing the Protocol, the ROK began its Green Growth strategy, meaning a series of environmental sound instruments were incorporated in its economic growth to create a more sustainable development.

4.4.1 Administrative, political capacity and contractual environment

Among the first steps towards more environmental consideration was South Korea's announcement to become one of the world's seven 'green' economic powers by 2020. The

'Green New Deal' pursued by the Korean government foresaw a total spending of about US\$ 38,5 million from 2009 on lasting four years (Shim, 2010). By setting in motion the strategy of Green Growth, South Korea took important steps for environmental protection and simultaneously for providing a good basis for the struggle against climate change. At the point when the Kyoto Protocol entered into force in South Korea, the political capacity to implement it was given by a maturing government and the necessary input by environmental movements and NGOs. Moreover, the annual spend for the environment was raised up to 2 percent of the GDP, which is more than proposed by UNEP (Shim, 2010). In order to respond to the UNFCCC an inter-ministerial Committee was organized and headed by the prime minister (OECD/IEA, 2006).

Despite the acceptable fundament for implementing such a Protocol, South Korea was originally listed as non-Annex I country. As non-Annex I country, for the ROK it is not mandatory to follow binding provisions, whereas other states with similar levels of GDP are registered as Annex I. In addition, South Korea's position as one of the highest GHG emitters would make it even more relevant to impose binding restrictions to it. The international community argues that Korea's economic and political development enables the country to make more concessions to the Protocol than it has made in the past. Another factor that limited South Korea's contractual environment is the fact that on some occasions it joined the opponents of the Kyoto negotiations, for example Japan, the United States, Australia, or Canada (Oberthür & Ott, 1999). These countries were strong opponents of binding targets since they feared the economic costs and a slowing of their development. Although South Korea compared to the United States and Japan, was not the driving force in these negotiations, it still advocated against legally binding emission targets.

Concerning the legal framework established as a basis for the implementation of the Kyoto Protocol, even though a Ministry of Environment was already in existence at the time, it was considered rather weak. A reason for the occurring miss-management is the large distribution of assignments among governmental institutions. To give an example, the Ministry of Energy and Resources is responsible for alternative energy sources, whereas the Ministry of Construction is in charge of infrastructure and water quality and the Forestry Ministry for conservation of mountains and forests (Chung & Kirkby, 2002). Thus, in many cases coordination between all those ministries often lacks and since the climate issue is embedded in a number of the items, which are covered by different ministries, it becomes challenging to form a comprehensive administrative and legal body to address climate change.

According to Chung and Kirkby, South Korea can be separated in three areas in view of its (air) pollution levels that create the initial points for further implementation of the Kyoto Protocol amongst others. The Seoul Metropolitan Area whose public image should have been sanitized by green belt areas, but where huge abuse occurred, specifically on the side of the government. This area suffers terribly from emissions caused by traffic and the resulting acid rain. Then, there exist semi-peripheral industrial zones, for instance Pohang, Kwangyang, Onsan, Ulsan, Yecheon, which are strongly affected by chemical use in industries. Finally, the peripheral rural zone also faces the problem of usage of chemicals, in particular in agriculture, which leads to the poisoning of the ground. Air pollution in this area is provoked by machines inserted for the cultivation of land (Chung & Kirkby, 2002). All these issues have challenged the Korean government and animated discussions to enforce its administrative capacity to respond to them in a structured way.

The Kyoto Protocol has been introduced to find new ways to address climate change, mainly based on market principles. As mentioned before, those market mechanisms refer to the emission trading system, joint implementation (JI), and the clean development mechanism (CDM). Those systems clearly demand an adequate economic basis and the political capacity to integrate them into the domestic market. Although Korea has no mandatory emission targets to reach, it has set itself voluntary targets. About 19 governmental departments have been involved in this process (OECD/IEA, 2006). Because of its principles concerning climate protection, the Clean Air Conservation Act is not only relevant for the Montreal but also for the Kyoto Protocol and provides a legal basis for emission reduction initiatives.

Therefore, although the political and administrative capacity was given by the time the Protocol entered into force, it faced a challenging situation regarding emissions in South Korea. Since the ROK has no binding provisions to follow, the necessity of a contractual environment is limited. However, by initiating the strategy of Low-Carbon Green Growth the environment to engage in climate protection was generally improved.

4.4.2 Epistemological community and awareness

Due to the complex meteorological, physical, and chemical processes that are connected with the substances addressed by the Kyoto Protocol, a national scientific community with a high level of knowledge is necessary in respect of the measures that need to be taken.

Article 10(d) of the Kyoto Protocol explains the requirements in terms of observation and research, and states: “Cooperate in scientific and technical research and promote the

maintenance and the development of systematic observation systems and development of data archives to reduce uncertainties related to the climate system, the adverse impacts of climate change and the economic and social consequences of various response strategies, and promote the development and strengthening of endogenous capacities and capabilities to participate in international and intergovernmental efforts, programmes and networks on research and systematic observation (...)” (UNFCCC, 2013). Clearly, Article 10 highlights the need to collaborate and draws only little attention to the formation of an epistemological community. In South Korea the MOE and Ministry of Science and Technology are mainly responsible for research in this area. The Korean Ministry of Environment is in charge of managing the Environmental Impact Assessment, environmental education, and research. The Ministry of Science and Technology on the other hand is responsible for waste management, managing the nuclear power industry, and research on nuclear accident response (Chung & Kirkby, 2002). Of course, research concerning renewable energy sources is also a field of great relevance. Therefore, the MOE has invested in research regarding GHG emission reduction technologies and on the other hand also on potential incentives for enterprises to comply with voluntary reduction targets. Further, the Korean Panel on Climate Change Management addressed itself with the task of researching health consequences and construction of ecology as well as creating an inventory system for analyzing emissions and their development (Choi, 2009). Among these measures, the improvement of incentives should be a priority to prompt enterprises to engage in emission reduction. Moreover, a number of panels have been organized by South Korea that gave government representatives, business, civil society, and the scientific community the opportunity to hold discussions on the idea of a Low Carbon Green Growth (Shim, 2010).

A factor that is especially important in order to offer a basis for a good governance structure is the level of overall concern regarding climate change. According to a poll realized in 2011, public awareness on climate change is relatively high and accounts for 94 percent. Furthermore, 94 percent of the Korean population responded in the affirmative to the question whether climate change could be considered a serious problem (Kim, 2011). In the light of environmental maturation in South Korea, a series of public disclosures of pollutant enterprises was published to inform the society about firms and industries that are not complying with demanded regulations. The publishing of these insights should demonstrate the willingness of the government to present the Korean population as mature citizens, who deserve to be informed about environmental problems and the responsible actors. The release

of a monthly violation reports was initiated and 113 lists were published between 1993 and 2002 with a total of 7073 violations (Dasgupta, 2006). Although this was an important step to involve the public and make them aware of pollutant actions, it was not an activity initially propelled by the Kyoto Protocol since it already existed before its adoption and was only a concomitant phenomenon.

It is further arguable whether Korea's decision to produce environmentally sound energy by installing more and more nuclear plants is in accordance with the concept of sustainable development and green growth. The general target is to extent nuclear energy from 36 percent in 2007 to 59 percent in 2030 (Shim, 2010), supported by large investment on the part of the Korean government. At this point it needs to be mentioned that nuclear energy is not a designated instrument to decrease GHG emissions in the clean development mechanism (CDM) (UNFCCC, 2001). Additionally, Korean environmental NGOs became alarmed when the Korean government announced its 'ambitious' plans, which involved the GHG reduction target of 4 percent from 2005. In terms of its renewable energy, South Korea has set itself the goal of increasing the ratio of renewable energy sources up to 6 percent from 2,7 percent in 2009. Even the People's Republic of China has planned to reach 20 percent of ratio of renewable energy in the next years (Shim, 2010). NGOs like Green Korea United consider these targets as insufficient and far too low, and have criticized the Green Growth concept of only basing its idea on the extension of nuclear power. Green Korea United for instance suggests responding to the Kyoto-ideas in the form of setting higher and truly ambitious targets (GKU 2010). Thus, environmental groups have been animated by the Kyoto Protocol, and consequently have stood up to complain about the government's missing commitment.

4.4.3 Compliance

With regard to compliance, primarily it needs to be said that for Korea it is not a difficult task to comply with its provisions since it is not assigned with the provisions of Annex I countries that are forced to attain certain targets. At the same time this can also be understood as a critique since Korea has reached a relatively high level of economic wealth and has been an OECD member since 1996. Nevertheless, there are a few activities that South Korea has implemented to achieve a reduction in its emissions.

In 2006, the ROK was ranked the third largest seller of certified emission reductions (CERs), accounting for 15,6 percent of the expected average of CERs per year. Newer projects also contain solar and hydropower (OECD/IEA, 2006). In continuation, South Korea established a

Designated National Authority to assess the selected CDM projects, which work under the auspices of the Inter-ministerial Committee of the UNFCCC and the Vice-ministerial Committee of the UNFCCC. In terms of financial expenditures, in 2008 the ROK issued a remarkable development assistance package (approximately US\$200) generally dedicated to trans-Asian projects attached to climate change (Yale Center for Environment, Law and Policy, n.d.). With respect to measures against the high carbon emissions on the part of Korean small and medium-sized enterprises (SMEs), a carbon footprint labeling was introduced by the MOE to encourage SMEs to limit their emissions (MOE, 2013b).

When the Kyoto Protocol entered into force in Korea various strategies were formulated such as the integrally managed conservation policy to organize a three-year plan for energy audit or to expand energy service companies. The implementation process of the different initiatives is observed by the Office of the Prime Minister (OECD/IEA, 2006). A program of countermeasures lasting from 2008 until 2012 was put into practice and approached five areas, namely negotiation, inventory, mitigation, research and development, and adaption. Those areas were foreseen to encompass the enhancement of the climate change industry and the quality of life as well as the promotion of the picture of a global Korea as major goals. To list some concrete plans of this program, for instance the improvement of a climate friendly infrastructure, strengthening the ‘polluters pay-principle’, elevating the level of technologies concerning climate change up to 80 percent, promoting the Climate Change Prediction and Disaster Management System, and establishing a system to decrease household waste and thereby reducing private GHG emissions (Choi, 2009). All these examples demonstrate that South Korea has been pushed by the Kyoto Protocol to analyze its emission sources and find ways to address to climate issues.

Although Korea’s performance as a non-Annex I state has been quite positive, it has to be countered that from 1990 to 2007 Korea’s carbon output increased at the highest pace among all OECD countries. Therefore, the announcement to set the target at 4 percent of emission reduction seems unambitious and is assessed not to contribute much to climate change mitigation (Shim, 2010). The OECD has calculated a business-as-usual scenario for South Korea’s CO₂ emissions, which are predicted to rise by 85 percent from 2000 to 2030 (and account for 2,1 percent per year). In addition, gas emissions are also forecasted to increase greatly until 2030 (OECD/IEA, 2006). These rather dismal prospects emphasize the necessity for the ROK to set stricter and more ambitious targets, especially in the field of renewable energies which already lags behind significantly. Thus, even though South Korea sufficiently

complies with its provisions, this seems relatively minimal in comparison with the targets for other countries.

4.4.4 Change of behavior

The Kyoto Protocol has altered South Korea's behavior in terms of climate protection, as the ROK was prompted to release policies for a better handling of energy sources and its consumption. Nevertheless, it needs to be considered that South Korea emerged as the ninth largest GHG emitter in the last decade, so the necessity for further rethinking is inevitable. Additionally, although the general attitude towards economic growth and a 'greener' form of development has been pushed forward by the introduction of the Green Growth strategy, there is still much work to be done, particularly in the sector of renewable energy that needs to be supported to a greater extent. South Korean citizens are increasingly informed about climate change, the reasons, and probable consequences, but NGOs such as Green Korea United must receive better assistance from the government including financial support. This leads to the topic of nuclear energy, from the UNFCCC not foreseen as a source of 'green' energy. South Korea is heavily investing in the establishment of nuclear plants and regards the generated power as ecologically valuable. Since the Kyoto Protocol does not include this form of power and many NGOs deplore this trend, the contribution and promotion of this energy generation remains arguable.

The Kyoto Protocol has brought new spirit to climate negotiations and encouraged Korea to review its policy tendencies; however, its effectiveness in South Korea is limited due to the simple reason of not being registered as Annex I country. What adds up to this point is the fact that South Korea was pressured by the international community to join the rest of the Annex I states in Copenhagen. The governmental representatives, who were sent to Copenhagen, proudly reported about the successful defense of the status as non-Annex I country (Shim, 2010). South Korea has set the target of reaching 30 percent less than the business-as-usual level by 2020. It is still too early to tell whether this target will be achieved. Up until today the facts that attract attention are Korea's immense energy consumption, which has been growing since the 1990s and resulted in great GHG emissions.

An agreement such as the Kyoto Protocol has little effect without universal participation. As Korea's example shows, a core element in climate protection is the management of incentives, especially in the case of developing countries. The CDM mechanism needs to be

further elaborated and discussed since it provides opportunities to the developed countries to act environmentally unfriendly.

	Contractual environment	Administrative & political capacity	Epistemic community	Concern and awareness	Level of compliance	Change of behavior
Absent or only marginally given	x weak	x				
Generally given, but with deficiencies			x		x	x
Acceptable to high				x acceptable		

Table 11: Kyoto Protocol and South Korea

4.5 South Korea and Agenda 21

The United Nations Conference on Environment and Development and its main product, the creation of Agenda 21, has had a certain effect on South Korea. The UNCED held in Rio is considered a watershed in South Korean environmental politics, its position within the international environmental institutions, and relevant transformations in organization, management, and ideology of South Korea's environmental movement (Kern, 2010; Ku, 1996; Lee, 2000). After and during the Conference took place, a number of environmental agreements were signed by the ROK and the environmental movement emerged as a powerful asserter of environmental protection and sustainable development. The Conference firstly offered a relevant opportunity for NGOs to enter international environmental negotiations. This also applied to South Korea since the Rio Conference is often considered as having been the turning point in environmental governance in the Republic of Korea as prior to the Conference various actors were involved in the preparations.

Agenda 21 is further important for South Korea since it emphasized the need to shift the weight from pure capital accumulation and unimpeded economic growth to the consideration of sustainable development. Apart from immense industrial constructions, the expansion of infrastructural institutions as well as apartment complexes and areas for leisure activities such as ski resorts or golf courses were responsible for environmental degradation in South Korea. Specifically, these actions spurred loss of wildlife and biodiversity, flooding, deforestation, and many other environmental problems (Chung, & Kirkby, 2002). Therefore, a general necessity to change the treatment of the environment was also imperative for the ROK.

4.5.1 Administrative, political capacity and contractual environment

Previous to the UNCED, the Korean government set in motion important preparations for the Conference and representatives of the government as well as NGOs, and civic groupings came together in order to discuss the upcoming Conference. Beside a hundred of Korean legislators, union leaders, journalists, and leaders of religious groups, a number of social activists and representatives of the Civic Group for Economic Justice formed the preparation committee for the Conference (Kern, 2010). This cooperation between different levels and areas would not have been possible during the era of military dictatorship in Korea that collapsed at the end of the 1980s, thereby giving democratic movements a chance. Although the majority of these movements were more of a political nature, in many cases they also

addressed environmental issues and various environmental movements emerged. This wave supported the creation of a contractual basis for international environmental agreements, such as Agenda 21. Additionally, the Conference in Rio elevated the environmental issue to a higher level. During the preparations for the Conference, the number of collaborating officials and governmental representatives increased and even the chaebol contributed by funding the delegates' travel costs to Rio (Kern, 2010).

At UNCED several decisions on sustainable development were made and Agenda 21 was issued. In continuation, South Korea established a Working Committee for Environmental Preservation and after considerable time (in 2000) a Commission for Sustainable Development was formed. Before the UNCED the Korean government installed a Global Environment Division (1991) in charge of handling issues that concern both the global and the national environment. Right after Rio the ROK created a Ministerial Committee for the Global Environment headed by the Prime Minister, who decided on Comprehensive Countermeasures for Global Environment. These Countermeasures encompassed 44 action plans in the industrial and environmental field as well as in the area of negotiations (Hong & Lee, 1996). What attracts attention is the fact that the word 'global' was frequently used, hinting at an increased environmental consideration and the global dimension of these problems. The preparation of South Korea's national Agenda 21 overtook the Ministerial Committee for the Global Environment together with the Ministry of Finance and Economy. When it came to developing an own Local Agenda 21 South Korea put into practice its Preparation Project in 1993. Simultaneously, the idea of creating the National Council on Sustainable Development (NCSD) received little support by the Korean government and was finally established (together with the Local Agenda 21 National Congress) only because of the persistence of groups composed of civic activists (Cha, 2000).

Shortly after the signing of Agenda 21, financially the Ministry of Environment was seen as not enough equipped with funds of the government. Out of the budget for environmental management, 15,2 percent were reserved for the MOE, 42,1 percent for the Ministry of Housing Affairs, 40,1 percent for the Ministry of Construction (later changed to Ministry of Construction and Transportation), and 2,5 percent made up the proportion for the Ministry of Trade, Industry, and Resources (MOE, 1994). In terms of spending, the ROK contributed about US\$5-6 million to the Global Environmental Facility between 1995 and 1997 (Hong & Lee, 1996).

4.5.2 Epistemological community and awareness

The scientific community is particularly challenged by the task to exercise adequate research for the implementation of Agenda 21 since it consists in large quantities of different research areas. A great quantity of scientists is necessary to cover all the points addressed by Agenda 21. To give an example, concerning the chapter that calls for a change in consumption patterns, Korea initiated a Life-Cycle Assessment (LCA), also referred to as “cradle-to-grave” analysis, which measures the environmental impact of products during all stages of its development. Additionally, research on and developing new composting methods and a program for environmental technology research were initiated (UN ROK Country Profile, 2002:10). Basically, Agenda 21’s chapter 35 is dedicated to science for sustainable development and it mentions, amongst others, the four relevant principles for this matter:

- „(a) Strengthening the scientific basis for sustainable management;
- (b) Enhancing scientific understanding;
- (c) Improving long-term scientific assessment;
- (d) Building up scientific capacity and capability.“ (UNEP, 2013)

Initially, the ROK needed to be pushed by the international community to join scientific research programs to enlarge its knowledge on global environmental issues and to install Korean branches of international institutions. As a response to these demands, South Korea has installed research programs for Sustainable Indicators and System of Integrated Environment and Economic Accounts, as well as for other areas such as climate change, where observation networks were established. In many areas LCA techniques were introduced as well as research based on experience in order to improve eco-labeling criteria (ROK, 1998). Furthermore, even the big business conglomerates were prompted to install centers for research and technology and using the results to create ‘green’ guidelines for the corporate sector (Eder, 1996).

As the example of civic groups’ effort concerning the creation of a NCSD shows, Korea’s citizens have accumulated certain knowledge on environmental protection and politics. Nevertheless, especially around the time of implementing a national Agenda 21, among the Korean population concrete knowledge on issues like recycling and energy efficiency was limited. In its country profile from 2002, the ROK listed a number of different measures to enhance public awareness such as the introduction of eco-labeling in 1992 offering an opportunity to choose between environmentally friendly produced goods and others, or the

promotion of eco-designs for services and products. Another example of initiatives to raise concern among the civil society is the Green Energy Family Program supported by media companies, to move towards more efficient and sustainable usage of energy. This program was initiated in 1995 and was based on a voluntary collaboration between NGOs, companies, and citizens (UN ROK Country Profile, 2002). Supplementary to eco-labeling, an Eco-Mark Association for higher standards was also established in 1992, being composed of representatives from environmental organizations, experts, business, and consumer organizations (ROK, 1998).

As indicated at the beginning, UNCED and a new spirit created by Agenda 21 enhanced the green movement in Korea, green environmentalism was expanded, and not limited to the capital Seoul. In connection with the green movement various differences between the period prior and after 1992 can be observed. Although in the 1980s the weight was shifted from only accusing polluters to accusing polluters and the government, after 1992 the target has been the government and the public. Additionally, previous to the Rio Conference activities were limited to the local and regional level and since 1992 they have addressed national and global problems. Another important factor is that at the beginning of these movements the impact on governmental policies was next to nothing and since the UNCED it has influenced formulation and implementation of policies (Jeong & Lee 1996; Koo, 1996; Yoon, 2000). As this comparison demonstrates, environmental governance was altered in South Korea towards more freedom for the civil society to participate in the decision-making process. However, the amount and size of environmental problems have increased in the last decades. Even though environmental awareness and concern have been on the rise, the public could push the government much more to engage stronger in environmental protection. In the light of governmental concern it needs to be mentioned that the Green Growth concept has also been absorbed in a critical way by the public and environmental groups, since they consider the targets insufficiently ambitious. Thus, as awareness is generally given, opponents need to call further attention to them.

4.5.3 Compliance

It is a rather difficult task to create a specific compliance record for the ROK concerning Agenda 21, since it touches almost all areas of environmental protection, and further areas such as human health and poverty reduction. First of all, each country participating in Agenda

21 processes was prompted to work out a Local Agenda 21. The government of the Republic of Korea set out the necessary procedures and recommendations for preparing a Local Agenda 21 in 1997. At the end of 2007 in total 218 local governments, accounting for 89 percent, had established a Local Agenda 21. Together with Australia, South Korea managed to reach the largest participation of all Asian-Pacific countries in terms of Local Agenda 21 (MOE, 2013c). The introduction of the Local Agenda 21 and its success needs to be attributed to Korea's NGOs that were especially eager to integrate the principles of Agenda 21 on the local level (Cha, 2000).

Among the national programs, one of the greatest initiatives was the realization of the eco-labeling program to attract the consumer's attention for products developed through environmentally friendly methods. Aside from the labeling program the Environmental Technology Development Support Act was issued in 1994 and targeted private companies and their education in a preventive measure for environmentally sound production. About one year later, the Environmentally Friendly Enterprise Certification (EFEC) Program was adopted for new management styles that seek a balance between environment and economy (Shin, 2005). However, it has to be noted that these programs generally functioned on a voluntary and indirect basis, that on the one hand invited to participate in environmental protection, but on the other punitive measures were not foreseen in case of non-participation or non-compliance.

Although Local Agenda 21 is regarded as having created a system of environmental governance with a variety of stakeholders in the local decision-making procedure (Cha, 2008), the budget allocated to the local government was about US\$550.000 in total, accounting for approximately US\$46.000 for each government, which is considered extremely little. The size of the budget is hardly sufficient to maintain offices in charge of Local Agenda 21 (Cha, 2000). The small funds for local governments limit the effectiveness of the implementation of the different Local Agenda 21 projects.

Concerning the EFEC Program, the certificates are valid for three years, in which the company has to deliver annual reports about improvements to the Head of the Regional Office of the MOE. If the responsible functionaries do not need to make supplementary requests, the certificates become effective for another year. Moreover, an enterprise's commitment to the EFEC Program is recompensed by different exemptions, low-interest loans, and the notification as 'green company'. The first three enterprises to implement the EFEC Program were Samsung Electronics, Doosan Crown, and Samsung Chemicals; by 2005 about 110

companies participated in the program (Shin, 2005). Since the basic concept of EFEC has shown relatively good results, the Program should be extended to encompass the majority of Korean companies.

South Korea is heavily investing in nuclear power plants and has designated nuclear energy as one of their most important sources of energy generation. Nuclear power is also a core element in the ROK's Green Growth and is supported greatly by the Korean government. The ROK was calculated to be the fourth largest nuclear power producer among OECD countries with a share of 17 percent of total energy generation and has foreseen to expand it up to 28 percent by 2030 (Jones & Yoo, 2012). However, Agenda 21 merely touches the issues of this form of energy generation, but devotes chapter 22 to the environmentally sound treatment of radioactive wastes. Additionally chapter 9(d) addresses the assessment of air pollution provoked by nuclear accidents (UNEP, 2013). Nonetheless, UNEP together with many Korean NGOs originally disapproved of nuclear power. The last four chapters are dedicated to institutional, administrative, and decision-making arrangements generally fulfilled by South Korea. Chapter 27 addressed the involvement of non-governmental organizations in decision-making processes, which was prompted during the negotiations concerning Korea's National Agenda 21 Action Plans, though their participation was only tolerated to a limited extent (Yoon, 2006).

As the Green Growth strategy was mainly implemented to please international environmental institutions and agreements, above all UNEP and Agenda 21, one of its crucial initiatives needs to be discussed. In light of Green Growth the Four Major Rivers Project was developed to face water-related problems such as flooding and droughts in the areas of the Han, Nakdong, Geum and Yeongsan rivers. This project involves the construction of more than twenty dams and is designed to restore the river, address ecosystem loss and provide water security. It was implemented in 2009, costing US\$19,3 billion, and declared complete in 2011 by former president Lee Myung-bak (International River Foundation, 2012). Apart from compliments from the South Korean government and the UNEP, that even called it the 'world's best model for climate change' (GKU, 2010b), a wide range of criticism on the part of Korean environmental groups such as Green Korea United and international groups like Friends of the Earth has emerged. These include the economic viability of the project, its goal, the fact that the Environmental Impact Assessment was carried out before the plans were completed and others (International River Foundation, 2012). GKU (2010b) claimed in 2010

that 75 percent of the Korean population was against the project's execution. By now parts of the project have already been realized and several issues, such as algal bloom and problems with faulty construction have been identified. The case of the Four Major River Project additionally highlights the controversial matter of Green Growth and its positive impact on the environment. Thus, even though this project has responded to various areas of Agenda 21, such as protection of the atmosphere, water supply, or waste management, it has violated other provisions, for instance in the field of biodiversity conservation, the recognition of indigenous people and their needs, and deforestation, since many people were forced to leave their homes and huge areas needed to be flattened for the construction of the dams. Generally speaking, basic compliance with Agenda 21 is given in South Korea hence it demonstrated a good performance regarding the construction of a framework to introduce Agenda 21 and has established a great number of Local Agenda 21 plans. Nevertheless, as concrete examples show the further implementation of the Local Agenda 21 lacked in many areas. Furthermore, by setting in motion Green Growth programs, the ROK complied with some provisions but at the same time also violated others.

4.5.4 Change of behavior

Agenda 21 but even more the Conference in Rio are regarded as having initiated a new style of environmental policy-making in Korea and raising the overall awareness of government, civil society, business, and national organizations. Although Agenda 21 has been criticized for being too far-reaching and addressing a wide range of environmental issues, it has still succeeded in drawing the attention to all those problems that would increase in case of non-action. What especially counted for Korea was the international environment embracing the ratification of Agenda 21, since its democracy was still in its infancy, and diplomatic relations had to be established. South Korea's Green Growth initiatives can be understood as a late response to Agenda 21's principles, and are considered a general change of behavior. Despite critical voices in terms of Green Growth's true effectiveness, the direction that Korea is taking by implementing these ideas needs to be considered.

While compiling Agenda 21 the greatness of environmental challenges became particularly visible and encouraged many countries, including South Korea, to keep these problems in mind and to make arrangements in order to combat them. Moreover, Korean environmental NGOs came alive and for the first time were taken seriously by the central government. Therefore, Agenda 21, together with UNCED, has affected Korea's environmental

governance and although not all provisions have been addressed or completely achieved, a new approach towards environmental governance was found.

	Contractual environment	Administrative & political capacity	Epistemic community	Concern and awareness	Level of compliance	Change of behavior
Absent or only marginally given						
Generally given, but with deficiencies		x	x		x	
Acceptable to high	x			x rising		x

Table 12: Agenda 21 and South Korea

5 Discussion and Conclusion

The conducted empirical analysis provides a number of insights about environmental governance in China and South Korea and assesses the effectiveness of different environmental conventions and protocols in these countries. A general trend from ‘close-to-nothing’ environmental protection to a certain level of implemented policies and measures to conserve the natural environment becomes visible both in China and South Korea. However, the trend has occurred with a time lag as China signed some conventions earlier than the ROK, but the ROK established a Ministry of Environment more than a decade before China. Nonetheless, there are other major patterns of observations such as the rising concern among the governments but also the civil society throughout the last years. In both countries earlier stages of implementation (for instance of CITES and the Montreal Protocol) show more implications and deficiencies than nowadays.

In terms of CITES, beside the high number of endangered species in China as well as in South Korea, in China coordination has been considered the greatest challenge to the creation of a contractual environment and sufficient administrative capacity. Although a legal body was created on the basis of the Environmental Protection Law, generally environmental laws were confronted with the traditional perception of nature. In both states a persisting problem is the necessity of natural resources for TCM, which needs to be addressed in a more intense way by CITES. Concerning the enforcement of an epistemic community, in South Korea’s case CITES lacked significantly in prompting scientific research, since various areas remain unsearched and the specific status of many species unclear. CITES in China, on the other hand, was unable to encourage the identification of a primary agency responsible for research. However, the convention gave the impetus for multiple efforts with regard to raising concern in both countries. Major observations with relation to compliance to CITES demonstrate that in China harsh punishments have been imposed to enforce compliance, though, a series of illegal poaching has still been registered. Despite the increase of fines in South Korea, lax enforcement was reported, which raises the question whether deterrence is effective. Speaking in general, CITES has induced a certain change of behavior in both countries, since before accepting the convention, the protection of endangered species was given neither in the PRC nor in the ROK. In South Korea CITES needs to target the promotion of a more capable scientific community and in China the reformulation of laws has to be addressed. This

research generally confirms Oksenberg and Economy's (1998) analysis of CITES's impact on China stating the failure to comply with the convention during the first years of implementation. Thus, CITES was effective in drawing the governments' and society's attention to the necessity of banning trade in endangered species. Nonetheless, a complete and successful ban has not taken place, also because of the incentives for violations.

The CBD already met with a more expanded foundation for environmental protection and had similar effects on China and South Korea. Ever since, the PRC has emphasized the fact of having been the first developing country to sign the CBD, whereas for Korea it was only among the first big environmental conventions to ratify. In both states the conditions for a successful implementation lacked due to the vast territories (especially in China) and the unclear distribution of competences. China developed the National Biodiversity Strategy Action Plan and Korea's pendant was named National Biodiversity Action Plan and simultaneously a systematic differentiation between I and II species in China compared to the Korean CE- and EN categorization was introduced. Although a legal basis was enacted in both states, China suffered more under ill-defined laws and money spent on the wrong purposes. Through CBD both Chinese and Korean scientific communities were promoted. South Korea managed to incorporate an information-sharing system that sought to improve the scientific situation. In terms of the raising of awareness about biological diversity, it has been easier for the CBD to be effective in Korea than in the PRC, since environmental NGOs were politically more accepted and less curtailed than in China. Although McBeath and Leng (2006) rather highlight the positive effects of CBD in China, there are a number of deficiencies to be found. China's compliance record has been downgraded by the lack of staff, funds, management, infrastructure, and transparency. In particular, compliance with the Cartagena Protocol is considered poor and higher incentives are needed to improve compliance. In this case, it appears that the limit of bearable deficiencies to remain effective has been exceeded by China. Although it took Korea considerable time to prepare an adequate policy apparatus to implement the CBD, it has generally complied with procedural provisions; especially protected areas are well managed and administrated. Nevertheless, CBD has been more effective on the national level than on the regional and local level. Therefore, the CBD has rather influenced South Korea to engage in protecting biological diversity, whereas in China the great number of issues weakens the effectiveness of the CBD.

The case of the Montreal Protocol presents a more pleasant picture, even though the initial situation cannot be considered an effort to create a contractual environment. Both countries only acceded the Protocol after careful considerations and because of China's demands the Protocol was even modified. It seems that for South Korea the status of an Article 5 country is even more questionable due to its great economic development and current status as newly industrialized country. However, both states were pressured by the international community and in fear of risking trade opportunities they engaged in implementing the Protocol. Concerning the Montreal Protocol, the power of international relations becomes more visible and confirms the realist point of view arguing that states rather comply with a convention if they are pushed by other countries or even by the threat of trade sanctions. Here, the liberalist concept is less reasonable since China and South Korea clearly have not acted out of a willingness to cooperate but because of economic pressures. In both countries epistemic communities were prompted by the international community, however, the People's Republic complained about bad cooperation between international and national scientists. Additionally, in both states environmental governance was improved and overall awareness of the depletion of the ozone layer has increased.

Especially in Korea environmental insights were made public more frequently. As indicated, the Montreal Protocol has been assessed as one of the most effective accords and indeed, China and South Korea both demonstrate acceptable records of compliance. The Protocol has effectively encouraged the countries to freeze some ODS, amongst other major halons and CFCs. An aspect that has to be further improved by the members of the Montreal Protocol is the handling of non-compliance, which is considered far too weak. Contrary to Kent's (2007) negative appreciation of China's compliance with the Montreal Protocol, given the number of fulfilled provisions as Article 5 country, the level of compliance seems acceptable. Without the Montreal Protocol the production of ODS would have unrestrainedly continued and ozone layer depletion would have caused more dramatic implications for the environment and human health. Although a complete rethinking is still due to occur in China and Korea (especially in business) through the Montreal Protocol the protection of the ozone layer went from zero to the phase-out of a series of ODS.

In relation to the Kyoto Protocol, it needs to be mentioned at the beginning that the effectiveness of such a Protocol strongly depends on universal membership, not registered by the Kyoto Protocol. Observed in the light of international relations, the issue of missing members important for successful outcomes becomes evident by the fact that Japan denied to

sign due to the US's refusal. Furthermore, it was found that the Kyoto Protocol targets the transformation of whole economies, which is less welcome in countries of high economic growth such as the PRC or ROK. Although China and Korea, among the biggest GHG emitters, are categorized as non-Annex I countries, the remaining provisions are merely addressed. The capacity to implement the Kyoto Protocol was limited in China at the time it entered into force, since the Ministry of Environmental Protection was still not established and the agency lacked in staff and effective laws. In contrast, Korea at that time had created a capable administrative framework for implementing environmental accords and along with its Green Growth strategy many projects were supported. In terms of public awareness, the Kyoto Protocol further encouraged disclosure of information on violations of enterprises; however, not only in China but also in South Korea this countermeasure had been practiced before and was only reanimated by the Protocol. A controversy particularly occurring in the ROK is the heavy promotion of nuclear energy to avoid GHG emissions. Nonetheless, the Kyoto Protocol has not counted nuclear plants as environmentally sound methods to generate power.

Another issue is the fact that the PRC and ROK are both eager to execute CDM projects, which creates problematic measure induced by the Protocol. Instead of giving developed countries the chance to find loopholes to produce emissions, a stronger incentive system is needed. The Kyoto Protocol is above all little effective in South Korea and China, since it is still cheaper for most enterprises to pay the fines than to comply with the respective provisions. Furthermore, the proportion of renewable energy in South Korea is very low and while agreeing with Shim (2010) it can be said that the goals for the next decades are also not very ambitious. For both countries it can be said that no real change in behavior of environmental governing has occurred because of the Kyoto Protocol, which in principle lacks in effective measures and effectuation. Nevertheless, perhaps the Protocol might also need more time since the other discussed conventions have had a longer period for implementation.

The final part of the empirical analysis composed Agenda 21, a convention elaborated during the Conference on Environment and Development in Rio. At the time Agenda 21 was signed, the Chinese institutions responsible for environmental protection still had no ministry status. However, not only South Korea but also China took the implementation of Agenda 21 seriously and developed a national Agenda 21. In continuation Local Agendas 21 were generated by each country. It is important to discuss under which circumstances Agenda 21

was signed since UNCED had a remarkable diplomatic effect and highlighted the need to protect the environment. Agenda 21 generally prompted the formation of scientific communities in China and South Korea, though it was necessary to push Korea stronger to invest in scientific research. Although environmental awareness was prompted by Agenda 21, in South Korea knowledge is said to be still very limited, especially concerning recycling. In order to propel environmental consideration, in China university programs on environmental management were introduced. A fundamental challenge to compliance for both states is the wide range of issues addressed by Agenda 21. To realize every provision of Agenda 21 huge capital is mandatory, that is neither existent in China nor in South Korea. Beside the lack in compliance with Agenda 21, both the PRC and ROK still follow the economy-first principle, which stresses the prevailing unfulfilled need to accept the concept of sustainable development as a directing concept for national environmental governance. Moreover, it still had an important effect on China and South Korea (and many others as well), since it put environmental protection on the policy agenda. Though in Korea NGOs and environmental movements have had a longer history than in China, Agenda 21 induced the formation of many NGOs and registered them as relevant parties in environmental negotiations. Thus, Agenda 21's major effective outcomes are ascribing paramount importance to environmental protection and the extension of environmental governance to non-governmental participants.

In order to return to the guiding research question, the general effectiveness of these conventions, representing IEIs, is to be assessed. After having analyzed the different accords it becomes clear that they do have an impact on environmental governance in China and South Korea, albeit in some cases rather limited. One of the principal effects, though it might sound marginal, is the mere fact that environmental issues are visualized and put on the political agenda. China and South Korea have immense urgent environmental problems threatening human health. As these countries have ultimately only experienced a rise in economic and living standards in the last decades, they generally favor economic growth over conservation of the environment.

Nonetheless, in recent years the concept of sustainable development has evolved more prominent than ever before in these countries, which can mainly be attributed to IEIs and their efforts. In terms of the necessary conditions for effective influence of IEIs, it needs to be mentioned that in many cases administrative capacity was generally given, though often lacking, particularly in China's case. Politically, South Korea has had a lead over China, since democratization has taken place and political freedom was expanded and allowed

environmental movements. One could argue Korea has walked earlier on the path of environmental maturation and has provided more space for non-governmental actors to play a part in environmental governance. However, in Korea deficiencies can also be observed in this process. As the analysis indicates, scientific communities in the respective countries have been promoted, but additional problems have occurred when bringing national and international scientists and experts together. In the majority of cases compliance has finally been judged as acceptable, but one needs to add here that especially concerning climate-related conventions the provisions to fulfill were less demanding because of the categorization as developing countries. Another question that emerges concerns the reasons for non-compliance and its consequences. Is non-compliance an indication for bad environmental governance? As demonstrated, it is not necessarily the case; hence the convention or protocol itself may be problematic. To give an example, Agenda 21 was assessed as having given important stimulus for commitment to environmental protection; however, compliance with the convention is low in China and South Korea. Firstly, as shown, the magnitude of articles decreases the capacity of complying with each provision and secondly, many of the provisions appear more like ideas than rules and regulations to follow, which on the one hand strengthens its encouraging character but on the other diminishes the systematical compliance with regulations.

In particular South Korea's example demonstrates that the international community exercises insufficient pressure with respect to its commitment, as its status could have been converted to a responsible industrialized country. This leads to the same dilemma in which the PRC finds itself. On the one hand they endeavor to be considered a respectful and responsible nation, ready to engage in environmental protection. On the other, on many occasions they assert their position as (still) poor developing country. This assumption emphasizes the existence of the general situation in which no one feels responsible for the ongoing environmental degradation. The evidence delivered by the examples of China and South Korea suggest a need for continuing and intensifying the work of IEIs, and as a broader approach giving them (and their conventions) more power and the necessary financial support.

It has become clear that issues such as climate change, global warming, or loss of biodiversity are real issues threatening the natural balance of the ecosystem and the health of human beings. Furthermore it has been globally acknowledged and the international community has understood the fact that human action is necessary to prevent catastrophic consequences.

International environmental conventions released by institutions are important countermeasures and need to be taken more seriously. This research demonstrates that, although these institutions have less influence in some aspects, they are effective in a number of matters. To improve the level of effectiveness, factors such as the broadness of addressed issues need to be reconsidered and the international community has to grant more power to IEIs.

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Appendix: Abstract

In the last decades a considerable number of International Environmental Institutions (IEIs) have been established to address environmental degradation, which is becoming more visible every day and threatens nature and human beings. The basic question that guides this research is how effective are these IEIs (and their accords) in terms of governance in China and South Korea to improve the environmental situation. Previous research has been conducted regarding the effects of IEIs as well as on environmental governance in China and South Korea separately. However, the effectiveness of IEIs on Chinese and South Korean governance has neither been analyzed nor compared. Thus, this thesis combines these areas and elaborates criteria that distinguish the effectiveness of IEIs. In continuation, in order to construct the empirical part the criteria are applied to five selected environmental accords signed by China and South Korea. The thesis identifies the impact of these accords on the two respective countries and thereby offers insights about successful contributions as well as deficiencies. Since great efforts are spent on the establishment of IEIs and the realization of such accords, it seems worthwhile to recognize whether and in which areas of governance they are effective and where beneficial impact on the part of IEIs still lacks.

Appendix: Zusammenfassung auf Deutsch

In den letzten Jahrzehnten wurde eine Vielzahl an Internationalen Umweltinstitutionen (IUI) geschaffen, um den täglich spürbarer werdenden Schäden der Umwelt entgegenzuwirken. Diese stellen nicht nur eine Bedrohung für die Natur sondern auch für den Menschen dar. Die Forschungsfrage, die diese wissenschaftliche Arbeit leitet, ist wie effektiv diese IUI (und ihre Abkommen) in Bezug auf Governance in China und Südkorea sind. Bisherige Untersuchungen haben sich vor allem selektiv auf die Wirksamkeit von IUIs oder auf die allgemeine Art der Governance bei Umweltthemen in China/Südkorea konzentriert, wobei außer Acht gelassen wurde, ob und inwiefern diese IUI in der spezifischen Verbindung zur chinesischen und südkoreanischen Governance effektiv sind. Ebenso wenig wurden unter diesem Aspekt Vergleiche zwischen den beiden Ländern angestellt. Ziel dieser Arbeit ist es daher die einzelnen Teilgebiete zu vereinen, beginnend damit auf wissenschaftlicher Basis verschiedene Kriterien zur Beurteilung der Effektivität zu erfassen. In weiterer Folge werden diese im empirischen Teil an fünf ausgewählten Umweltabkommen angewandt, die jeweils von China und Südkorea unterzeichnet wurden. Diese Disputation analysiert den Einfluss der Abkommen auf die beiden Länder und geht dabei auf Defizite und positive Beiträge ein. Angesichts des großen Aufwands zur Realisierung dieser Abkommen, ist es wichtig festzustellen, ob und in welchen Bereichen der Governance eine Wirkung zu erkennen ist und wo Verbesserungspotential besteht.

Appendix: Curriculum Vitae

Laura Wagner, BA

AUSBILDUNG

Seit Februar 2012	Masterstudium: East Asian Economy and Society (Wirtschaft und Gesellschaft Ostasiens) Universität Wien
Seit September 2011	Bachelorstudium: Koreanologie Universität Wien
September 2007 – November 2011	Bachelorstudium der Transkulturellen Kommunikation (Deutsch, Spanisch, Chinesisch) Universität Wien, Abschluss mit BA of Arts
Februar - Juli 2010	Auslandsaufenthalt in Peking ; Studium an der Beijing Language and Culture University
Juli 2009	Sprachkurs an der Beijing Language and Culture University, Peking
1999 – 2007	Stiftsgymnasium Melk Matura mit ausgezeichnetem Erfolg in den Fächern Deutsch, Mathematik, Englisch, Latein, Spanisch und Religion

BERUFSERFAHRUNG

9.9.2013 – 7.12.2013	Kulturforum der Österreichischen Botschaft Peking ; Verwaltungspraktikum
Temporär seit April 2012	Wien Tourismus GmbH
Temporär von 2009-2011	Microsoft Österreich GmbH
Temporär von 2008-2011	GEO Reisen Incentive & Marketing GmbH

SPRACHEN

Deutsch:	Muttersprache und Bildungssprache
Englisch:	kompetente Sprachverwendung
Spanisch:	kompetente Sprachverwendung
Chinesisch:	kompetente Sprachverwendung
Koreanisch:	selbstständige Sprachverwendung
Französisch:	selbstständige Sprachverwendung