School of Sociology and Public Policy

China's paths to environmental recovery: Examining environmental concerns, priorities, and challenges

Vanessa Filipa Pacheco Teixeira

Dissertation submitted as partial requirement for the conferral of the
Master's in International Studies

Supervisor:

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ACKOWLEDGEMENTS

I would like to thank all the people who helped and supported me throughout the process of writing this dissertation.

Firstly, I would like to thank my supervisor, Dr. Maria Fernandes-Jesus, for all the valuable tips and suggestions that helped build a better dissertation, and for always being available to help with any doubts or explanations. Working with you has been truly rewarding.

Secondly, I would like to thank my family for always being supportive and encouraging me to further my education and pursue my career goals.

Thirdly, I would like to thank my friends, who were always there to encourage me and cheer me up whenever reading or writing became overwhelming, and who celebrated my small accomplishments every step of the way.

And finally, I would like to thank ISCTE for the possibility to obtain this degree and develop a research project about such an interesting topic.

Thank you all,
Vanessa Teixeira

RESUMO

O crescimento económico da China começou na década de 1970, surtindo efeitos devastadores na vida da população chinesa, bem como no meio ambiente, e originando várias complicações de saúde. Contudo, décadas depois, o governo chinês anunciou melhorias no meio ambiente, indicando que a China está a recuperar dos efeitos da poluição. Alguns autores concluíram que grande parte das políticas ambientais da China se focam no controlo e redução das emissões poluentes, o que poderá explicar esta recuperação. No entanto, até então, são poucos os estudos que analisam as políticas ambientais da China ao longo do tempo, recorrendo a vários tipos de documentos governamentais. Esta dissertação recorre à análise qualitativa de conteúdo de 54 documentos do governo chinês relacionados com o ambiente, procurando identificar as principais preocupações ambientais do governo chinês, o tipo de políticas ambientais que têm sido implementadas na China, e que fatores contribuíram para a redução dos efeitos da poluição. Os resultados indicam um foco em políticas relacionadas com poluição da água e do ar, cooperação internacional, desastres naturais, e controlo de indústrias. A análise sugere uma crescente preocupação com as alterações climáticas nas suas políticas governamentais, e uma necessidade cooperação internacional no âmbito das políticas ambientais. Desta forma, o presente estudo oferece contributos relevantes para disciplina de Estudos Internacionais sobre o ambiente. Assim, sugerimos que futuros estudos se foquem no aspeto temporal das políticas ambientais, relacionando-as com a evolução do estado do ambiente e com o contexto nacional e internacional em termos ambientais e de alterações climáticas.

Palavras-chave: alterações climáticas, China, crise ambiental, desenvolvimento sustentável, políticas ambientais, poluição

ABSTRACT

China's ongoing economic growth started in the 1970s, and its effects have been devastating on the lives of the population and on the environment, producing harmful health complications. However, nearly fifty years later, the Chinese government has reported that China's environment has started to recover from those effects. Authors have found that a many of China's policies have focused on emission control and reduction, which could be the reason for these successful improvements. However, few studies analyse politics throughout the years, using various types of government documents. In this dissertation, we use qualitative content analysis to analyse 54 documents made available by the Chinese Ministry of Ecology and Environment, in search for information regarding the main environmental concerns of the Chinese government, the types of environmental policies that have been promulgated, when they started being developed, and how they have contributed to pollution reduction. The findings point to a focus on policies related water and air pollution, international cooperation, climate and natural disasters, and the control of industries and enterprises. Furthermore, the analysis suggests that China has been recovering in the last years due to an increasing concern with climate change policies, and that international cooperation is necessary in the context of environmental policymaking. Therefore, this present study presents interesting contributes to the discipline of International Environmental Studies. We suggest that future research on the subject focuses on the timeline of policymaking within the international and domestic contexts of the fight against climate change, evaluating the effectiveness of these policies.

Keywords: China, climate change, environmental crisis, environmental policies, pollution, sustainable development

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LIST OF ACRONYMS

EPI – Energy Policy Institute

IPCC – Intergovernmental Panel on Climate Change

MEE – Ministry of Ecology and Environment

MEP – Ministry of Environmental Protection

NASA – National Aeronautics and Space Administration, 2020

NDRC – National Development and Reform Commission

SDGs – Sustainable Development Goals

UNCCS – United Nations Climate Change Secretariat

UNCED – United Nations Conference on Environment and Development

UNFCCC – United Nations Framework Convention on Climate Change

UNGA – United Nations General Assembly

INTRODUCTION

In the late 1970s, the Chinese constitution included environmental mitigation amongst its main concerns (State Council Information Office, 2006). However, by 2014 environmental degradation was worse than ever, pollution being visible in cities like Beijing, where fog took over people's lives for several days (The Lancet, 2014). By then, China had already become one of the biggest emitters of carbon dioxide in the world (Zheng and Kahn, 2017). Despite this situation, an interesting phenomenon would take place a few years later. In March 2019, the Chinese Minister of Ecology and Environment, Li Ganjie, declared that China's well-known environmental issues were being tackled (Ministry of Ecology and Environment, 2019). Ganjie stated that, in 2018, the "concentration of the fine particulate matters went down 9.3 percent year on year in the 338 cities at or above the prefectural level" (ibid.). Moreover, Ganjie asserted that, in the case of Beijing, this figure was 12.1%, a further improvement from the 20.5% drop registered in 2017. Considering this improvement, Beijing became one city with the most notorious environmental improvement in China. Overall, according to Ganjie, "the objectives in the annual plans of the ecological and environmental sector have all been accomplished" (ibid.).

This phenomenon, coupled with the fact that China once had one of the biggest carbon footprints in the world, makes the state and evolution of its environment a very relevant and intriguing case study. Considering the decades during which China's environment became progressively degraded, and the terrible outcomes that resulted from pollution, one cannot help but wonder how it was possible for the Chinese government to slow down and, perhaps, reverse the process of degradation. Thus, the present dissertation aims to contribute to a better understanding regarding the topic of China's environmental recovery, mainly focusing on China's recovery process and the policies that made it possible, but also taking into account the international context of environmental policies and law-making. Taking this aim into consideration, the research question of this dissertation is "what kind of environmental policies have been applied in China during the last three decades, and what results have they produced?".

In order to seek answers to this question, this dissertation conducts a qualitative content analysis on several types of documents published by the Chinese government, such as Policies, National Plans, and Yearly Reports on the state of the environment. Although the literature regarding the topic of environmental policies is extremely vast, especially in the context of China's environmental degradation, it was considered that a qualitative approach to environmental policies could provide more thorough answers to this question and allow for a clear overview of the main environmental concerns, as well as the areas in which environmental policies have focused. Thus, this dissertation resorts to the thematic analysis of several environment-related government documents, focusing on the main topics that are found within the sample of documents and the relations and interactions between them.

The present dissertation is divided into three main chapters. The first chapter is a literature review, in which we start by exploring the international context of climate change and environmental damage, and the policies and/or agreements that have been designed to combat this issue. We then move onto our case study, describing China's environmental downfall, the effects of pollution, and the policies that have been applied to fight it. In the second chapter, we define the research question and enumerate the respective research objectives. We also describe the methodology that was used in the analysis process for the dissertation, as well as the process of document selection. Lastly, in the third chapter, we share the most relevant findings that were extracted from the analysis. We divide the findings into categories and interpret the relations among them, in an attempt to understand how they interact with one another. The third chapter is followed by a discussion of the presented results, as well as some final conclusions.

1. LITERATURE REVIEW

In this chapter, we will present the evolution of environmental policies and law-making over the last decades, as well as any controversies and divergences that could be observed among States. We will describe the process of China's environmental degradation, as well as what the Chinese government has done in response since environmental issues were detected. We will consider some possibilities of policies that might allow for environmental recovery in the future. Furthermore, we will explore the effects of pollution on the environment, ecosystems, and human health. We will briefly address the international panoramic in a primary overview of environmental degradation and climate change combat, but mainly focus on China's actions against these challenges over the last few decades.

1.1. INTERNATIONAL CONTEXT

According to Nanda and Pring (2013), environmental problems did not receive much attention until the late 20th century, when international environmental law started seriously evolving. As stated by Meadows et al. in 1972, by then the concern with the environment was primordial, as well as the scientific studies regarding pollution and environmental degradation. Up until then, the idea that one country's environmental issues do not only affect that country, but also affect other nations around the globe, was not quite as common as it may be nowadays (ibid.). However, the effects of these environmental issues are seldom felt in the same fashion around the globe, since developing countries are usually the most affected by hindering changes in the climate due to climate vulnerability (Lybbert and Summer, 2010). Therefore, due to climate change and environmental degradation being global challenges, they defy "traditional notions of national sovereignty, since the environment does not stop at political borders", and the actions taken by one country can "have impacts in other countries, in areas outside any country's jurisdiction, and even globally" (Nanda and Pring, 2013: 7-8).

In the international scenario, one of the most relevant meetings related to the environment was held in Stockholm in 1972 (Nanda and Pring, 2013), a conference that has been described as "a first taking stock of the global human impact on the environment, an attempt at forging a basic common outlook on how to address the challenge of preserving and enhancing the human environment" (Handl, 2012: 1). The Stockholm Conference originated a document that is known as the Stockholm Declaration, mainly composed of 26 environmental principles (Nanda and Pring, 2013). This Declaration raised awareness regarding environmental issues on a global scale and kickstarted the adoption of action plans such as the Program of Action on the Environment, adopted by the European Economic Community Commission in 1974 (Kiss and Shelton, 2007).

Before the evolution of international environmental law during the 1970s, each individual country had the authority to manage and explore their resources as they wished, given that there practically was no environmental control on a global scale, or even the obligation to take into account the overall state of the global environment (Nanda and Pring, 2013). Furthermore, as stated by Kiss and Shelton (2007), national and international environmental laws focused on the protection of specific environmental areas (e.g., wild plant and animal species), rather than on the state of the environment as a whole. During the 1980s, however, it became clear that this was not enough in order to combat environmental degradation (ibid.), especially considering the discovery of the hole in the ozone layer in 1987 (Nanda and Pring, 2013). During the same year, two relevant environment-related documents were published: *Environmental Perspective to the Year 2000 and Beyond*, and *Our Common Future* (ibid.). The first considered environmental degradation as a threat to the health of the world's population, and well as to the existence of life on planet Earth, regardless of the progress that had been made until then (ibid.). In turn, the latter adopted the concept of sustainable development as its core feature, endorsing and encouraging its implementation on a global scale (ibid.).

Years earlier, an important concept was made public in the 1983 Brundtland Report. According to Kiss and Shelton (2007: 39), in this document, sustainable development was presented and defined as "development that meets present and future environment and development objectives". The Brundtland Report eventually led to another global conference focused on the environment, namely the 1992 United Nations Conference on Environment and Development (UNCED), which was held in Rio de Janeiro and thus became known as the Rio Conference (ibid.). This Conference marked the 20th anniversary of the Stockholm Conference, and was also intended to "address the North-South environment-development split" (Nanda and Pring, 2013: 108). The Rio Conference could have been an opportunity for developing countries to seek the recognition of their right to development, as well as financial aid from developed countries as a way to satisfy their development and environmental needs (ibid.). While the principles of the Stockholm Declaration were legally nonbinding, the Rio Conference gave origin to two binding treaties, namely the Convention on Biological Diversity and the Framework Convention on Climate Change (UNFCCC) (ibid.). The latter has the objective of reducing pollutant emissions into the atmosphere, which is also the focus of Principle 21 of the Stockholm Declaration (ibid.). This objective was solidified and further developed in the Kyoto Protocol in 1997, which listed more specific requirements needed to carry out the terms of the Framework Convention on Climate Change (ibid.). This Protocol was, according to Sarkar (2020: 54), "the first international agreement to keep the global temperature rise under check", requiring developed countries to use 1990 as the base year for the inventory of greenhouse gases, as well as for the calculation of the levels assigned to each country (UNFCCC, 2008).

Unlike what one might have expected from the apparent concern with climate change, the state of the environment had only further deteriorated in the 20 years between the Stockholm and Rio

conferences (Nanda and Pring, 2013). In fact, according to the World Meteorological Organization (2019), there was significant loss of ice sheets, namely in the Antarctic ocean, between 1979 and 1990. Similarly, the concentrations of CO_2, CH_4, and N_2O in the atmosphere registered a steady increase from the year 1984 onward, inevitably contributing to global warming (ibid.). Thus, it seems that the Stockholm conference did not produce significant changes on a global scale, as environmental degradation kept worsening over the years.

As previously mentioned, it was not until the late 20th century that the notion of the impact of one country's actions on other countries and/or the entirety of the planet itself became widely known. Seemingly due to the realization that this could easily become a real scenario, the Rio Declaration required States to assess environmental impacts of harmful events and communicate all other States that could be affected by those events (Handl, 2012). Thus, the Rio Declaration called for the balance between the States' sovereignty and right to the exploitation of their resources, and their responsibility to guarantee that no damage would be done to the environment of other States or regions that are beyond their jurisdiction (Nanda and Pring, 2013). Indeed, as stated by Kiss and Shelton (2007), the majority of States now recognize and accept the need for global efforts and cooperation in order to combat environmental degradation. Thus, as suggested by Handl (2012: 5), it would seem clear that the Rio Conference had a significant impact on the "international political-legal discourse", as well as on international cooperation and the efforts to combat and counteract climate change.

Similar to the Rio Declaration, Agenda 21 was also a product of the Rio Conference, being adopted in 1992 (Kiss and Shelton, 2007). Unlike the Rio Declaration, however, Agenda 21 is legally non-binding, as is the case of the Stockholm Declaration (ibid.). It is, essentially, an action plan that details several "policies, plans, programs, processes, and other guidance" that should be followed by the governments that attended the Rio Conference (Nanda and Pring, 2013: 120). This document tackles various aspects of sustainable development, including resource conservation and management, environmental protection, international cooperation, and poverty reduction (UNCED, 1992).

Already in the 21st century, namely in 2012, a new Rio Conference, often referred to as Rio+20, took place in order to mark its 20-year anniversary (Nanda and Pring, 2013). The objective of the conference was to renew and ensure the commitment of involved States to sustainable development, as well as to identify the progress that had been achieved since the Rio Conference in 1992 and any gaps that needed to be worked on (United Nations General Assembly, 2010).

Years later, in September 2015, 191 United Nations members met in New York to decide on the adoption of several Sustainable Development Goals (SDGs) that focused on different social, economic, and environmental dimensions (United Nations General Assembly, 2015). These goals are in line with the so-called 2030 Agenda, which aims to attain 17 different SDGs, encompassing 169 targets, by the year 2030 (ibid.; Sarkar, 2020). Among these goals are ensuring environmental protection, ending

hunger and poverty worldwide, promoting gender equality, and creating the possibility for sustainable and inclusive economic growth to occur (United Nations General Assembly, 2015).

In December 2015, the efforts to embark in international cooperation on sustainable development continued in the form of a new global agreement – the Paris Agreement (Rogelj et al., 2016). This global agreement aimed "to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty", as well as to craft a plan to keep the rise of global average temperature under 2ºC above the pre-industrial levels (UNFCCC, 2015). According to Faulkner (2016), in order to achieve this, a reversal of current global greenhouse gas emissions is necessary, and CO_2 emissions should be reduced to net zero by 2060-2075. Thus, this goal appears to be quite a challenge for the international community, especially if one considers many countries' right to development. Taking this into consideration, the Paris Agreement made it possible for each country to "set their own level of ambition for climate change mitigation", recognizing that drastic emission reductions should not be forced upon major global powers (ibid.). Hence, it seems that the Paris Agreement provided a pragmatic and down-to-earth approach to international environmental cooperation, perhaps more so than the declarations and agreements that preceded it (ibid.).

Considering the international context of environmental cooperation, policies, and agreements presented above, it would seem plausible to infer that environmental law making has suffered several changes and thus evolved throughout the years. Through these international policies and agreements, it seems that environmental protection and climate change combat have been developed in countries all around the globe. However, as we have seen above, the state of the environment has been deteriorating nonetheless, with significant ice sheet loss and increasing concentrations of greenhouse gases in the atmosphere – regardless of the international agreements that have been signed over the last decades. In chapter 1.1.1., we will look at the types of policies that have been crafted since the global commitment to environmental protection in an attempt to combat the worsening of environmental degradation.

1.1.1. MITIGATION VS ADAPTATION POLICIES

According to the Intergovernmental Panel on Climate Change (IPCC, 2018), there are, essentially, two types of environmental policies that have been designed and applied during the last few decades of combating climate change. The first is mitigation, which consists of actively reducing climate change itself, mainly by controlling and reducing the emissions of greenhouse gases into the atmosphere or by increasing greenhouse gas sinks (e.g. forests), which will contribute to the accumulation and storage of these gases (ibid.). The second, usually referred to as adaptation, consists of adjusting to the changes in the climate and to the current and/or future state of the climate and its effects (ibid.). By adapting to climate change, this approach intends on reducing the otherwise larger impact of climate change consequences, such as sea level rise or extreme weather events (National Aeronautics and Space

Administration, 2020). In other words, mitigation is an anticipative and proactive approach to climate change, while adaptation is usually a reactive approach – although it can also be used in a proactive form, especially when it comes to recurring climate change events that are expected to occur (Shalizi and Lecocq, 2007). According to the United Nations Climate Change Secretariat (UNCCS, 2019: 45), around one quarter of the initiatives that focus mostly on the adaptative approach "produce no outputs at all", while initiatives that mostly focus on mitigation "perform particularly well". Regarding both approaches, the UNCCS (2019) asserts that mitigation and adaptation, especially when applied to the land-use sector – which includes ecosystems, forestry, and agriculture –, can contribute to the fulfilment of numerous SDGs. Namely, combating and stopping forest loss is described as one of the most effective measures for the land-use sector to contribute to climate change mitigation, considering that forests function as greenhouse gas sinks (ibid.). In fact, the land-use sector has been described as able to absorb 29% of CO_2 emitted due to human activities, and could be the source of one third of the necessary mitigation process in order to keep global warming below 2ºC (ibid.) Furthermore, healthy forests and sustainable land use can help achieve "food security (…), industry innovation and infrastructure (…) and responsible consumption and production", which are part of the SDGs (ibid., p. 5). However, although mitigation does seem to be the most effective approach, adaptation is also important, as it allows for the reduction of the possible magnitude of climate change impacts (ibid.), namely disasters such as drought, floods, or extreme weather (UNFCCC, 2015). Regarding adaptation approaches and strategies, the protection of water is considered crucial due to the importance of clean freshwater in order to maintain a "resilient society" (UNCCS, 2019). In order to combat the effects of climate change in regard to water resources, it would seem wise to design and invest in infrastructure that can not only resist these effects, but also be adapted and/or altered in the future if need be (ibid.). Thus, while adaptation may not aid in the prevention of climate change and its effects, it may help soften their impact (UNFCCC, 2015), as well as any damage caused by these effects (VijayaVenkataRaman, Iniyan, and Goic, 2012). Moreover, as the Earth's climate has, in fact, started to change, it would seem clear that these changes will continue to take place in the future, making the need for adaptation policies "inevitable" to some extent (Shalizi and Lecocq, 2007). In fact, the IPCC (Stavins et al., 2014) considers that, while adaptation has not been as popular as mitigation over the years, its inclusion in policymaking is becoming increasingly important in order to reduce potential damages caused by climate change.

Considering the importance and outcomes of each approach, it seems that it is not enough to focus on either mitigation or adaptation, but it would be wiser to combine both approaches in order to attain optimal outcomes (ibid.), as they are "two key components of climate policy" (Duguma, Minang, and Noordwijk, 2014). Contrarily, Ingham, Ma and Ulph (2007) consider the two approaches as substitutes and not as complements, unless it is observed that deeply investing on and using one approach may reduce the costs of the other. Nevertheless, it is generally accepted that mitigation and adaptation should be managed harmoniously, as the contrary would "promote inefficiencies" and boycott synergies

between institutions that work on each of the approaches at hand (Duguma, Minang, and Noordwijk, 2014: 421). Thus, it seems that it would be ideal for mitigation and adaptation policies to be jointly arranged (Lecocq and Shalizi, 2007) in order to effectively design and apply a "mitigation-adaptation nexus" (Lee, Yang and Blok, 2020) that could be able to produce sustainable end results (VijayaVenkataRaman, Iniyan, and Goic, 2012).

It seems pertinent to stress how climate change policies can affect countries differently, depending on their economy and whether they are developed or developing nations. In many developing countries, climate change is often overlooked when governments are faced with other, immediate development issues – namely poverty and hunger elimination, and transport or infrastructure needs (Halsnæs and Verhagen, 2007). As stated by Lybbert and Summer (2010), developing countries are usually the most affected by hindering climate change and climate change policies. Within these countries, moreover, the poor are often most affected by this situation, as they are highly reliant on agriculture and may be severely affected by climate change and its respective policies (ibid.). Furthermore, as asserted by Shalizi and Lecocq (2007), while the population that is subject to the effects of climate change is usually larger in developing countries, these countries are the ones with the least financial stability to pay for the damages caused by climate change, or to finance adaptation measures. In fact, developing countries (and poor countries in particular) are often more vulnerable to climate changes and extreme weather (e.g. storms, floods and heatwaves) and can take longer to recover from these phenomena due to a lack of resources (Eckstein et al., 2019). In addition, developing countries often encounter limitations in managing natural resources, investments, and technological advances (Halsnæs and Verhagen, 2007). According to Nwedu (2020), mitigation has been the most common approach in the last decades, as previously mentioned, especially in developing countries. This may be due to the UNFCCC, which gave more emphasis to mitigation than adaptation policies, regardless of the specific needs and circumstances of developing countries that were recognized by the same convention (ibid.). However, evidence suggests that relying solely on mitigation can negatively impact developing countries, underlining the importance of designing adaptation policies in these countries (ibid.). Thus, it seems that developing countries face numerous challenges and thus require international cooperation and financial aid from developed countries, as well as research and development programs that will improve consciousness about adaptation policies (Shalizi and Lecocq, 2007).

1.1.2. THE RIGHT TO DEVELOPMENT

Still focusing on developing countries, one of the most relevant topics when addressing climate change seems to be the right to development. Though it is inevitable for developing countries, such as China, to adapt their industries and economy in order to effectively fight against pollution and environmental degradation, it seems possible that their right to development may be a potential impediment to this

adaptation. In 1986, the United Nations General Assembly (UNGA) adopted the Declaration on the Right to Development, recognizing every country's right to development, a process that allows for the "constant improvement of the well-being of the entire population" (UNGA, 1986: 1). As asserted in the Declaration, the right to development constitutes an "inalienable" human right, in which human beings are the "central subject of the development process" (ibid.). Aside from being the central subject of this process, human beings should also be the main beneficiaries of development (ibid.). Additionally, according to the Declaration at hand, it is the State's responsibility to guarantee the existence of favourable circumstances that allow for the development of "peoples and individuals" (ibid., p. 2). According to Nanda and Pring (2013: 30), the right to development is a symbiosis between two different rights: the States' sovereignty and their right to control and develop their economies however they think best, and the States' and individual people's right to require a "minimum level of economic development or wealth". The right to development is also regarded in the Stockholm and Rio Declarations, as both documents describe the environment-development relationship as "one of the most sensitive challenges" (Handl, 2012: 4).

According to Schrijver (2020), however, there has been some controversy surrounding the concept of the right to development. Particularly, there is an apparent disagreement between western and developing countries, as the latter have attempted to secure the concept of right to development through a separate, specific convention (ibid.). In turn, the political stance of western or developed countries has not been favourable to this desired convention, as there is not an unanimous agreement regarding the definition of the right to development, nor regarding the ways in which it can be applied and implemented (ibid.). Similarly, Ibhawoh (2011) states that some consider the Declaration on the Right to Development to be too vague to produce real effects on issues related to domestic and/or international development. Moreover, critics have argued that the right to development is "devoid of meaning" and described it as "catastrophic", impractical, and a political failure (ibid., p. 77). Although the right to development is inherently a human right and thus entails that the individual should be regarded as the subject of the development progress, rather than the object (Sarkar, 2009), some developing countries seem to confuse this human right with a right of the State itself to economic growth (Schrijver, 2020). Furthermore, according to Handl (2012), even though the United States agreed to the Declaration on the Right to Development, a distinct statement declared the State's objection to the concept of development as a right. Thus, it is possible to conclude that there is some discord within the scenario of international politics, as not all countries agree with the right to development – or, at least, with its definition or applicability, which seems to have resulted in disagreements between developed and developing countries, as well as among developed nations.

In 2016, China issued a white paper on this subject, titled 'The Right to Development: China's Philosophy, Practice and Contribution'. This document, similar to the Declaration mentioned above, considers the right to development to be an 'inalienable' human right, adding that this right symbolizes

"dignity and honor" (State Council Information Office, 2016). The State Council underlines the fact that China is the world's largest and most populated developing country, "with a population of over 1.3 billion", and stresses that national development is the biggest concern of the Communist Party of China (ibid.). In the white paper, a rather relevant chapter is dedicated to "Environment-Friendly Development", in which the State Council clearly states a commitment to this route of development and the State's objective to "deliver a more livable and beautiful environment for the people" (ibid.). In order to achieve this, the State has resorted to the creation of an "environmental governance system" that was implemented not only by the government, but also by companies and the public in a joint effort. China, the State Council asserts, aims to achieve "higher-level" development precisely by protecting and guaranteeing the right to the process of development, all the while keeping environmental concerns at the forefront of this process.

Taking the information presented above into account, it seems that we are confronted with a potential cycle. While making the population their main concern inevitably forces developing countries, such as China, to reduce their environmental degradation and, consequently, improve the health of the population, these countries' right to development should also mean economic improvements that will, most likely, cause an aggravation in terms of environmental degradation. In chapter 1.2., we will describe China's environmental problems and their origin, as well as the effects that environmental degradation can have on ecosystems and human health. We will also explore the government's efforts to combat them whilst attempting to honour the population's right to development and provide the Chinese with clearer skies and a brighter future ahead.

1.2. THE CASE OF CHINA

China's economy witnessed economic reforms and impressive growth rates starting in the 1970s, which eventually resulted in the transformation of a "centrally planned economy" into a market economy (Wang, 2018: 167). As suggested by Garnaut, Song and Fang (2018), China's GDP has been growing consistently since the 1980s, rapidly increasing overtime. Furthermore, it has recently surpassed many competitors' GDP, including that of Canada, Italy and the United Kingdom, being considered nowadays as the "second-largest economy in the world" (Wang, 2018: 169).

However, this economic growth quickly became intolerable (Golley, 2016), generating devastating consequences on the lives of the population – China had achieved significant economic growth, but at what cost? As stated by Schipani (2014: 77), in cities like Beijing, where the rapid process of urbanization was coupled with commonly "unfavorable geological conditions", the Chinese population suffers with dangerously high levels of pollution and noxious, unbreathable air. Moreover, according to Golley (2016), China's process of rapid economic growth "resulted in wide-ranging environmental damage across China (and beyond), from smog-ridden skies to contaminated rivers, toxic soils and

'cancer villages'". In fact, the Chinese population was already experiencing black smoke and acid rain in the 1980s, although the peak of China's pollution did not occur until the 21st century, as stated by Wang et al. (2015). It was found that, in 2013, PM_1, $PM_{2.5}$, and PM_{10} concentrations were higher than they were in 2014, in spite of any fluctuations that were observed in some regions, which suggests that 2013 could represent the peak of China's air pollution (ibid.).

By the early 2000s, pollution in China was already severe, mainly due to frantic coal consumption (Zheng and Kahn, 2017). From the period between 1980 and 2012, there was a significant increase in the annual coal consumption, from 700 million to 4 billion tons (ibid.). This increase meant that China alone had been consuming "almost as much coal as the rest of the world combined" (ibid.). Unsurprisingly, China ended up becoming one of the biggest CO_2 emitters in the world, with emissions increasing from 12.8 to 23.6 percent within the period of 2000-2012. However, it seems that coal consumption and rapid industrialization are not the only reasons for China's increasing levels of pollution. Schipani (2014) states that air pollution is dependent on multiple factors – namely, the geography of the city itself could contribute to poor air quality. In Beijing, which "sits on a plain flanked by hills", air pollution could get trapped in the atmosphere if there is hardly any wind to carry it away (ibid., p. 77). In contrast, when the Springtime brings strong winds, dust and particles from the Gobi Desert could be carried into the city's atmosphere (ibid.). These specific characteristics cause dangerously high PM_{10} concentrations in the atmosphere, which are detrimental to our health (ibid.).

According to Garnaut, Jotzo and Howes (2008), the current economic growth rates are higher than the rates of the Golden Age during 1950s and 1960s, meaning that we are living in the 'Platinum Age'. However, this growth relies on the increase of resource usage, inevitably resulting in greenhouse gas emissions and, consequently, climate change (ibid.). Pan (2018:525) believes that China's climate change is a 'grey rhino', as opposed to a 'black swan' event, as it is a prominent and obvious issue that is widely acknowledged, but often disregarded in order to continue the process of industrialisation and economic growth.

Thus, the adverse effects of China's economic growth seem undeniable, having severely impacted the state of the environment. In chapter 1.3., we will thoroughly describe the consequences of this process of development and economic growth on the environment, mainly focusing on air and water pollution.

1.3. The Devastating Consequences of Economic Growth

1.3.1. Air Pollution

According to the Energy Policy Institute (EPI, 2018), polluted air is known to carry particles that are referred to as $PM_{2.5}$ and PM_{10}, catalogued based on their size – $PM_{2.5}$ corresponds to 2.5 micrograms

(µg) or smaller, and PM_{10} to 10 micrograms or smaller. The reduced size of such particles enables them to remain in the atmosphere for extended periods of time and to travel long distances, which often means that the particles are inhaled by the population before they finally settle on the ground (ibid.). When looking at air pollution, it seems relevant to take different approaches to Air Quality Index into account. Depending on each country's standards, the same level of pollutant concentrations could be regarded in different ways. Figure 1.1 below showcases these differences in three different countries and/or regions – China, Europe, and United States of America (USA). Based on Figure 1.1, it is possible to infer that, in the USA and Europe, it is considered that $PM_{2.5}$ pollution levels are dangerous for the health of the population when they reach 40-50 micrograms per cubic meter (µg/m3). Contrastingly, in China, the "red line" starts only at approximately 160 µg/m3. Thus, it would seem obvious that air pollution level standards are much lower in China, perhaps due to the fact that $PM_{2.5}$ concentrations are, generally speaking, higher in China than in the remaining countries and regions, as we will address in this chapter.

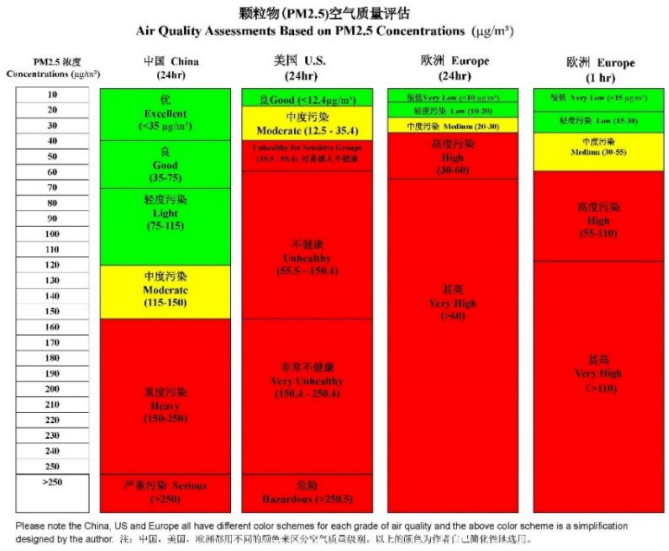

Figure 1.1: Assessment of Air Quality based on PM2.5 Concentrations in various countries (in Andrews, 2014)

Some of the possible consequences of $PM_{2.5}$ and PM_{10} exposure include "lung disease, cancer, strokes, and heart attacks", along with "detrimental effects on cognition" (EPI, 2018: 4). Regarding $PM_{2.5}$ specifically, which is the most prominent air pollutant in several Chinese cities (Zheng and Kahn, 2017), Alzheimer's disease and dementia are also among the health consequences of exposure (EPI, 2018). A recent study suggests a correlation between exposure to particulate air pollution in cities and human life expectancy, along with mortality and morbidity (Zheng and Kahn, 2014). For instance, an increase of 100 µg/m3 in PM_{10} exposure has the potential to reduce life expectancy at birth in 1.5 years, and in up to 2.3 years at age five (ibid.). Moreover, an increase of just one $\mu g/m^3$ (microgram per cubic

meter) in PM_{10} and sulphur dioxide exposure could potentially cause an increase in 'all-cause mortality', as well as in hospital admissions for diseases related to the cardiovascular and respiratory systems (ibid.). Additionally, according to Golley (2016), China's rapid economic development ultimately wide-ranging environmental damage across China (and beyond), from smog-ridden skies to contaminated rivers, toxic soils and 'cancer villages'".

In turn, these consequences on the health of the population lead to a decrease in work productivity and thus cause economic costs in Chinese cities (Schipani, 2014). In Shanghai, for example, the cost of the effects of air pollution on human health totalled US$625 million, representing roughly 1 percent of the city's GDP (Zheng and Kahn, 2014). However, in other cities, like Zaozhuang, this cost could add up to 10 percent of the city's GDP (ibid.).

Therefore, it would seem as though we are presented with a vicious cycle. On one hand, the health of the environment has been disregarded so that China's economy could achieve rapid growth, which resulted in damage to the health of the population. On the other hand, with health deterioration comes a decrease in work productivity, which then generates high costs for the cities and reduces their profit. Thus, it seems that air pollution control and reduction is quite advisable and, most likely, urgent.

1.3.2. WATER POLLUTION

Even though China's rapid economic growth has produced several negative outcomes on the environment, perhaps one of the most concerning is the pollution of water – especially drinking water. According to Wu et al. (1999: 251), this contamination can originate "potentially serious consequences for human health". The authors state that the process of rapid growth is exerting incredible pressure on China's natural resources, especially water (ibid.). In rural areas, especially, industries have increasingly produced wastewater over the last decades of economic growth, inevitably contributing to water pollution (ibid.). This wastewater, which is normally discharged onto surface waters, ends up contaminating drinking water resources and water bodies with, among others, "organic matter, acids, alkalis, nitrogen, phosphate, […] cyanide, lead, [and] mercury" (ibid., p. 52). In fact, in the case of lead pollution, it was reported that the levels registered in some rivers exceeded the national standards by 44 times (Tomba, 2016).

According to Schmidt (2002: A517), water pollution is a "serious public health hazard in China, perhaps even more so than polluted air". This situation seems particularly relevant if we take into account that close to half of the Chinese population drinks contaminated water, which can contain chemicals and biological wastes – a health threat that is often coupled with frequent water shortages (ibid.). Similarly, Tomba (2016: 45) finds that "over seventy percent of river water in the country may be unfit for human contact, let alone drinking, and its use in agriculture [is] a danger to public health".

Additionally, it seems that pollutants are not only found in surface water, as it is estimated that more than 60 percent of underground water also contains pollutants (ibid.). Thus, we are presented with a concerning situation that could lead us to wonder whether there is such a thing as potable water in China, considering that such a high percentage of it is contaminated.

Unlike what has been described regarding rural areas, urban water is generally not polluted by industrial waste discharge, but by organic sewage waste that is discharged into bodies of water without proper treatment (Wu et al., 1999). In fact, only about 10 percent of said discharge undergoes any type of sewage treatment, which has "resulted in widespread contamination of drinking water supplies, and in turn resulted in significant episodes of illness" (ibid., p. 253). Moreover, as stated by Cheng et al. (2018: 350), it is estimated that at least 1.8 billion people worldwide drink fecally contaminated water. Taking this into account, it would seem plausible to assume that China is not an exception, especially considering that "9 billion tons of domestic wastewater [are] discharged every year in rural areas of China" (ibid.).

Besides the prominent issue of water pollution, China also suffers from disparities in the distribution of water resources. As stated by Wu et al. (1999: 251), the "populous North" often faces drought due to water scarcity, while the "lives and land" of the Southern population are endangered by floods. In fact, the Chinese National Development and Reform Commission (NDRC, 2007: 18) declared that evidence suggested "an increase in frequency of hydrological extreme events, such as drought in [the] North and flood in [the] South". Additionally, the NDRC stated that "[water resources] per capita are likely to further decrease" in Northern China, where scarcity is most prominent, in the next 50 to 100 years (ibid.).

As previously mentioned, water shortages happen frequently in China – so frequently, that the phenomenon has been described as being "chronic" (Schmidt, 2002: A517). Consequently, the population in Northern China has resorted to "using industrial wastewater for irrigation", a harmful habit that could cause an increase in "cancer mortality and birth defects" (Wu et al., 1999: 254-255). Similarly, Drechsel and Evans (2010) state that over 80 percent of sewage that is generated in developing countries does not receive any kind of treatment before being discharged into the environment. This seems particularly relevant considering that around 50 percent of the population in these countries depends on water sources that have been contaminated for irrigation, among other uses (ibid.). In fact, the 2017 United Nations World Water Development Report suggests that about two to seven percent of the total worldwide area that relies on raw and/or diluted wastewater for irrigation is part of the Chinese territory (Koncagül et al., 2017). Thus, it seems undeniable that part of China's population has resorted to polluted water resources for various uses due to scarcity and lack of sewage and wastewater treatment.

As stated by Wu et al. (1999: 251), "China has as much water overall as Canada, and has 100 times more people". This could mean that China's water pollution problem is even greater than it seems, as the water supply is already scarce for the country's population density, and the available water resources

become inadequate for consumption due to contamination. The NDRC (2007) suggests that a balance between water supply and demand in China could be achieved in the next 50 to 100 years if water resources were to be sustainably explored and utilized. Nonetheless, this balance may not be possible to achieve in all regions of China, considering that the supply-demand gap could be expanded in the regions where water is already scarce (ibid.).

In 2010, it was estimated that roughly one billion people around the globe consumed agricultural produce "initially grown with wastewater" (Drechsel and Evans, 2010). These consumers are exposed to serious health risks because wastewater is seldom treated properly before being used in agriculture (ibid.). Besides the possible health impacts mentioned above, contaminated water may cause diarrhoea, which is one of the biggest causes for disease in the developing world (ibid.). Furthermore, it has been found that diarrhoea can slow down child development by preventing the absorption of important nutrients or even life-saving vaccines (ibid.).

According to various authors, the consumption of contaminated water, as well as lack of sanitation, can originate several illnesses and health complications. In 2002, nearly 2.4 million people, mainly in developing countries, died due to diseases stemming from water and sanitation – or lack thereof (Drechsel and Evans, 2010). Wang et al. (2008) and Wu et al. (1999) found a correlation between the consumption of contaminated water or exposure to pollution and an increase in cancer incidence and mortality. In fact, it seems that liver cancer is connected to the discharge of human and livestock excreta into lakes, in addition to the overuse of fertilisers in agriculture (Wu et al., 1999). Moreover, the consumption of contaminated water is linked to spontaneous abortions, premature births, and birth defects (Wang et al., 2008). It was also found that "average mortality in polluted areas is 4.7 per 1000, higher than the average of 3.6 in less polluted areas", suggesting a correlation between pollution and an increase in mortality and chronic disease (ibid., p. 652).

1.4. THE ROAD TO RECOVERY

Through the exploration of China's climate change response over the last decades, Pan (2018) finds that climate change was not taken seriously until the 1990s. In fact, in the late 1970s, it was regarded with denial and disbelief and was not officially integrated into the government's political agenda (ibid.). Roughly 20 years later, China started to take action against climate change, namely through the publication of yearly reports and through signing international agreements (ibid.). However, China did not begin planning a climate change response until the late 2000s to 2010s – the period that, according to Pan (2018), marks the shift from passivity to proactivity. In fact, in 2016, Chinese President Xi Jinping declared that it was China's obligation to "contribute to and lead efforts to build a global ecological civilization" (ibid., p. 530), suggesting an effort to join the global fight against climate change.

However, while Pan (2018) considers that China did not officially demonstrate preoccupation regarding climate change in government programs and initiatives until the 1990s, other authors disagree with this statement. According to Shi (2008), in 1973, the Environmental Protection Office was established, coinciding with the implementation of the "three synchronisations' system" (ibid., p. 368-369) – a system that entailed the creation of anti-pollution measures, along with the design of equipment and industrial plants. Moreover, the author states that China's 1978 Constitution reflected the government's resolution to protect the environment and work on pollution prevention and control (ibid.). Identically, Ross (1998) states that China's environmental awareness began to take form in the early 1970s, when an environmental protection group was established with the purpose of supervising the preparations for the Stockholm Conference. From then on, the Chinese government acknowledged the "need to incorporate the environment in the national planning process" (ibid., p. 812). In fact, it is possible to observe that the 1978 Constitution underlines a concern with the environment: "The state protects the environment and natural resources and prevents and eliminates pollution and other hazards to the public" (Constitution of the People's Republic of China, 1978). Therefore, it seems that the Chinese government showed interest in fighting environmental degradation early on, in spite of the lacking environmental protection during the process of economic growth.

Then-Minister of Ecology and Environment Li Ganjie stated, in 2019, that China's air quality had seen significant improvements in the past years, which allowed for the achievement of China's objectives listed in the yearly plans. Thus, it seems that China has been able to improve its air quality – but how has this been achieved?

The Chinese government started promulgating new environmental laws and making alterations to existing legislation starting in 1996 (State Council Information Office, 2006). Moreover, by the end of 2005, over 800 environmental protection standards had been promulgated, which suggests a concern with China's environmental problems that had been around for decades (ibid.).

One of the main pollution control policies promulgated by the Chinese Government since the 1970s is the Total Emission Control Program (TEC), which has been reported as an effective policy (Hu et al., 2018). Implemented in the late 1980s, this program was designed with the purpose of attributing emission quotas to China's provinces, which should aim to decrease pollutant emissions by 10 percent over five-year periods (ibid.). However, unlike what one might have expected, pollution levels kept increasing despite the implementation of the TEC, a problem that became quite visible in 2015, when dozens of Chinese cities were invaded by heavy smog (ibid.). This event was quite concerning, especially considering that the concentration of $PM_{2.5}$ was of roughly 300 μg/m3, dangerously above the safe level of 15 μg/m3 recommended by the World Health Organization (ibid.). Therefore, as stated by Hu et al. (2018), it seems clear that the TEC has not produced significant improvements in the environment, despite being considered as an effective measure (ibid.).

In fact, the authors find that this program suffers from an applicability issue: its application is more accurate in specific areas or industries that it is when applied to the whole territory of China (Hu et al., 2018). This is apparently due to a difficulty in measuring the pollutants that should be reduced, in addition to the fact that this program has not targeted the same pollutants throughout the years, some of them even being excluded over time (ibid.). Thus, it would seem clear that the TEC has the potential to become a helpful tool in China's war against pollution, but the inability to apply it to the entirety of the country's vast territory hinders this potential and reduces the accuracy of pollutant quantification (ibid.).

In contrast, Zheng and Kahn (2014) believe that China's major cities did see improvements in their air quality, while simultaneously experiencing growth both in population and per-capita income. Nonetheless, although this took place in several cities, others saw an increase in the concentration of PM_{10} in their atmosphere (ibid.). Fortunately, however, the general distribution of PM_{10} concentrations in China has decreased (ibid.). According to the authors, starting in 2008, the city of Hong Kong started to pay manufacturers in the province of Guangdong roughly 150 million dollars each year for the installation of "pollution-reducing equipment" (ibid., p. 77). This way, Hong Kong can be protected from atmospheric pollution that is not only caused by the city itself, but also by its neighbouring cities – an external pollution problem that might be harder to keep under control (ibid.).

However, Hong Kong is not the only city that decided to apply local policies that are specific to its jurisdiction. As stated by Schipani (2014), Beijing decided to implement a policy that focuses on the control and reduction of automobile emissions within the city. Considering that, being the capital, Beijing has experienced rapid population growth, as well as a speedy process of urbanization, the number of vehicles that circulate within the city has also increased significantly (ibid.). In fact, the number of cars in Beijing increased from 1.39 million to 2.65 million from 1999 to 2005. Considering that these numbers tend to increase overtime, it would seem clear that, 15 years later, the number is likely to be much higher. Thus, in order to keep vehicle emissions in check, Beijing's automobile emission policy entails an evaluation of each vehicle, based on its emissions and whether they meet the standards. To identify the vehicles that meet the standards, a green or yellow tag is placed on their windows – if a vehicle does not have one of these tags, its driver will most likely be fined by authorities (ibid.). Moreover, Beijing has made plans to eliminate thousands of outdated vehicles (e.g. buses or taxis), as they are one of the city's main sources of pollution (ibid.).

Considering that energy consumption in buildings represents roughly 30 percent of all energy that is used in China, the government eventually decided to invest in green energy and buildings (Zheng and Kahn, 2014). As a result, in 2007, China became the world's largest producer of solar photovoltaic panels (ibid.). The purpose of this investment is to increase the use of green and non-fossil-fuel energy, so that they represent up to 15 percent of the country's primary energy consumption (ibid.). This would originate a decrease in coal consumption and, consequently, a decline in China's pollutant emissions,

allowing for improvements in air quality. In chapter 1.5.1., we will attempt to understand whether China could improve the state of its environment, and how this could possibly be achieved.

1.4.1. IS THERE ROOM FOR IMPROVEMENT IN THE FUTURE?

Garnaut, Jotzo and Howes (2008) present a business-as-usual projection of the potential impact of various environmental policies. Through this projection, the authors estimate that China's growth process in the next years will be decisive for climate change around the globe, and that the country's position in international negotiations will greatly influence the global response to climate change (ibid.). In fact, it would seem that these predictions were correct. According to Pan (2018), in 2014, China took the lead and began playing an important role in international negotiations regarding the environment and climate change. However, as indicated by the plans of recovery that have been constantly put into motion, China has not fully recovered its air quality, nor has it solved the issue of climate change overall. As stated by Pan (2014), China should concentrate on building an ecological civilisation, becoming an example within the international community and paving the way for other countries to follow.

According to Schipani (2014), many improvements could be achieved in China, namely in Beijing. The author considers that the incorporation of urban forest could reduce pollution (especially, CO_2 concentrations) and, consequently, improve air quality. Additionally, the author suggests a new policy regarding vehicles within the city – a new tax that would charge vehicle drivers based on mileage, that is, how much they travel by car. Moreover, the 'Vehicle Miles Travelled' tax has been successfully implemented in the United States. This tax appears to be in line with the policy that was previously addressed, described by Zheng and Kahn (2017), which suggests that both measures could be harmoniously implemented. Lastly, Schipani (2014) underlines the importance of finding a substitute for coal in energy production. In order to achieve this, Beijing could make use of the winds that, as previously mentioned, come from the Gobi Desert. These winds could be used for wind-powered energy production, allowing Beijing to generate green energy with little (if any) costs to the environment (ibid.).

Also focusing on vehicle-related policies, Zheng and Kahn (2017) suggest another possibility of furthering the fight against pollution, namely through the reduction of vehicle emissions. In 2008, during the Beijing Olympics, a successful driving restriction was implemented: every other day, driving was limited, which resulted in a 19 percent decrease in air pollution (ibid.). Similarly, the one-day-per-week driving restriction that was implemented between 2008 and 2009 allowed for a decline of 8 percent in atmospheric pollution (ibid.). Considering both restrictions, the authors suggest a possible combination of several driving restrictions, along with the previously mentioned process of discarding older vehicles, which could potentially be an effective initiative, improving China's environment (ibid.).

As a result, it would seem plausible to infer that, although China did get into a grave situation, its efforts and attempts to combat environmental issues are noteworthy. However, although progress has been made through the promulgation of policies such as the ones that were described in chapter 1.4., the issue of pollution has not yet been resolved. Fortunately, as observed above, several authors are optimistic and suggest different ways in which China can improve in the future – something that the Chinese government seems eager to achieve.

SUMMARY

In this chapter, we have presented the main international environmental conventions and agreements that took place since the 1970s, as well as the types of environmental policies that were applied globally and on a domestic level under the influence of such agreements. We also explored the concept of the right to the development, as well as the controversies and discord that it generated among nations around the globe. We have presented China as the case study of this dissertation, describing the process of economic growth and respective consequences on the environment and on human health. Furthermore, we explored the ways in which China has been combatting environmental degradation and how this could be improved in the future. Throughout this chapter, we have been able to observe that China has, effectively, committed to clearing the skies and improving its environmental quality through a series of policies and measures against pollution. In the next chapter, the methodology used for the purpose of this dissertation will be presented, along with the research question and respective objectives. In chapter 3, we will present the results of the analysis that was conducted on 54 documents published by the Chinese government from the year 2000 onward, in an attempt to see the full picture of China's environmental governance, as well as the specific measures that have been designed and applied.

2. METHODOLOGY

In this dissertation, we will attempt to answer one main question: "what kind of environmental policies have been applied in China during the last three decades, and what results have they produced?". This question is the core concern of this dissertation, focusing on China's road to recovery and the specificities of its recovery process. The aim of the study is to understand the environmental policies that have been applied at the national level, based on official and governmental documents.

In order to find answers to the research question, the research objectives of the present dissertation are as follows:

1. To examine which are the main environmental concerns in China.
2. To identify the environmental policies that have been applied on a national level.
3. To identify the turning point that originated new environmental policies in China.
4. To explain how China has been able to recover from the effects of pollution and increase the quality of life each year.

Considering the literature reviewed above, we can expect to find several policies and measures applied by the Chinese government, regarding environmental issues in general and specific types of pollution that affect the lives of the population – and, ultimately, hurt the country's economy by representing an enormous health cost. We can also expect to encounter several environmental and health improvements, especially in the last five to 10 years, when China began to heavily manifest its concern with the pollution levels in major cities, such as Beijing.

2.1. METHOD

This dissertation aims to analyse the environmental policies implemented by the Chinese Government and evaluate whether they have been effective and produced the desired results. For this purpose, we analysed the Policies, Five-Year Plans, and Action Plans. Complementarily, we analysed the Yearly Reports with the intent of understanding the environmental improvements and their relation to the Government's policies and actions. The analysis of the documents was conducted through the software MAXQDA (more specifically, the 2020 version). This software was used for qualitative content analysis, and as a tool to apply variables to the Government documents and see how they relate to one another, and to the topics found within the documents. This software was also used to identify thematic relations and overlapping. For the purpose of this dissertation, only the documents available in English were analysed.

2.2. DOCUMENT SELECTION

There are six groups of documents, of different types, each type of document constituting a variable within the software. The six types of documents are Action Plans, Policies, Climate Change Reports, National Five-Year Plans, Specific Five-Year Plans, and Yearly Reports on the State of the Environment. The sample of documents used for the analysis is composed of fifty-four (54) documents, all of which were retrieved from the Chinese Ministry of Ecology and Environment's website.

The first group of documents, consisting of Action Plans, contains 14 different documents. These Plans focus on various environmental issues and challenges that China faces (and has faced) over the years, from energy conservation to pollution accidents and technological development. These documents cover a ten-year period, from 2007 to 2017.

The Ministry of Ecology and Environment has put together several Specific Five-Year Plans, referring to the years from 2004 to 2020. A total of four Specific Five-Year Plans were analysed, each of them focusing on a distinct challenge concerning climate change and environmental recovery.

Similarly, two National Five-Year Plans, issued by the State Council but made available by the Ministry of Ecology and Environment, were analysed. These plans refer to the years from 2006 to 2015, and specifically focus on environmental protection.

In regard to the Yearly Reports on the State of the Environment (hereinafter referred to as Yearly Reports), 13 distinct documents were analysed. Taking the range of years provided by the National and Specific Five-Year Plans into account, only the Yearly Reports referring to the period from 2005 to 2017 were analysed – the latter being the most recent Yearly Report made available for retrieval.

Regarding Policies, the sample consisted of 15 documents. Only the Policies since the year 2000 onward were analysed, although the Ministry of Ecology and Environment (hereinafter referred to as MEE) provides access to Policies promulgated starting in 1986. Considering the dates of publication of the remaining groups of documents, however, it was decided that, for the purpose of this dissertation, only the Policies that were issued from 2000 onward would be analysed. Furthermore, as previously addressed, pollution in China became 'acute' by the early 2000s (Zheng and Kahn, 2017: 72), suggesting that the year 2000 is an important landmark in regard to China's environment.

The last group, consisting of six Climate Change Reports, covers the years from 2016 to 2019. This group is made up of four reports on China's Policies and Actions for Addressing Climate Change, as well as one National Communication on Climate Change and one Biennial Update Report on Climate Change.

2.3 DATA ANALYSIS

A thematic analysis of the documents described above was conducted through the previously mentioned software. In this process of analysis, each code represents a topic, which can refer to anything between a specific type of pollution, a government measure, and evolution of environmental quality or pollution levels. In Annex A, a figure illustrates all the codes created during the analysis, as well as the volume of occurrences of each one. The main objective of this code system and coding process is to identify the most prominent concerns of the Chinese government, both reflected in the policies and legislation that were promulgated over the years. Similarly, the emphasis that each environmental issue or type of pollution is given in official reports and plans of action can be a good indicator of what the government considers to be a priority. With this objective in mind, the coding system was used as a tool to perform a content analysis of the documents.

A total of 5 codes, each of them representing a main topic, were used in the analysis of the documents described above. Throughout the process of analysis, to better understand and analyse the documents, a system of parent and sub-codes was created. Thus, a hierarchy of codes was created, organizing each code and sub-code based on overarching topics and the specificities that are mentioned within each topic. The parent codes refer to *Types of Pollution and Environmental Areas of Concern*; *Hazards, Accidents, and Emergencies*; *Goals to Be Achieved*; *Government Measures*; and *Evolution of Environmental Quality*. Each of these parent codes (or topics) originated a group of sub-codes (or sub-topics) during the process analysis, all of which are directly related to their parent topic. Due to space and page limits, we have chosen to present only the most relevant sub-codes, that is, those with more than 60 occurrences within the entire sample of documents. More specifically, only the most relevant sub-codes that provide pertinent findings for the attempt to answer the research question and achieve the research objectives will be presented in chapter 3. Similarly, in case there are other codes within these sub-codes, only those with enough relevance will be considered in chapter 3, the minimum of occurrences being 30. Given the inability to present all codes in this dissertation, the complete coding system and respective hierarchy can be found in Annex B.

Although the entirety of the coding system was important for this analysis, two of the parent codes were the most crucial for reaching conclusions directly related to the research question and objectives of the present dissertation: *Evolution of Environmental Quality* and *Government Measures*. The segments extracted from these parent topics allow for a better understanding of the types of policies issued by the Chinese government, as well as the connection of said policies with environmental improvements or, in the worst-case scenario, environmental degradation. As for the remaining parent codes, they helped to identify the main types of pollution that have been worrying the Chinese government – and, certainly, the Chinese population –, as well as the goals and targets that have been set over the years.

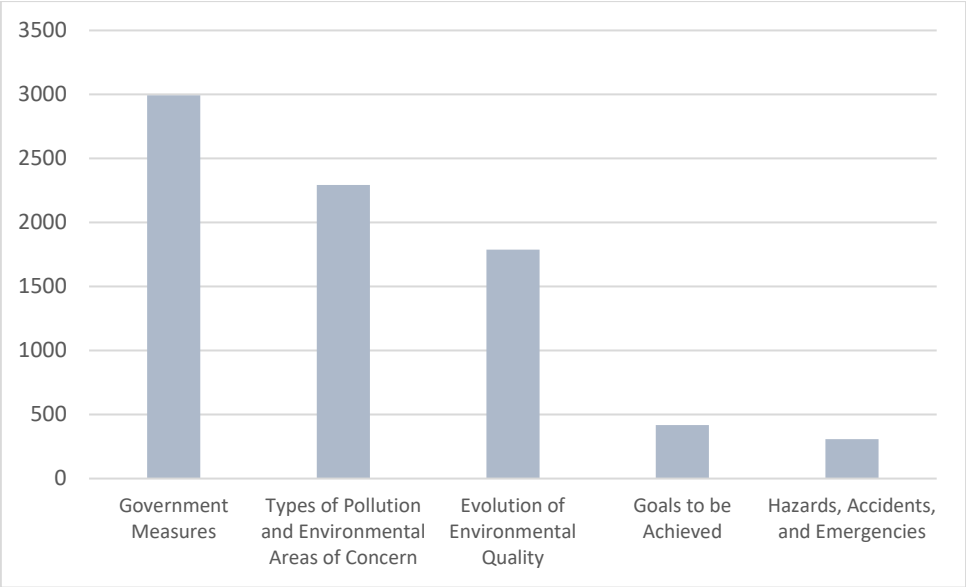

Figure 2.1: Number of Instances of Code Groups

The parent code *Types of Pollution and Environmental Areas of Concern* focuses on the different types of pollution that are mentioned in the sample of documents, such as air and water pollution, as well as the various areas of environmental concern, which include forests, biodiversity, and marine environment, among others. This code includes 13 sub-codes, which, in turn, include other sub-codes. As indicated by Figure 2.1, this is one of the most prominent parent codes, with 2294 manually coded segments throughout the entire sample of documents, second only to the *Government Measures* code.

Regarding *Hazards, Accidents, and Emergencies*, it is clearly indicated in Figure 2.1 that this parent code is the least prominent of all. With 307 occurrences, this parent code refers to environmental hazards and events that harm the environment, such as nuclear outbreaks and pollution accidents, as well as climate or natural disasters that are, inevitably, emergencies that need a swift response from the Government. The latter situations were coded with a specific sub-code, *Climate/Natural Disasters*, in order to distinguish between the types of accidents and/or emergencies. This sub-code alone registered 224 distinct occurrences within the documents, indicating that climate and natural disasters are not only a prominent phenomenon in China, but also a source of concern for the Chinese government.

The second least prominent parent code is *Goals to Be Achieved*, which is related to the goals and targets that were set by the Government and mentioned in the sample of documents. This code has a total of 418 occurrences, including those of its sub-codes. The most prominent of these sub-codes is *Environment and Economy*, which refers to the segments of text in which the development of a Green and/or sustainable economy is mentioned, as well as those that focus on the balance between economic

growth and environmental protection. This may be an indicator that achieving sustainable development is one of the main goals set by the Chinese Government.

As for the topic of *Government Measures*, referring to the actions taken by the government over the years, it was possible to generate 20 sub-codes during the analysis. These sub-codes also originated 24 new codes among them, adding another level to the hierarchy. The topics within *Government Measures* include *Environmental Protection*-related policies and measures, *Financial Investment*, *International Cooperation*, *Technological Advances*, *Changes/Improvements to the Law*, *Control of Industries/Enterprises*, and *Public/Population*. Within these topics, several (more specific) sub-sub-topics emerged during the process of analysis, all of them directly related to the topics mentioned above. A few examples of these sub-sub-codes are *Education & Information* and *Damage to/Concern About Human Health* within the *Public/Population* sub-code, and *Resource Conservation* and *Nature Reserves/Protected Areas* under the *Environmental Protection* sub-code.

Within the topic of *Evolution of Environmental Quality*, four sub-codes were created. The first, titled *Improvement*, was used to code every segment of text in which there was indication of an environmental improvement, mostly in relation to a previous year. In some cases, the improvement can be related to a policy that was applied previously and yielded positive results. Similarly, the second sub-code, titled *Neutral*, was used for segments of text that indicate a stagnation or absence of evolution in terms of environmental quality. Essentially, this code indicates that, from one year to another, or since an environmental policy was put in place, no changes were observed or reported. Contrary to the first sub-code, the third refers to the *Worsening* of environmental quality. This is used for segments of text in which there is indication of an aggravation of environmental quality or pollution levels, acting as the reverse of the *Improvement* sub-code. Lastly, an extra sub-code was created based on a combination of the remaining ones: *Relative Improvement*. This sub-code is used for segments in which there was indication of both improvements and aggravations regarding a specific situation. *Relative Improvement* can be used, for example, for a situation in which a certain river has seen some improvement in its mainstream, but its tributaries saw a decrease in water quality. This would be considered a relative improvement, as the improvement of the river's mainstream has been undermined by an aggravation in a tributary.

Through this process of analysis, in which the codes and sub-codes can be translated to topics and sub-topics, it was possible to understand the relations between each of these topics, as well as the way they interact within the documents. This was possible due to the different tools available in the MAXQDA software, which allow for both a quantitative and a qualitative approach to the document analysis. Using the code system and its extracted text segments as data, this interaction between documents and codes can be analysed in order to present the findings and reach conclusions.

In this chapter, we have presented the research question and objectives that this dissertation will focus on and try to answer. We have described the sample of documents that was used for the analysis and the different types of documents that are included in the sample. In this chapter, we have also explained the process of analysis that was conducted for the purpose of this dissertation, as well as the coding system that was created through the process of manual coding of each of the documents. Similarly, we have explained the purpose of each parent code, as well as that of the most relevant sub-codes that were created within the parent codes. In chapter 3, we will present the findings that were extracted from this method of analysis, including the most common topics, the relation between them, as well as between these topics and the documents. Furthermore, we will present the most relevant results found within each of the main codes and their sub-codes.

3. FINDINGS

In this chapter, we will present the results of the analysis described in chapter 2, divided into sections that relate to the five main topics. The topics are, as described in chapter 2, *Types of Pollution and Environmental Areas of Concern*; *Hazards, Accidents, and Emergencies*; *Goals to Be Achieved*; *Government Measures*; and *Evolution of Environmental Quality*. These main topics correspond to the five parent codes that were created during the analysis, and their most relevant sub-codes will also be considered based on the criteria presented in the previous chapter. Due to space and page limits, only the sub-codes with the most relevant findings for achieving the research objectives introduced in chapter 2 will be presented.

The most prominent code is, undoubtedly, that which corresponds to environmental Improvements. With nearly 200 less occurrences, Water Quality takes the second place, making it the most prominent topic regarding pollution in China. The codes Neutral and Worsening take the third and fourth places, respectively, followed by International Cooperation in fifth place. Figure 3.1 illustrates the thirty most common codes that occur in the sample of documents, which translates to the most common topics and, therefore, the biggest concerns of the Chinese government regarding environmental issues.

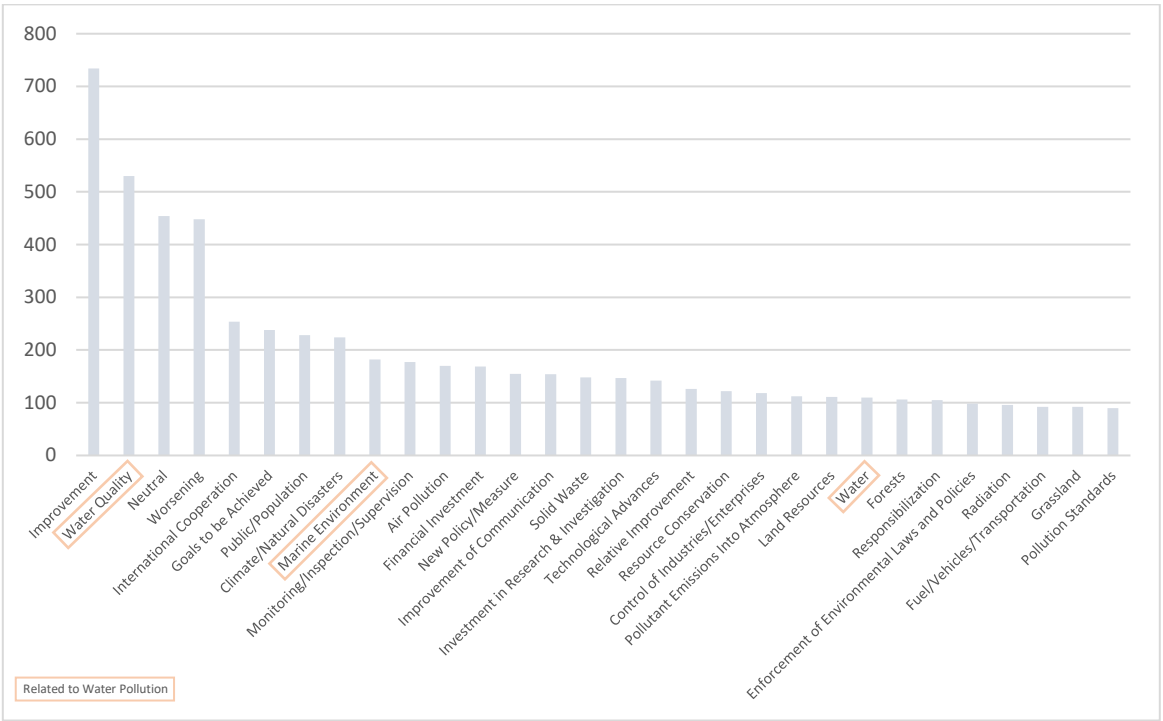

Figure 3.1: Top 30 Most Common Codes/Topics

3.1. LEXICAL SEARCH

As a method of comparison between the manually coded segments and the overall occurrence of each type of pollution, a lexical search was run on every document. For this purpose, the lexical search consisted of a scan through all of the documents, in search for keywords that were related to each type of pollution. These keywords were: air, atmosphere, atmospheric, acoustic, soil, noise, and water. Due to the fact that, within the documents, the same kind of pollution may be referred to using different words, the lexical search included all of the terms used by the government. This is the case for air and atmosphere/atmospheric pollution, as well as acoustic and noise pollution. The aim of this lexical search was to compare the number of coded segments and its percentage with the number of occurrences of each pollution-related keyword within the documents. The results of the lexical search are shown in Table 1 below.

Word	Word Count
Water	6397
Air	1332
Soil	675
Noise	278
Atmospher(e)/(ic)	172
Acoustic	168

Table 1: Number of Occurrences of Pollution-Related Keywords (Lexical Search Results)

Below, Figure 3.2 illustrates the percentage of each type of pollution found through the lexical search mentioned above. Similarly, Figure 3.3 represents the percentage of each type of pollution found in the manual coding that was conducted using the software. Taking the data presented in Figure 3.2 and 3.3, it is possible to understand that the proportions of each type of pollution (Air, Water, Soil, and Noise) found in the lexical search and through the process of manual coding are similar. The main discrepancy between the two types of analysis seems to be the fact that the word “water” is more common than the code that represents water-related text segments, while the opposite happens regarding air pollution. As suggested by Figure 3.2 and 3.3, there is less frequency of the words “atmosphere” and “air” than that of the manually coded segments regarding air pollution. As for noise and soil pollution, the proportions seem close in both types of analysis, only varying by 2 or 3%, respectively.

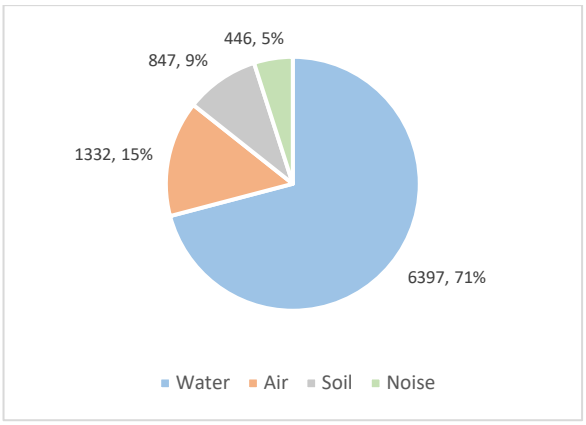

Figure 3.2: Frequency of Pollution-Related Words (Lexical Search Results)

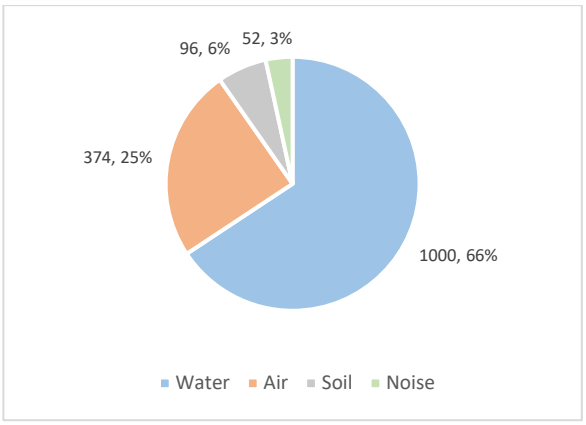

Figure 3.3: Frequency of Pollution-Related Codes (Manual Coding)

Similarly, a lexical search was also used to scan the documents and find out the most common words. In Figure 3.4, a word cloud provides a visual representation of the most common words found within the 54 documents, which seem to be aligned with the most common themes that were found through the coding process. The five most common words in the documents are “environmental”, “water”, “China”, “national”, and “grade”. Figure 3.5 enumerates the 30 most common words found within the documents that were analysed, providing a hit count for each of the featured words. Similar to what has been presented in Figure 3.1, the main type of pollution that is mentioned in the documents is water pollution. Three words can be directly related to this topic, namely “water”, “river”, and “lake”, accounting for a total of 9,854 occurrences of water pollution-related words.

Figure 3.4: Word Cloud (Most Common Words in Analysed Documents)

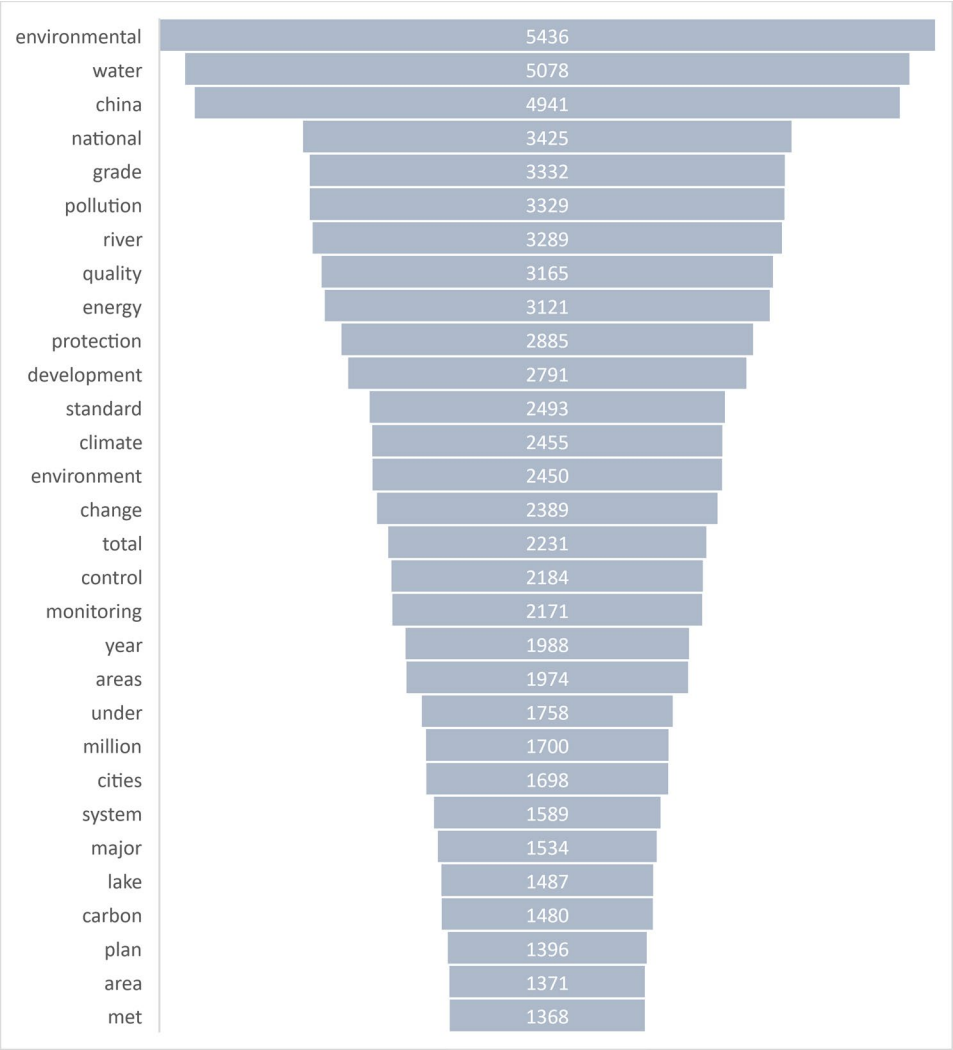

Figure 3.5: Word Frequency (30 Most Common Words)

Regarding the most common topics (Figure 3.1), they appear to be in line with the most common words found within the documents (Figure 3.5). While Water Quality, Climate/Natural Disasters, Monitoring/Inspection/Supervision, Resource Conservation, and Pollution Standards are among the 30 most common codes (translating to topics), “water”, “river”, “protection”, “climate”, “monitoring”, and “standard” are among the 30 most common words. Thus, although they may not be found in the same order of occurrence, or in the same proportion, the most common words do match the most common topics that were found throughout this process of analysis.

3.2. Types of Pollution and Environmental Areas of Concern

3.2.1. Water Pollution

Regarding the different types of pollution that China has faced, and continues to face, the most prominent topic is water pollution. There are a total of 1000 occurrences of water pollution-related codes in the documents, such as Water Quality, Marine Environment, Wetland, and Groundwater Pollution. This result seems to indicate that water pollution and water resources are one of the key concerns of the Chinese government. Out of the 1000 occurrences, 776 are found in the sample of Yearly Reports, making it clear that this code is most prominent in this group of documents, while it occurs less often in other types of documents. In Figure 3.1, it is possible to observe the water-related topics that are among the thirty most common ones, framed by an orange border. Additionally, there is another topic that is related to water pollution: Solid Waste. As stated by Schmidt (2002), solid waste (e.g. biological wastes such as excrement) causes severe water pollution, indicating that these two topics are likely to interact with one another within the documents. Indeed, the topic of Solid Waste was found to intersect with water-related codes on 45 occasions, thus adding to the emphasis of the government on the combat of water pollution and improvement of water quality.

Out of the 1000 occurrences of Water-related codes, 63 intersections were found between these sub-codes and the topic of Goals to be Achieved. This indicates the existence of 63 goals and targets related to water pollution that have been set by the Government since the year 2000. Other relevant intersections were found between water pollution and other, unrelated codes, which can be found in Figure 3.7 below.

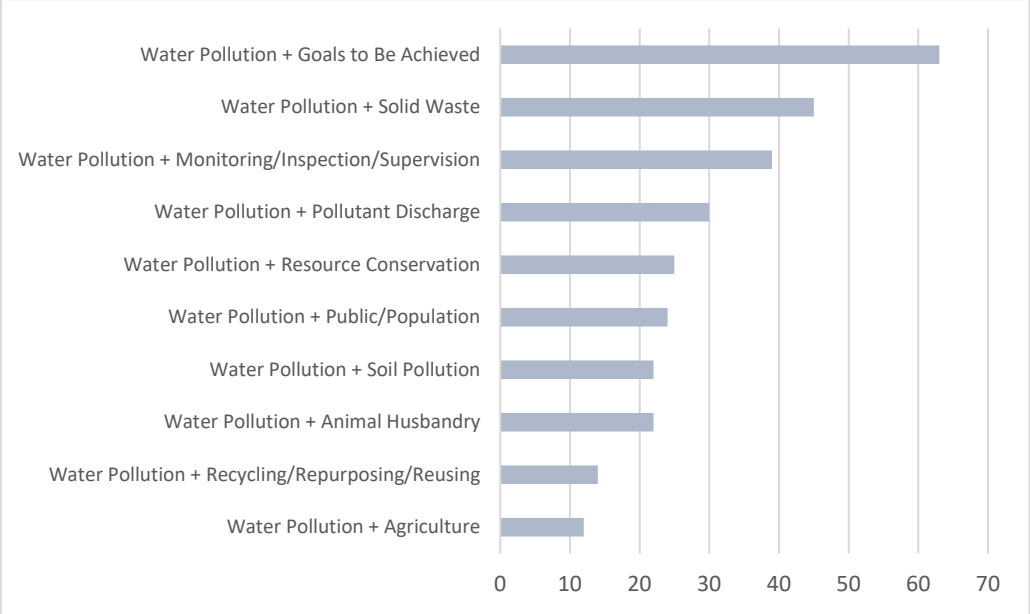

Figure 3.6: Intersections between Water-related codes and other codes

Among these codes are the ones related to Monitoring/Inspection/Supervision, Environmental Protection, Pollutant Discharge, Resource Conservation, and Public/Population. Furthermore, water pollution-related codes intersect with Agriculture on 12 occasions, and with Animal Husbandry on 22 occasions. In turn, these two codes intersect with Sewage on five and 11 occasions, respectively. In the case of the intersections between Water-related codes, Agriculture, and Animal Husbandry, a good portion of the segments refer to the impact of the two activities on drinking water supplies and quality of groundwater, as indicated by the following extracted segment: "we will control the adverse impacts of hazardous wastes, urban pollution and agricultural non-point pollution on groundwater" (State Council, 2011: 16).

Taking these intersections into account, it seems clear that the government is concerned with the pollution that is generated by Agriculture and Animal Husbandry, though this is not the main concern regarding water pollution. As indicated by the data shown in Figure 3.7, the sub-codes Resource Conservation and Recycling/Repurposing/Reusing intersect with Water-related codes on several occasions, indicating a clear concern with the preservation of water resources, namely drinking water resources, and a will to explore the reuse of water – more specifically, the repurposing of rain water.

Pollutant Discharge has also been found to intersect with Water-related codes on 30 occasions, making it the fourth most common intersection. In order to control the discharge of pollutants, the government has also manifested its will to guarantee the monitoring and control of enterprises that discharge pollutants onto water bodies, as suggested by the intersections between Water-related codes and Monitoring/Inspection/Supervision.

Thus, taking the data presented above into account, as well as the main intersections found between Water pollution and other topics, it would seem reasonable to infer that the Chinese government has manifested a strong concern with water pollution, presenting several targets and goals that should be achieved in order to combat this environmental problem.

3.2.2. AIR POLLUTION

With respect to air pollution, which seems to be the main focus of the news articles and academic papers, the Chinese government appears not to emphasize air pollution as much as water pollution – although it is given more emphasis than other types of pollution, which will soon be mentioned. The codes regarding air pollution sum up to 374 occurrences throughout the documents, which translates to less documents and sections of documents dedicated to this type of pollution. Out of the 374 occurrences, an intersection between the Air Pollution and Goals to Be Achieved codes was found in a total of 18 segments. Figure 3.8 shows the seven codes that intersect the most with the Air Pollution code throughout the documents,

among them Animal Husbandry, Public/Population, Agriculture, Energy Saving/Conservation, Sewage, Solid Waste, and Control of Industries/Enterprises.

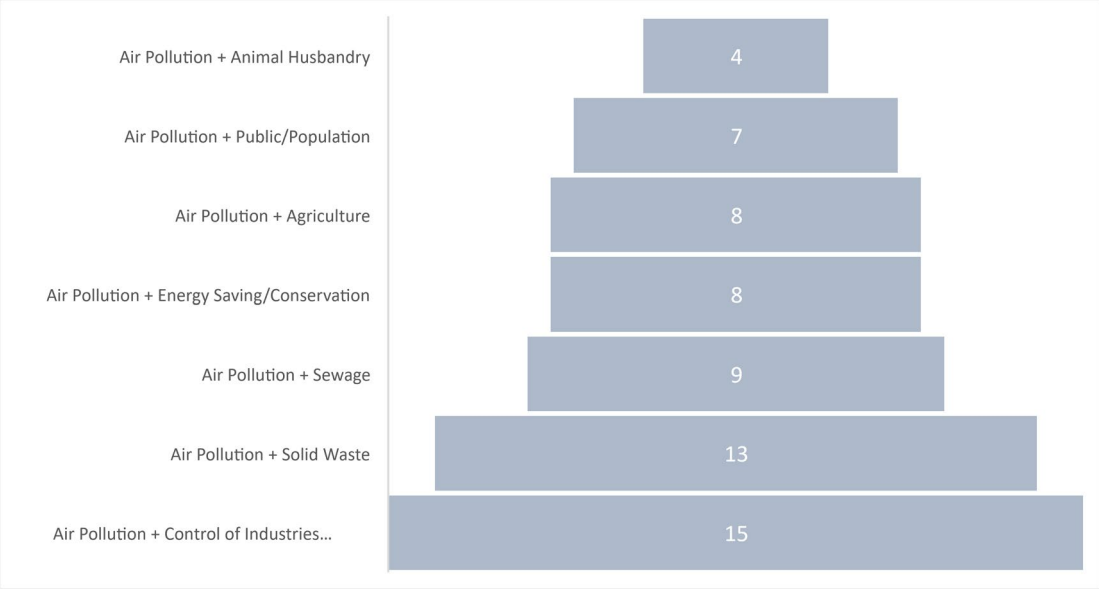

Figure 3.7: Intersection between Air Pollution-related and other codes

Linked to air pollution is indoor air pollution, which is, according to Ritchie and Roser (2020), "responsible for 1.6 million premature deaths each year", especially in poorer countries. This type of pollution is caused by the lack of access to clean fuels for cooking and heating, namely in poor households (ibid.). The use of coal, crop waste, or dung "produces particulate matter", which is linked to respiratory diseases, its effects aggravated if these fuels are burned in small spaces (ibid.). Although it only registered 20 occurrences, it seemed relevant to mention such a lethal type of pollution that, according to the authors, can lead to "heart disease, pneumonia, stroke, diabetes and lung cancer" (ibid.), and is directly related to air pollution – one of the main concerns of the Chinese government, as seen above.

3.2.3. NUCLEAR POLLUTION

Within the documents, several mentions of nuclear discharge and radiation people were found, represented by the sub-codes Nuclear (Discharge) Pollution and Radiation, accounting for a total of 106 instances. These codes were found to intersect with other codes on very few occasions, the most prominent intersection being found between Radiation and Monitoring/Inspection/Supervision with 8

occurrences. This may indicate that, as this issue has been a concern for the Chinese government, it was considered necessary to keep nuclear activity under surveillance:

> "We will improve nuclear and radiation environment monitoring system, establish supervision monitoring system for important nuclear facilities and real-time on-line monitoring system for the discharge from other nuclear facilities, and facilitate construction of the buildings for national base for research and development of nuclear and radiation safety supervision technologies, key laboratories and routine work." (State Council, 2011: 36)

> "Efforts were made to enhance the establishment of emergency monitoring systems for sudden nuclear and radioactive accidents." (MEP, 2008: 30)

3.2.4. SOIL POLLUTION

Concerning soil pollution, there are 96 occurrences of coded segments of text. This sub-code was inserted within a broader code that encompasses everything concerning with Land Resources, in which desertification is another sub-code. Out of the total number of occurrences, 19 were found to have intersected with the Goals to Be Achieved code within the analysed documents. These intersections translate to 19 soil-related goals and targets set by the Chinese government. Furthermore, eight other relevant intersections were found between Soil Pollution and other codes, as can be observed in Figure 3.9 below. Among the intersecting codes are Agriculture, Investment in Research & Investigation, Monitoring/Inspection/Supervision, Resource Conservation, Financial Investment, and Water.

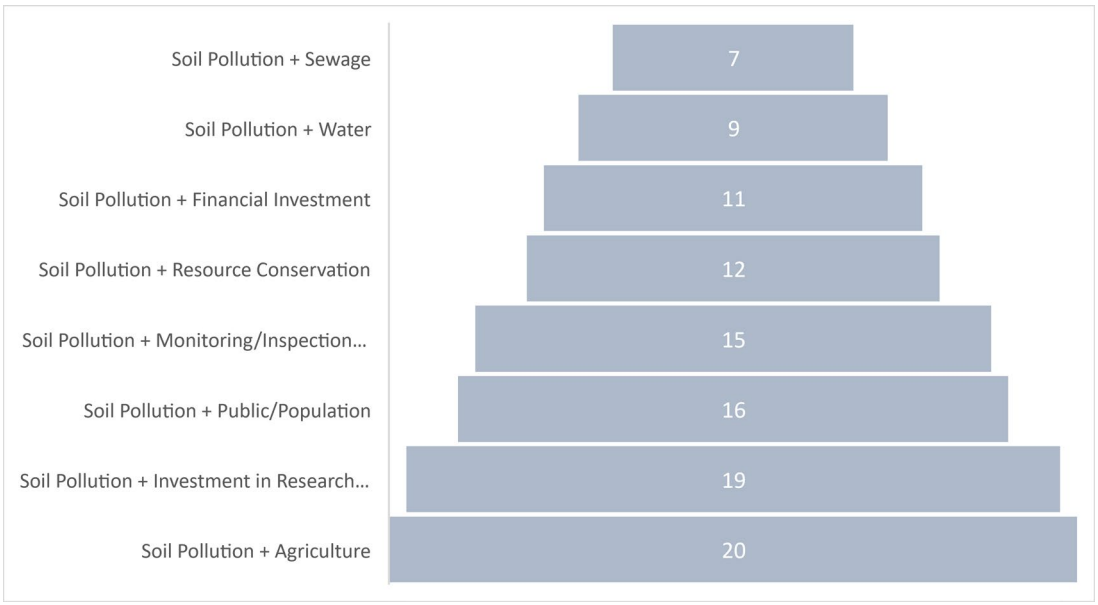

Figure 3.8: Intersection between Soil Pollution-related and other codes

3.2.5. NOISE POLLUTION

As for noise pollution, the number of occurrences is 52, making it the least-explored type of pollution. There were no found intersections between noise pollution and the Goals to Be Achieved code, unlike what has been described regarding the remaining types of pollution. Although it is clear that the Chinese government acknowledges the importance of a healthy acoustic environment, including this issue in all of the Yearly Reports, it seems that noise pollution is not as emphasized as other types of pollution.

Thus, it would seem plausible to infer that the Chinese government considers water pollution to be the most concerning type of pollution, followed by air and soil pollution, not giving as much emphasis to noise pollution, in Policies or Yearly Reports.

3.3. HAZARDS, ACCIDENTS, AND EMERGENCIES

The next parent code is Hazards, Accidents, and Emergencies, which focuses on environmentally harmful events and climate or natural disasters, as well as environmental hazards. Within this code, a sub-code was created specifically for segments that refer to or mention climate and/or natural disasters. This sub-code is more prominent than its parent code, as Hazards, Accidents, and Emergencies registers 83 occurrences, while Climate/Natural Disasters sums up to 224 occurrences. Thus, within the topic of catastrophic events that harm the environment and, most likely, affect the lives of the population, Climate/Natural Disasters are the most emphasized by the Government. This is especially clear if we consider the fact that, in each Yearly Report, there is a chapter dedicated to this environmental issue.

In order to compare the occurrences of each of these codes and their interactions with others, Figures 3.10 and 3.11 were created based on the data extracted from MAXQDA. Figure 3.10 illustrates the interactions between several relevant codes and Hazards, Accidents, and Emergencies, focusing on the ten most common intersections. As can be observed, this parent code intersects the most often with Public/Population, indicating a concern with the lives of the population. Similarly, the fourth most common intersection is found between Hazards, Accidents, and Emergencies and Damage to/Concern about Human Health. This intersection will be explored in chapter 3.5.2.

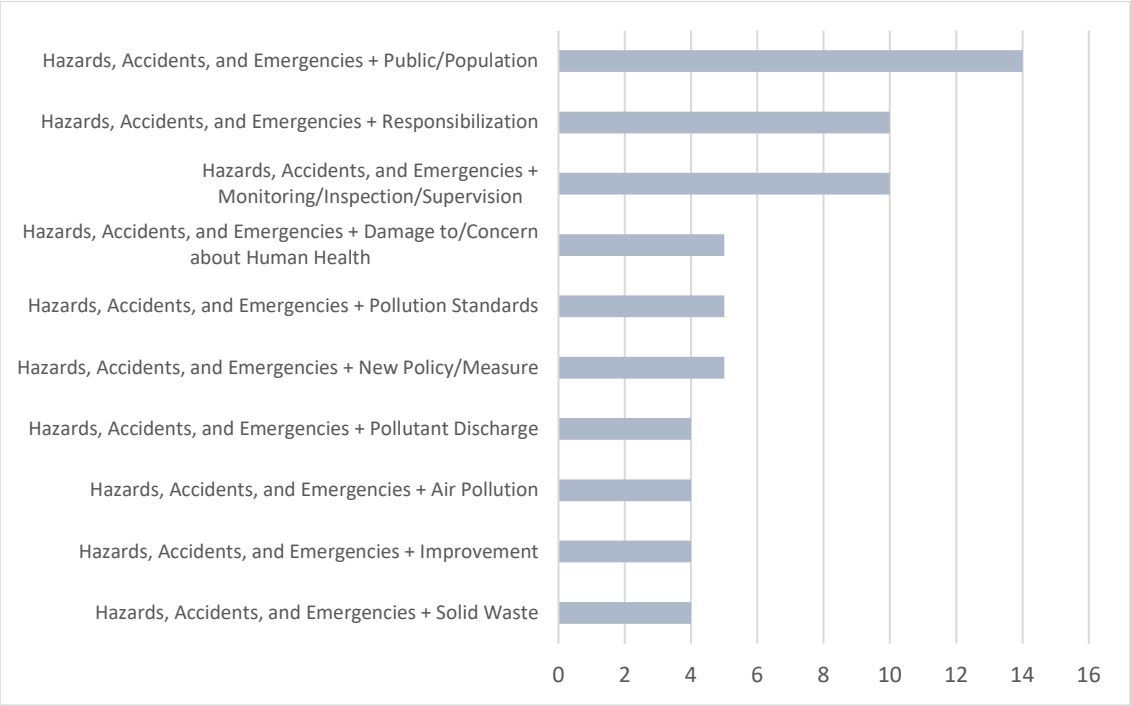

Figure 3.9: Intersections found between Hazards, Accidents, and Emergencies and other relevant codes

The second and third most common intersections were registered between Hazards, Accidents, and Emergencies and the codes that refer to Responsibilization and Monitoring/Inspection/Supervision, respectively. Considering the segments of text in which these codes intersect, it is possible to infer that, in regard to pollution and environmental hazards, as well as harmful events, the Chinese government considers these situations to be very serious. Therefore, the government calls for the monitoring and supervision of such situations, in order to prevent and/or successfully combat the possible consequences that they could have on the environment and, more importantly, on the lives of the population. In the following segment, the Chinese government declares the need for an efficient emergency response system, coupled with the monitoring of this response:

> "Environmental protection authorities should establish environmental risk management and emergency response system with high efficiency and improve the capacity in environment emergency response monitoring. They should work out feasible program for environment emergency response; provide necessary emergency response relief substances and equipment; and strengthen the development of work forces for environment emergency response, technical support and disposal & disaster relief teams with the organization of regular training and exercises." (State Council, 2011a)

Additionally, the government attributes the emergency-response-related responsibilities to the local governments, perhaps in an attempt to make this response system available everywhere, a task that could possibly be hard to achieve if the responsibility relied only on the central government:

> "The local people's governments shall take chief responsibility for environmental emergency response, and their functions shall be brought into full play according to different emergency levels." (State Council, 2006: 403)

As for the remaining relevant intersections, namely with Pollutant Discharge, Air Pollution, and Solid Waste, they suggest that the government is largely concerned with the environmental effects of these harmful events and pollution hazards. This seems to be aligned with the findings described in chapter 3.2, namely regarding the issues of air, soil, and water pollution, as the government emphasizes these types of pollution both on their own, among themselves, and also in relation to Hazards, Accidents, and Emergencies. The following segments of text represent instances of intersection between this sub-code and Air Pollution, Solid Waste, and Pollutant Discharge, respectively:

> "We will conduct supervision on pollution sources and reduce the emissions of toxic and hazardous waste gases such as mercury, lead and dioxins." (State Council, 2011: 17)

> "Priority is to treat the domestic sewage and garbage and the pollution from the livestock and poultry breeding farms and agricultural non-point sources near the source water, and eliminate the pollution hazards that pose a threat to the drinking water quality." (Ministry of Environmental Protection (MEP) and Ministry of Finance (MOF), 2016)

> "They [environmental protection authorities] should continuously carry out special environmental protection campaigns on cracking down enterprises that illegally discharge pollutants and ensure public health. […] They should handle environmental pollution and ecological damage accidents according to law, and carry out supervision systems such as reject the approval of EIS of new construction projects at river basin, region and industry level due to overload of pollutants." (State Council, 2011a)

The codes referring to Pollution Standards and New Policy/Measure intersect with the parent code Hazards, Accidents, and Emergencies on five occasions each, indicating the existence of several standards regarding pollution-related hazards, accidents, and emergencies. It also seems to indicate that the government has taken action on this matter by issuing several policies and/or measures.

It is worth noticing that, in regard to the evolution of environmental quality, the sub-code referring to Improvement intersects with Hazards, Accidents, and Emergencies more on a total of four occasions. Similarly, although it is not represented in Figure 3.11, the sub-code Worsening is found to intersect with the code at hand on three different instances. This implies that there are nearly as many environmental aggravations related to Hazards, Accidents, and Emergencies than there are improvements. In addition, this parent code does not intersect with the sub-code Neutral on any occasion. For illustration purposes, the following segments represent intersections between Hazards, Accidents, and Emergencies and the sub-codes Improvement and Worsening, respectively.

"There were 156 environmental emergencies reported and properly handled in 2010, down by 8.78% from the previous year." (MEP, 2011: 21)

"There was a growing trend of emergent environmental accidents in China in 2008. 135 emergency accidents were handled directly by MEP, which was an increase of 22.7% as compared with 2007, which included 12 severe accidents (4 more than that of 2007), 31 major accidents (4 less than that of 2007) and 92 ordinary ones (increasing by 26)." (MEP, 2009: 34)

3.3.1. CLIMATE/NATURAL DISASTERS

The same cannot be observed regarding the sub-code Climate/Natural Disasters, as there are more intersections between this sub-code and Worsening, than there are intersections with Improvement. Figure 3.11 below shows the intersections found between Climate/Natural Disasters and other relevant codes, displaying the ten most common intersections. It seems possible to infer, based on Figure 3.11, that the most common intersection is found between the sub-code at hand and Worsening, followed by the intersection between the same sub-code and Improvement. Thus, it would seem clear that, while the parent code registered more instances of improvements, its specific sub-code referring to climate and natural disasters registered the exact opposite. Furthermore, this sub-code also intersects with Relative Improvement and Neutral, though these intersections are far less prominent.

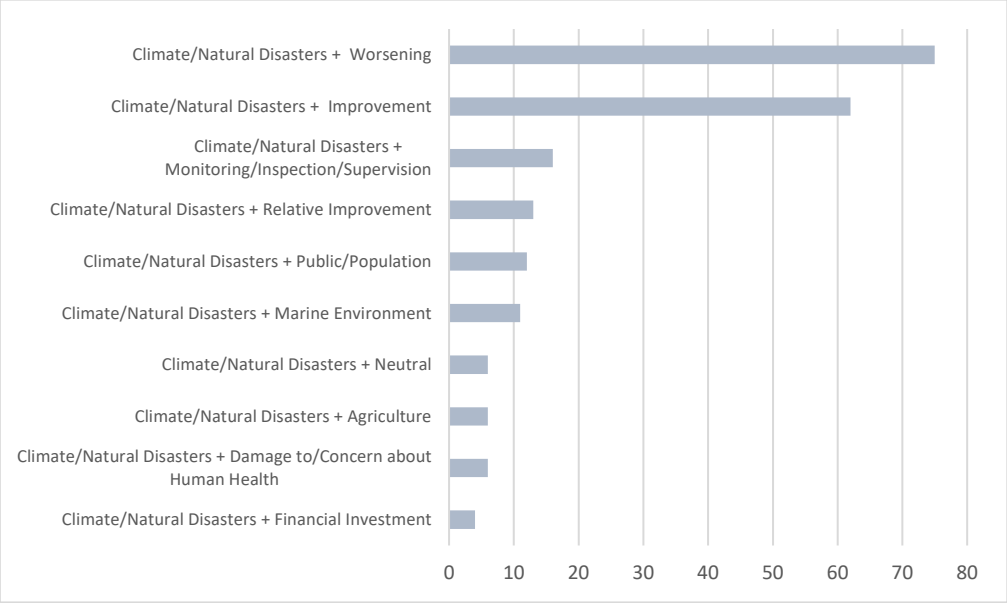

Figure 3.10: Intersections found between Climate/Natural Disasters and other relevant codes

It would appear obvious that, when it comes to Climate/Natural Disasters, several catastrophes take place in the Marine Environment, as there are various instances of intersection between the two sub-codes. Examples of these natural marine disasters are red tides, storm surges, and tsunamis, which can be found in the following segments:

> "In 2005, the direction economic losses China had suffered from storm surges, red tides and ocean waves grew by almost 5 times than in 2004. Among them, storm surge (including typhoon waves alongshore) was the primary marine disaster in 2005, causing the direct economic losses of 32.98 billion yuan and 137 death or missing." (MEP, 2006: 87)

> "A total of 179 marine disasters such as storm surge, sea wave, sea ice, red tide and tsunami occurred in the whole year, similar to that of 2005. They caused direct economic loss of 21.845 billion yuan, down by 11.4 billion yuan compared with that of 2005 and 492 deaths or missing, up by 121 people than 2005." (MEP, 2007: 114)

Regarding the remaining intersections illustrated in Figure 3.11, it would seem plausible to infer that the government considers the process of monitoring climate and natural disasters a priority. Coupled with this emphasis that the government gives to the preparation for eventual climate and natural disasters is the concern with the population. This concern is indicated by the intersection between Climate/Natural Disasters and Public/Population, as well as between this code and Damage to/Concern About Human Health. Also related to the population is the intersection with Agriculture, as the impacts of climate disasters can be devastating for the rural inhabitants that earn a living through agriculture and often see their crop fields destroyed. The economic losses can be high, as indicated by the segments presented above, making it necessary for the government to invest on the prevention and mitigation of the effects of these events, as suggested by the intersection between Climate/Natural Disasters and Financial Investment: "[The Ministry of Health] appropriated about 44.79 million yuan disaster relief and anti-epidemics funds to disaster-hit provinces in 2006." (MEP, 2007: 117). Therefore, taking the relations found between these topics into account, it becomes clear that the government is deeply concerned with the effects of pollution on the Chinese population, as will be discussed in chapter 3.5.2., and committed to the vigilance and prevention of climate and/or natural disasters.

3.4. GOALS TO BE ACHIEVED

The third parent code that we will be looking at is Goals to be Achieved, which focuses on the goals and targets set by the government that are mentioned within the documents. As described in chapter 2, this parent code includes several sub-codes, the most relevant being Economy and Environment, as it is the most prominent, with the highest number of occurrences, and represents one of the main goals of the Chinese government: achieving Green Growth and Sustainable Development. The yearning to achieve

this balance between economic growth and environmental protection can be found in the following extracted segments:

> "Actively carrying out sustainable development strategy, our country puts environmental protection at important strategic position and continuously makes make more efforts in addressing environmental problems over the past years with remarkable achievements." (State Council, 2011a)

> "Chinese President Xi Jinping emphasized for many times, addressing climate change should not be done at others' requests, but on our own initiative. It is not only the internal needs to achieve sustainable development but also the due responsibility to promote the development of the community with a shared future for mankind." (MEE, 2019: 1)

Using the coding system, it is possible to analyse intersections between different codes, as seen above. For the purpose of understanding the main topics that the government focuses on when it comes to establishing goals and targets, Figure 3.12 illustrates the intersections between Goals to be Achieved and other relevant codes.

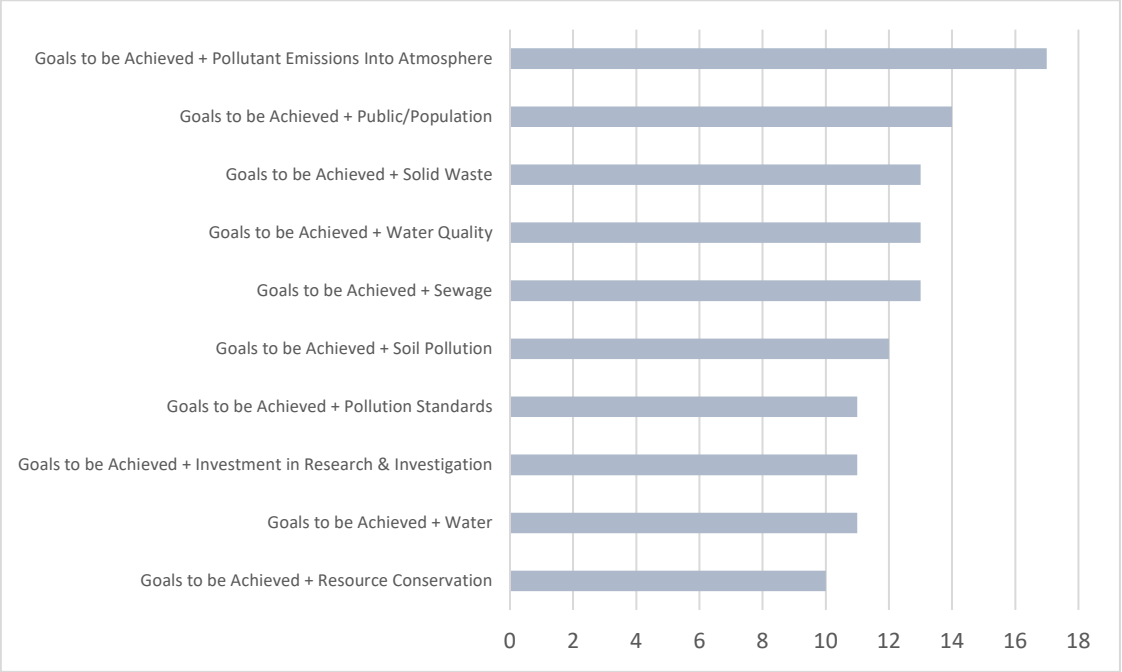

Figure 3.11: Intersections found between Goals to be Achieved and other codes (Top Ten)

The most prominent intersection is found between Goals to be Achieved and Pollutant Emissions into Atmosphere, which indicates a high prominence of air pollution-related targets and goals within the documents. Similarly, though less pronounced, Figure 3.12 suggests a high incidence of goals established in relation to water pollution, sewage treatment, and soil pollution, as well as the

conservation of existing resources, such as potable water and forest land. Moreover, still regarding pollution, the parent code at hand is found to intersect with Pollution Standards on several occasions, two of which are illustrated in the segments presented below:

> "The Taihu Lake watershed should reduce in-flowing pollution loads such as total nitrogen and total phosphorus, the water quality of the lake should go up to Grade V with control of eutrophication trend." (State Council, 2011: 14)

> "By the end of 2015, the combined air pollution of the above regions will be under effective control and the urban air quality of all cities will meet or be better than national Grade II standard with significant reduction of acid rain, haze and smog pollution." (State Council, 2011: 17)

These segments seem to suggest that the Chinese government has set several targets related to the attainment of a certain pollution standard, whether it regards the air quality or the water quality in rivers, lakes, and drinking water sources, or any other existing standard. As shown by the second text segment presented above, some of these goals are associated with a deadline that is set by the government, increasing the urgency to achieve them.

The second most common intersection is found between Goals to be Achieved and Public/Population, once again suggesting a very accentuated concern with the population on the part of the government. It is worth noting that the majority of the coded segments in which these codes intersect focus on one of two goals: 1) increase the public knowledge and participation regarding environmental issues, and 2) improving the quality of life of the population, which will be further explored in chapter 3.5.2. Examples of situations one and two can be found in the following segments, respectively:

> "Enhance education for all citizens on low carbon lifestyle and consumption, advocate green, low carbon, healthy and civilized lifestyle and consumption patterns, and promote low carbon consumption throughout society. Encourage public institutions to take the lead and set an example." (Anon., 2018: 23)

> "The Executive Meeting of the State Council reviewed and approved the 11th Five-Year National Plan for Safe Drinking Water Project in Rural Areas at the end of August of 2006, which identifies the target of addressing safe drinking water issue for 160 million people by the end of 2010, thus reducing half population without access to safe drinking water." (MEP, 2007: 91)

Thus, it would seem plausible to conclude that, overall, the targets and goals set by the government are largely related to the most prominent types of pollution that require close attention, as well as to the wellbeing of the Chinese population that has been (and might still be) affected by environmental issues. This concern will be addressed and further explored in chapter 3.5.2. below.

3.5. GOVERNMENT MEASURES

3.5.1. INTERNATIONAL COOPERATION

The most prominent sub-code within Government Measures is International Cooperation, which refers to the mutual aid and collaboration between China and other countries. This seems to be a priority for the Chinese government, especially if one takes the Belt and Road Initiative into account – which focuses, precisely, on the cooperation between China and other countries. This international cooperation encompasses everything from financial aid and investment in other countries to raising awareness and educating the population of other countries on environmental issues and sustainable development.

According to the Third National Communication on Climate Change (Anon., 2018), China has received international funding and loans from multilateral agencies, bilateral channels, and from within the Financial Mechanism under the United Nations Framework Convention on Climate Change Convention. However, as most funds were intended for climate change mitigation, the Chinese government emphasises the need for adaptation funds as well (ibid.). Thus, although China is willing to invest on its environmental recuperation, as well as on other countries', it is possible to observe that it is nonetheless reliant on international cooperation and funding to be able to focus on its environmental issues on a domestic level.

3.5.2. PUBLIC/POPULATION

As shown chapter 3, the code that relates to Public/Population is one of the most prominent within the sample of documents, taking the seventh place in the top 30. This suggests that the Chinese government has shown notable concern with the country's population, whether regarding public participation, awareness, or the health of its citizens. Due to the emphasis given to this topic, two sub-sub-codes were created under Public/Population: Education & Information, and Damage to/Concern about Human Health. These sub-topics, although related to their parent code, allow for further specification within the segments related to the population. As a way of analysing the codes related to Public/Population and their relation to all other codes, the documents were scanned for any intersections that could be found between Public/Population and other relevant codes. Among the codes that intersect with Public/Population are Hazards, Accidents, and Emergencies, Goals to Be Achieved, Environmental Protection, Improvement of Communication, Monitoring/Inspection/Supervision, and International Cooperation. As seen in Figure 3.13 below, the most amount of intersections was found between Public/Population and Hazards, Accidents, and Emergencies (including intersections with its sub-code Climate/Natural Disasters), indicating a clear concern with the health of the population during catastrophic events. The following segment illustrates this concern:

"An 8-magnitude quake struck Wenchuan County, Sichuan Province on May 12, 2008. The CPC Central Committee and the State Council paid high attention to the situation and Secretary General Hu Jintao made an important instruction. The State Council established a headquarters for disaster relief headed by Premier Wen Jiabao and set up 8 working groups for assistance, forecast and monitoring, medical service, resettlement, infrastructure, production, public security and publicity, which consisted of related government departments, army, armed police, local Party Committee and government principals." (MEP, 2009: 24)

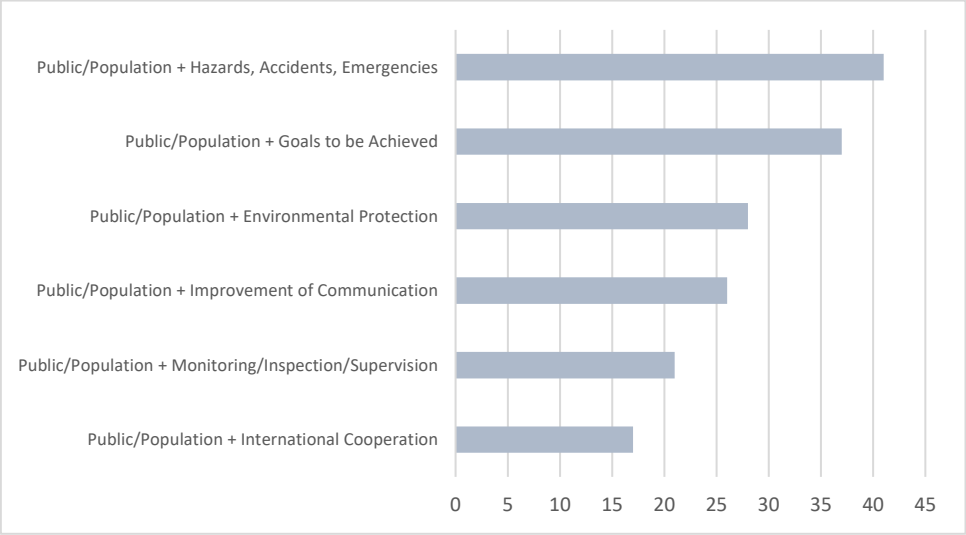

Figure 3.12: Intersection between Public/Population code, and other relevant codes

Another concern that has been found through the analysis of segments extracted from coded documents is related to the rural population, specifically. The government considers that the disparities found between the lives of the rural and urban populations should be lessened, manifesting the intention of improving the quality of live and raising the income of rural residents. This government initiative is represented in the following segment:

"Notable progress has been made in bringing benefits to the rural residents by protecting the environment. The local areas have taken the opportunity of the integrated rural environment management to vigorously spread the technologies for reducing the use of chemical fertilizers and pesticides, controlling their hazards, and improving their efficacy; to develop clean, circular, and eco-friendly plantation and breeding models; to promote the comprehensive utilization of such countryside organic wastes as crop stalks, and animal and poultry dung; and to develop agritainment and rural tourism. All those efforts have helped protect the rural environment, push up the farm yields, and increase the incomes of the rural residents. Furthermore, practical techniques have been selected and spread to protect the environment in the countryside." (MEP and MOF, 2016)

Furthermore, the data presented in Figure 3.13 indicates an inclination towards the need for the improvement of communication amongst the different institutions and governments, in order to achieve the goals and targets regarding population – and, of course, the environmental goals in general. This will be further explored in chapter 3.5.5., which focuses on the sub-code Improvement of Communication The following segment illustrates an intersection between Public/Population and Improvement of Communication, in which local governments are declared responsible for environmental protection, as well as raising awareness among the population:

> "Principal officials of local governments and relevant departments are the No. 1 responsible people for environmental protection work within their administrative territory or their system, and one senior officials of local governments and each department would be designated to take charge of environmental protection work to ensure all the necessary environmental awareness, responsibility, measures and input would be in place." (State Council, 2005)

This can be explained by the impacts that pollution hazards can have on the lives and health of the population, such as contamination of drinking water sources and agricultural fields, exposure to high levels of radiation, or to indoor air pollution, making the population a concern of the government in the midst of harmful events. Similarly, the fourth most common intersection is found between Hazards, Accidents, and Emergencies and Damage to/Concern about Human Health, highlighting the clear emphasis that the Chinese government puts on the wellbeing of the population.

The segments and intersections presented above seem to reflect the prominent concern with the lives of the population on the part of the government, as well as a preoccupation with the lack of popular environmental information and education, which have been translated into policies and goals that should be achieved within the next years.

3.5.3. Resource Conservation

Regarding the sub-code Resource Conservation, which refers to the government's intention to promote the protection and preservation of natural resources, Figure 3.14 presents the most common intersections that were found with other codes. In this figure, it is possible to observe that Goals to be Achieved was found to intersect with Resource Conservation on several occasions, indicating that this is one of the main goals set by the government. This goal to increase resource conservation can include resources from energy and solid wastes to potable water and forest land, as previously addressed in chapter 3.4. Moreover, according to the data presented below, namely any resource-related intersections, it would seem possible to infer that water, energy, and land or soil are the main types of resources that concern the government.

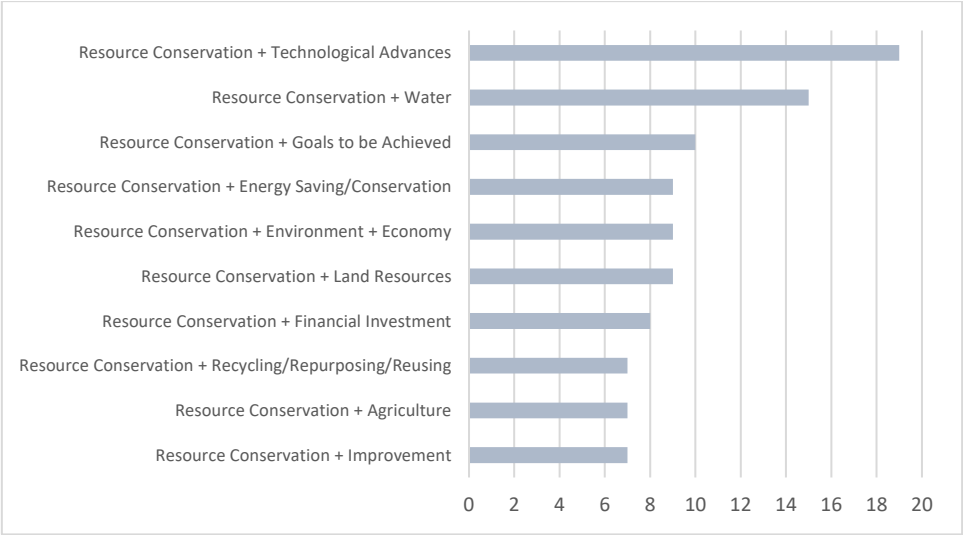

Figure 3.13: Intersections found between Resource Conservation code and other relevant codes

In order to achieve higher rates of resource conservation, the ability to reuse and recycle some of these resources is necessary, as indicated by the intersection between Resource Conservation and the sub-code Recycling/Repurposing/Reusing. Furthermore, in order to reach this goal, there is a need for adequate technology that allows for the conservation of resources, as suggested by the intersections found between Resource Conservation and Technological Advances. The following segment represents one of these intersections, specifically focusing on technology that allows for water conservation:

> "Focus on the development of water-saving technologies and equipment for industries with high consumption of water such as thermal power generation, textile, petrochemical, paper-making and metallurgical industries." (State Economic and Trade Commission, 2004)

Taking these intersections into account, it would seem plausible to conclude that the government has made it a priority to invest on the protection and conservation of resources, namely in regard to water, energy, and land resources.

3.5.4. Improvement of Communication

This sub-code refers to situations in which the need for the improvement of communication between different institutions, such as ministries or regional and local governments, is emphasized, or for situations in which this improvement was successfully attained.

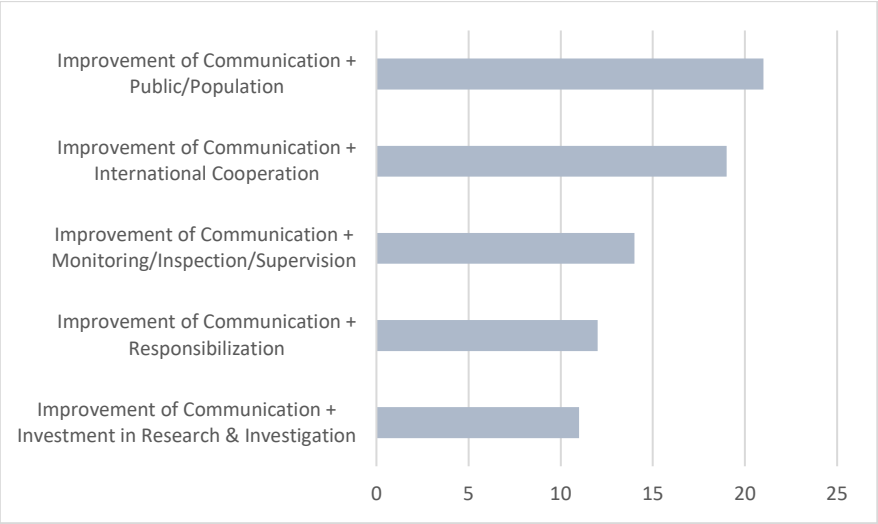

Figure 3.14: Intersections found between Improvement of Communication code and other relevant codes

As indicated by the data presented in Figure 3.15, the main intersection has been found between Improvement of Communication and Public/Population, which has been addressed in chapter 3.5.2. The second most common intersection, with International Cooperation, implies a need for better domestic communication among national institutions and governments in order to attain successful international cooperation and combined effort.

3.6. EVOLUTION OF ENVIRONMENTAL QUALITY

Focusing on the topic of Evolution of Environmental Quality, the data extracted from the documents suggests that there were more environmental improvements over the years than there were aggravations or situations in which nothing changed from one year to another. Overall, in all of the analysed documents, there were 734 occurrences of Improvements, this being the largest group of occurrences. As for Neutral or stagnant evolution, that is, no apparent changes in environmental quality, there were 454 occurrences, while 448 aggravations (Worsening) were detected and reported by the Government. Additionally, 126 occurrences of Relative Improvement were detected in various monitored areas, as can be observed in Figure 3.16 below.

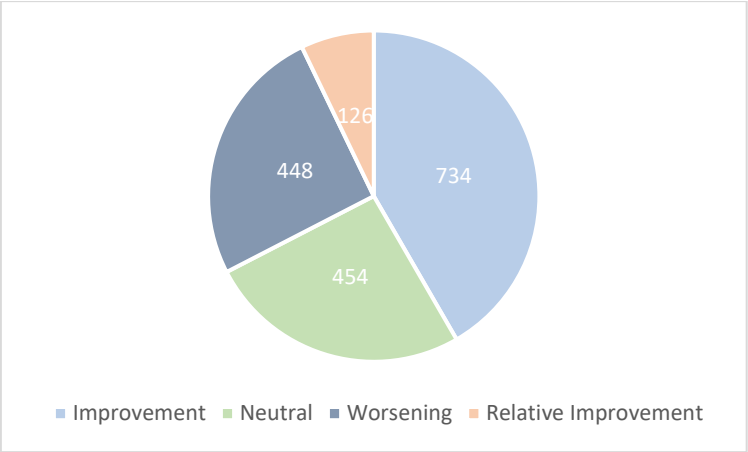

Figure 3.15: Evolution of Environmental Quality (number of occurrences)

The evolution of environmental quality can be compared in different types of documents, illustrated in Figure 3.17. Through this comparison, it is possible to infer that every sub-code under the topic of Evolution of Environmental Quality is more prominent in the Yearly Reports than in any other type of document. This can be justified by the fact that, in the case of Yearly Reports, the purpose of the publication of the document is to summarize the state of the environment and register any changes in its quality. In contrast, the other documents mostly serve as a catalogue of the policies and/or legislation that were implemented, as well as the government's plans and goals to be achieved. Thus, although all of the documents serve an informative purpose, their contents do not provide the same amount – or the same kind – of information. This being the case, there is more emphasis on the evolution of environmental quality in the groups of Yearly Reports than there is in the remaining groups of documents that were analysed.

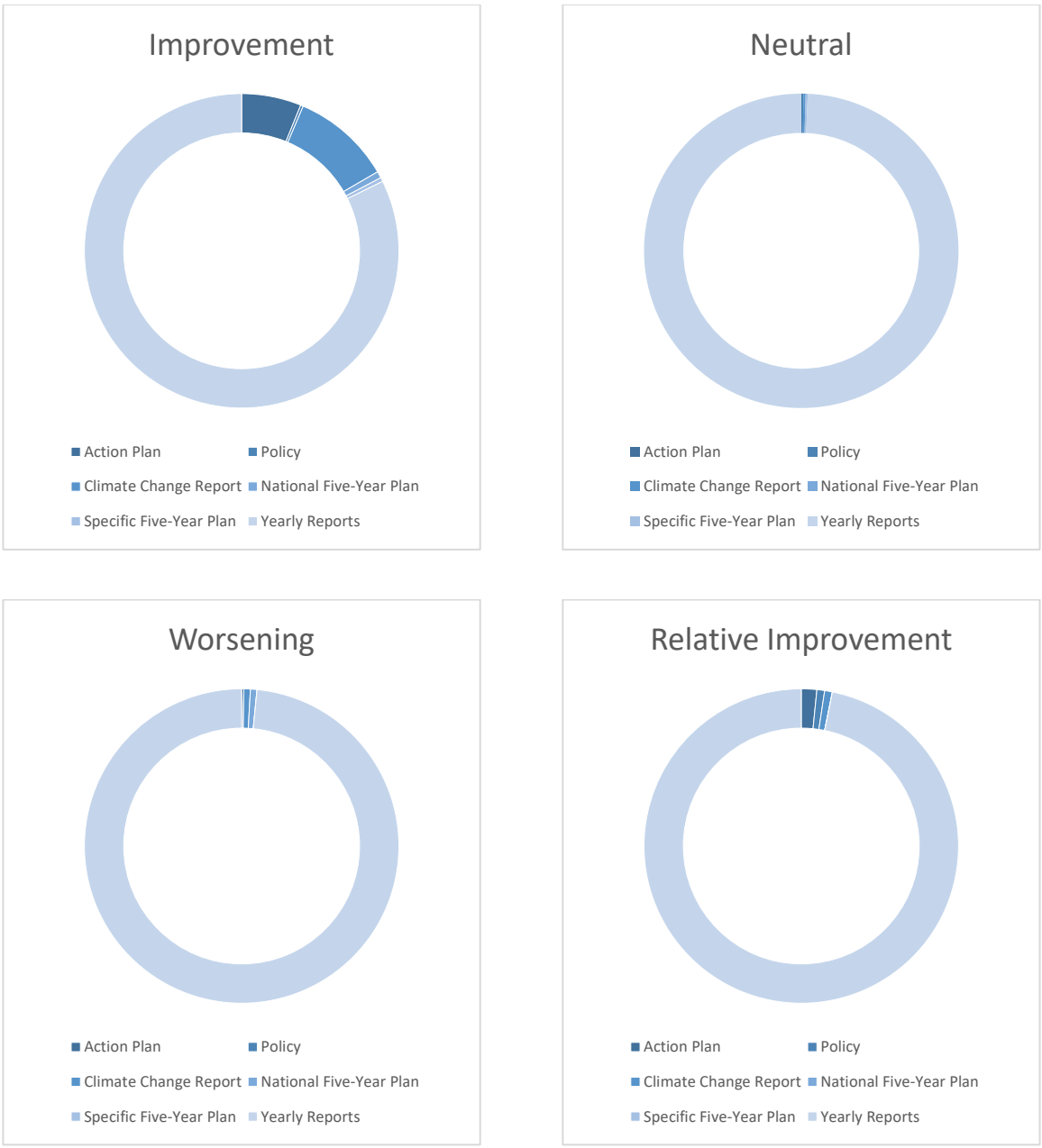

Figure 3.16: Incidence of Improvement, Neutral, Worsening, and Relative Improvement codes (respectively) in each type of document

Taking this into consideration, it is possible to focus solely on the Yearly Reports and observe the evolution of environmental quality, year on year. Considering that each Report corresponds to a certain year, during a twelve-year period, each of the sub-codes under the Evolution of Environmental Quality topic were exported and accounted for in Figure 3.18. Through the analysis of the twelve Yearly Reports on the State of the Environment, it is possible to observe, on a chronological level, the evolution of environmental quality from 2005 to 2017. As previously mentioned, the most common evolution-related

code in the documents refers to environmental improvements. This code is the most prominent in every one of these documents, except for one, which refers to 2006, in which there are more instances of *Neutral* environmental evolution. Figure 3.18 below illustrates the evolution of environmental quality, including every improvement and aggravation that were reported.

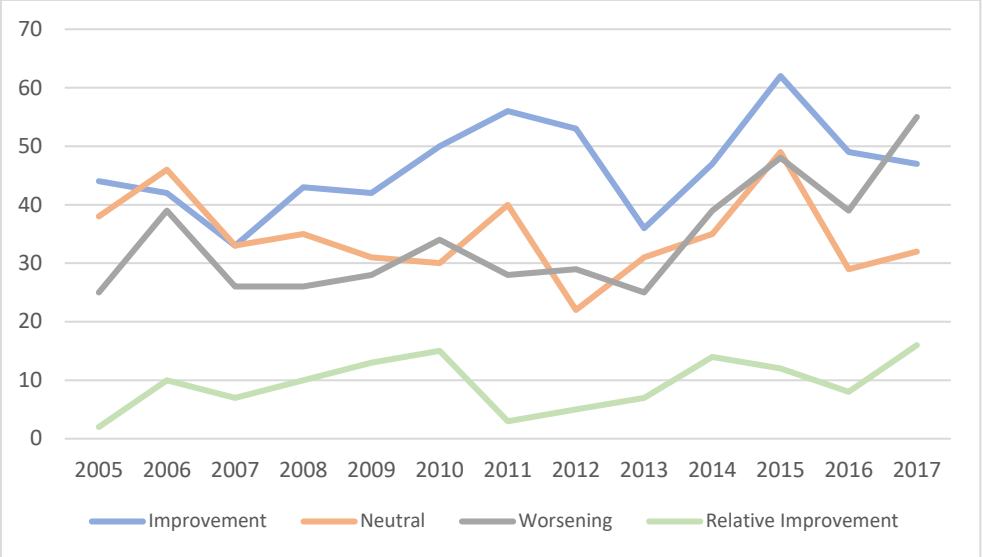

Figure 3.17: Evolution of Environmental Quality from 2005-2017 (based on Yearly Reports)

As suggested in Figure 3.18, 2015 is the year with the most environmental improvements, and the same happens with the code that corresponds to neutrality. However, the year with the most incidence of aggravations seems to be 2017, with a decrease in the amount of improvements and a slight increase of neutral situations in relation to the previous year.

Therefore, it would appear obvious that, while Improvement is, by far, the most common sub-code within Evolution of Environmental Quality, this is not the case in every type of document. As we have been able to infer, the parent code Evolution of Environmental Quality and its sub-codes are far more prominent in Yearly Reports than in any other type of document. Furthermore, the amount of occurrences of these sub-codes is not stagnant or linear over the years, with several variations having been registered year on year.

3.7. Environmental Policies

As mentioned in Chapter 2, out of the 54 documents that were analysed, 15 were Policies issued by the government from the year 2000 onwards, accounting for 27.3% of the sample of documents. These Policies cover a range of 17 years, from 2000 to 2017, although there have been some years in which

the Chinese government did not issue any Policies, while other years saw various Policies issued. Represented in Figure 3.19 are the Policies that were issued, by year, as well as the number of Policies that were issued during each year. In this figure, it is possible to understand that 2000 is the year in which the biggest amount of Policies was issued, with a five-year gap until the publication of the next Policy, in 2005. The last Policy that was issued by the Government was published in 2017. During this year, two Policies were issued, both of them regarding the Belt & Road Initiative.

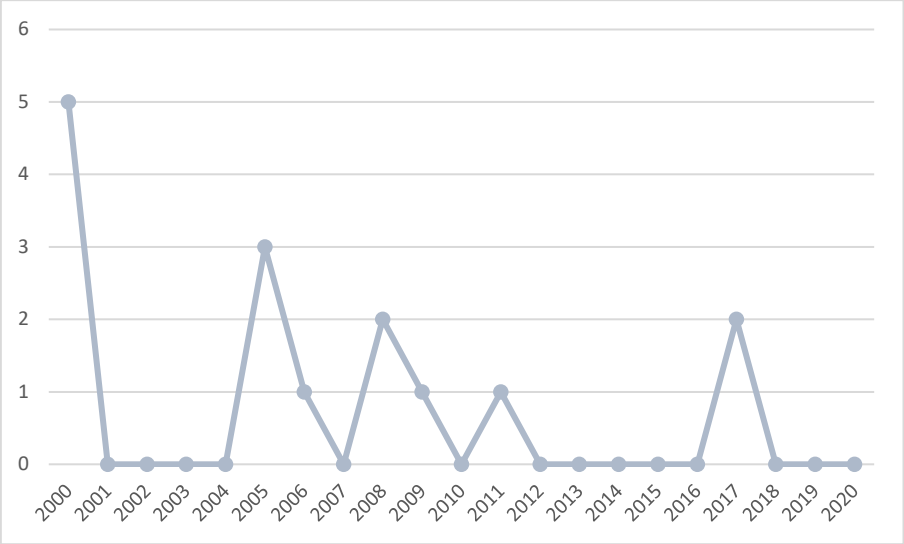

Figure 3.18: Number of Environmental Policies Published by Year

As shown in Figure 3.20, the main topic within Policies is International Cooperation, with 48 occurrences. The second most common topic found in this group of documents is the code that refers to Monitoring/Inspection/Supervision, indicating an emphasis on the control of industries and enterprises, as well as on the supervision of the levels of pollution – namely, water pollution – and protection of resources, as suggested by the segment presented below. In fact, the Chinese authorities perform inspections in industrial facilities, and apply sanctions to any industry that does not comply with environmental laws and policies, as suggested below. Additionally, the enterprises that do comply with these laws and policies are often rewarded, for example, with tax reductions. Thus, it would seem clear that the Government considers the surveillance of environmental quality and natural resources, as well as the close monitorization of the activities of enterprises and industries, to be crucial for the achievement of environmental targets. This can be seen in the following segments that were extracted from the documents:

> "It is necessary to strictly control and gradually reduce the exploitation quota of underground water and establish the coordination and control system of drawing water off from the rivers, lakes, brakes

and dams in order to guarantee environmental water supply for the urban rivers and lakes." (State Council, 2000)

"Environmental protection authority should strengthen prevention and control of pollution by industrial solid waste, and intensify management of hazardous waste and medical waste. In case of redevelopment and utilization of contaminated sites, environmental assessment and environment-friendly treatment should be conducted. Environmental protection authority should carry out compulsory clean production examination in major enterprises. It should facilitate assessment of the environmental performance of polluting enterprises and conduct strict environmental protection check on listed companies." (State Council, 2011a)

"Ministry of Finance and the State Bureau of Taxation may organize or entrust relevant authorities to inspect the pollution discharge value of low pollution discharge of automobiles that enjoy the reduced consumption tax policy. If they fail to meet the requirement, their qualification for the reduction of the consumption tax will be cancelled." (Ministry of Finance and State Taxation Administration, 2000)

"Environmental protection authority should make more efforts in punishing the enterprises causing heavy metal pollution. They should adopt the measures to make corrections within a given period of time. In case of failure to meet the requirement, they will be shut down and banned according to law." (State Council, 2011a)

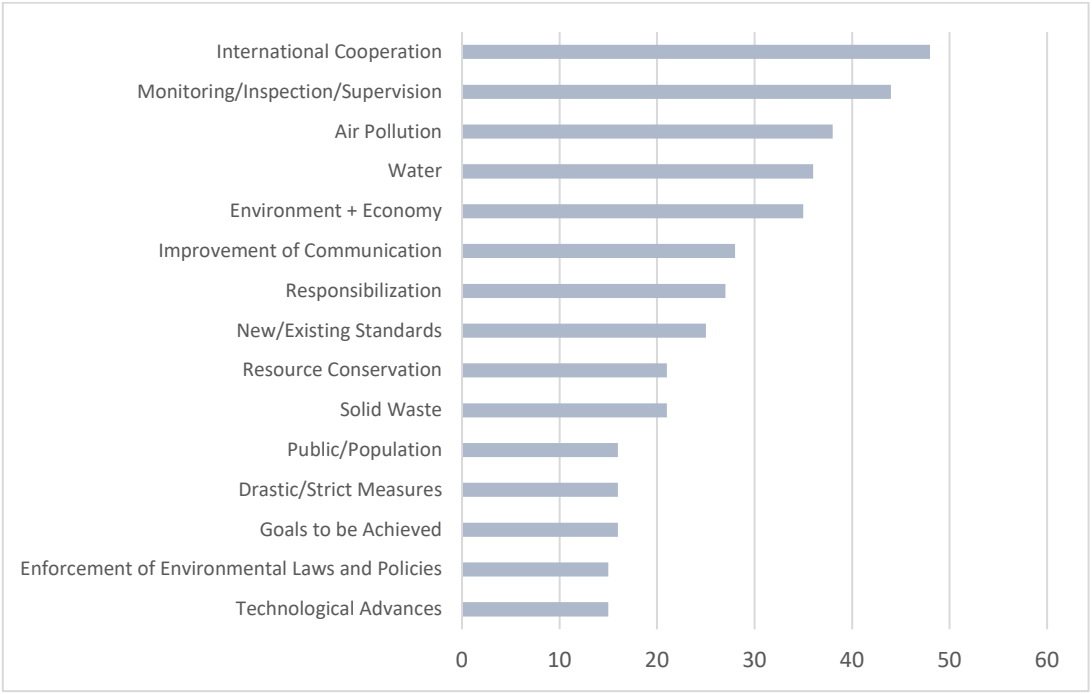

Figure 3.19: Top 15 Most Common Codes in Policies

Air and water pollution take the third and fourth places within the top 15 most common codes, suggesting that these are, in the eyes of the Government, the two most concerning types of pollution. Indeed, air and water seem to be the biggest concerns in terms of pollution in China, according to all of the documents that were analysed, although not always in the same order. As we have been able to observe, water pollution in the most prominent topic within the whole sample of documents – especially within the Yearly Reports. However, when we focus on the Policies, it is air pollution that takes the lead, water being the second most addressed type of pollution. It is also worth noting that the Air Pollution code includes two sub-codes – as it is possible to observe in Annex B –, one of them relating specifically to Fuel/Vehicles/Transportation, which registered 25 instances alone. Therefore, few would dispute the idea that China has focused some of its policies on the control of vehicle emissions specifically, as a way to combat pollutant emissions into the atmosphere, as well as on the automobile industry, as will be illustrated below. The following segments are examples of occurrences of air and water pollution codes, respectively, found within the sample of Policies:

> "In order to protect ecological environment, promote the production and consumption of automobiles with low pollution discharge and encourage the progress of technology of the automobile industry, with the approval of the State Council, a policy for reducing taxation of the consumption tax on sedan cars with low pollution discharge is to be implemented." (Ministry of Finance and State Taxation Administration, 2000)

> "The automobile production enterprises shall keep separately the sales amount and the sales value of the car types with the approved reduction of the consumption tax. Otherwise, the tax authorities will not reduce the consumption tax." (Ministry of Finance and State Taxation Administration, 2000)

> "It is to vigorously advocate the exploitation and use of non-traditional water supply such as recovery and usage of sewage and incorporate them into the unified management and allocation of water resources. In the cities with a serious water shortage during the dry seasons measures to exploitation and usage of rainy water, floodwater and slight saltwater shall be put into attention and in the coastal cities it is necessary to pay attention to desalination treatment of sea water and direct use of it." (State Council, 2000)

According to the data presented in Figure 3.20, the code Environment and Economy is among the five most common within Government Policies. As described in Chapter 2, this code refers to the healthy relationship between environment and economy, namely the achievement of a sustainable or green economy, which is, as seen in chapter 3.4, one of the main objectives of the Chinese government. Taking this into consideration, it would seem predictable that this code would be among the most prominent within the Policies issued by the government in the last two decades. The following segments illustrate two distinct occurrences of Environment and Economy within government Policies, clearly indicating a dedication on the part of the government regarding sustainable development and a condemnation of those who do not comply with it:

> "Chinese President Xi Jinping stressed the concept of green development in many occasions, calling for in-depth eco-environmental cooperation and intense eco-environmental protection in a joint effort to build green Silk Roads." (Anon., 2017)

> "At present, there is quite pre-eminent phenomenon that some local authorities focus on GDP growth rather than environmental protection." (State Council, 2005)

Furthermore, the Chinese government considers the role of the population to be crucial in achieving green development, since public awareness and, more importantly, participation, has become a concern over the last years. The segment presented below illustrates this emphasis that the government has placed on the role of its population in regard to achieving sustainable development:

> "GEP has attached great importance to the special role of the public awareness and participation by youth and has made a lot of efforts in this area, such as the Youth Seminar on Green Development in May 2012 in Beijing, the Youth Seminar on Green Economy and Ecological innovation in September 2012 in Beijing and, the Youth Seminar on Green School in July 2013 in Beijing […]" (MEP, s.a.: 6)

Thus, considering the data presented above, it seems that the Chinese government has focused much of its energy on the promulgation of Policies that answer environmental issues or that can help pave the way to environmental health and sustainable development.

In this chapter, we have presented and summarized the main findings that were possible to extract from the analysis of the sample of documents. Due to page and space limits, not all findings were included in this chapter, as only the most relevant findings for answering the research question of this dissertation were presented. In the next chapter, we will discuss these findings, in an attempt to answer the research question "what kind of environmental policies have been applied in China during the last three decades, and what results have they produced?", as well as to achieve the research objectives described in chapter 2.

DISCUSSION AND CONCLUSION

In this dissertation, we have presented the theoretical framework regarding international environmental law- and policy-making, as well as the discrepancies that can be found between the parties that are involved – namely, between developed and developing countries, as the latter often suffer from climate vulnerability. We have presented a literature review on China's environmental degradation and the main types of pollution that affect the lives of the population, along with some of the policies that have been applied, and a few possibilities for recovery in the future. Through the process of analysis, we have explored and described the main themes found within the sample of government documents and the ways in which they relate to one another within these documents. In this chapter, we will discuss the results that have been produced by the analysis, as well as the ways in which what we found relate to the literature that was presented in chapter 1. Furthermore, we will attempt to provide an answer to the research question and evaluate whether the research objectives have been achieved. Lastly, we will review the methodology that was used for this dissertation and whether it was adequate considering the research question and objectives, suggesting possibilities for further investigation in the future.

As we have seen, international environmental law and agreements have come a long way since the 1970s, changing the way they portray climate change and the strategies that are used in order to combat it. Furthermore, we have been able to comprehend the types of environmental policies that have been designed and applied in the international and domestic contexts – namely, mitigation and adaptation policies (IPCC, 2018; National Aeronautics and Space Administration, 2020). We have seen that, historically, mitigation has been the preferred approach in terms of environmental policies, but adaptation has been gaining more supporters over the years as well, as it is generally accepted (with few exceptions, namely Ingham, Ma and Ulph (2007)) that both approaches should be complementary to one another (Duguma, Minang, and Noordwijk, 2014; Lecocq and Shalizi, 2007; Stavins et al., 2014).

Other authors concluded that China's water pollution is, possibly, the biggest threat for the health of the population, as it causes harmful health issues (e.g. diarrhoea, chronic diseases, cancer, birth defects, and spontaneous abortions), along with air pollution, which is also associated with several health complications (e.g. Alzheimer's disease, dementia, cancer) and a decrease in life expectancy (EPI, 2018; Golley, 2016; Wu et al., 1999; Drechsel and Evans, 2010). While the documents that were analysed for the purpose of this dissertation do not focus on the specific health complications that these types of pollution may cause, it is clear that air and water pollution are the most prominent concern within the sample of documents that were presented. In fact, water pollution, along with harmful types of pollutants that affect the quality of water resources (e.g. solid waste), is the most prominent and emphasized type of pollution within the entire sample of documents, and the second most prominent within the sample of Policies. This seems very fortunate, as it not only shows that the government is aware of the harms

that water pollution may bring upon the population, but also indicates that the government considers it to be the most concerning type of pollution – possibly more so than air pollution, as suggested by Schmidt (2002). Furthermore, as we have been able to understand, China suffers from water scarcity and disparities its distribution throughout the territory (Wu et al., 1999; NDRC, 2007), which makes it necessary to tighten the control of water pollution and decrease the exploitation of water resources, in order to prevent further deterioration and reduce or stabilize scarcity levels in the regions that suffer from drought. In fact, our analysis shows that China's policies emphasize the need for monitoring and supervision of natural resources (e.g. underground water, rivers, and lakes) and pollution levels found within them. Additionally, the government has considered it wise to use non-traditional water sources (e.g. rainwater, floodwater, and slight saltwater) in the regions with the highest levels of scarcity. As for coastal regions, desalination of sea water is also advised, in order to save drinking water resources. Moreover, it was found that many water-pollution-related goals were set by the government over the years, as well as goals related to solid waste, sewage, and water quality. Therefore, it seems that the Chinese government has made efforts to combat water pollution and find solutions to help with water resource conservation, indicating an awareness regarding the effects that were enumerated by the authors mentioned above and an urgency in preventing them.

Regarding air pollution, other authors have found this type of pollution to be associated with many health issues, among them lung disease, strokes, heart attacks, cognitive disorders (e.g. Alzheimer's disease and dementia), and cancer (EPI, 2018; Golley, 2016). In addition, authors also found that air pollution contributes to decreasing work productivity, which could originate economic losses of over $600 million (Schipani, 2014; Zheng and Kahn, 2014). Considering that air pollution is the second most prominent type of pollution within the documents that were analysed, and the most common within the sample of Policies, it seems clear that the government has considered the fight against air pollution a priority. This being the case, we were able to observe that industry and enterprise control is a significant part of China's strategy against this type of pollution, as the industrial sector is, evidently, one of the biggest emitters of greenhouse gases. In fact, industries that do not comply will be penalized, either through the payment of a fine or by seeing their factories shut down by authorities. Similarly, we included fuel and vehicle-related segments of text within the topic of air pollution, as automobile emissions also contribute greatly to air pollution and, as found by Schipani (2014), the number of vehicles in Chinese cities has been increasing significantly in the last years. Considering the data analysis presented in chapter 3.7, it seems that some of China's policies have focused on vehicle emissions, specifically. This is especially relevant considering that Schipani (2014) and Zheng and Kahn (2014) consider automobile-focused policies and taxes to be a good approach to the combat of air pollution, and list them as effective initiatives to implement in the future, as a way to improve China's environment. Therefore, as the most concerning types of pollution for the Chinese government seem to be water and air pollution, the results are in line with past studies that, similarly, emphasize these types

of pollution (e.g. Schipani, 2014; Golley, 2016; Schmidt, 2002; Tomba, 2016; and Drechsel and Evans, 2010).

However, although other types of pollution are not as emphasized (or, in some cases, are not even mentioned) by other authors, it became clear that the Chinese government has shown concern regarding noise, soil, and nuclear pollution. As we have seen, they are mentioned in every yearly report, and each of these environmental issues dialogue with other types of pollution and, most importantly, with the government's need for monitoring and supervision, along with the need to protect the lives of the population.

Another topic that is not, to our knowledge, very present in the literature is environmental hazards and accidents. Through the process of analysis, we were able to infer that this is a huge concern of the Chinese government, especially considering that climate and natural disasters are part of this category. Similar to what has been described above, monitoring is one of the main government measures in order to prevent or soften the damages that these events can bring, along with the protection of the population – who is, naturally, the most affected by such accidents and disasters. Thus, it seems clear that China has committed to the vigilance and surveillance of environmental hazards, accidents, and climate/natural disasters. Furthermore, this seems to suggest that China has already been affected by the consequences of climate change, which could mean that adaptative measures and policies will have to be prioritized in the future.

Regarding international cooperation, the analysis suggests that China considers it to be a rather important dimension of climate change combatting. Among the government measures, this is the most prominent, indicating a clear allegiance to international cooperation. This is especially clear if we consider the Belt and Road Initiative that China has designed as a mutual aid and cooperation program between China and other countries. We found that this international cooperation encompasses many aspects, from financial aid and investment in other countries to the education of their population, raising awareness regarding environmental issues and the concept of sustainable development. Similarly, it also encompasses the aid that China itself has received from other countries, namely for the implementation of mitigation policies. As we gathered from the literature, mitigation policies have been the most prominent over time, but adaptation has been gaining more importance within the last years (IPCC, 2018; Stavins et al., 2014; UNCCS, 2019). In fact, within the documents that were analysed, China alerts for the need of funds directed at adaptation policies, which suggests that the government recognizes this importance that has been attributed to adaptation in the international scenario of environmental policies, and considers this approach to be necessary in order to adapt to the (already present) effects of climate change mentioned above. Taking this into consideration, it seems clear that China is willing to invest in environmental policies domestically and internationally, but the country is, nonetheless, reliant on

international funding and cooperation as well when it comes to environmental recuperation and climate change combatting.

As mentioned above, the document analysis pointed out a clear concern with the population, which was present in most of the documents. This topic is the seventh most common within the sample of documents, and it is included in many of the goals that were set by the government. Considering all of the health complications that may stem from human exposure to all kinds of pollution and contamination (e.g. EPI, 2018; Golley, 2016; Wu et al., 1999; Drechsel and Evans, 2010), along with the fact that so many coded segments in the analysis focus on the public and population, it seems that China has decided to act upon the importance of the health of its population. The government has also focused on the disparities of quality of life within its own territory. It was suggested by the analysis that the quality of life in urban areas is higher than that in rural areas, which inevitably affects the lives of the people. Therefore, the government has manifested its intention to improve the quality of the lives in rural areas, namely by increasing their income, which is especially relevant if one considers the vulnerability that comes with poverty. As we have seen in the literature, the poor are usually the most affected by climate change, as they often rely on agriculture, an activity that is severely affected by extreme weather events, such as drought, floods, or heatwaves (Lybbert and Summer, 2010; Shalizi and Lecocq, 2007). Still regarding how the population is considered in the documents, the analysis suggests that China has manifested its concern with the population's knowledge (or lack thereof) when it comes to environmental degradation and climate change. This concern with the population and the people's environmental awareness could be explained by the known health complications that may be caused by pollution, which have been described by various authors (EPI, 2018; Golley, 2016; Wu et al., 1999; Drechsel and Evans, 2010). By putting population-centred policies in motion and raising environmental awareness within the communities, it could be possible to prevent further degradation of the environment and reduce the population's exposure to contaminated resources, such as water or produce that is grown with contaminated water or on contaminated soil. This seems to be in line with what the literature has found regarding the importance of the population in developing countries, namely when it comes to the right to development (e.g. UNGA, 1986; State Council Information Office, 2016). As described by the UNGA (1986), the right to development should entail constant improvements to the population's lives and well-being, and it is the State's duty to provide these improvements and guarantee that this development is possible. Considering what has been have found and described above, it seems clear that China has attempted to fulfil its duty when it comes to the population's right to development by showing a concern with and focusing on their well-being and education (especially regarding environmental degradation). Thus, we consider that China has shown concern with the right of its people to development, as well as with the improvement in their quality of life and the recuperation of the environmental damages that have been caused in the last few decades.

The analysis shows that several of China's goals and targets are related to resource conservation, namely regarding water resources. In order to achieve adequate conservation of resources, the government has made it a goal to invest and focus on improving technology that will help with this issue, in order to save water in various contexts (e.g. in thermal power generation, textile, and metallurgical industries, which are known to consume large quantities of water). Considering that authors have predicted a decrease in China's per capita water resources in the Northern region, where it is most scarce, this seems like a logical approach and a necessary measure (NDRC, 2007; Wu et al., 1999). In fact, as mentioned by the UNCED (1992), resource conservation and management are some of the most crucial aspects to sustainable development, indicating that China might be on the right path to achieving sustainable growth and development.

Regarding the evolution of China's environmental quality, it seems that 2015 was the year with the most registered improvements, and 2008 the year with the least amount of registered improvements. Curiously, 2015 was also the year with the most cases of neutral environmental quality – that is, situations in which there were no changes compared to the year before –, which coincides with the highest amount of improvements, as mentioned above. In turn, 2012 is the year with the least number of neutral situations. Concerning environmental degradation, we were able to conclude that 2017 was the year with the highest amount of registered aggravations, while 2013 was the year with the least amount of registered aggravations. Overall, the segments that represent improvements are the most common, followed by neutral situations or registered aggravations of environmental quality. Thus, it is possible to infer that the evolution of China's environmental quality is not linear, showing several variations year on year. However, the analysis does not make it clear why these variations take place over the years. A second, more focused analysis could generate results regarding the reasons behind these variations, and what they mean in the context of China's environmental policies.

Taking the data and considerations presented above into account, it seems possible to answer the research question of this dissertation: "what kind of environmental policies have been applied in China during the last three decades, and what results have they produced?". As we have been able to observe, the majority of China's environmental policies are based on the mitigation approach, focusing on reducing pollutant emissions (e.g. automobile and industrial emissions) and establishing pollution standards that would, ideally, allow China's environment to fully recover over time. Furthermore, some of these policies have focused on the criminalization of pollution, namely by sanctioning enterprises and industries that do not meet pollution standards and shutting down those that, among other illicit practices, knowingly discharge pollutants illegally. In turn, these policies also include rewards for those who do meet these standards and that comply with environmental policies and standards, usually in the form of tax reductions. As mentioned above, water and air pollution are some of the main concerns within China's policies, as they are the most prominent types of pollution that China is currently facing.

Furthermore, a great portion of these policies focus on monitorization, whether regarding industrial activity, automobile emissions, natural resources, or environmental quality.

Regarding the research objectives, we have been able to achieve most of them, but not all. The third objective, which was to identify the turning point that originated new environmental policies in China, has not been achieved due to the methodology that was used for the analysis. In order to be able to pinpoint the year, event, or moment that triggered China's environmental policies, a time-based approach to the analysis of the sample of documents would be more effective. Through the analysis of each document based on the year of its publication, as well as on its contents, would most likely generate clearer results that would allow us to successfully pinpoint this moment in time, if it exists. Furthermore, it would also be important to take the international context into consideration, as there are many external factors that could have led China to focus more on environmental degradation and respective combatting policies (e.g. international environmental agreements, conferences, and accords).

The first objective, however, has been achieved through the process of document analysis. This objective aimed to examine which are the main environmental concerns in China, which translates to pointing out the most prominent topics that were found within the documents. As described above, the most prominent and relevant environmental concerns for the Chinese government are (in order of prominence) water pollution and the quality of water resources, international cooperation, the well-being of the population, climate and natural disasters, air pollution, investment in research and technology, and resource conservation. Aside from analysing which were the most prominent concerns of the government, we have also been able to observe the ways in which they interact amongst one another.

Lastly, the second and fourth objectives, which aimed to identify the environmental policies that have been applied on a national level and explain how China has been able to recover from the effects of pollution and increase the quality of life each year, produce similar answers to what has been said above regarding the research question. Considering that all policies that were part of the sample of documents were intended to be applied to the entirety of China's territory, they are all national policies. As previously mentioned, the focus of these policies is the mitigation of environmental degradation, namely through the reduction of emissions from the industrial sector and vehicle circulation, as well as through the control and monitorization of environmental degradation and pollution levels. Additionally, it was found that the monitorization of industries and enterprises is coupled with sanctions and rewards, which may be applied based on whether or not the environmental policies are fulfilled and standards are met. Therefore, these mitigation policies appear to be the reason why China's environment has improved during the last years and why it was possible to achieve the environmental goals that were set by the government, as declared by Li Ganjie (Ministry of Ecology and Environment, 2019).

LIMITATIONS AND FUTURE RESEARCH

The methodology used in this dissertation has allowed us to comprehend what the main environmental concerns of the Chinese government are and, perhaps most importantly, how they interact with one another, and how they may be related. It has also allowed us to answer the research question that was proposed for this dissertation, and to achieve some of the research objectives related to this question. Generally speaking, the methodology that was used was successful in achieving these objectives and the overall purpose of the dissertation. However, there are some aspects that could have been changed in order to provide more thorough information regarding environmental policies, namely regarding the year that each document refers to. As previously mentioned, future research on this subject would likely benefit from taking the year of publication, along with the international (and even domestic) context of environmental policymaking, as this would allow for a thorough overview of the policies and whether they produce environmental improvements, further degradation, or no outputs at all. Additionally, a more detailed analysis (perhaps more focused on interpretation) of some of the documents could possibly allow for a better understanding of the challenges that China faces (and has faced), highlighting the biggest difficulties that are present in China's environmental policymaking.

Aside from the limitation presented above, there are other limitations to this dissertation. Firstly, due to a language barrier, it was only possible to analyse documents that were available in English, which rises some concerns regarding a potential misunderstanding or overlooking of relevant content due to the process of translation. Lastly, the lack of access to direct input from stakeholders, members of the government, or policy makers is a limitation, as the results would have been much more insightful if it had been possible to get information and opinions directly from the source. Future research would certainly benefit from interviewing members of the Chinese government, especially members of the Ministry of Ecology and Environment, and including the input from these representatives in their project would produce very relevant and interesting results, especially when compared with the data extracted from the government documents. Similarly, input from members of environmental non-governmental organizations or social movements could also produce interesting results and, perhaps, help to point out any divergences between the input of official members of the government and that of individuals that are not part of any governmental institutions regarding the same topics.

All in all, the present dissertation is aligned with what has been found within the literature, confirming part of what had been previously written regarding the topic of China's environmental policies, but provides a wider overview of the Chinese government's concerns regarding environmental issues and degradation. This allows for a clear understanding of the contents of China's environment-related policies, reports, and action plans, as well as the ways in which the main themes interact with one another. It allows us to conclude that China has resorted to the mitigation approach in regards to environmental policies, focusing on the main pollution threats, which are air and water pollution, and

that the government has implemented several strategies that allow for better control of pollutant emissions into the atmosphere and pollutant discharge onto water bodies, among other resources. We consider that the present dissertation contributes to the discipline of International Environmental Studies in the sense that it underlines the implications of China's environmental degradation within the international scenario, as well as the need for environmental policies that involve not only a specific country, but all countries globally.

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ANNEX A

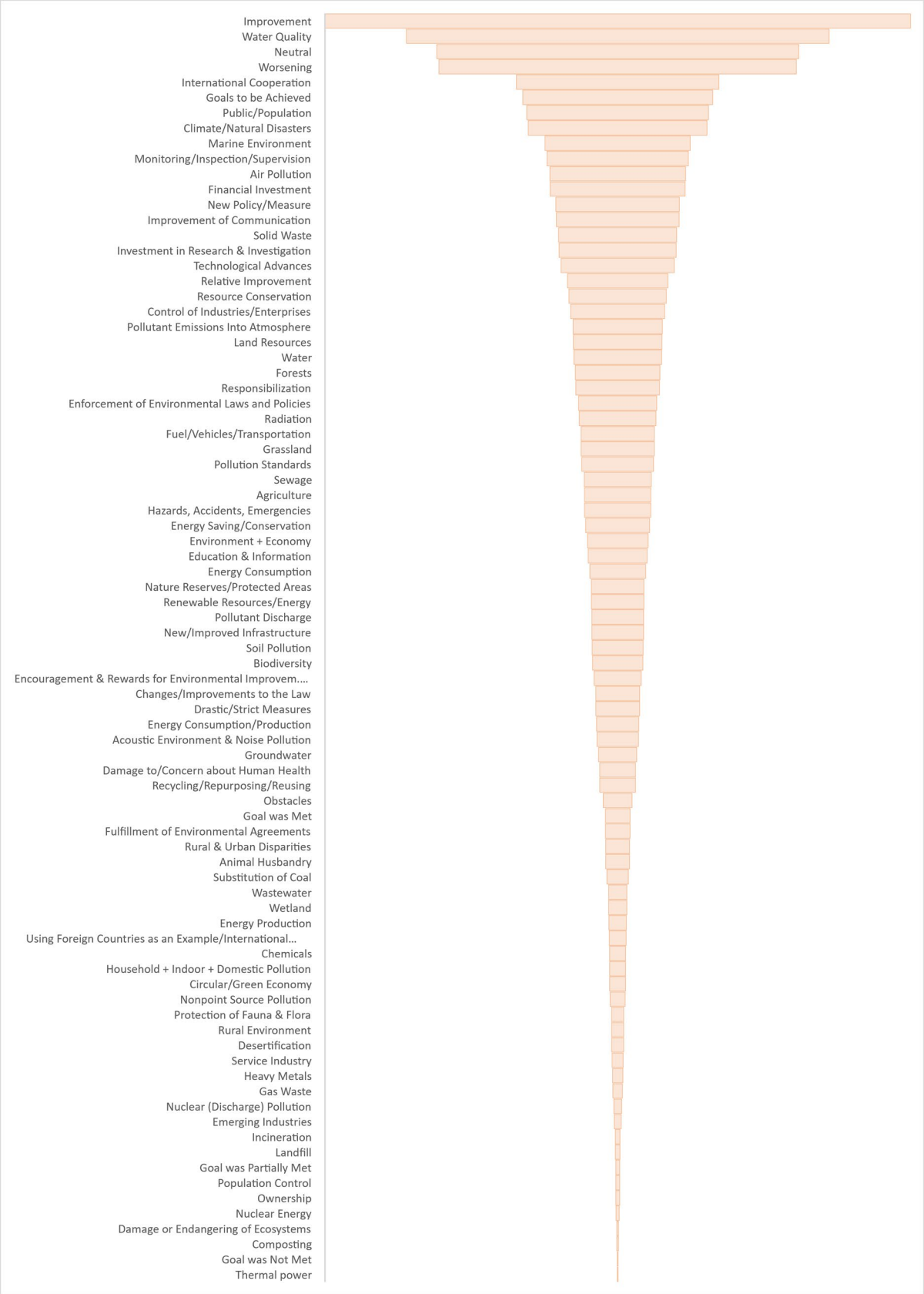

Figure A.1: Volume of Occurrences of Codes

ANNEX B

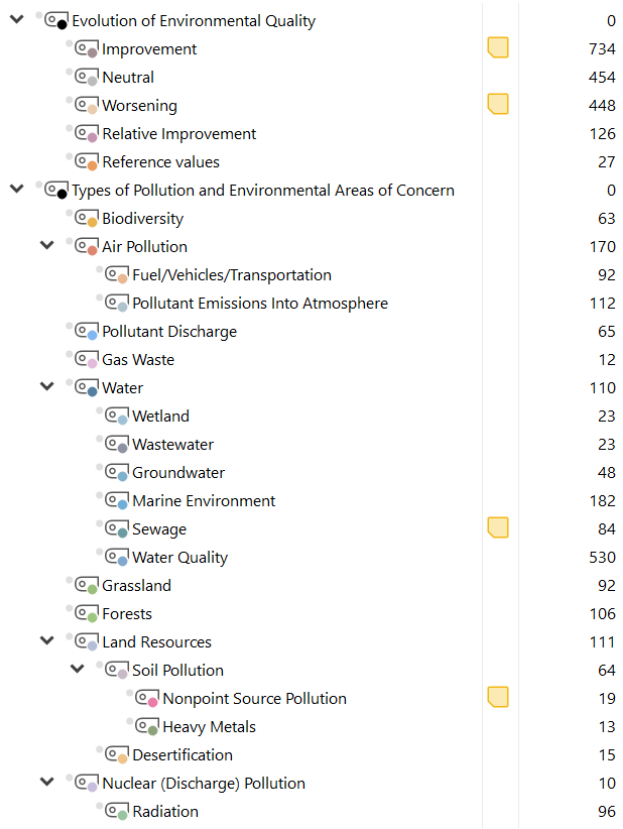

Figure B.1.1: Coding System (part one out of four)

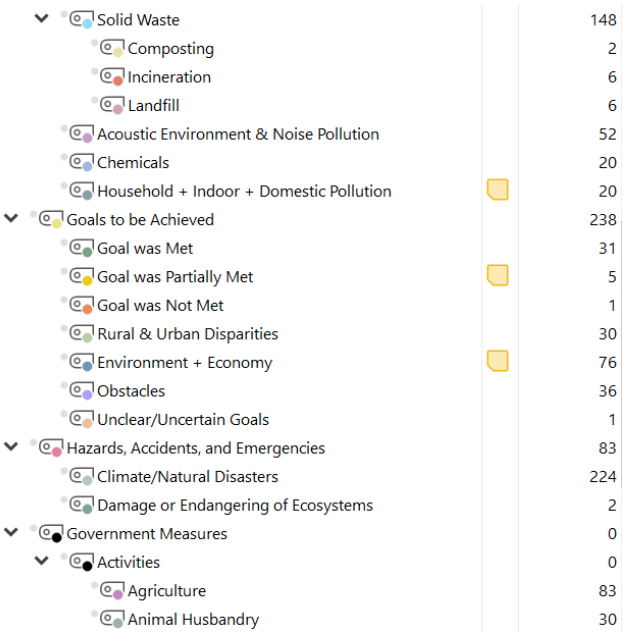

Figure B.1.2: Coding System (part two out of four)

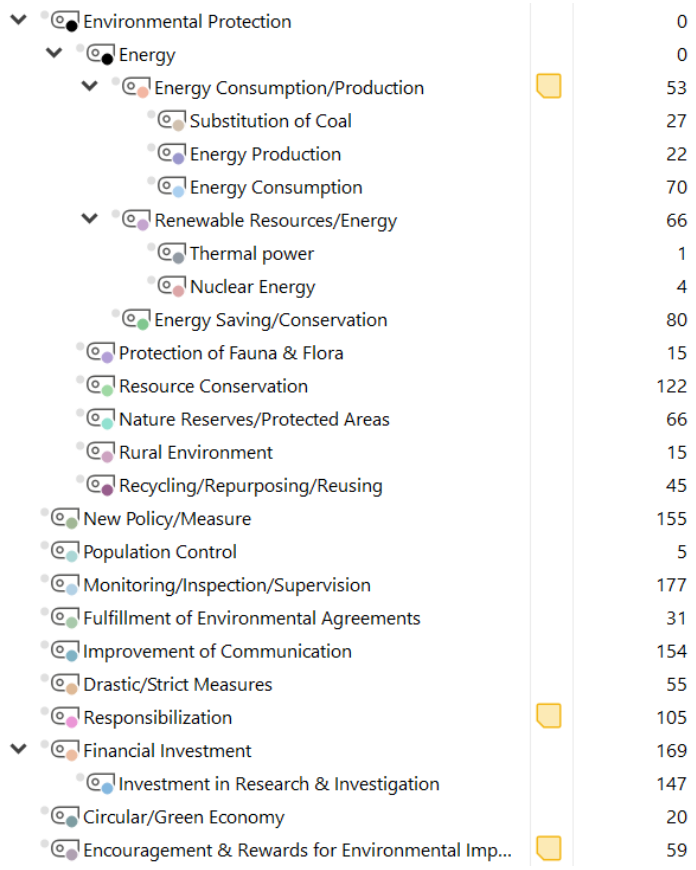

Figure B.1.3: Coding System (part three out of four)

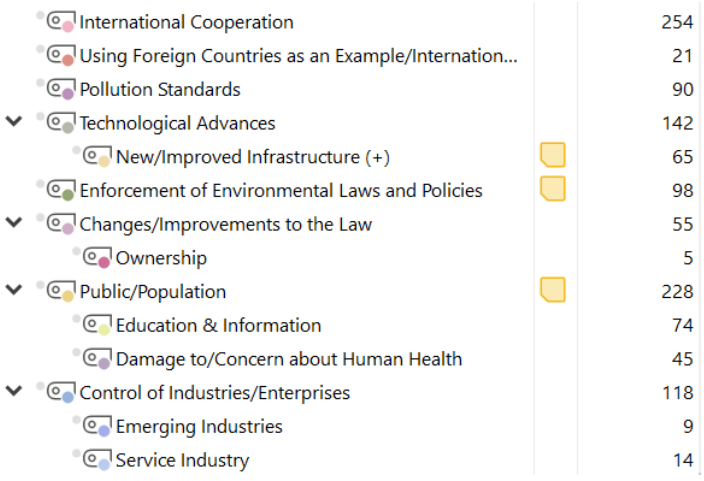

Figure B.1.4: Coding System (part four out of four)

europass Curriculum vitae

PERSONAL INFORMATION

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vanessat2108@hotmail.com

Sex Female | Date of birth 21/08/1996 | Nationality Portuguese

WORK EXPERIENCE

13/11/2018–12/05/2020

Bookshop specialised seller

SONAE MC (Note!), Sintra (Portugal)

10/2016–12/2016

Assistant to the Cultural Dissemination Department

Biblioteca da Faculdade de Letras da Universidade de Lisboa

Collaborated in the organization and preparation of events, as well as their publicity through of pamphlets and posters designed by me.

07/2015–10/2015

Shop assistant

ZARA PORTUGAL - CONFECÇOES, SA, Oeiras (Portugal)

07/2014–09/2014

Shop assistant

Metro Kids Company, Oeiras (Portugal)

EDUCATION AND TRAINING

2015–2018

Bachelor's degree in Languages, Literature and Culture

Faculdade de Letras da Universidade de Lisboa (FLUL), Lisboa (Portugal)

Languages: English, Spanish, French, Latin

Specialization within the degree:

- History *minor*
- Classical Studies *minor*

09/2018–Present

Master's degree in International Studies

ISCTE - Instituto Universitário de Lisboa, Lisboa (Portugal)

Awaiting Master's thesis defense

Specialization within the degree:

- China

PERSONAL SKILLS

Mother tongue(s) Portuguese

Foreign language(s)

UNDERSTANDING		SPEAKING		WRITING
Listening	Reading	Spoken interaction	Spoken production	

English	C2	C2	C2	C2	C2
French	B1	B1	B1	B1	B1
Spanish	B1	B1	B1	B1	B1
Latin	A1	A1	A1	A1	A1

Levels: A1 and A2: Basic user - B1 and B2: Independent user - C1 and C2: Proficient user
Common European Framework of Reference for Languages - Self-assessment grid

Digital skills

SELF-ASSESSMENT				
Information processing	Communication	Content creation	Safety	Problem-solving
Proficient user	Proficient user	Independent user	Independent user	Proficient user

Digital skills - Self-assessment grid

Driving licence B