Science diplomacy: The need for cooperation in the South China Sea and outer space

by

Jarred van der Westhuizen

A mini-dissertation submitted in partial fulfilment of the requirements for the degree

MASTER OF DIPLOMATIC STUDIES

Department of Political Sciences,
Faculty of Humanities, University of Pretoria

Research Supervisor: Ms EP Pretorius

March 2019

ABSTRACT

China's rise, both geopolitically and economically, has presented real challenges for the United States of America (USA) in maintaining its global dominance. Thus, when President Xi Jinping announced his vision of a global "community of a shared future for mankind", he also unequivocally announced China's superior future role in this peaceful community when he stated that "A country with a history of more than 5,000 years has a lot to contribute to the rest of the world when it comes to peace and development" (Sharma 2018). President Xi also acknowledges the need for mutual respect and constructive bilateral cooperation between China and the USA.

However, over the past few years, China's actions in the South China Sea resulted in the degradation of the natural environment, despite the international legal protection of the oceans by the United Nations Convention of the Law of the Sea, and the guidelines in the 1995 Global Programme of Action for the Protection of the Marine Environment from Land-based Activities of the United Nations Environment Programme's (UNEP). Similarly, the scientific advancement of outer space exploration has provided China and the USA, in particular, the opportunity to develop their strategic position in the international arena and have in the process created technological pollution in Earth's orbit in spite of the guidelines to prevent space debris as outlined by the Committee on the Peaceful Uses of Outer Space (UNCOPUOS). Clearly, narrow self-interests and hegemonic competition dominate the relations between China and the USA at the expense of environmental governance.

ACKNOWLEDGEMENT

I would like to extend my deepest gratitude to my family and friends who have supported me throughout the entire process and journey. I have learnt so much about myself and the fascinating, yet ever-changing dimensions of Diplomacy and International Relations.

I would also like to express my sincere appreciation to my supervisor, Ms. Pretorius, for her dedication, encouragement and guidance throughout this process. Without your support, I would not have been able to reach my full potential.

DECLARATION AND DISCLAIMER

Full Name: Jarred van der Westhuizen

Degree: Master of Diplomatic Studies

Student Number: u13009169

I declare that this research paper is my own original work. Sources have been acknowledged in accordance with the guidelines set by the University of Pretoria.

As an employee of the High Commission of Canada in South Africa, the High Commission of Canada is not responsible for the comments or views expressed in this academic research paper.

TABLE OF CONTENTS

List of Abbreviations

AAAS:	American Association for the Advancement of Science
ASAT:	Anti-Satellite Weapon
ASEAN:	Association of Southeast Asian Nations
CSIS:	Centre for Strategic and International Studies
EEZ:	Exclusive Economic Zones
HST:	Hegemonic Stability Theory
IADC:	Inter-Agency Space Debris Coordination Committee
IBP:	International Biological Programme
ICJ:	International Court of Justice
IISD:	International Institute for Sustainable Development
LEO:	Low Earth Orbit
NASA:	National Aeronautics and Space Administration
NATO:	North Atlantic Treaty Organization
PCA:	Permanent Court of Arbitration
PRC:	People's Republic of China
UN:	United Nations
UNCED:	United Nations Conference on Environment and Development
UNCLOS:	United Nations Convention on the Law of the Sea
UNCOPUOS:	United Nations Committee on the Peaceful Uses of Outer Space
UNEP:	United Nations Environment Programme
UNESCO:	United Nations Educational, Scientific and Cultural Organization
UNGA:	United Nations General Assembly
UNOOSA:	United Nations Office for Outer Space Affairs
USA:	United States of America
USSR:	Union of Soviet Socialist Republics
WCED:	World Commission on Environment and Development
WST:	World Systems Theory

CHAPTER 1

INTRODUCTION

1.1 Introduction

The conduct of diplomatic relations to ensure peace between powerful entities have been taking place for a significant part of human history. A rudimentary form of international law very often guided these negotiations because, as Amerasinghe (2001: 367) states, "…wherever there were relations between groups of societies which were state-like entities, there was likely to be a law governing those relations". International rules have also regulated the relations between the Chinese empire and its neighbours since the middle of the eight century B. C. while humanity and chivalry became the guidelines for relations in ancient India (Amerasinghe 2001: 369, 388).

Maritime conflict between European states during the European *Age of Discovery* motivated Grotius to acknowledge the sea as a common space and to declare that "the freedom of the seas derived not only from nature but also from custom and hence from consent" (Armitage 2004: xix). He explained his "*mare liberum"* principle by arguing that *"*The sea cannot become the property of anyone, but owes forever to all men a use which is common to all"[1] (Grotius 2004: 78). Nevertheless, peace agreements, such as the 1648 Peace of Westphalia and the 1815 Congress of Vienna, limited the functionality of international law to ensuring peace between sovereign nations. The failure of the League of Nations paved the way for the establishment of the United Nations (UN) and governance of the four global commons, the High Seas, the Atmosphere, Antarctica, and Outer Space as part of the post-2015 UN development agenda (United Nations System Task Team on the Post 2015 UN Development Agenda 2013: 6).

Global commons are defined by the United Nations System Task Team on the Post 2015 UN Development Agenda (2013: 5) as "those parts of the planet that fall

---

[1] The result of the doctrine that rests on Grotius argument, is that national rights and jurisdiction over the oceans are limited to a nation's coastline (UN. Oceans and the Law of the Sea).

outside national jurisdictions and to which all nations have access". The global commons are non-exclusive, non-rivalrous public goods but without multilateral agreements to govern the global commons, their misuse will eventually result in the tragedy of the commons[2]. This research focuses on two of the four global commons. Firstly, the High Seas and particularly on parts of the South China Sea, a semi-enclosed sea area in the Pacific Ocean, extremely rich in resources and stretching approximately 1.4 million square miles (Quintos 2015). Secondly, outer space and in particular Earth's orbit, home to over 1000 functional satellites and up to 100 million small debris objects that pose threats to operational satellites and human life, both on earth and in space (Hall 2014).

The third United Nations Conference on the Law of the Sea (UNCLOS III) resulted in the adoption in 1992 of the United Nations Convention on the Law of the Sea (UNCLOS) an international treaty defined by the Permanent Court of Arbitration (2009) as "… a regulatory framework for the use of the world's seas and oceans, *inter alia*, to ensure the conservation and equitable usage of resources and the marine environment and to ensure the protection and preservation of the living resources of the sea".

As indicated, parts of the South China Sea are considered global commons, which underlines the importance of international law to ensure the peaceful access of all countries to the waterways surrounding the islands of this region, and to protect the environment from the actions of dominant states in the region. China claimed sovereignty over most part of the South China Sea, thereby demonstrating its assertiveness and strategic ambitions in the region while the United States of America (USA), supported by the British and French, opposes China's hegemonic claims and conducts regular freedom of navigation operations (Mearsheimer 2010; Emmerson 2016; Fong 2018).

---

[2]Garrett Harding introduced this concept in 1968 in his article "The tragedy of the commons" in *Science* (volume 162: 1243-1248). He argued that the 'tragedy of the commons' lies in each person's attempts to maximise his/her gain and that "the individual benefits as an individual from his ability to deny the truth even though society as a whole, of which he is a part, suffers".

Similarly, the negotiations in the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) led to the creation of the Outer Space Treaty. The Outer Space Treaty (1967) declares that "exploration and use of outer space, including the Moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of Mankind". While there are currently no specific binding agreements for the mitigation of space-related pollution, a better international framework to deal with the growing space debris problem has become increasingly important in the last decade (Leister 2010). This need for cooperation is further reinforced by the notion that no state has sovereignty in outer space, and with the lack of an overarching government and accountability, space debris has drastically increased with severe environmental consequences (Hertzfeld 2009).

Consequently, international attention on the South China Sea and outer space predominantly focuses on the military implications of actions in the two global commons. The problem arises when political decisions informed by national interests and aspirations for global hegemony result in the lack of cooperation between China and the USA to address environmental degradation in the South China Sea and in outer space. This study focuses on the global level of analysis in terms of the hegemonic aspirations of the two dominant states, the USA and China. However, the degradation of the environment in the two global commons frontiers, provide a true testing grounds for science diplomacy.

Furthermore, China's rise creates questions about the future world order and how responsible China, as a hegemon, will be towards the norms underlying the protection of the environment. How will *tianxia,* a principle that guided two centuries of imperial China's dominance of its neighbours, legitimatize China's territorial claims in the South China See region and its positionality in outer space by challenging the US's hegemonic supremacy? Will the global arena function as "a hierarchical system that values order over freedom, ethics over law, and elite governance over democracy and human rights"? In other words, as a system "where imperial China's hierarchical governance is updated for the twenty-first century" which presents a new hierarchical vision for the 21st century (Callahan 2008: 753, 759).

1. 2 Research Questions and Objectives

This study seeks to answer the following main question:

What are the causes of environmental degradation in the South China Sea and outer space, despite the existence of the United Nations Convention on the Law of the Sea (UNCLOS) and the Outer Space Treaty as key international agreements which aim to foster cooperation and advance sustainability in the two global commons?

Sub-questions:
- How grave are the environmental degradations in the South China Sea and in outer space, who is to blame and why?
- What are the guidelines in UNCLOS and in the outer space treaty UNCOPUOS on the protection of the South China Sea and outer space and why are these guidelines insufficient to prevent environmental insecurity in these two global commons?
- How to ensure that science diplomacy strengthen environmental governance in the South China Sea and outer space?

Objectives of this Study:

The main purpose of this study is to investigate the extent of environmental degradation in the South China Sea and in outer space and to determine how to ensure that science diplomacy provide the opportunity to overcome the environmental challenges in the two global commons.

More specifically the study intends to:
- Determine whether the USA and China's quest for global hegemony contribute to environmental degradation in the South China Sea and outer space by assessing the environmental consequences of their actions in the two global commons.
- Determine the ability of UNCLOS and the Outer Space Treaty to provide legal protection of the South China Sea and outer space.

- Identify alternative measures to be employed by multilateral institutions, such as the UN, to prevent environmental catastrophes in the South China Sea and in outer space.

1.3 Research Approach

Qualitative research in essence aims to create understanding from data collected throughout the research, by interpreting the meaning of the data (Creswell 2014: 4). This meaning is descriptive and explanatory in nature and does not use variables and statistics to predict an outcome as is the case in quantitative research.

This study acknowledges the argument of Ritchie and Lewis's (2003: 11) that the behaviour of states cannot be overlooked as it provides the platform for multiple ontological realities to exist, which reinforces the meaningful contribution of states in the international system. The relations between states in the twenty-first century have been complicated by increased globalisation and new challenges affecting the way in which states cooperate to overcome issues that affect them directly. Given China's increased global presence in the international arena, its relations with other states, such as the USA, fluctuates with constant changes in global interests. Therefore, the research will apply a qualitative research methodology, as it aims to highlight the axiological, or value-driven, underpinnings that exist within the relationships between China, the USA and the UN and the impacts their relations have on the natural environment.

1.4 Research Methodology

A literature review is in essence a "desk-based research method" that uses primary and secondary sources to review what is known about the phenomenon being studied (Jesson et al 2011: 74). Therefore, this research will utilise a thematic literature review to identify and synthesise themes relating to the environmental degradation in the South China Sea and outer space. The breaking down of the themes involves a systematic analysis and evaluation of the data (Allen 2017).

A thematic analysis can be described as "a qualitative research method that can be widely used across a range of epistemologies and research questions" (Nowell et al 2017). A thematic analysis thus best suits this research as it identifies, categorises, and analyses various themes within a dataset. A thematic analysis is flexible in nature and provides rich detail to the phenomenon being studied which can be interpreted by the researcher accordingly. By identifying themes in the literature, a triangulation of how the literature and themes speak to each other is developed to ensure a better understanding of the phenomenon being studied and to ultimately answer the research question (Allen 2017).

In order to identify themes within the existing literature, a purposive sampling technique will be utilised. Kumar (2014: 164) states that sampling is "the process of selecting a few from a bigger group". Therefore, instead of providing a quantitative element to the number of samples that will lead to the point of saturation, the samples were purposively chosen from primary and secondary sources to contextualise and capture the main themes to provide a better understanding of the phenomenon being studied. The key themes identified throughout the literature include: China's role as a regional hegemon in the Southeast Asian region; The rise of national interest and the upsurge in the Tragedy of the Commons; The knowledge gained from working groups and experts in the South China Sea and outer space; the rise of science diplomacy to overcome overfishing and the destruction of coral reefs in the South China Sea as well as the technological pollution in outer space. The theoretical framework provided by liberal environmentalism is also a key theme in the literature applicable to this study.

As will become evident in the literature overview, the primary sources are UNCLOS and the Outer Space Treaty which provide the basis through which states may conduct their activities within the parameters of international law. Secondary sources include academic papers and books that have been published by well-known authors. Articles in academic journals focusing on International Relations are often to be found in digital libraries, such as JSTOR and Taylor & Francis. These secondary sources will provide the contextual background of the research problem and will also contribute to the structure of the analysis.

1.5 Literature Review

The literature applicable to this study is divided in four themes. The *first theme* relates to the broad theoretical focus guiding the research: the nature of the emerging balance of power in the twenty-first century. This study envisages an emerging bipolarity between the USA and China, supported by Gaiser and Kovač (2012) but contradicted by authors such as Andrew Korubko (2017) who argues that the hegemony of the USA will be replaced with a multipolar order. However, many IR scholars, such as Kapuwa, Amin and Naseer (2012) posit that American hegemony is on the decline in particular due to the rise of China. Layne (2018: 89) also states, "…rather than Donald Trump's election, it is the big, impersonal forces of history— the relative decline of American power, and the emergence of a risen China—that explain why the Pax Americana's days are numbered". Yet, Kapuwa, Amin and Naseer (2012: 1) have a more limited view of Chinese dominance and state "… we are poised to see a world not with a super power, but with many great powers, greatly influenced and dictated by China because of their heavy economic muscles. However, as Spies (2019: 204) posits, "… at the start of the twenty-first century, increasingly diffuse and fluid power relations in the global system seem to defy easy classification". This study investigates the possibility of cooperation amidst hegemonic fluidity, characterised by increased competition between the USA and China due to declining American hegemony and rising Chinese dominance, in particular in the South China Sea region and outer space.

The *second theme* relates to the conceptual framework of the study. The concepts 'global governance' and 'global environmental governance' are explained in a variety of sources, but *Global governance and the United Nations,* published in 2001 and edited by Rittberger, proved to be very useful, in particular the chapter by Brühl and Rittberger, *From international to global governance: Actors, collective decision-making, and the United Nations in the world of the twenty-first century. Our Common Future*, the Report of the Brundtland Commission[3] in 1987, provided crucial practical background on the evolution of the two concepts. Because diplomacy is a key

---

[3] Published by the World Commission on Environment and Development (WCED), this report was named after the chairperson of the WCED, Gro Harlem Brundtland.

instrument to enable global governance, valuable insight on the evolution of the concepts 'diplomacy' and 'global governance' were found in *Global diplomacy and international society (2018),* and *Global South perspectives on diplomacy* (2019) by Spies. That was also the case with Barston's *Modern diplomacy (2013) and* Sending, Pouliot, and Neumann's 2011 article, "The future of diplomacy. Changing practices, evolving relationships". Valuable information on science diplomacy, the most important concept to be clarified, was gathered by The Royal Society and American Association for the Advancement of Science (AAAS) in the 2010 publication of *New frontiers in science diplomacy: Navigating the changing balance of power*. Hegemony was clarified by focussing on the views of critical scholars, such as Gramsci and Cox; traditional mainstream scholars, such as Keohane, and because the topic also warranted the contribution of Chinese scholars, Zhu's 2001 article "International Political Economy from a Chinese angle" was also analysed.

The *third theme* links with the theoretical framework of this study which combines the state-centric approach of neorealism; the institutional focus on cooperation of the liberal institutionalists; the norms of sustainable development underlying neoliberal environmentalism; and the dominant role of norms as determinants of identity, structure and activities of social constructivism. Thus, this research topic not only glues these approaches together, but the views of scholars representing these perspectives also signifies the evolution of the IR study field as well as the practice of international/global relations since the 1970s. Kenneth Waltz's 1979 book, *The theory of international politics,* provides a classic analysis of neorealism while Robert Keohane's explanation of the tenets of neoliberal institutionalism in his book, *After Hegemony: Cooperation and Discord in the World Political Economy* became an important book for the theoretical discussion in the second chapter. The 1997 doctoral thesis and 2001 book of S. F. Bernstein, *The Compromise of Liberal Environmentalism,* contains crucial information for understanding the view of liberal environmentalists on global cooperation to protect the environment. It also provides a comprehensive overview of the development of international organisational and environmental governance and the role played by the norms underlying liberal environmentalism. Finally, the 1998 article of Ted Hopf, "The promise of constructivism in International Relations Theory" and his 2013 article "Common-sense Constructivism and Hegemony in World Politics" in the world-renowned journal, *International*

Organization, served as crucial sources for understanding the views of social constructivists related to this study.

The geopolitical setting of the South China Sea area and territorial and maritime disputes, the main legal issues at the basis of relations in the South China Sea, are the main topics of the *fourth theme.* As indicated, UNCLOS is the main primary source, but the 1982 Law of the Sea Convention of the UN as well as the 1995 Global Programme of Action for the Protection of the Marine Environment from Land-based Activities of the United Nations Environment Programme's (UNEP), are also primary sources for the legal framework of this study. The 1982 Law of the Sea Convention stipulates that states may conduct freedom of navigation within 12 nautical miles of another state's sovereign territory and that exclusive economic zones (EEZs) stretch 200 miles offshore (United Nations General Assembly 1982). UNCLOS provides clarity on what an island is and establishes standards for maritime claims and the resolution of disputes between states. The July 2016 ruling in the South China Sea Arbitration case under Annex VII of UNCLOS is of particular importance because the decision unanimously rejected the People's Republic of China's (PRC) claim to historic rights over the majority of this part of the sea, referred to as the Nine-dash Line (Permanent Court of Arbitration 2016; Klein 2016). A variety of secondary sources were also identified for this theme. Sison (2018) and Mora *et al* (2016) for example, provide valuable information on the geopolitical setting of the three island groups: the Pratas, Paracel and Spratly and attribute the disputes in the region to the region's economic potential for China and the overlapping territorial claims of the member states of ASEAN (China/Taiwan, Vietnam, the Philippines, Indonesia, Malaysia, and Brunei). Gao and Jia (2013) focus on the South China Sea as a "vital route of maritime trade and transport".

China's island building activities in the region and the environmental impact of these activities are part of the fourth theme. The environmental impact of these activities on the coral reefs and atolls of the Spratly Islands since 2013 is a main concern for authors such as Asner *et al* (2017), Quintos (2015), Truong-Minh Vu and James Borton (2015). Vu and Borton (2015) are particularly concerned about the impact of environmental degradation on food security in the South China Sea region and state that "nearly 80 percent of the South China Sea's coral reefs have been

degraded and are under serious threat in places from sediment, overfishing, destructive fishing practices, pollution and climate change". Scientists involved in the South China Sea Expert Working Group; the Vietnam's Institute for Strategy and Science and the National Geographic Pristine Seas Program (Quintos 2015) are also deeply concerned about Chinese activities in the region. The research of these scientists and institutes is therefore very important for this study because, not only do they contribute vital information, but as Richard Benedick (1998: 6) explains, "Science and scientists have a role of unprecedented importance in the new science diplomacy".

The Washington based Centre for Strategic and International Studies (CSIS) launched the South China Sea Expert Working Group and the Sumitro Chair for Southeast Asia in 2017, publishing their first report entitled *Defusing the South China Sea Disputes: A Regional Blueprint* in October 2018, thereby acknowledging the imperative to find local solutions to manage the disputes in the South China Sea. Both focus on the environmental degradation of the region and publish extensively on the topic. For example, the comprehensive report of the Sumitro Chair for Southeast Asia provides crucial information on the underlying complexity of maritime and territorial disputes in the South China Sea (Poling 2013; South China Sea Expert Working Group 2017). In the same way, the Inter Agency Debris Coordination Committee (IADC) and the working group on the long-term sustainability of outer space activities, initiated by the scientific and technical subcommittee of the UNCOPUOS, was established to identify key areas of concern pertaining to the increase in space debris and guidelines to better manage the way in which outer space is operated by states. The working group and the IADC regularly provide updates on their findings within many platforms and its mitigation guidelines provide states and other actors operating in outer space with vital information on the status of the debris problem as well as provide recommendations for states to be more environmentally conscious when operating in outer space (Gérard 2012).

1.6 Limitations and Delimitations of this Research

The qualitative approach could have presented a limitation, but the limited use of quantitative date can soften the challenge to measure and convey the vast environmental degradation in the South China Sea and outer space in qualitative

terms. Another limitation is the data represented in the research, in that it cannot be used to generalise about the broader population, as the data is not statistically tested to prove the research question.

The research will focus on the environmental consequences of human actions driven by hegemonic motives in the two global commons: The High Seas (South China Sea) and Outer Space. The research is limited to the data collected on the hegemonic ambitions between China and the US and the impact it has on the coral reefs, over-fishing and space debris in the Low Earth Orbit (LEO).

1.7 Ethical Considerations

No human participants were used during the conduct of the research and all desk-based research (primary and secondary sources) are accessible in the public domain.

1.8 Research Structure

Chapter One: Introduction

This chapter outlines the background of the study. It also lays out the problem statement, objectives, research question and the study justification.

Chapter Two: Theoretical and conceptual framework

Environmental liberalism, the theoretical framework for an analysis of the role of science diplomacy in environmental governance is the main focus of this chapter. Neorealist and neoliberal institutionalist interpretations of hegemony will also provide a crucial framework for the analysis of the global hegemonic competition between the USA and China. Social constructivism will play a role in outlining the normative characteristics of the international arena. Science diplomacy, environmental governance and hegemony will be unpacked in the conceptual framework to discuss the activities in how states cooperate to improve the conditions of the global commons.

Chapter Three: Environmental degradation in the South China Sea and outer space

This chapter seeks to understand, explain, and unpack the causes and consequences of environmental degradation in the South China Sea and outer space by means of the various themes identified, which communicate with each other to ultimately contextualise the phenomenon under investigation.

Chapter Four: Conclusion

Chapter four will present the main research findings to ultimately answer the research question within the context of the two global commons.

CHAPTER 2

CONCEPTUAL AND THEORETICAL FRAMEWORKS

2.1   Introduction

International relations theories address two questions, the first being what the realities are to be investigated and explained and the second, how to gain knowledge of these realities (Maxwell 2014: 224). The first question relates to the ontological foundations of theory, outlining the objective and subjective realities (positivism and post-positivism). The second question relates to the epistemological foundation of theory, referring to the scientific or experiential knowledge (rational and reflectivist). Dunne et al (2013) posits that rationalist IR theories, such as neorealism and neoliberal institutionalism, have problematised environmental issues as an expansion of their locus of enunciation. Both these theories gave way to particular limitations, explained as the nature of the international political system and the dominant role of states in this system. Therefore, both theories have ineffectively acknowledged the normative structure underlying managing environmental issues which resulted in the inclusion of social constructivism as an approach focusing on the norms underlying decisions and actions in the global arena in the twenty-first century.

Concepts on the other hand, are not only "predisposed to how we decipher the world", but also serve as crucial intersubjective elements in the communication of viewpoints and basic assumptions, according to Guzzini (2017: 8) The particular meaning allocated to concepts also assists in testing the coherence of theories, their relevance to the subject matter they decipher and the differences between theories. In this chapter, core concepts to be clarified are global environmental governance, science diplomacy and hegemony. These concepts are part of the vocabulary of both neorealism and neoliberal institutionalism, but there are significant differences in the meaning and importance allocated to these concepts by scholars of both theories.

In this chapter, the liberal environmentalist theoretical perspective will be applied to develop a framework for the assessment of global environmental cooperation in the South China Sea and outer space. Neorealism and neoliberal institutionalism will be

applicable for the interpretations of the hegemonic competition between the USA and China for the analysis of environmental governance in an arena where sovereignty is still a dominant norm and where China, as a rising power, rivals the USA as the ruling power[4]. Hegemonic aims and limited political will often result in the inability of states to reach consensus and to successfully address issues of common concern in the fields of human development, human rights and the environment. Will the notion of the protection of the environment, therefore, limit China's ability to compete with its rival? This chapter will also briefly outline the characteristics and normative ontological and epistemological underpinnings of social constructivism which exists in the international arena today and in particular the constructivists' claim that "common norms imply common identity" (Palmujoki 2006:1).

Besides a theoretical framework, this study first of all requires a conceptual framework to explain the issues underlying the need to cooperate in the South China Sea and outer space. The first concept to be clarified is global governance and in particular global environmental governance while science diplomacy, the second dominant concept in this study denotes the instrument most often used to make environmental governance possible. Hegemony, the third concept to be clarified, will provide a better understanding of the context of US-China rivalry in the South China Sea and outer space.

2.2   Conceptual framework

Global governance and global environmental governance; diplomacy and science diplomacy and hegemony are core concepts to be discussed in this section.

2.2.1 Global governance

Global governance[5] is a concept rooted in the attempts to create and sustain a partnership between the dominant actors in the global arena with the aim to collectively

---

[4] Graham Allison (2017) refers to the classical tale of 'Thucydides' trap' as an example where new rivals challenge existing hegemons and states. "The past 500 years have seen 16 cases in which a rising power threatened to displace a ruling one. Twelve of these ended in war".
[5] Governance is described by Bevir (2011) as ubiquitous, multijurisdictional and a concept that denotes the involvement of a plurality of stakeholders in patterns of interaction.

ensure human security in the world. Global governance has since the 1970s presented a theoretical and practical framework for managing global relations, but its evolution from international to global governance as well as its multidimensional and rather complex nature need clarification. By distinguishing between international and global governance, Brühl, and Rittberger (2001: 2) also touch upon the evolution of the concept global governance and the underlying tension between International relations theories that give states an exclusive and dominant role in the international arena and theories that argue for the acknowledgement of a multitude of global actors.

Nevertheless, Brühl, and Rittberger (2001: 2) explain international governance as management by states using multilateral diplomacy in international (mostly) governmental institutions where they prescribe and maintain international norms and where their decisions mainly regulate the national and international levels. In contrast, global governance denotes "multilevel governance" due to "… the increased involvement of non-state actors in norm- and rule-setting processes and compliance monitoring" (Brühl, and Rittberger 2001: 2). Of particular importance is their acknowledgement of the continuous importance (but not dominance) of "states and international institutions as both the addressees and the makers of norms and rules in global governance" (Brühl, and Rittberger 2001: 2).

Focusing on the challenges facing humanity in the twenty-first century in his Millennium Report, Kofi Annan, a former Secretary General of the UN, identifies three main challenges facing humanity in the twenty-first century as "freedom from want"; "freedom from fear" and "…leaving to successor generations an environmentally sustainable future" (Annan 2000: 17). Annan (2000: 12) also explains how to best meet the opportunities and challenges presented by globalisation stating, "If we are to capture the promises of globalization while managing its adverse effects, we must learn to govern better, and we must learn how better to govern together". Furthermore, Annan (2000: 13) acknowledges that effective global governance demands more participation of non-state actors in global decision making and more accountability in the management of global challenges. He advises that governments must realise their dual responsibility, firstly towards their own societies and secondly towards the global public good, and contends that "…states are, collectively, the custodians of our common life on this planet—a life the citizens of all countries share".

The United Nations Committee for Development Policy (2014: vi) states that global governance involves the recognition and protection of norms, policies and institutions, used by states and other global actors "to bring more predictability, stability and order to their responses to transnational challenges". Consequently, global governance implies partnerships between global actors, their decisions guided by negotiated rules and policies and their actions aiming to solve issues of common concern.

2.2.2 Diplomacy and Science Diplomacy

Diplomacy, "an elusive concept" and a practice older than the state-centric system in which it operates, is defined by Spies (2018: 8) as "a peaceful and continuous process of communication", which "involves international relations among states or other collectivities on the basis of intermediation, reciprocity and formal representation". Described as both art and practice, diplomacy has for centuries been presented as a core instrument of foreign policy with diplomats spanning geographic space to represent their countries. To this day their main focus is to ensure effective communication and decision-making, to build bridges, to create common ground and to seek consensus which can evolve in formal agreements while representing their governments and people. Diplomacy takes many forms, such as bilateral, multilateral and polylateral cooperation, and is first of all a state-centric social activity because diplomats communicate the identity and interests of their states to the rest of the world. Hurd (2011:585) highlights the importance of diplomacy in the international arena as "the conceptual resources of the international system [being] the structural elements and states [being] the agents, and the practice of diplomacy draws the two together conceptually and empirically".

Twenty-first century diplomacy still comprises a diverse set of practices with state and non-state actors "…increasingly engaged in representation in the context of global governance effort" (Sending et al. 2011:542). It is still a main function of diplomats to create a climate conducive for their governments to reach consensus and sign formal agreements which form part of the international legal framework (Spies 2018: 43-44). However, globalisation and enhanced technological innovation, due to the fourth

Industrial Revolution, result in a greater demand for public diplomacy and effective global governance (Spies 2018: 163). As such, traditional diplomacy has been enriched with the application of new technologies (digitisation), the availability of 'big data'[6] and networks involving the interaction between multiple actors aiming to ensure the effective management of multiple issues. Thus, the twenty-first century is gradually changing the institutional environment in which diplomats and other non-state actors operate, resulting in innovative practices, the deeper integration of the diplomatic arena into society, and the creation of new platforms for non-state actors. These actors most often are highly influential, grassroots connected transnational advocacy groups and non-governmental organisations focusing on issues, such as the protection of the environment, cyber security and trade-related intellectual property (Sending, Pouliot and Neumann 2011:535; Spies 2018: 174).

Meanwhile, environmental diplomacy has since the 1970s become an item on the global agenda and has evolved from predominantly unilateral and bilateral, state-centric cooperation to multilateral conferences. These conferences fulfilled the practical need for multilateral and polylateral cooperation to address issues that are too large in scope for single states alone to handle (Barston 2013: 154). The 1972 United Nations Conference on the Human Environment, (the Stockholm Conference), was the first multilateral conference on the environment attended by delegates from 114 countries. The three parallel NGO meetings held outside the official proceedings created a multilateral platform for two very different groups. On the one hand, NGOs and activists who voiced their concerns and criticism against the pollution caused by industrialisation, and a small group of scientists, who gathered to show their concern over pollution and the irresponsible use of resources on the other hand (Black 2012).

The Stockholm Conference created an opportunity for cooperation between scientists and diplomats, resulted in the establishment of the UN Environment Programme (UNEP) and was the forerunner of many multilateral conferences, such as the 1992 UN Conference on Environment and Development UN (UNCED) in Rio de Janeiro and the 2015 UN Framework Convention on Climate Change (Paris

---

[6] Big data is explained by Hocking and Melissen (2015: 16) as the result of" the sheer growth in the quantity of digital information that is being produced and stored on a daily basis and, crucially, the fast-growing capacity for automated analyses of such data".

Agreement) (Center for International Earth Science Information Network 1972; American Institute for Contemporary German Studies 1998: 4). Grieger (2012) highlights the significance of the Stockholm Conference "…its ultimate success was that environmental policy became a universal concern within international diplomacy, and the conference's motto of "Only one Earth" became iconic for the modern environmental movement. In the run-up to the Stockholm Conference the issue of intergenerational justice was also raised for the first time.

Environmental diplomacy inevitably demands the disappearance of the old divisions between science and diplomacy, as the role of scientists at the multilateral environmental conferences for example indicates. But what is science diplomacy? The Royal Society (2010: 2) defines science diplomacy as the "use of scientific interactions among nations to address the common problems facing humanity and to build constructive, knowledge based international partnerships" (Royal Society 2010: 2). Science diplomacy is not a new phenomenon, but its importance is growing as many of today's challenges have scientific dimensions and require cooperation between countries (Royal Society 2010). The advantage of science is that it is not seen as political and can thus help building trust between countries (Treacy 2015) and provide "alternative channels of engagement" (Royal Society 2010: v). Through this, scientific exchange can pave the way for political dialogue when there are only weak formal relations (Royal Society 2010).

Science diplomacy, broadly described as the direct involvement of scientists in diplomatic endeavours, came to the fore in 1968 when UNESCO held its Intergovernmental Conference of Experts on a Scientific Basis for Rational Use and Conservation of the Biosphere (the UNESCO Biosphere Conference) in Paris. The management of ecosystems as a basic requirement for development in the Third World countries was a core concern of scientists involved in the International Biological Programme (IBP). Their involvement in the UNESCO Biosphere Conference gave these scientists a global platform to play an important role in follow-up international research programmes focused on "…the rational use of natural resources to deal with global environmental problems." (Bernstein 1997: 134-135).

The importance of science diplomacy was emphasised during a meeting in 2009 in the United Kingdom, sponsored by the Royal Society and the American Association for the Advancement of Science (AAAS). Three categories of science diplomacy were identified at this meeting, the first being "*science in diplomacy*", explained as "informing foreign policy objectives with scientific advice" (The Royal Society 2010: vi; Turekian et al 2018). The advice of the delegates to the 2015 science diplomacy summer course, organised by AAAS and The World Academy of Sciences (TWAS), explains the first category: "You can influence policy through scientific collaboration, an awareness of national circumstances, and a careful understanding of how to communicate. Most of all, constant dialogue between scientists of different countries can help make science an important part of how countries work" (The World Academy of Sciences 2015). The second category, "*science for diplomacy*" refers to diplomacy assisting increased international cooperation between scientists, as happened for example after the state visit of President Richard Nixon to the Soviet Union in 1972 which was followed by a variety of agreements on US-Soviet science and technology (Abelson 1972: 701). The third category, *"diplomacy for science"* relates to the contribution of science to improve relations between countries (The Royal Society 2010: vi; Turekian et al 2018). The 2018 science diplomacy courses organised by AAAS and TWAS in Trieste, Italy, involving 45 scientists and government officials from 18 countries, represent the third category (The World Academy of Science 2019).

In practice, the three categories frequently overlap due to multiple needs, purposes and networks created by the cooperation between scientists and diplomats, as Turekian et al. (2018) explain. They decided to add three more categories of science diplomacy which they describe as "actions designed to directly advance a country's national needs; actions designed to address cross-border interests; and actions primarily designed to meet global needs and challenges". They claim that their categories provide more "clarity of expectation and role of agency ownership…which can help produce effective initiatives and coordination" (Tureikan et al 2018). Trade related cooperation between scientists in the pharmaceutical arena and diplomats representing governments who want access to cheaper antiretroviral medicine is an example of the first category. Scientists providing information to support government actions to prevent cross-border infections between animals is an example of the

second category while scientists involved in multilateral environmental conferences represent the third category.

Nevertheless, the Royal Society's state-centric definition emphasizes a positive role of science diplomacy, but neglects questions related to the impact of the unequal global knowledge structure on science diplomacy. Thus, it needs to be asked whose knowledge is deemed relevant and how this impacts science diplomacy. The usefulness of the science diplomacy concept is debated though (Turekian et al. 2018). The difference between conventional science cooperation and science diplomacy is also unclear (Treacy 2015). Some claim that the focus of science diplomacy is on national interests while international collaboration is about the advancement of knowledge (Turekian et al. 2018), Masters (2016: 182) asserts a dual role of science diplomacy in that it "has strategic value in facilitating international relations and advancing science". Furthermore, the multiple goals of science diplomacy are also reflected in the different motives of scientists and diplomats. Scientists' work often transcend national borders, as they are working on common problems and are interested in 'truth', while diplomats are pursuing foreign policy goals (The Royal Society 2010). While this is an oversimplification and the opposite may be the case, questionable is what is given priority in science diplomacy. Additionally, it needs to be asked what constitutes scientific truth (JIAS 2016).

The Royal Society (2010: vi) portrays science as neutral, the basis for exchange of ideas across cultures, religions and nationalities and states that "Scientific values of rationality, transparency and universality are the same the world over". Nevertheless, as Masters (2016) points out, the global knowledge structure is unequal because the Global North is the main producer of knowledge and the Global South is the consumer. The former has the ability to set the agenda and to decide by and large which knowledge and activities are given priority in multilateral institutions. Countries from the Global North may impose approaches that benefit their interests in science cooperation. Therefore, science diplomacy can bring countries together but can also divide them. Annegarn and Swap (2012) identify three types of science diplomacy relationships: *Exploitative* (only the powerful side sets the agenda and benefits), *transactional / instrumental* (local scientists are more involved but not as partners) and *transformational* (shared responsibility, mutually beneficial). Thus, the latter should

inform science diplomacy in order to establish reciprocal relationships and to avoid the imposition of knowledge.

Moreover, the absence of an in-depth examination of science diplomacy and the changing role of technological advancements within International Relations has been pointed out by scholars, such as Krishna-Hensel (2010), who states that "there is as yet no systematic examination within the field of IR as how these changes are going to influence the debates on power, deterrence, diplomacy, and other instruments of international relations". Chasek (2001: 2) also posits that the UN has been the main platform where states can voice their concerns over environmental issues to enable negotiation and agenda setting. However, logistically the United Nations system has posed many challenges in effectively addressing these issues. Subsequently, states have opted to multilaterally and bilaterally negotiate among themselves to overcome issues that directly affect their environment, both nationally and regionally by means of sea, land or air. Yet, power politics and the quest for a hegemonic role in the global arena often force countries to prioritise national interests above cooperation to save the sustainability of planet Earth. Therefore, it will be necessary to conceptualise global environmental governance, as governance relies on diplomacy in order to be affective and address common global issues.

2.2.3 Global environmental governance

Global environmental governance is the result of a growing environmental consciousness and is described by the International Institute for Sustainable Development (IISD) as "the sum of organizations, policy instruments, financing mechanisms, rules, procedures and norms that regulate the processes of global environmental protection (Najam et al. 2006: 3). The UNEP refers to international environmental governance which it defines as "…the continuing process of interactive decision making in international environmental matters. It includes institutions and organizations as well as binding agreements, policy instruments and procedures that regulate environmental protection at the international level" (United Nations Environment Programme 2017: 4).

Since the last decades of the twentieth century, protecting planet Earth has become a main issue on the global agenda and in the normative framework underlying the liberal tradition in International Relations. However, the notion of the need to protect the environment is not a recent phenomenon, but has gradually entered the international area as part of justice based on human rights according to the liberal philosopher, such as John Rawls (1993). He explains justice as fairness, to be found in well-structured, orderly, decent societies where people have human rights, including the right to subsistence which should not be infringed upon by economic development and the indiscriminate use of non-renewable resources. His arguments develop a duality in terms of "sustainable fairness" explained as saving the resources in the natural environment for future generations, but also as protecting the rules, agreements and institutions responsible for ensuring justice and fairness, as explained by (Abplanalp 2010: Xiv).

Nevertheless, environmental consciousness and concern for future generations' ability to have the same access to resources than the current generation, did not come naturally to the arena of international relations, neither in theory nor in practice. The publication of *Our Common Future*, the Report of the Brundtland Commission[7] in 1987, focused the efforts of the international community on the need to protect scarce resources and biodiversity. This commission provided a definition of sustainable development and blamed global environmental problems on "the enormous poverty of the South and the non-sustainable patterns of consumption and production in the North" (United Nations General Assembly 1987).

The result is an increasing gap between the global North and South and is the consequence of insufficient political will and ability which results in what Ludwig and Kok (2018: 5) describe as a "massive implementation gap". Auer (2000: 157) also adds that the complexity of international environmental problems "take many forms and are manifested within and across a variety of natural and human-constructed

---

[7] Published by the World Commission on Environment and Development (WCED), this report was named after the chairperson of the WCED, Gro Harlem Brundtland.

scales and time frames" while Schumacher[8] (1973) warns about the dire future consequences of the destruction of vulnerable natural resources. Despite milestones, such as the Paris Agreement[9] and the agreement on the Sustainable Development Goals of the 2030 Development Agenda, the UNEP warned that the uneven progress and lack of implementation should not be ignored (Ludwig and Kok 2018).

2.2.4 Hegemony

Hegemony, a highly debatable, but core concept in International Relations, originated from the Greek '*hēgemonia' and* denotes the role of a political leader, the ability to control, or to hold the most power (Dirzauskaite and Ilinca 2017: 17). Hegemony thus denotes a leadership position, a position of dominance and the ability of one entity to exercise a certain degree of power and/or influence over another at the national or international level. The hegemon can be a group of states (as was the case with the Greek city-states) or an individual state (Britain in the nineteenth century) with the potential or ability to perform the roles of a leader on either the international or regional level. Hegemony thus denotes a power hierarchy, a hegemonic relationship manifested in the practical relations in ancient times between states and empires. In the international arena hegemony refers to a hierarchical "system of power relations between competing*/or between dominant and vassal*/states" (Boothman 2008: 203). Saull (2017) contends that "the legacy of empire is such that hegemony has tended to refer to political arrangements among the advanced capitalist states, while force, contestation and resistance have been much more common currencies in "North–South relations" since 1945".

---

[8] Schumacher's book, Small is Beautiful (1973) is one of the first major sources on the vulnerability of the earth and the danger of the loss of non-renewable resources. This book preceded other seminal sources on the protection of the environment, such as Peter Haas's (1990), *Saving the Mediterranean: The Politics of International Environmental Cooperation*, and Oran Young's (1994) *International Governance: Protecting the Environment in a Stateless Society.*

[9] The Paris Agreement, signed on 12 December 2015 by the parties to the UNFCCC, aims to "combat climate change and to accelerate and intensify the actions and investments needed for a sustainable low carbon future" (United Nations Framework Convention on Climate Change 2018).

For centuries hegemony has been a main focus in both traditional and critical IR theories, but as Ted Hopf (2013: 319) contends, "The earliest and most prominent theorists of hegemony were predominantly materialist in orientation". Furthermore, traditional IR theories focus predominantly on the positive role of hegemons as is the case in the hegemonic stability theory" (HST) of Charles Kindleberger. A pessimistic view of critical theorists is represented in various approaches, such as the World Systems Theory of Immanuel Wallerstein which focuses on the exploitative hegemonic relations between core, periphery and semi-periphery since the sixteenth century (Saull 2017). Three features most commonly associated with hegemony, are the hegemon's substantial power in comparison to other actors, its ability and willingness to take a leadership role, and being accepted as a leader by other dominant powers in the international arena (consent) (Dirzauskaite and Ilinca (2017: 19).

The sources of hegemony are also a core concern of both traditional and critical theorists. A hegemon relies on its ability to exercise direct or indirect power as determined by the tangible and intangible assets available at its disposal. The (critical) scholars of the Frankfurt School identify three sources of hegemonic power as *open power*, which translates into direct power; *covert power* explained as more subtle or 'soft' power, and *structural power* comprising systems of norms and rules in today's world (Yilmaz 2010: 195). Gramsci explains consent as the source of obedience in hegemonic relationships and argues that ideology serves as the legitimiser of hegemonic power because it mobilises popular consent and thus creates legitimacy for the hegemon (Hunt 1990: 311). The result is an asymmetric relationship characterised by coercion and consent. For Gramsci, "the construction of hegemony was not a one-way process of being imposed from above, but a product of negotiation between the dominant and the dominated…" (Moolakkattu 2009: 44), Robert Cox agrees with Gramsci and adds that hegemony is predominantly linked to the socio-economic characteristics underlying a particular political order. Institutions are created to stabilise and perpetuate a particular order. As Hopf (2013: 320) contends, "Cox is the first scholar to systematically combine material power, ideas, and institutions in a comprehensive theory of hegemony". Cox explains that globalisation impacts on global hegemony by creating a hierarchical world order comprising three groups: the integrated, (dominant group), the dominated (subordinate group) and the excluded (marginalised group) (Moolakkattu 2009:451, 455). Nevertheless, force and

persuasion were the sources of hegemony for realist Machiavelli while Robert Keohane lists two sources for economic hegemony: productivity including the control over capital, and the possession of raw materials (Dirzauskaite and Ilinca 2017: 44).

Escaping from an existing hegemonic order is imperative for critical theorists, such as Gramsci, who suggests the development of a counter-hegemonic ideology to oppose the existing ideology (Hunt 1990: 313). However, Evans and Newham (1998: 221) follow a more pragmatic approach and advise that states in the international system rationally decide how to approach their particular situation and that they position themselves in such a way that they either agree, compete or remain unresponsive to the hegemon's dominant position in the system. For the past few decades, hegemony has become a concept criticised by many IR scholars for its negative association, particularly in a Chinese context where they are apprehensive of hegemony, "always connecting it with oppression and selfishness" (Zhu 2001). Therefore, authors like Islam and Goldstein (2006) who have studied the rise of China, point out that China as a rising power in the international system has two directions to follow: either compete and oppose the hegemonic position of the US to manage the balance of power in the international system or to conform to the norms and structures as institutionalised by the hegemon.

2.3   Theoretical framework

As explained in the first chapter, theory is a crucial component in research as it extrapolates from the complex reality in which we live and simplifies the phenomenon under investigation. As such, theory also "…provides 'lenses' that can be applied to enhance our understanding of the social dynamics of the world we live in" (Olivier, Neethling and Vrey 2015: 39). In this section, a mixed theoretical framework comprising elements of both the liberal and realist tradition will be introduced. Between traditional diplomacy and modern diplomacy, the latter with its stronger focus on the involvement of new actors addressing new issues alongside states, lie neoliberalism[10] "Going green" and issues relating to the role of institutions in global environmental

---

[10] Neorealism was introduced in 1979 by Kenneth Waltz in his book *Theory of International Politics.*

governance are fairly new trends within the study field of IR. However, the issue of the impact of power politics and the quest for hegemony on cooperation between states have been longstanding issues in the international relations environment for a very long time.

2.3.1 Neorealism versus Neoliberal Institutionalism

The neorealism versus neoliberal institutionalism debate has been prevalent in the study field of International Relations for many years and has largely revolved around the ontological and epistemological differences relating to issues of the state of anarchy, how cooperation exists (or lack thereof) and the meaningful roles of institutions as opposed to state sovereignty and individualistic state-centrism.

Pessimistic about human nature and highlighting the anarchic structure of the international system where competition and conflict between states are unavoidable, neorealists deny the ability of institutions to change the behaviour of states. Neorealists are mainly concerned with the sovereignty of states, international power relations, the power games between states, the type of balance of power system resulting from these games and hegemony. Neorealists argue that a dominant, hegemonic state ensures stability in the anarchical international system when the hegemon is allowed to assert its power over other states through institutions, such as the UN, by means of formulating rules to ensure cooperation and stability (Haynes 2011: 125). This argument is supported by the tense relationship that currently exists between the USA and China, as China aims to illustrate its assertive behaviour in the Southeast Asian region for its aspirations of taking the hegemonic position from the USA. Moreover, for neorealists the main purposes of rules and treaties are to regulate and manage the power relationships among states. Sovereignty, the main norm legitimising international behaviour according to neorealists, also legalise behaviour and the dominant position of states in the international arena and serves as a guidance device for states in global environmental governance.

For neorealists, international organisations, such as the UN, are not independent actors, because they only serve limited roles either as instruments in the hands of dominant states or as 'talk shops', arenas where states deliberate. As Clive Archer

(2001: 73) explains "Arenas in themselves are neutral; they can be used for a play, a circus or a fight". Ultimately, due to their structural-functional features, these multilateral fora support and legitimise the existing international order which is based on the unequal relationship between the states. Mearsheimer accuses neoliberal institutionalists of avoiding the reality of the barriers to cooperation in the international arena and argues that "given the limited impact of institutions on state behaviour, one would expect considerable scepticism, even cynicism, when institutions are described as a major force for peace" (Mearsheimer 1994/95: 47).

In contrast, for liberals in general and neoliberal institutionalists in particular, humanity inherently wants to cooperate despite the anarchic nature of the international system. Institutions have thus become core instruments for stabilising the system. As Robert Keohane, main proponent of neoliberal institutionalism, explains, cooperation is enabled by institutions, such as the UN, because states usually "respect international formal and informal rules and regulations, and work together for mutual beneficial courses of actions" (Islam: 2009). Institutionalised interactions to improve relations between states as the dominant actors in the international arena is therefore a core concern of the neoliberal institutionalist who argue that states can reach agreements within the framework provided by institutions (Collins 2012). Robert Keohane (1984: 51) maintains in his book, *After Hegemony*, that cooperation can exist in an international system where states often have opposite, even conflicting policies and advise that states should rather opt to negotiate to coordinate their policies. Stein (2008: 208) describes neoliberal institutionalism as "a view of international institutions as the self-interested creations of states", but also contends that these institutions often are created by states to avoid unilateral, self-interested decision making which can cause conflict. Keohane and Martin (2005: 42) acknowledge that power politics most often determine the nature and functions of an international institution such as NATO and that bipolar relations comprising conflicting goals limit the ability of institutions to fulfil meaningful roles. Nevertheless, institutions "…make commitments more credible, establish focal points for coordination, and in general facilitate the operation of reciprocity" (Keohane and Martin 1995: 42). The UN is often cited by neoliberal institutionalists as an example of a formal manifestation of the goal of states to cooperate while international regimes, with their focus on principles and norms as

the basis for rules and institutions, are key examples of informal manifestations of cooperation between states.

The emergence of new environmental norms since 1972 had given rise to not only North-South deliberations, but also to an ideological shift away from the securitisation of the global arena to the responsibility to address growing environmental concerns (Bernstein 2002: 2-3). In addition, the role of international institutions has increased since these institutions restructure and revitalise eco-friendly norms and strengthen multilateral cooperation and science diplomacy. Neorealists and neoliberal institutionalists agree that a state's national interests, and not the intrastate norms or norms within international institutions should motivate cooperation between states. Yet, it is the liberal environmentalists who finally drew the focus away from traditional issues centred around sovereignty to the environment.

2.3.2   Liberal Environmentalism

In recent times, the need for international cooperation between states have escalated, especially in the field of environmentalism. Many scholars focus on how sovereign states interact with one another from an economic and security point of view and often overlook the impact of these intricate relationships on the natural environment. Underlying the commitment to protect the environment is the conviction that "…as the international community pays more attention to environmental problems, responses will move slowly toward a more ecological understanding of our world and humankind's place in it" (Bernstein 1997: 2). Ecological thought is immersed in dealing with issues of "anthropocentric" policies that place nature's existence beneath human progression and economic development (Haynes 2011: 204). Liberal environmentalism deals with the way in which states can prioritise nature in such a way that humanity's relationship with nature can be strengthened through cooperation for the sustainability of present and future generations. Furthermore, there is an important link between environmental protection and the maintenance of the liberal international economic order (Bernstein 2002: 1).

Liberal environmentalists also prioritise the normative role of institutions and contend that institutions must also be norm entrepreneurs, prioritising the values and

norms that will ensure changing policies to ensure the protection of the environment (Bernstein (2002: 17) Norms are thus essential within governing frameworks, as governance allows for various states to align their common ideals and objectives (Rosenau 1995). Three major international events related to the environment shaped a new "norm complex" that transitioned into liberal environmentalism and also strengthened the impact of environmental norm entrepreneurs on the global agenda. The first event was the UN Stockholm Conference, the second was the World Commission on Environment and Development (WCED) in 1987 and the third was the UN Conference on Environmental Development (UNCED) in 1992 (Bernstein 2001: 109). Bernstein (2002: 1) points out that "the norms of liberal environmentalism predicate international environmental protection on the promotion and maintenance of a liberal economic order".

Nevertheless, states, as rational units, are still considered to be the main actors conducting their competitive relations and their interaction with international institutions driven by their need to maximise "absolute gains" (Haynes 2011: 525). Yet, global environmental concerns have caused a transcendence beyond the domain of power politics and national security concerns to the global environment. This 'new' issue area requires a multidisciplinary approach and a long-term focus (Haynes 2011: 467). These new concerns emphasize the importance of the role of international institutions, such as the UN, to strengthen cooperation among states by means of science diplomacy. The final ingredient in the development of the theoretical framework in this chapter comes from social constructivists with their focus on intersubjective norms as the core ingredients of actions.

2.3.3 Social Constructivism

The juxtaposition between what we feel when making the choices we do and rationality, can often be confusing as we tend to experience feelings and reason as one and the same thing. However, our attributes and emotions often play a key role in determining the outcome of a political decision, as it outlines the motives behind any decision. It is by analysing human and collective decisions which permits us to transcend the ontological and epistemological truths that the state is a single actor within the global system, thereby disregarding the intrastate units whose opinions and

actions often shape the outcomes of what we understand a state's foreign policy to be in a particular setting in time.

Social constructivists, such as Adler, Finnemore and Sikkink, are interested in understanding the dynamic relationship between structure and agency; the underlying norms and institutions that inform the way decisions are made; they accept that personal interests of international actors play a role in the international arena and aim to analyse these interests to explore how they are constructed (Haynes 2011: 214). Therefore, this theory explains what encourages states to align their national interests to establish communities of intersubjectivity (Jackson and Sørensen 2013: 218-219). Finnemore (1996: 128) suggests that identity and national interest often explain a state's actions, which are then understood through the "norms of behaviour embedded in international society". Finnemore and Sikkink (1998: 893) contend that it is not only important to analyse the shared norms between states, but also the intrastate norms since many of the underlying norms within the current web of multilateral institutions, such as the UN, have developed from the states who have constructed the world order to inevitably "shape national policies by 'teaching' states what their interest should be" (Finnemore and Sikkink 1998: 888).

Hopf (1998: 181-199) points out that it is in the best interest of states to pursue "communities of intersubjectivity in world politics, and domains within which actors share understandings of themselves and each other, yielding predictable and replicable patterns of action within a specific context". Hence, it is therefore understood that common norms, identities and ideas create the foundation for cooperation and that the international arena is viewed as an "intersubjective social context" Hopf (1998: 173). These ideas and norms shape the international system (the structure) which in turn determines the behaviour of the various actors (the agents).

The agency-structure debate has been ongoing for many decades and is finding relevance again in the twenty-first century. Walter Carlsnaes (1992) has attempted to redress the way in which we perceive a long-standing issue in the philosophy of social sciences: The intrinsic relationship between agency and structures. Carlsnaes (1992) discusses the agency-structure debate in the framework of foreign policy analysis and explains this framework in a way that highlights its social ontological underpinnings by

debating the "interplay over time which exists between agency and structure". He argues that policy-makers, through their choices and their actions, take part in institutionalising the structures which both empowers and restricts their subsequent actions. Onuf (2011: 80) also argues that society is constructed by the agents who form it into its own distinctive character and in turn redefines the agents over time as changes occur in the global environment. Transnational advocacy groups and international organisations are actors involved in the spreading of norms (Balaam and Dillman 2019: 105, 107).

Social constructivists contribute two important views to this study. The first concerns global environmental governance and the conceptual tools they identify as crucial for the inclusion of issues on the global agenda, such as framing, "a process of defining what the essence of a global issue is, what is causing it, who is involved, what its consequences are and what the best approach to addressing it is" (Balaam and Dillman 2019: 100). The second view relates to the perception of countries of one another and the way they represent these perceptions. As Chengxin Pan (quoted in Balaam and Dillman 2019: 114) explains "Ultimately the representation a country makes of another is never fully objective: rather, it reflects the self-imagination, desire, and power of the country making the representation".

2.4   Conclusion

This chapter highlighted the concepts and theory-praxis nexus relevant to this study as it explained parallel evolutionary processes resulting from IR theory attempting to fulfil its most basic functions, that of providing a basic framework for analysis and lenses for understanding and explaining global governance, diplomacy and hegemony in the international relations arena from 1945 until the twenty-first century. The conceptual framework clarifies the status and roles of states, international institutions and non-state actors in the global arena, and also the norms underlying the decisions and actions of these actors. Clearly, globalisation changed 'international' into 'global' and contributed to the importance of science diplomacy and global environmental governance.

This chapter also created a theoretical framework while exploring international cooperation, hegemony and environmental-related norms from the neorealist, neoliberal institutional, neoliberal environmentalist and social constructivist perspectives. It found that neorealism and neoliberal institutionalism provided a theoretical platform for the hegemonic-driven relationship between the USA and China while the UN is overwhelmingly limited to the roles of instrument and arena. Liberal environmentalists highlighted the environment as an issue area for the cooperation between states, while social constructivism added a new approach to norms as determinants of identity and actions. Yet, power politics and the quest for hegemony, as represented in the relations between and perceptions of the leaders and publics of the USA and China, drive the decisions in the South China Sea and outer space and are twenty-first century manifestations of neorealism which are key concerns linked to chapter 3 and its various themes.

Chapter 3

THE ENVIRONMENTAL IMPACT ON THE TWO GLOBAL COMMONS:
SOUTH CHINA SEA AND OUTER SPACE

3.1 Introduction

This chapter addresses the question of whether the existing global governance structures are able to manage the environmental challenges created by space debris, coral reef destruction and over-fishing resulting from the actions of China in this area to assist its quest for hegemony. Various themes will be outlined, discussed and triangulated to provide the reader a more concrete understanding of environmental issues in the twenty-first century.

As mentioned in the first chapter, the 1992 UN Convention on the Law of the Sea (UNCLOS) and the 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space are the two international agreements that regulate the actions of states in the oceans and outer space. These two agreements outline the parameters of what states are entitled to as codified by the states who have ratified the agreements. These two agreements are also the manifestation of the global environmental governance regime as indicated in the previous chapter. The geopolitical situation in the South China Sea is multifaceted and complex, given the tension between the multiple countries involved, each adding their own national interest to the playing field. The deterioration of the coral reefs in the South China Sea and the drastic increase in over-fishing call for a dynamic revaluation of the current governance practices.

Moreover, space-based technological advancements have gradually become a significant part of our daily lives and space exploration has since the onset of the twenty-first century increased significantly as a result of the status it gives to a country and its impact on development. As Poulssen (2016: 2) explains, "the day that humanity first reached outside its thin atmosphere was also the day that outer space became a subject of international politics". Outer space has become a new theatre for cooperation and competition in international relations, both as a military arena and an

arena for peaceful cooperation. The focus of this study lies with the peaceful uses of outer space and in particular, space security relating to space debris and the effective management thereof, in short, the governance of outer space. As the growth in technological debris exponentially increases, the likelihood of debris collisions with functional satellites and spacecrafts also increases. Moreover, despite institutional and legal attempts to govern outer space, such as the Committee on the Peaceful Uses of Outer Space (COPUOS)[11], created by the United Nations General Assembly in 1959 and the Outer Space Treaty[12], concern increases about the ability to deal with the various issues in space which may inevitably result in the unsustainable functionality of the Low Earth Orbit (LEO).

3.2 Setting the Stage in the South China Sea

3.2.1 The Nine-Dash Line

The disputes in the South China Sea involve a string of sovereignty violations in an environment of disputed territorial claims from multiple countries in the region. In 1948, the Chinese government published a map in a scattered out U-shaped line to indicate its positionality and claim in the South China Sea (Keyuan 1999) which then became known as the Nine-Dash Line. This map reappeared in 2009 (Table 1) when the Chinese government addressed a *note verbale* to the UN outlining its concern over Vietnam and Malaysia's Joint Submission to the Commission on the Limits of the Continental Shelf, stating their "indisputable sovereignty over the islands in the South China Sea and the adjacent waters, sovereign rights and jurisdiction over the relevant waters as well as the seabed and subsoil thereof" (United Nations General Assembly 2009). China's claims are, however, not within the lines of international practice as the

---

[11] UNCOPUOS "The Committee has two subsidiary bodies, the Scientific and Technical Subcommittee, and the Legal Subcommittee, both established in 1961" (United Nations Office for Outer Space 2019).

[12] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies 1966. UN Office for Outer Space Affairs (UNOOSA) UN General Assembly. Resolution 2222 (XXI). (United Nations. General Assembly 1967).

claims over the submerged reefs cannot be considered as sovereign claims as they do not follow the definition of land territories according to UNCLOS (Austin 2015).

China's sovereignty claim in the South China Sea was therefore not recognised by the international community under international law of the Convention, as this claim would account for "about 85.7 percent … equivalent to 3 million square kilometres of the 3.5 million square kilometres total surface area of the South China Sea" (Carpio 2017). Moreover, the discovery of large quantities of oil and gas in the South China Sea has resulted in the increase of territorial claims from multiple countries Tønnesson (2001)[13]. Subsequently, the Philippines submitted a case to The Hague under Annex VII of the Convention on the Law of the Sea, objecting China's claims in the South China Sea.
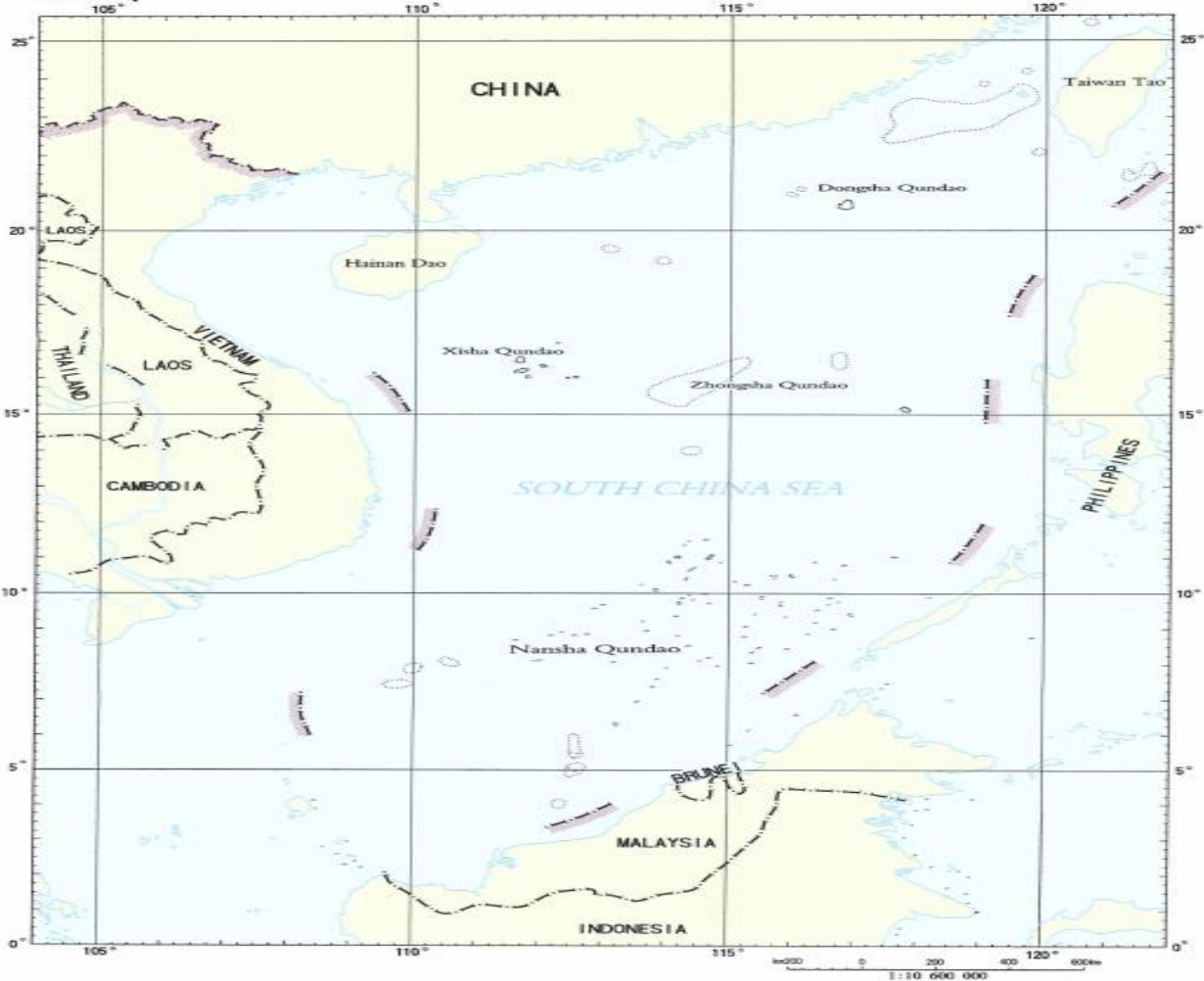
Source: United Nations General Assembly (2009)

---

[13] Countries have full sovereign rights over the marine resources (for example fish, oil and gas) within 200 nautical miles of their territory (The Lowy Institute for International Policy 2019).

3.2.2 The Ruling of the Permanent Court of Arbitration

The UN Convention on the Law of the Sea[14] came into effect in 1994 and was established to provide member states clear guidelines to settle disputes relating to the ocean of which all the countries that have laid claims in the South China Sea are parties to. The ruling made by the Permanent Court of Arbitration to disregard China's claims over the Scarborough Shoal in favour of the Philippines is one of the most significant decisions made in the past few decades, as it challenges the authority of China, one of the permanent members on the Security Council of the UN (Leavy 2017: 241).

Prior to the ruling, China's Ministry of Foreign Affairs released a statement in 2014 on its position regarding the jurisdiction of the Tribunal on the matters of the disputes between the states involved (China Daily 2014). The Tribunal responded in 2015 by indicating that consistent with UNCLOS under Article 288, "in the event of a dispute as to whether a court or tribunal has jurisdiction, the matter shall be settled by decision of that court or tribunal" (United Nations General Assembly 1982). Subsequently, the Permanent Court of Arbitration (2016) reviewed the claims and after examining Annex VII of UNCLOS, concluded that "there was no legal basis for China to claim historic rights to resources within the sea areas falling within the nine-dash line".

3.2.3 China's Island Building Initiative

Before China started its elaborate project to dredge and build artificial islands in the Spratly Islands on top of existing coral reefs, the coral reefs had already shown signs of distress. The building of islands by China in the Spratly Islands by dropping gravel and sand on coral reefs, has expanded to account for approximately thirteen square kilometres which inevitably erodes and extinguishes the coral reef and the habitat for thousands of species (Asner et al. 2017).

---

[14] This Convention comprises 320 articles and nine annexes. It governs "all aspects of ocean space, such as delimitation, environmental control, marine scientific research, economic and commercial activities, transfer of technology and the settlement of disputes relating to ocean matters" (United Nations Oceans & Law of the Sea 2018). .

By 2013 China initiated its island building program with the intention to strengthen its grip on the region and to advance its sovereign rights in the South China Sea (Carroll 2017). The Permanent Court of Arbitration (2016) concluded that China has gone against Article 192 and 194 of UNCLOS stating that China's building of artificial islands "has caused severe harm to the coral reef environment" and has "violated its obligation to preserve and protect fragile ecosystems and the habitat of depleted, threatened, or endangered species".

3.4 Working Group in the South China Sea

In 2017 the CSIS created a working group comprising experts in the field of the natural environment, law and policy analysts and expanded the current understanding of the multitude environmental issues in the South China Sea. These experts do not seek to achieve any particular political outcome from the states involved in the South China Sea, but rather to seek "consensus on realistic, actionable steps that claimant states and interested parties could take to boost cooperation and manage tensions at sea" (Centre for Strategic and International Studies 2018). The members and experts of the working group was chosen as a regional effort and has, since its inception, successfully drafted two agreements which they consider to be a representation of the most effective solution to manage the territorial disputes and resource sustainability. The two agreements include the Code of Conduct in the South China Sea and the effective management of fish stocks with environmental cooperation at its core purpose.

3.4.1 Code of Conduct for the South China Sea

The action to start the dialogue of cooperation in the South China Sea only came about when the Arbitral Tribunal at The Hague ruled against China's territorial claims. Soon after in 2017, the ASEAN member states and China recognised the need to institute a framework on the Code of Conduct in the South China Sea which would "facilitate the work for the conclusion of an effective COC on a mutually-agreed timeline" (ASEAN 2017: 43). Both Le Luong Minh, former Secretary General of ASEAN, and Vivian Balakrishnan, former Foreign Minister of Singapore, made reference to the vision of

the framework which would aid with future dialogues in the event of disagreements in the South China Sea and that the framework is "an important document because it represents, in a sense, consensus and more important than that, a commitment on behalf of the 10 ASEAN states and China to make progress on this long overdue issue" (Dancel 2017). It is, however, important to note Le Luong Minh's concern regarding the framework not being legally binding as anticipated by the member states of ASEAN.

3.4.2 Managing Fish Stocks and Implementing Environmental Cooperation

The exploitation of fish resources in the South China Sea is a major issue which has placed substantial pressure on sustaining the already depleting fish stocks. In 2017 the South China Sea Expert Working Group estimated that the "total fish stocks in this area have been depleted by 70-95 percent since the 1950s" (Centre for Strategic and International Studies 2018). The use of cyanide and dynamite destroy coral reef which can according to Somalia and Cheung (2015) result in a 50 percent decline in key fish stocks by 2045. Article 123 of the UNCLOS (United Nations 1982) mandates that "states bordering […] a semi-enclosed sea [like the South China Sea] should cooperate with each other" especially in the areas concerning the protection of the marine environment and management of fish stocks. Therefore, the Centre for Strategic and International Studies (2018), highlights the importance of an effective management working document in order to sustainably manage fishing stocks. To this effect, it would not focus on the overlapping claims submitted by all the neighbouring countries, to which the fish have no understanding of territorial sovereignty, but rather focus on the critical numbers of the depleting fish stocks in the South China Sea.

3.5 Knowledge from Scientists: Environmental Impact in the South China Sea

Coral reefs create a diverse and habitable environment for thousands of species, yet they are one of the most vulnerable and susceptible ecosystems continually being threatened by actions, particularly in the South China Sea. The growing population in the region, over-fishing and the building of artificial islands also provide a real threat for the sustainable management of the coral reefs and in the South China Sea. It is estimated by marine biologists that approximately 16200 hectares of coral reefs have

been destroyed by human activities, accounting for up to 10% of the total reefs in the South China Sea (Rathi 2016). Over-fishing in the South China Sea is largely driven by the growing domestic demand for seafood as a vital resource for food security and with the growth in population over the past few decades. According to the World Bank, the Southeast Asian region and China compromise for roughly a quarter of the world's population (The World Bank 2019). Moreover, the types of harmful fishing techniques, such as bottom trawling and the use of explosives and poisonous substances, present a real challenge to coral reefs in the South China Sea (Vo et al. 2013).

In order to produce empirical and objective findings regarding the effects of a state's actions on the natural environment, states are requested under part 12 of UNCLOS (1982) to "observe, measure, evaluate and analyze, by recognized scientific methods, the risks or effects of pollution of the marine environment", which are then to be published or reported to international multilateral organisations for discussion the output of the data collected.

3.6 Setting the Stage in Outer Space

Outer space has been an arena for rivalry between the USA and the Union of Soviet Socialist Republics (USSR, Russia after 1991) since the launch of Sputnik in 1957 and the creation of the International Space Station (ISS) with the aim to enable cooperation between space-faring nations (Poulssen 2016: 1). Founded in 1956, China's space program only took off after 12 years when the country successfully launched its first satellite on 24 April 1970, thus becoming the fifth country, after the Soviet Union, USA, France and Japan to succeed in outer space (Kulacki and Lewis 2009: 4). After American President Roland Reagan's "Star Wars" speech in March 1983, China decided to refocus its national development plan by including science and technology (Kulacki and Lewis 2009: 21-22). Thus, "fear of falling behind was a much more powerful motivation than a sense that the party might improve its standing by launching satellites and astronauts into space" (Kulacki and Lewis 2009: 31). its first launch of a man-operated spacecraft in 2003, China became "the world's third most prominent spacefaring nation" behind the US and Russia (Harvey 2004: 291).

Similarly, the USA's space program has also started to take form after the launch of Sputnik which led to the establishment of the National Aeronautics and Space Administration (NASA) in 1958. Numerous developments have transpired after the end of the Cold War, such as changes from a bipolar to a more multipolar balance of power as new challenges and opportunities arose, such as China's economic growth; the ratification of UNCOPUOS by more countries; the increased focus of countries on technological advancements; and the environmental impact of these new developments. Subsequently, the General Assembly advised states in 1991 to be more focused on "the protection and the preservation of the outer space environment" and pay specific attention to the issues of collisions caused by space debris (United Nations General Assembly 1991: para 23-24).

3.6.1 Definition of Space Debris

With the proliferation of space technology, it is important to clarify 'space debris'[15]. In the thirty second plenary session, the Scientific and Technical subcommittee of the UNCOPUOS released a definition, shortened by the Inter-Agency Space Debris Coordination Committee, to define space debris as "all man-made objects including fragments and elements thereof, in Earth orbit or re-entering the atmosphere, that are non-functional" (Inter-Agency Space Debris Coordination Committee 2007).

3.6.2 International Court of Justice (ICJ)

The ICJ determined in an advisory opinion that the legality of the actions of a state lies not only in the encroachment of other states' rights, but also in the impact these actions may incur on the environment, stating that "the environment is not an abstraction but represents the living space, the quality of life and the very health of human beings, including generations unborn. The general obligation of states aims to ensure that activities within their jurisdiction and control respect the environment of other states or

---

[15] The US makes the distinction between "Space Debris" and "Orbital debris", where the latter refers to any type of man-made object in Earth's orbit and the former referring to a broader range, which may include both man-made objects as well as natural objects, such as meteorites (The White House 1995).

of areas beyond national control are now included in the corpus of international law relating to the environment" (International Court of Justice 1996: 241-242).

3.7 UNCOPUOS Working Group on the Long-term Sustainability of Outer Space Activities

UNCOPUOS is divided in the Legal subcommittee and the Scientific and Technical subcommittee. One of the key focus areas of the UNCOPUOS is the long-term sustainability of outer space activities which comprises issues relating to space debris, in particular the space debris mitigation guidelines. While international laws were being formulated for Outer Space, the UNCOPUOS substantially expanded its knowledge from the laws, guidelines and regulations of other global commons, such as the laws of the sea (Quinn 2008).

The UNCOPUOS working group is one of the only global platforms that develops the principles and laws which govern outer space activities through a process of absolute agreement from all the member states. This creates a sense of legitimacy which fosters international cooperation, however, as a result of the type of consensus required, the negotiation process often stagnates and may have led to the unsuccessful institutionalisation of binding norms since the formation of the five outer space treaties (Lyall and Larsen 2009). Until 2010, issues of space debris and mitigation were limited to the subcommittees of COPUOS. After various discussions on the importance of shifting the agenda to address environmental degradation, the UNCOPUOS founded the working group on the long-term sustainability of outer space (Martinez 2018).

The Working Group's objectives are to analyse the current space debris growth and make recommendations to protect the future and peaceful use of outer space in such a way that it will build both cooperation and promote free and fair access to all states. Furthermore, they have the responsibility to "consider current practices, operating procedures, technical standards and policies associated with the long-term sustainability of outer space activities throughout all the phases of a mission life cycle" (Martinez 2018). The scientific and technical subcommittee of COPUOS subsequently instituted four expert groups which brought in the expertise of scientists and policy and

legal analysts from the member states who are part of the COPUOS. In the COPUOS, various diplomatic consultations and mediation take place in order for member states to agree on, and consent to, the protection of the outer space environment and the complexities relating to sustainability (Martinez 2018). It is important to note that while the negotiations take place, the expert groups provide the working group with insights and guidelines obtained from data and experiential exchange between the experts and scientists from the various countries involved. Martinez (2018) points out that the expert groups have "proved successful [results] and has subsequently been used as a model for COPUOS to organise its work in the consideration of other topics".

Therefore, scientists and experts provide the pragmatic know-how of the issues relating to space debris. As pointed out by scientists such as Donald Kessler (1991), the issue of space debris incidents involving multiple fragment objects, also known as the Kessler effect, could lead to the unsustainable and inoperable use of the Low Earth Orbit (LEO). Since the UNCOPUOS released its Technical Report on Space Debris in 1999, they have made it implicitly clear that the present level of space debris has the potential to create a dangerous environment to both existing spacecrafts and satellites in Earth's orbit as well as to life on earth, should the debris survive the re-entry following a high increase in atmospheric temperatures (United Nations 1999).

3.8 The Inter-Agency Space Debris Coordination Committee (IADC)

In 1989 the Bush Administration released a new national space policy, reiterating that the American government "[…] will encourage other space-faring nations to adopt policies and practices aimed at debris minimization" (Marshall Institute 1989). This policy inspired the establishment of working groups between NASA and other space organisations from various states, which resulted in the formation of the Inter-Agency Space Debris Coordination Committee (IADC) (NASA Orbital Debris Program Office 2007). The IADC was created in 1993 to transfer the collected data on space debris to the Scientific and Technical Subcommittee. It comprises of a Steering Group and four working groups: Measurements; Environment and Database; Protection; and Mitigation. The guidelines of the IADC served as the foundation for the formation of the debris mitigation guidelines of the UN. The guidelines comprise of four aspects: limiting debris released during normal operations, minimizing the potential for on-orbit

break-up, post mission disposal, and prevention of on-orbit collision (Inter-Agency Space Debris Coordination Committee 2007). Given these set guidelines, which were developed in order to protect the sustainability and use of outer space, it is questionable whether or not these guidelines provide any form of deterrence for states to continue conducting unsustainable and harmful activities in outer space.

3.9 US-China Rivalry: Challenging the Dominant Hegemon

China has been clear that they aim to restore their economic, technological and political position in the international system (Senate Select Committee on Intelligence 2019) and develop its "core interests" which aims to conserve the control held by China's Communist Party, by protecting China's "sovereignty, territorial integrity and national unity" and to sustain development and economic growth.

3.9.1 South China Sea

For many decades the US has dominated both the Southeast Asian region with its close ties to key role players in the region, such as Japan. The power of the US is, however, being challenged by emerging super powers such as China, shifting the balance in the international system from a unipolar to a multipolar order, creating complex relations between the US and China. Since the onset of China's construction of artificial islands, the US has over past few years exercised its rights under UNCLOS to freely navigate the South China Sea, not exceeding 12 nautical miles, stating that "[…] The United States will fly, sail and operate wherever international law allows, as we do all around the world" (Rosenberg 2015) and thereby challenging China's position and control in the region.

In *The Clash of Civilizations*, Huntington (1996) was concerned about the future clash between nations which is observable today with regards to the power dynamics between states, especially that of the US and China. Since the ruling of the Permanent Court of Arbitration, the USA has subsequently placed much emphasis on shifting its foreign policy objectives towards China. The USA has been actively involved in Southeast Asia through its trading blocks in the region and its efforts in transforming

the political structure in the region to one that follows a more liberal and free-trade system (Ikenberry 2014).

China's exponential growth is slowly taking away the US's sole hegemonic role in the region, creating an unclear feature of Southeast Asia and China's role as a rising hegemon in the region and its relations with other Southeast Asian countries (Ikenberry 2014). It is interesting to note that the United States has increasingly involved itself in the disputes considering that they have not made any claims in the South China Sea, but rather due to their close ties with the Philippines and Japan as well as to the security of their national interest (Council on Foreign Relations 2017).

3.9.2 Outer space

Ratified by approximately one hundred UN members in 1967, the Outer Space Treaty was created to ensure that the extra-terrestrial environment of Earth and the LEO, in particular, was exploited peacefully and sustainably (Doel 2003). With the possibilities of space exploration and outer space being codified by the UN as a global common, its use has ever since been exploited for the advancement of national interest and development at the detriment of the natural environment.

China tested its newly innovated anti-satellite missile technology in 2007 thereby communicating two statements to the international community: China is positioning itself as a key space actor and issues relating to space debris are imminent (Quinn 2008). This test, however, was disapproved by China's US counterpart speculating that the "the deliberate destruction of a satellite in a highly used orbit, creates mass quantities of space debris that will remain a global danger for decades […]" (Hitchens 2007). In 2002, China, as a member of the IADC, recognised the space debris mitigation guidelines of the IADC, prior to the testing of the ASAT, yet did not comply with the objectives and purpose of what these guidelines stood for.

This year marks fifty years since the US has positioned its dominant stance in the international arena by displaying its technological capabilities when Apollo 11 landed on the moon in 1969. China is now challenging the USA's global hegemonic

dominance when they successfully landed their own lunar probe, Chang'e-4, on the far side of the moon at the start of 2019 (Cobb 2019). Cobb (2019) points out the potential environmental dangers in outer space that could be caused by a growing tendency towards a new space race between the US and China.

3.10 Conclusion

The start of an already observable geopolitical shift in the international arena, from a predominantly US-centric order to one that is being challenged by countries such as China, is causing a slow, but continuous restructuring of the current international order. As indicated in chapter 2, the hegemonic domination of the US has portraited a clear indication of neorealist tenets as well as Gramsci's argument that, in the case of the US, ideology was and still is an instrument to gain consent. Neorealism is further evident when considering China's resistance towards being dominated in its efforts to compete for hegemonic domination for the balance of power between these two powerful states.

This chapter has made it clear that states do not enter legal-binding agreements that would restrict its sovereignty and have an impact on its national interests. Therefore, neither the existing international treaties of the ocean and outer space, nor the guidelines drafted by working groups, provide a sound framework for the effective management of the two global commons to prevent a tragedy of the commons. Therefore, it calls for a revaluation of the foundation, legitimacy, laws and success of the international institutions who are responsible for governing the global commons in a system with no single authority. This chapter has also outlined the importance of sustainability and cooperation since the 1972 Stockholm conference as key tenets of liberal environmentalism, mentioned in chapter 2.

CHAPTER 4

CONCLUSION: REVIEW AND RECOMMENDATIONS

4.1 Introduction and Rationale of Study

This chapter provides a summary of the key findings in the preceding chapters and will also provide suggestions on areas of further investigation on international agreements and norms. There are several motivations that prompted this research. These include the close link between the foundation of international agreements of the ocean and outer space; the relationship between the ocean and outer space regarding the lack of established borders as a result of common spaces; questions about the effectiveness of international agreements to address common problems; and the increased role science and scientists play in the diplomatic arena to enable mediation for cooperation to exist. The study, therefore, did not seek to investigate the militarisation of the South China Sea or outer space, although this may also impact the environment.

4.2 Summary of the Key Findings

Chapter 1 presented the background to the tense environment experienced in the South China Sea as a result of the various territorial and maritime claims as well as the growing interest in the exploration of outer space. The literature review made it possible to categorise and isolate the purposive sample of literature which focused on the various issues relating to the Tragedy of the Commons and the way in which the two global commons were managed, allowing to extrapolate the different, reoccurring themes from the samples utilised.

Since the end of the Cold War, the world entered a new era of unipolarity with the USA as the sole superpower, setting the agendas and norms of the global arena and its institutions. However, the USA's global presence and authority is continuously being challenged by countries such as China which is increasingly becoming more powerful and influential. Therefore, the world is currently facing a shift in the geopolitical dynamics of the global system as mentioned in chapter 3, which has also

outlined the importance of finding new and effective resolutions to solving the issue of environmental degradation in the two global commons. Along with this paradigm shift, chapter 2 outlined the transition from international governance to global governance with the onset of new emerging state and non-state actors performing important roles in the diplomatic arena to address the issue of degradation in the two global commons.

The change to a multipolar order is characterised by increased diplomatic interaction between various states to collectively address a plethora of common globalised issues. As part of the globalised issues, this research investigated the extent of environmental degradation in the South China Sea and in outer space as well as to determine how science diplomacy can provide the vehicle for negotiations and objective knowledge sharing within multilateral organisations to overcome the environmental challenges confronted by the two global commons to ultimately improve the current environmental governance practices. It is, however, recommended that since governance is often associated with multilateral actions executed within multilateral institutions, more focus is required on bilateral commitments and agreements in support of global governance.

Chapter 2 therefore provided a detailed theoretical framework for understanding the current relationships between states in the international arena and how cooperation is perceived. The insights of Robert Cox were put into practice in different sections of this study. Cox (2010) maintains that it is crucial "not to cling to one theory to explain what happens in the world", therefore the mix of different theoretical approaches in chapter 2 serves to provide a stronger theoretical framework for the assessment of China's actions in the South China Sea and in outer space.

In May 2017, President Xi Jinping announced the establishment of an international coalition for green development during his speech on the Silk Road Economic Belt (Jinping 2017). Bilateral and multilateral cooperation and the protection of the environment features strongly in President Xi's foreign policy, however, over the past few years, China's actions in the South China Sea resulted in the degradation of the natural environment, despite the international legal frameworks formulated by international organisations such as the UN. Similarly, the scientific advancement of outer space exploration has provided China and the USA, in particular, the opportunity

to develop their strategic position in the international arena, but their space exploration has in the process created technological pollution in earth's orbit in spite of the guidelines to prevent space debris as outlined by the Committee on the Peaceful Uses of Outer Space (UNCOPUOS).

Today, the USA is faced with the challenge of using soft, hard and smart power in the attempt to manage its relationship with China and its rising power in the international system. As discussed in chapter 3, the US is perceived by the international community to be on a path that will allow more actors to take a position on the centre stage. China is now ready for the world to embrace its vision and to display its desire to have "more influence, more respect and more space" (Sun 2015). This is further reinforced by China's intention to restructure the global institutions to reflect the norms and values present within their own communities and cultures (Prakash 2017) as identified within the social constructivist theory.

Diplomacy is a centuries old practice and an important instrument in the communication of a state's foreign policy, which allows for mediation and negotiation to take place in a system that is anarchic in nature, yet cooperation still possible. Diplomacy has evolved to accommodate the challenges of the changing landscape characterised by of a multipolar world order where political will often inhibits the sustainability of the natural environment, rapidly increasing populations, more demanding economies and the impact of the fourth industrial revolution. The inclusion of scientists and experts, as new role players in the realm of international relations, is a natural outflow of the attempts of diplomacy to remain relevant as a key instrument of global governance.

As mentioned in the conceptual framework of chapter 2, environmental governance is the sum of laws and organisations focused on the effective management of individual and collective actions. Science diplomacy ensures the transfer of knowledge between states and improves international cooperation to ensure environmental sustainability. Science diplomacy also plays a pivotal role in environmental governance and is crucial for the protection of the marine ecosystem in the South China Sea and the mitigation of the proliferation of space debris.

The study reveals that formal institutions, such as the UN, play a vital role in enabling international agreements by providing a continuous forum for interstate interaction to discuss various issues which creates a robust interdependence between the states. It is the neoliberal institutionalist view, as mentioned in chapter 2, that these institutions provide a system that allows for cooperation to exist to enable the creation of a platform for the sharing of information and knowledge gathered by various experts, scientists and working groups. It is therefore important for institutions such as the UN to continuously reform its structures and remain relevant in all forms of the global society to be able to collectively address multifaceted issues, especially global environmental issues which could affect the sustainability of future generations.

Chapter 3 established that the scientists and experts involved in providing reports and analyses concerning environmental degradation is an intrinsic part of scientific cooperation to "work on problems across borders and without boundaries [with] cooperation made possible by the international language and methodology of science, cooperation in examining evidence that allows scientists to get beyond ideologies and form relationships that allow diplomats to defuse politically explosive situations" (Holt 2015). Chapter 3 also interestingly noted that states in constant competition with one another for the title of global hegemon, often cause distrustful relations and lead to the harmful management of natural resources. The examples illustrated through the study is the case of the South China Sea in China's attempt to sustain its growing domestic demand and influence in the region and with the case of China's attempt to showcase its technological advancements by possibly starting a new era of a Sino-US space race, leading to the proliferation of space debris.

Therefore, the study demonstrated the many challenges faced by the current international system in dealing with the environmental concerns in the two global commons mentioned throughout the research. It also demonstrated that science diplomacy may be the key factor in providing an effective system of change to address concerns pertaining to the natural environment, as scientists unify through their discoveries on important issues by presenting the data and comparing the findings to ultimately come to a consensus on how to cooperate to affect change.

Moreover, this study reiterated the link between theory and practice because, as Cox (2010) also states, "Theory derives from practice and experience, and experience is related to time and place". This study focused on the use of diplomacy, as a key instrument of global governance, to ensure not only the survival of states as was the dominant aim during the twentieth century, but the protection of the global commons and planet earth, a main concern of the twenty-first century. Cox (2010) furthermore also explains that critical theory serves a particular purpose by providing "analysis of forces and trends, to discern possible futures and to point to the conflicts and contradictions in the existing world order". This study did not choose to follow the path of identifying with either of Cox's 'problem-solving' or 'critical' theories but aimed to present a particular issue – protecting the earth against the consequences of hegemonic competition, by identifying the danger of current motives and practices in the two global commons.

The USA and China do not adhere to the norms of sustainability and intergenerational equality, which demands that they use the existing framework underlying global governance to protect the two global commons, the South China Sea and outer space. These norms provide a social constructivist lens through which international agreements determine their underlying aims and goals. Ultimately, the earth's sustainability is built upon the norm of intergenerational equity which demands recognition that "…we, the human species, hold the natural environment of our planet in common with all members of our species: past generations, the present generation, and future generations" (Weiss 1992: 20).

The research therefore investigated the causes and extent of the environmental degradation of the two global commons through the analysis of the various themes identified in chapter 3. In the process, it was identified that the international treaties governing these common spaces are not adequate in addressing common problems of environmental degradation. It was therefore the aim of this research to illustrate the importance of science diplomacy and the role of scientists in facilitating cooperation between states to allow their valuable knowledge to be shared within international organisations, such as the UN, to foster dialogue and enhance the understanding of the significance of sustainability and future generational preservation.

4.3 Areas for Further Research

Throughout the analysis of the research conducted, the following two questions emerged and may provide further areas of research to envisage a restructuring of the global environmental regime and the decision-making institutions which contribute to an improved 'Green Society': The first question relates to why some norms are more important than others with regards to the manner in which most states abide by the norms and legal framework of sovereignty, but fail to recognise the importance of the norm of 'Going Green' and the sustainability of common spaces that affect all ecosystems. As explained in the analysis, the international agreements and legal frameworks are not adequate in addressing degradation in the global commons, therefore, the second question relates to whether new UNCLOS and UNCOPUOS agreements should be formulated, by whom should they be formulated and how to ensure that these new agreements address the issues of the natural environment.

Bibliography

Abelson, P. H. 1972. Science, Technology, and Diplomacy. American Academy for the Advancement of Science. *Science*, 178 (4062): 701.

Abplanalp, E. 2010. *Background environmental justice: an extension of Rawls's political liberalism*. Department of Philosophy. University of Nebraska. Lincoln Philosophy Dissertations, Theses, & Student Research. Available at: http://digitalcommons.unl.edu/philosophydiss (Accessed 12 November 2018).

Allen, M. 2017. *The SAGE Encyclopedia of Communication Research Methods*. Los Angeles: Sage. Available at:
https://clickup.up.ac.za/bbcswebdav/pid-1265522-dt-contentrid37068122_1/
courses/dip878_s1_2018/thematic%20analysis.pdf. (Accessed 8 May 2018).

Allison, G. 2017. The Thucydides Trap. Available at:
https://foreignpolicy.com/2017/06/09/the-thucydides-trap/ (Accessed 17 November 2018).

Amerasinghe, C. F. 2001. The Historical Development of International Law - Universal Aspects. *Archiv des Völkerrechts*, 39 (4): 367-393.

American Institute for Contemporary German Studies. 1998. Environmental diplomacy. Conference Report. John Hopkins University. Available at:
https://www.aicgs.org/site/wp-content/uploads/2011/11/environmentaldiplomacy.pdf
(Accessed 5 March 2019).

American Institute for Contemporary German Studies (AICGS) 1998. *Environmental diplomacy.* Conference Report. Available at: http://gsn123.angelfire.com/6070conf.pdf
(Accessed 29 May 2018).

Annan, K. 2000. "*We the People." The Role of the United Nations in the 21st Century*. New York: United Nations.

Annegarn, H. J. and Swap, R. J. 2012. SAFARI 2000: A Southern African Example of Science Diplomacy. *Science & Diplomacy*. Available at: http://www.sciencediplomacy.org/article/2012/safari-2000 (Accessed 10 July 2018).

Archer, C. 2001. *International Organizations*. Third Edition. London: Routledge.

Armitage, D. 2004. *The Free Sea by Hugo Grotius.* Translated by R. Hakluyt, Introduction by D. Armitage. In: *Natural law and enlightenment classics*, edited by K. Haakonssen. Indianapolis: Liberty Fund. Available at: https://scholar.harvard.edu/files/armitage/files/free_sea_ebook.pdf (Accessed 26 May 2018).

ASEAN. 2017. Joint Communiqué of the 50th ASEAN Foreign Ministers' Meeting. Available at: https://asean.org/storage/2017/08/Joint-Communique-of-the-50th-AMM_FINAL.pdf (Accessed 23 January 2019).

Asner, G. P., Martin, R. E. & Mascaro, J. 2017. Coral reef atoll assessment in the South China Sea using Planet Dove satellites. *Remote Sensing in Ecology and Conservation*, 3 (2): 57-65.

Auer, M. R. 2000. Who Participates in Global Environmental Governance? Partial Answers from International Relations Theory. *Policy Sciences*, 33 (2):155-180.

Austin, G. 2015. Why Beijing's South China Sea Moves Make Sense Now. Available at: http://nationalinterest.org/blog/the-buzz/whybeijings-south-china-sea-moves-make-sense-now-14643 (Accessed 01 February 2019).

Balaam, D. N. and Dillman, B. 2019. *Introduction to International Political Economy.* Seventh Edition. New York: Routledge.

Barston, R. P. 2013. *Modern diplomacy*. Fourth Edition. Harlow: Pearson.

Benedick, R. 1998. Diplomacy for the environment. In: *Environmental diplomacy.* Conference Report of the American Institute for Contemporary German Studies Available at: http://gsn123.angelfire.com/6070conf.pdf (Accessed 29 May 2018).

Bernstein, S. F. 1997. *The Compromise of Liberal Environmentalism*. A thesis submitted in conformity with the requirements for the degree of Doctor of Philosophy Graduate Department of Political Science, University of Toronto. Available at: https://www.collectionscanada.gc.ca/obj/s4/f2/dsk2/ftp02/NQ27604.pdf
 (Accessed 7 March 2019).

Bernstein, S. 2001. *The Compromise of Liberal Environmentalism*. USA: Columbia University Press.

Bernstein, S. 2002. Liberal Environmentalism and Global Environmental Governance. *Global Environmental Politics*, 2 (3): 1-16.

Bevir, M. 2011. Governance as theory, practice and dilemma. In: *The SAGE handbook of governance,* edited by M. Bevir. Los Angeles: SAGE.

Black, R. 2012. Stockholm: Birth of the green generation. Available at: https://www.bbc.com/news/science-environment-18315205 (Accessed 5 March 2019).

Boothman, D. 2008. The Sources for Gramsci's Concept of Hegemon. *Rethinking Marxism,* 20 (2): 201-215.

Brühl, T., and Rittberger, V. 2001. From international to global governance: Actors, collective decision-making, and the United Nations in the world of the twenty-first century. In: *Global governance and the United Nations system*, edited by V. Rittberger. Tokyo: UNU Press.

Callahan, W. A. 2008. Chinese Visions of World Order: Post-Hegemonic or a New Hegemony? *International Studies Review,* 10 (4): 749-761.

Carlsnaes, W. 1992. The Agency-Structure Problem in Foreign Policy Analysis. *International Studies Quarterly*, 36 (3): 245-270.

Carpio, A. T. 2017. The South China Sea dispute: Philippine sovereign rights and jurisdiction in the West Philippine Sea. Available at: https://www.slideshare.net/SamGalope/the-south-china-sea-dispute-philippine-sovereign-rights-and-jurisdiction-in-the-west-philippine-sea (Accessed 24 January 2019).

Carroll, C. 2017. Protecting the South China Sea: Chinese Island-Building and the Environment. Available at: https://www.foreignaffairs.com/articles/china/2017-06-09/protecting-south-china-sea (Accessed 19 December 2019).

Center for International Earth Science Information Network (CIESIN). 1972. The Stockholm Conference. Available at: http://www.ciesin.org/docs/008-570/box9.html (Accessed 5 March 2019)

Centre for Strategic and International Studies. 2010. UN Perspectives on Space. Available at: https://www.csis.org/analysis/un-perspectives-space (Accessed 8 June 2018).

Centre for Strategic and International Studies. 2018. CSIS expert working group on the South China Sea. Available at: https://amti.csis.org/expert-working-group-scs/ (Accessed 24 January 2019).

Chasek, P. S. 2001. *Earth negotiations: Analyzing thirty years of environmental diplomacy*. New York: United Nations University Press.

China Daily. 2014. China's position paper on South China Sea. Available at: http://www.chinadaily.com.cn/china/2014-12/07/content_19037946.htm (Accessed 29 January 2019).

Cobb, W. W. 2019. Will China's moon landing launch a new space race? Available at: http://theconversation.com/will-chinas-moon-landing-launch-a-new-space-race-109359 (Accessed 03 February 2019).

Collins, J. 2012. Assessing International Cooperation on Climate Change: A Neoliberal Analysis of the Effectiveness of Formal International Environmental Institutions. *Mapping Politics*, 4: 1-7.

Council on Foreign Relations. 2017. China's Maritime Disputes. Available at: http://www.cfr.org/asia-and-pacific/chinas-maritime-disputes/p31345#!/?cid=otrmarketing_use-china_sea_InfoGuide (Accessed 16 December 2018).

Cox, R. 2010. Theory talks. Robert Cox on World Orders, Historical Change, and the Purpose of Theory in International Relations. Available at: http://www.theory-talks.org/2010/03/theory-talk-37.html (Assessed 23 March 2019)

Creswell, J. W. 2014. *Research design. Qualitative, quantitative and mixed methods approaches.* Fourth Edition. California: Sage.

Dancel, R. 2017. Deal on framework of South China Sea code. Available at: https://www.straitstimes.com/asia/se-asia/deal-on-framework-of-s-china-sea-code (Accessed 23 January 2019).

Dirzauskaite, G. and IIinka, N. C. 2017. Understanding "hegemony" in International Relations Theories. Aalborg University. Available at: https://projekter.aau.dk/ojekter/files/260247380/Understanding_hegemony_in_International_Relations_Theories.pdf (Accessed 6 March 2019)

Doel, R. E. 2003. Constituting the Postwar Earth Sciences: The military's influence on the environmental sciences in the USA after 1945. *Social Studies of Science*, 33 (5): 635-666.

Dunne, T., Kurki, M. and Smith, S. 2013. *International relations theories: discipline and diversity*. Third Edition. Oxford: Oxford University Press.

Emmerson, D. K. 2016. Why Does China Want to Control the South China Sea? Available at: https://thediplomat.com/2016/05/why-does-china-want-to-control-the-south-china-sea/ (Accessed 28 May 2018).

Evans, G. and Newnham, J. 1998. *Penguin Dictionary of International Relations*. London: Penguine Books.

Finnemore, M. 1996. *The Constructivist Turn in International Relations Theory*. New York: Cornell University Press.

Finnemore, M., and Sikkink, K. 1998. International Norm Dynamics and Political Change. *International Organization*, 52 (4): 887-917.

Fong, L. 2018. What's behind Beijing's South China Sea moves – and why US patrols are making things worse? *This week in Asia*. 29 March. Available at: https://www.scmp.com/week-asia/geopolitics/article/2139073/whats-behind-beijings-south-china-sea-moves-and-why-us-patrols (Accessed 28 May 2018).

Gaiser, L. and Kovač. I. 2012. From Bipolarity to Bipolarity: International Relations Repeating Again. *Journal of Global Policy and Governance,* 1 (1): 49–63.

Gao, Z. and Jia, B. B. 2013. The Nine-Dash Line in the South China Sea: History, Status, and Implications. *The American Journal of International Law*, 107 (1): 98-124.

Gérard, B. 2012. The Origins of the "Long-term Sustainability of Outer Space Activities" initiative at UN COPUOS. *Space policy*, 28 (3): 161-165.

Grieger, A. 2012. Only One Earth: Stockholm and the Beginning of Modern Environmental Diplomacy. Available at:
http://www.environmentandsociety.org/arcadia/only-one-earth-stockholm-and-beginning-modern-environmental-diplomacy (Accessed 5 March 2019)

Grotius, H. 2004. The Free Sea. Hugo Grotius, Defense of Chapter V of the Mare Liberum. In: *Natural law and enlightenment classics*, edited by K. Haakonssen. Indianapolis: Liberty Fund.

Guzzini, S. 2017. *Realist theories and practice.* DISS Working Paper no. 8. Copenhagen: Danish Institute for International Studies.

Haakonssen, K. (Editor). 2004. *Natural law and enlightenment classics.* Indianapolis: Liberty Fund. Saving the Mediterranean.

Haas, P. 1990. Saving the Mediterranean. *The Politics of International Environmental Cooperation.* New York: Columbia University Press.

Hall, L. 2014. The History of Space Debris. Space Traffic Management Conference. Available at: https://commons.erau.edu/stm/2014/thursday/19 (Accessed 09 June 2018).

Harding, G. 1968. The tragedy of the commons. *Science,* 162: 1243-1248.

Harvey, B. 2004. *China's Space Program: From Conception to Manned Spaceflight.* Chichester, UK: Praxis publishing.

Haynes, J. 2011. *World politics: international relations and globalisation in the 21st century.* First Edition. New York: Pearson Longman.

Hertzfeld, H. 2009. Current and future issues in international space law. *ILSA Journal of International and Comparative Law*, 15 (2): 325-335.

Hitchens, T. 2007. U.S.-Sino Relations in Space: From "War of Words" to Cold War in Space. *China Security*, 1: 12-30.

Hocking, B. and Melissen. J. 2015. *Diplomacy in the digital age.* Clingendael Netherlands Institute of International Relations. The Hague: Clingendael Institute.

Holt, R. 2015. Scientific Drivers for Diplomacy. Available at: http://www.sciencediplomacy.org/perspective/2015/scientific-drivers-for-diplomacy (Accessed 16 February 2019).

Hopf, T. 1998. The promise of constructivism in International Relations Theory. *International Security*, 23 (1): 171 – 200.

Hopf, T. 2013. Common-sense Constructivism and Hegemony in World Politics. *International Organization*, 67 (2): 317-354.

Hunt, A. 1990. Rights and Social Movements: Counter-Hegemonic Strategies. *Journal of Law and Society*, 17 (3): 309-328.

Huntington, S. P. 1996. *The Clash of Civilizations and the Remaking of World Order*. New York, NY: Simon and Schuster.

Hurd, I. 2011. Law and the practice of diplomacy. *International Journal,* 66 (3): 581-596

Ikenberry, G. J. 2014. From Hegemony to the Balance of Power: The Rise of China and American Grand Strategy in East Asia. *International Journal of Korean Unification Studies*, 23 (2): 41-63.

Inter-Agency Space Debris Coordination Committee. 2007. IADC Space Debris Mitigation Guidelines. Available at: http://www.unoosa.org/documents/pdf/spacelaw/sd/IADC-2002-01-IADC-Space_Debris-Guidelines-Revision1.pdf (Accessed 12 February 2019).

International Court of Justice. 1996. Legality of the Threat or Use of Nuclear Weapons. Available at: https://www.icj-cij.org/files/case-related/95/095-19960708-ADV-01-00-EN.pdf (Accessed 16 February 2019).

Islam, A. K. M. K. 2009. Co-Operation Under Anarchy Neo-Liberal Institutional Explanations. *The Indian Journal of Political Science*, 70 (3): 861–872.

Islam, S. S. and Goldstein, A. 2006. Rising to the Challenge: China's Grand Strategy and International Security. *International Journal*, 61 (3) 769-769.

Jackson, R.H., and Sørensen, G. 2013. *Introduction to International Relations: Theories and Approaches.* Fifth Edition. Oxford: Oxford University Press.

Jesson, J., Matheson, L. and Lacey, F. M. 2011. *Doing your literature review: traditional and systematic techniques.* Los Angeles, California: SAGE.

JIAS. 2016. *Science Diplomacy in Africa: Concepts, praxis, prospects.* JIAS Workshop Series No. 1, Johannesburg: Johannesburg Institute for Advanced Study (JIAS).

Jinping, X. 2017. Work Together to Build the Silk Road Economic Belt and The 21st Century Maritime Silk Road. Speech by H.E. Xi Jinping President of the People's Republic of China at the Opening Ceremony of The Belt and Road Forum for International Cooperation, 14 May. Available at: http://www.fmprc.gov.cn/mfa_eng/wjdt_665385/zyjh_665391/t1465819.shtml (Accessed 8 July 2018).

Kapuwa, B. P., Amin, M., and Naseer, R. 2012. The Decline of US Hegemony in a Sino-Century. Implications and Future for Africa. *Berkeley Journal of Social Sciences*, 2 (5): 1-15.

Keohane, R. O. 1984. *After Hegemony: Cooperation and Discord in the World Political Economy.* Princeton, N.J.: Princeton University Press.

Keohane, R. O., and Martin, L. L. 1995. The Promise of Institutionalist Theory. *International Security*, 20 (1): 39-51.

Kessler, D. J. 1991. Collisional cascading: The limits of population growth in low earth orbit. *Advances in Space research*, 11 (12): 63-66.

Klein, J. 2016. South China Sea: UN Law of the Sea Arbitration Tribunal Sinks the Rule of Law. Available at: https://www.foreignpolicyjournal.com/2016/08/20/south-china-sea-un-law-of-the-sea-arbitration-tribunal-sinks-the-rule-of-law/ (Accessed 28 May 2018).

Korubko, A. 2017. 21st-century geopolitics of the multipolar world order. *Geopolitika.* Available at: https://www.geopolitica.ru/en/article/21st-century-geopolitics-multipolar-world-order (Accessed 29 May 2018).

Krishna-Hensel, S. F. 2010. Technology and International Relations. *The International Studies Encyclopedia*. Denmark: Robert A. Blackwell Publishing.

Kulacki, G. and Lewis, J. G. 2009*. A Place for One's Mat: China's Space Program*, *1956–2003*. Cambridge: American Academy of Arts and Sciences.

Kumar, R. 2014. *Research methodology: a step-by-step guide for beginners.* Fourth Edition. Los Angeles: SAGE.

Layne, C. 2018. The US–Chinese power shift and the end of the Pax Americana. *International Affairs*, 94 (1): 89-111.

Leavy, C. S. M. 2017. The Permanent Court of Arbitration's role in clarifying the South China Sea disputes. Indo-Pacific Strategic Digest. Available at: http://www.defence.gov.au/ADC/Publications/documents/digest/Spring_2017/IPSD_Leavy_spring2017.pdf (Accessed 23 March 2019)

Leister, V. 2010. Economic Governance and Space Law: Emerging Foundations for Development of Common Pool Resources in Outer Space. *The Indian Journal of International Economic Law*, 3 (2): 64-83.

Lowy Institute for International Policy. 2019. Asia: South China Sea. Available at: https://www.lowyinstitute.org/issues/south-china-sea (Accessed 01 February 2019).

Ludwig, K. and Kok, M. T. J. 2018. *Exploring new dynamics in global environmental governance*. The Hague: PBL Netherlands Environmental Assessment Agency.

Lyall, F. and Larsen, P. B. 2009. *Space law: a treatise*. Surrey, England: Ashgate.

Marshall Institute. 1989. National Space Policy. Available at: http://marshall.wpengine.com/wp-content/uploads/2013/09/NSD-30-NSPD-1-National-Space-Policy-November-2-1989.pdf (Accessed 16 February 2019).

Martinez, P. 2018. Development of an international compendium of guidelines for the long-term sustainability of outer space activities. *Space Policy*, 43: 13-17.

Masters, L. 2016. South Africa's Two Track Approach to Science Diplomacy. *Journal for Contemporary History*, 41 (1): 168-186.

Maxwell, J. A. 2014. Designing a qualitative study. In: *The sage handbook of applied social research methods*, Second Edition, SAGE Publications, Inc., Thousand Oaks, CA.

Mearsheimer, J. J. 1994/95. The False Promise of International Institutions. *International Security*, 19 (3):5-49.

Mearsheimer, J. J. 2010. The Gathering Storm: China's Challenge to US Power in Asia. *The Chinese Journal of International Politics*, 3(4): 381-396.

Moolakkattu, J. S. 2009. Robert W. Cox and Critical Theory of International Relations *International Studies*, 46 (4): 439 –456.

Mora, C., Caldwell, I.R., Birkeland, C. and McManus, J. W. 2016. Dredging in the Spratly Islands: Gaining Land but Losing Reefs. *PLOS Biology*, 14 (3): 1-7.

Morin, J., and Balais, C. 2018. Strengthening Multilateral Environmental Governance through Bilateral Trade Deals. CIGI Policy Brief. 123. Available at:

https://www.cigionline.org/publications/strengthening-multilateral-environmental-governance-through-bilateral-trade-deals. (Accessed 8 March 2019).

Najam, A., Papa, M., and Taiyab, N. 2006. *Global Environmental Governance A Reform Agenda*. Denmark: International Institute for Sustainable Development (IISD).

NASA Orbital Debris Program Office. 2007. Orbital debris mitigation re-emphasized in the new U.S. national space policy. *Orbital Debris Quarterly News*, 11 (1): 1-8.

Nowell, L. S., Norris, J. M., White, D. E. and Moules, N. J. 2017. Thematic Analysis: Striving to Meet the Trustworthiness Criteria. *International Journal of Qualitative Methods,* 16: 1-13.

Olivier, L., Neethling, T. and Vrey, F. 2015. Theoretical approaches in international relations: the South African military as a foreign policy instrument. *South African Journal of Military Studies*, 43 (2): 39-64.

Onuf, N. 2011. Structure? What structure? In: *Realism and world politics*, edited by Booth, K. London: Routledge.

Palmujoki, E. 2006. Liberal Norms and Global Environmental Governance. Paper delivered at the Sixth Pan-European Conference on International Relations, Torino 12 – 15 September 2006 Section Seven: Global Governance, a Critical Encounter. Available at: http://www.eisa-net.org/eisa-net.org/be-bruga/eisa/files/events/turin/Palmujoki-Palmujoki%20Section%207%20paper.pdf (Accessed 18 November 2018)

Permanent Court of Arbitration. 2009. United Nations Convention on the Law of the Sea. Available at: https://pca-cpa.org/en/services/arbitration-services/unclos/ (Accessed 28 May 2018).

Permanent Court of Arbitration. 2016. The South China Sea Arbitration. [Press release]. 12 July. Available at: https://pca-cpa.org/wp-content/uploads/sites/175/2016/07/PH-CN-20160712-Press-Release-No-11-English.pdf (Accessed 08 May 2018).

Poling, G. B. 2013. *The South China Sea in focus. Clarifying the limits of maritime disput*e. A Report of the CSIS Sumitro Chair for Southeast Asia Studies. New York: Rowman and Littlefield.

Poulssen. J. 2016. *Rivals and Cooperation in Outer Space.* Department of Political Sciences. Master Thesis International Studies. Available at: https://openaccess.leidenuniv.nl/bitstream/handle/1887/43365/Rivals%20and%20Cooperation%20in%20Outer%20Space.pdf?sequence=1 (Accessed 16 January 2019).

Prakash, A. 2017. Beware the rhyme of history. Available at: https://indianexpress.com/article/opinion/columns/beware-the-rhyme-of-history-british-prime-minister-neville-chamberlain-munich-conference-german-annexation-adolf-hitler-china-world-war-4582702/ (Accessed 03 March 2019).

Quinn, A. G. 2008. The New Age of Space Law: The Outer Space Treaty and the Weaponization of Space. *Minnesota Journal of International Law*, 17 (2): 475-502.

Quintos, M. F. A. 2015. UNCLOS Part XII and Protecting the Marine Environment In South China Sea – Analysis*. Eurasia Review*, 25 June. Available at: https://www.eurasiareview.com/25062015-unclos-part-xii-and-protecting-the-marine-environment-in-south-china-sea-analysis/ (Accessed 29 May 2018).

Rathi, A. 2016. The Most Ignored Aspect of the South China Sea Brawl Might be the Key to Solving it. Available at: https://qz.com/741989/the-most-ignored-aspect-of-the-south-china-sea-brawl-might-be-the-key-to-solving-it/ (Accessed 14 January 2019).

Rawls, J. 1993. The Law of Peoples*. Critical Inquiry*, 20 (1): 36-68.

Ritchie, J. and Lewis, J. 2003. *Qualitative research practice: a guide for social science students and researchers.* London: Sage.

Rittberger, V. 2001. *Global governance and the United Nations system*. Tokyo: UNU Press.

Rosenau, J. 1995. Governance in the Twenty-first Century. *Global Governance*, 1 (1): 13–43.

Rosenberg, M. 2015. U.S. Rebukes China on Efforts to Build Artificial Islands. Available at: https://www.nytimes.com/2015/05/28/world/asia/us-rebukes-china-on-efforts-to-build-artificial-islands.html (Accessed 19 December 2018).

Saull, 2017. Hegemony and the global political economy. Available at: http://oxfordre.com/internationalstudies/view/10.1093/acrefore/9780190846626.001.0001/acrefore-9780190846626-e-208 (Accessed 6 March 2019).

Schumacher, E. F. 1973. *Small is Beautiful. Economics as If People Mattered.* London: Blond & Briggs.

Sending, O. J. Pouliot, V. and I. B. Neumann. 2011. The future of diplomacy. Changing practices, evolving relationships. *International Journal,* 66 (3): 527-547.

Sharma, B. P. 2018. Xi's 'Community of shared future' has global implications. Available at:
http://www.chinadaily.com.cn/a/201803/21/WS5ab1c83aa3106e7dcc1441b5.html
(Accessed 9 July 2018).

Sison, M. P. T. 2018. Universalizing the Law of the Sea in the South China Sea Dispute. *Ocean Development & International Law*, 49 (2): 157-175.

Somalia, U. R. and Cheung, W. W. L. 2015. *Boom or bust. The future of fish in the South China Sea*. Canada: University of British Columbia.

South China Sea Expert Working Group. 2017. A Path Towards Environmental Management in the South China Sea. A blueprint for fisheries management and environmental cooperation. Available at: https://thediplomat.com/2017/09/a-path-

towards-environmental-management-in-the-south-china-sea/   (Accessed 28 May 2018).

Spies, Y. K. 2018. *Global diplomacy and international society.* South Africa: Palgrave Macmillan

Spies, Y. K. 2019. *Global South perspectives on diplomacy*. South Africa: Palgrave Macmillan.

Stein, A. A. 2008. Neoliberal Institutionalism. *The Oxford Handbook on International Relations.* New York: Oxford University Press.

Sun, Y. 2015. China's 3 Desires: More Influence, More Respect, and More Space. Available at: https://nationalinterest.org/blog/the-buzz/chinas-3-desires-more-influence-more-respect-more-space-13893?nopaging=1 (Accessed 03 March 2019).

The Royal Society. 2010. New frontiers in science diplomacy: Navigating the changing balance of power. The Royal Society and American Association for the Advancement of Science (AAAS). Available at: https://royalsociety.org/~/media/royal_society_content/policy/publications/2010/4294969468.pdf (Accessed 16 May 2018).

The White House. 1995. Interagency Report on Orbital Debris. Available at: https://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20000011871.pdf (Accessed 12 February 2019).

The World Academy of Science. (TWAS). 2015. The art of blending science and policy.   Available   at: https://twas.org/article/art-blending-science-and-policy (Accessed 6 March 2019)

The World Academy of Science. (TWAS). 2019. Science diplomacy. Available at: https://twas.org/science-diplomacy. (Accessed 6 March 2019)

The World Bank. 2019. Population. Available at:

https://data.worldbank.org/indicator/SP.POP.TOTL?end=2017&start=2016
(Accessed 12 February 2019).

Tønnesson, S. 2001. An International History Dispute in the South China Sea. Available at: http://www.cliostein.com/documents/2001/01%20rep%20eai.pdf (Accessed 16 January 2019).

Treacy, S. 2015. Science diplomacy: a view from the South. Available at: https://twas.org/article/science-diplomacy-view-south (Accessed 13 July 2018).

Turekian, V. C., Gluckman, P. D., Kishi, T. and Grimes, R. W. 2018. Science Diplomacy: A Pragmatic Perspective from the Inside. Available at: http://www.sciencediplomacy.org/article/2018/pragmatic-perspective (Accessed 13 July 2018).

United Nations. 1972. Report of the United Nations Conference On The Human Environment, Stockholm, 5-16 June 1972. Available at: http://www.un-documents.net/aconf48-14r1.pdf. (Accessed: 5 March 2019)

United Nations. 1999. Technical Report on Space Debris. Available at: https://www.orbitaldebris.jsc.nasa.gov/library/un_report_on_space_debris99.pdf (Accessed 2019/02/12).

United Nations. 2017. *Oceans and the Law of the Sea*. Available at: http://www.un.org/en/sections/issues-depth/oceans-and-law-sea/ (Accessed 29 May 2018).

United Nations. Committee for Development Policy 2014*. Global Governance and Global Rules for Development in the Post-2015 era.* New York: United Nations.

United Nations Environment Programme 2017. Introduction to Environmental Governance. Available at:
https://globalpact.informea.org/sites/default/files/documents/International%20Environmental%20Governance.pdf (Accessed 22 March 2019)

United Nations Framework Convention on Climate Change 2018. Available at: https://unfccc.int/process-and-meetings/the-paris-agreement/what-is-the-paris-agreement. (Accessed 13 November 2018).

United Nations. General Assembly. 1967. *United Nations Treaties and Principles on Outer Space.* Available at: http://www.unoosa.org/pdf/publications/STSPACE11E.pdf (Accessed 08 June 2018).

United Nations. General Assembly. 1982*. Convention on the Law of the Sea.* Available at: https://www.refworld.org/docid/3dd8fd1b4.html (Accessed 17 May 2018).

United Nations. General Assembly 1987. *Report of the World Commission on Environment and Development: Our Common Future.* Available at: http://www.un-documents.net/our-common-future.pdf. (Accessed 12 November 2018)

United Nations. General Assembly. 1991. *Resolution 46/45: International Cooperation in the Peaceful Uses of Outer Space (9 December 1991).* [Online]. A/RES/46/45. Available at: http://www.un.org/en/ga/search/view_doc.asp?symbol=A/RES/46/45 (Accessed 08 February 2019).

United Nations. General Assembly. 2009. Note verbale dated 6 May 2009 from the Permanent Mission of the People's Republic of China to the United Nations addressed to the Secretary-General, 07 May 2009, CML/17/2009, available at: http://www.un.org/depts/los/clcs_new/submissions_files/mysvnm33_09/chn_2009re_mys_vnm_e.pdf (Accessed 20 January 2019).

United Nations. Oceans & Law of the Sea 2018. United Nations Convention on the Law of the Sea of 10 December 1982. Available at: http://www.un.org/depts/los/convention_agreements/convention_overview_convention.htm (Assessed 22 March 2019)

United Nations. Office for Outer Space. 2019. Committee on the Peaceful Uses of Outer Space. Available at:http://www.unoosa.org/oosa/en/ourwork/copuos/index.html (Accessed: 22 March 2019).

United Nations System Task Team on the Post 2015 UN Development Agenda. 2013. *Global governance and governance of the global commons in the global partnership for development beyond 2015*. Available at: http://www.un.org/en/development/desa/policy/untaskteam_undf/thinkpieces/24_thinkpiece_global_governance.pdf (Accessed 26 May 2018).

Vo, S. T., Pernetta, J. C. and Paterson, C. J. 2013. Status and trends in coastal habitats of the South China Sea. *Ocean & Coastal Management*, 85: 153-163.

Vu, T and Borton, J. 2015. Science Diplomacy a Crucible for South China Sea Disputes. *Geopolitical Monitor. Situation Reports*. Available at: https://www.geopoliticalmonitor.com/science-diplomacy-a-crucible-for-south-china-sea-disputes/ (Accessed 27 May 2018).

Waltz, K. 1979. *Theory of International Politics*. Reading, Massachusetts: Addison Wesley.

Weiss, E. B. 1992. In Fairness to Future Generations and Sustainable Development. *American University International Law Review*, 8 (1): 19-26.

Yilmaz, S. 2010. State, power and hegemony. *International Journal of Business and Social Sciences,* 1 (3): 192-205.

Young, O. 1994. *International Governance: Protecting the Environment in a Stateless Society.* New York: Cornell University Press.

Zhu, W. 2001. International Political Economy form a Chinese angle. *Journal of Contemporary China*, 10 (26): 45-54.