



Ca' Foscari
University
of Venice

Master's Degree programme

in International Relations
"Second Cycle"
(D.M. 270/2004)

Final Thesis

GREEN DIPLOMACY IN EAST ASIA

Supervisor

Ch. Prof. Stefano Soriani

Assistant supervisor

Ch.ma Prof.ssa Sara De Vido

Graduand

Grecia Obregon Ramirez
Matriculation Number 855270

Academic Year

2016 / 2017

A Carolina Ramírez Rodríguez,
Quien incondicionalmente cree en mí.

Madre, que tu nostalgia se vuelva el odio más feroz.
Madre, necesitamos de tu arroz.
Madre, ya no estés triste, la primavera volverá,
Madre, con la palabra 'libertad'.
Madre, los que no estemos para cantarte esta canción,
Madre, recuerda que fue por tu amor.

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ABBREVIATIONS

APP	Asia-Pacific Partnership on Clean Development and Climate
ASEAN	The Association of Southeast Asian Nations
CCs	carbon dioxide capture and geological storage
CDM	Clean Development Mechanism
CDS	Commission on Sustainable Development
CFCs	chlorofluorocarbons
CH ₄	methane
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CO ₂	carbon dioxide
COP	Conference of the Parties
CPC	centralized pollution control
DPS	discharge permit system
EANET	East Asia Acid Deposition Monitoring Network
ECO ASIA	Environmental Congress for Asia and the Pacific
ECOSOC	Economic and Social Council
EIA	environmental impact assessment
ENGOs	Environmental non-governmental organizations
ENGOs	Environmental Nongovernmental Organizations
EPA	Environmental Protection Agency
EPBs	Environmental Protection Bureaus
EPCs	Environmental Protection Commissions
EPOs	Environmental Protection Offices
ERS	The Environmental Responsibility System
ESCAP	Economic and Social Commission for Asia and the Pacific
EU	European Union
FAO	Food and Agriculture Organization
FYP	Five-Year plans
GDP	gross domestic product
GEF	Global Environmental Facility
GHGs	greenhouse gases
GMOs	genetic modified organisms
HCFCs	hydrofluorochlorocarbons
HFCs	hydrofluorocarbons
IET	International Emissions Trading
INDCs	Intended Nationally Determined Contributions
IPCC	Intergovernmental Panel on Climate Change
IUCN	Union for the Conservation of Nature
JI	Joint Implementation
LTT	The Limited Time Treatment
LULUCF	Land Use, Land-Use Change, and Forestry
N ₂ O	nitrous oxide
NEPA	Chinese National Environmental Protection Agency
NEPC	Chinese National Environmental Protection Commission

NEPRCC	Chinese National Environmental Protection and Resource Conservation Commission
NGOs	Non-governmental organizations
ODA	Official Development Assistance
ODSs	ozone depleting substances
OECD	Organization for Economic Co-operation and Development
PA	Paris Agreement
PFCs	perfluorocarbons
PM2.5	fine particular matter
POPs	Persist Organic Pollutants
PPP	Polluter pays principle
REDD	Reducing Emissions from Deforestation and Forest Degradation plus conservation mechanism
SEPA	State Environmental Protection Administration
SF6	sulfur hexafluoride
TEC	Total Emission Control for Major Pollutant Discharges
UN	United Nations
UNCED	United Nation Conference on Environment and Development
UNCSD	United Nations Conference on Sustainable Development
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNISDR	UN International Strategy for Disaster Reduction
WHO	World Health Organization
WMO	World Meteorological Organization
WWF	World Wildlife Fund of Nature

Italian Abstract

La storia contemporanea inizia con due importanti eventi, la rivoluzione francese, che abbraccia nuovi elementi di diritto universali con la sua dichiarazione di libertà, uguaglianza e fraternità, e la rivoluzione industriale che capovolse il nostro modello di produzione e di consumo segnando l'inizio dell'effetto più distintivo della nostra era: la globalizzazione.

Queste due rivoluzioni scatenarono la trasformazione del mondo, che vide presto la riorganizzazione politica dei paesi basate sul modello di stato-nazione. La crescita economica, lo sviluppo tecnologico e la produzione di beni di massa aiutarono a creare un ambiente prospero e accompagnate alle campagne di educazione rafforzarono il ruolo dello stato e il nazionalismo.

La rivoluzione industriale permise l'accumulo del capitale nei paesi che seguivano il modello britannico di sviluppo, il fumo delle fabbriche era considerato sinonimo di progresso e sviluppo. Presto le potenze cercarono di spandere la loro sovranità, scattando così il primo e il secondo conflitto a scala mondiale. Le guerre erano comuni, il nuovo modello di produzione e lo sviluppo della tecnologia fecero diventare un conflitto senza precedenti. Le due guerre mondiali videro lo sviluppo di nuovi armamenti con il nuovo modello di produzione in catena e l'uso di sostanze chimiche a scopo bellico. Per sostenere la guerra, il medio ambiente fu sfruttato insaziabilmente e tante nuove tecnologie furono rilasciate senza testare l'impatto nel medio ambiente.

Alla fine della Seconda guerra mondiale il mondo era diviso in due blocchi, da una parte gli Stati Uniti che abbracciavano la democrazia ed erano idealisti difensori della libertà, dall'altra i Sovietici che

rappresentavano il blocco comunista. Durante la guerra fredda la paura dell'effetto domino, che comportava la espansione dei regimi comunisti nel mondo, impulso agli Stati Uniti a tutelare con cautela ogni decisione dei popoli che erano stati affidati agli alleati dopo la fine della Seconda guerra mondiale. Giappone passo di essere il peggiore nemico ad essere l'alleato prediletto degli Stati Uniti. La Cina che era stata riunificata dai comunisti diviene nemica finché non fu opportuno diventare alleati. Il Vietnam e la Corea vennero divisi per metà. Quando gli Stati Uniti tornarono sconfitti dal Vietnam la Corea rimane ancora divisa.

La fine della seconda guerra mondiale vide anche la nascita delle Nazioni Unite, l'organizzazione internazionale più importante al mondo. Che aiuto a consolidare il diritto internazionale e a tutelare le nazioni per creare una comunità internazionale armoniosa. L'Organizzazione delle Nazioni Unite dedicò i primi decenni a creare uno schema di diritto internazionale che governasse le problematiche e le materie più importanti ed imminenti per garantire la pace tra le nazioni. Il trattato di non-proliferazione nucleare del 1968, che entrò in vigore due anni dopo, segnò il cambiamento dell'atmosfera di tensione che si era vissuta durante la guerra fredda.

Con questa nuova energia nell'aria i trattati internazionali in materia ambientale iniziarono a fiorire. Sotto la pressione di diversi movimenti ambientalisti, la agenda ambientale iniziò a prendere importanza e in 1970 si svolse la Conferenza di Stoccolma sull'Ambiente Umano, che ricapitolava l'effetto dell'uomo sulla biosfera e le risorse naturali. E chiedeva cooperazione tra le nazioni industrializzate e quelle in sviluppo, per fronteggiare il degrado ambientale e promuovere un modello di sviluppo in armonia con il medio ambiente. Ma le nazioni del 'Sud', non accolsero bene il messaggio, per loro questo implicava abbandonare lo sviluppo per aiutare alle nazioni del 'Nord' a pulire il loro inquinamento.

Per facilitare lo sviluppo della cooperazione e guidare le nazioni verso una strada 'verde', fu creato nel 1972 l'UNEP, il programma delle Nazioni Unite per l'ambiente, che sino ad oggi rimane il principale meccanismo dell'ONU per promuovere la cooperazione e protezione ambientale. L'UNEP fu incaricata di preparare quello che diviene il trattato in materia ambientale più coronato da successo, la Convenzione di Vienna per la protezione dello strato d'ozono del 1985 e il suo Protocollo di Montreal del 1989, che hanno avuto successo ad eliminare le sostanze che danneggiano lo strato d'ozono, e adesso con l'ultimo ammendamento di Kigali del 2016 cercano di ridurre i gas serra che hanno sostituito le sostanze danneggianti dello strato d'ozono per mitigare il cambiamento climatico.

L'UNEP e Organizzazione Meteorologica Mondiale istituirono il 'Gruppo intergovernativo di esperti sui cambiamenti climatici' (IPCC) che è incaricato di pubblicare una raccolta del materiale scientifico più recente riguardante lo stato del cambiamento climatico di maniera apolitica per guidare i leader nella giusta scelta della creazione di leggi per mitigare gli effetti avversi del cambiamento climatico.

Sulla base delle scoperte e statistiche raccolte dal primo rapporto pubblicato dal IPCC nel 1990, si creò un consenso per svolgere il primo Vertice sulla Terra. La Conferenza delle Nazioni Unite sull'Ambiente e lo Sviluppo (UNCED) si svolse nel 1992 a Rio di Janeiro, Brasile. Questa conferenza vide l'adozione d'importanti documenti per combattere il cambiamento climatico, aprendo alla firma delle 'Tre convenzioni di Rio', la Convenzione delle Nazioni Unite sui cambiamenti climatici (UNFCCC), la Convenzione sulla Diversità Biologica (CBD) e la Convenzione contro la desertificazione (UNCCD). Inoltre, accolse anche due importanti documenti, la dichiarazione di Rio sull'ambiente e lo sviluppo e l'Agenda 21, che sottolineano il 'principio di responsabilità comuni ma differenziate' che fu cruciale per avvicinare il Nord e il Sud a ratificare questi trattati.

Il principio di responsabilità comuni ma differenziate, sottolinea la differenza dei paesi industrializzati che hanno già inquinato e i paesi in via di sviluppo che cercano di industrializzarsi, assegnando diverse responsabilità nei confronti della mitigazione dell'inquinamento ambientale. E' proprio su questo principio che il Protocollo Kyoto del 1997 basa le sue guide di riduzione di emissioni.

Il Protocollo Kyoto prevede di diminuire le emissioni di gas ad effetto serra del 5.2% ai livelli del 1990. Per raggiungere questi obiettivi, fissati soltanto ai paesi Industrializzati (Annex-1), sono stati ideati tre meccanismi di mercato flessibili 'cap and trade'. Il primo è lo scambio delle quote di emissione (emission trading), che prevede che le quote che un paese riesca a ridurre e non usare per il suo beneficio, possano essere vendute ad altri paesi Annex-1 al miglior prezzo nel mercato. Il secondo meccanismo, l'attuazione congiunta (joint implementation), prevede che due o più paesi annex-1 cooperino in progetti mirati a ridurre le emissioni nel territorio di uno di questi paesi. Mentre il 'meccanismo per lo sviluppo pulito' (Clean Development Mechanism) prevede che i progetti di riduzione di emissioni possano essere sviluppati in paesi in via di sviluppo (Non-Annex) dove risulta più economico avviare i progetti che possono generare più quote di riduzione di emissioni, in base alle tecnologie usate nei paesi in via di sviluppo che sono meno efficienti energeticamente. Grazie alla ratifica della Russia nel 2004 il protocollo di Kyoto entrò in vigore nel 2005, otto anni dopo della prima ratifica, per la mancanza del punto che prevedeva che le parti ratificanti fossero responsabili del 55% totale delle emissioni mondiali per avviare l'entrata in vigore.

A seguito del protocollo di Kyoto, si sono state avviate diverse trattative per raggiungere un accordo che coinvolgesse anche i paesi con economie di rapido sviluppo come la Cina e l'India, che un decennio sono passate a contribuire per una maggior parte delle emissioni globali. Ma questo

periodo non vide l'adozione di accordi con un limite di emissioni legalmente vincolante. L'Accordo di Copenaghen del 2009, fu la traduzione disperata di mettere per scritto le aspettative dei paesi responsabili della maggior parte dell'inquinamento –gli Stati Uniti, Cina, India, Brazil e Africa del Sud– e non prevede nessuna riduzione di emissioni legalmente vincolante, ma si limita a rafforzare l'importanza di prevenire che il riscaldamento globale non superi 2° centigradi. L'Accordo di Copenaghen fu ratificato dai paesi non-annex, creando speranza di raggiungere un futuro accordo dove i paesi non-annex cercano di ridurre emissioni.

Questo accordo è l'accordo di Parigi che fu adottato nel 2015 nella ventunesima Conferenza delle parti che si è tenuta a Parigi, ed entrato in vigore il 4 Novembre 2016. L'accordo di Parigi è legalmente vincolante, ma non prevede un limite prefissato per ridurre le emissioni, rimane ad ogni nazione dichiarare i propri contributi intenzionali determinati a livello nazionale (INDCs). L'accordo di Parigi è stato ratificato da 174, tra cui la Cina, il principale produttore di emissioni. Nel Giugno scorso il presidente americano, Donald Trump, ha dichiarato la sua intenzione di ritirarsi dall'accordo di Parigi e creando un aria di paura che Cina decidesse anche di seguire l'America. Ma la Cina ha ribadito il suo ruolo dentro l'accordo di Parigi, riaffermando la sua posizione come leader nella diplomazia ambientale.

La regione del Est Asiatico ha visto diversi cambiamenti durante gli ultimi decenni, ma c'è una differenza sostanziale legata al percorso storico e socioeconomico di ogni paese che ha influito nel degrado ambientale di ogni paese. Giappone è un paese che iniziò la sua industrializzazione prima delle guerre mondiali, nonostante la perdita di infrastruttura dopo la seconda guerra mondiale fu capace di diventare alleato degli Stati Uniti ed impulsare la sua economia basata sulle esportazioni raggiungendo un miracolo economico. Nonostante il rapido cambiamento nella legislazione giapponese durante il periodo di contaminazione più alto, il popolo

giapponese soffre in alcune regioni ancora per colpa del degrado ambientale dovuta alla povera pianificazione di legislazione in materia ambientale prima degli anni 70 e dovuta anche ai residui radioattivi nucleari. Il Giappone rapidamente riuscì a diventare leader sulle leggi ambientali nel periodo in cui le relazioni internazionali ambientali fiorirono, per poi passare per un periodo passivo durante gli anni 80 e riprendersi negli anni 90 ed impulsare l'adozione del protocollo di Kyoto.

La Cina guidata dal Partito Comunista Cinese, iniziò a svilupparsi nel dopoguerra con un'economia basata sull'agricoltura, passando per fasi di crescita e anche per fasi di sofferenza create dagli ideali utopici del leader del Partito Comunista Cinese, Mao Zedong. La Cina aprì la porta agli investimenti e adottò un'economia di mercato negli anni 70, grazie alle linee di pensiero di Zhou Enlai e Deng Xiaoping. La Repubblica Popolare Cinese iniziò ad adottare politiche su misura per la protezione ambientale solo dopo le Conferenze in materia ambientale tenute in seno all'ONU. Durante le prime Conferenze la Cina ribadì costantemente il principio di responsabilità comuni ma differenziate, facendo spesso appello alle nazioni industrializzate. L'economia cinese vide una trasformazione che non si è arresa finora, la trasformazione è evidente nei centri urbani e rurali che hanno sofferto entrambi per il degrado ambientale. L'inquinamento ambientale è diventato un problema che il Partito Comunista Cinese cerca di risolvere ad ogni costo per creare una società in armonia con l'ambiente. Il cambiamento del punto di vista cinese sull'importanza di mitigare il cambiamento climatico e creare un'economia e uno sviluppo sostenibile si è tradotto nelle ultime conferenze in materia ambientale, in cui la Cina è emersa come una delle figure più importanti della diplomazia ambientale.

La Repubblica di Corea, ha seguito un processo di sviluppo economico simile a quello del Giappone, ma raggiungendo livelli di inquinamento dell'aria più preoccupanti. La legislazione in materia ambientale in Corea del Sud iniziò ad essere mirata a combattere l'inquinamento alla fine degli

anni 70. Rinforzando le leggi precedenti negli anni 90, dove si vide un cambiamento più drastico grazie agli sforzi compiuti dal governo. Negli ultimi anni, la Corea del Sud ha iniziato a perseguire una politica di sviluppo sostenibile, sicurezza energetica e mitigazione del cambiamento climatico. Promovendo specialmente la nuova politica 'Low Carbon, Green Growth' adottata nel 2008 che insieme alla ricerca di una sicurezza energetica rimangono le guide di sviluppo economico sostenibile adottate dalla Corea per ridurre le emissioni.

Il Vietnam è un caso particolare, perché iniziò il suo sviluppo solo dopo il ritiro delle forze americane dal suo territorio in 1975. Il suo sviluppo fu ostacolato da 20 anni di embargo da parte degli Stati Uniti e la sua cattiva scelta di invadere la Cambogia, cosa che non fu gradita dalla comunità internazionale che tagliò gli aiuti e finanziamenti. Vietnam soffrì un degrado ambientale notevole durante la guerra con gli Stati Uniti, dove bombe antiuomo e residui di armi chimiche sono ancora un problema che colpisce la popolazione vietnamita. Il Vietnam è uno dei paesi che soffre di più gli effetti avversi del cambiamento climatico, ed è un paese che negli ultimi tre decenni è riuscito a sviluppare una crescita economica costante, riuscendo a passare di essere tra le nazioni più povere al mondo e diventare un paese con un reddito medio. Considerando questi aspetti, il Vietnam è uno dei paesi che ha ricevuto aiuti per controllare adeguatamente l'inquinamento e mitigare il cambiamento climatico. E' l'interesse nazionale diventare una 'green economy' con uno sviluppo sostenibile, e contemporaneamente mitigare e adattare gli effetti del riscaldamento globale, che comportano problemi sociali e la rilocalizzazione dei cittadini nelle aree vulnerabili ad inondazioni.

La regione dell'Est Asiatico è molto vulnerabile ai cambiamenti climatici, senz'altro poiché i centri economici e le zone più popolate sono concentrate sulla lunghezza delle zone costiere. Il riscaldamento globale promuove cicloni e tempeste tropicali più frequentemente e di maggiore forza, diventando un grave problema per la popolazione. Per mitigare gli

effetti del cambiamento climatico, la regione dell'est asiatico ha mostrato grande attenzione all'efficienza energetica e alla produzione di energia pulita. Il Vietnam, ha diversi progetti di piante idroelettriche. La Cina che continua ad usare il carbone come principale fonte per creare elettricità, ha iniziato ad aggiungere meccanismi per ridurre le emissioni delle piante energetiche. La Corea del Sud esegue dei progetti di risparmio energetico nella infrastruttura e promuove iniziative disegnate a livello locale per assicurare di adattare e mitigare con un approccio che varia caso per caso. E finalmente il Giappone sta cercando di allontanarsi dall'energia nucleare dopo il disastro creato dal terremoto sulla pianta nucleare di Fukushima, implementando campagne di per promuovere l'adozione della efficienza energetica in ogni settore e il risparmio energetico nelle ditte e nelle case.

Questa regione continua a cercare di cooperare internazionalmente sia nei forum delle Nazioni Unite, sia a livello regionale in associazioni come l'ASEAN e la sua forma più tre: Giappone, Corea del Sud e Cina. Molto importanti sono le relazioni bilaterali tra questi paesi, principalmente quelli in materia di controllo dell'inquinamento dell'aria transfrontaliero che rimane uno dei problemi più grossi della regione.

In base all'accordo di Parigi, questi paesi hanno inviato i loro 'contributi promessi stabiliti a livello nazionale' (INDCs), che sono le promesse fatte dai governi nel confronto della mitigazione del cambiamento climatico. Ogni proposta è accompagnata dalla spiegazione su come ogni governo pensa di ridurre le emissioni, creando così uno schema chiaro ed onesto per ridurre gli effetti avversi del cambiamento climatico.

Il cambiamento climatico è un problema che i governi dovranno affrontare a livello nazionale con misure di adattamento e mitigazione, ma con la guida e la cooperazione creata in seno alle Nazioni Unite abbiamo più probabilità di ridurre in maniera più veloce gli effetti negativi del cambiamento climatico. La diplomazia ambientale diventerà

ogni volta più importante, sia per negoziare trattati in materia ambientale, sia per risolvere le problematiche che inizieranno a sorgere dovute al riscaldamento globale.

Introduction

During the last century anthropogenic greenhouse gases emissions have spiked due increased population and the most important: a change in our production patterns. Since the Industrial Revolution, anthropogenic emissions have increased becoming higher and constant. The globalization that we have achieved in the last few decades of our economies and consumption patterns have worsen even more our situation.¹

The 4th Assessment Report of Intergovernmental Panel on Climate Change stated that there is 90 percent probability that the last fifty years of increased global warming is due anthropogenic-induced change.² Man-made modification of the environment with the purpose of urbanization and deforestation, the use of certain chemicals, and unprecedented and increasing greenhouse gases emissions have already lead to an increase of 0.75° Celsius on our global average temperatures over the last hundred years.³ The forecast if we do not act in order to prevent it is that by 2100 the temperature will have increase, on a business as usual scenario, from 1.4 to 5.8 Celsius degrees. The alarming problem is that this scale of temperature change has not been experienced in ten thousand years.⁴

What we are experiencing is a chain reaction triggered by the greenhouse effect that is an anthropogenic-related emission concentration that builds up and enhances the natural effects of our ozone layer. Our earth has a natural greenhouse, which is our ozone layer that is composed by water vapor and greenhouse gases like ozone, methane and carbon dioxide that

¹ (Philander, Encyclopedia of Global Warming and Climate Change. Second Edition, 2012) Vol. I. p.3

² (Wei-Yin Chen J. S., 2012) Vol.I.p.2

³ *Idem.*

⁴ (Philander, Encyclopedia of Global Warming and Climate Change. Second Edition, 2012). Vol. II. P.780

is the most concentrated amounting 95% of all GHGs⁵; these gases retain the sun's radiation in the form of heat, creating a prosper climate for life helping biodiversity to thrive. Without this natural greenhouse our global average temperature would be 33° Celsius colder.⁶

Global warming induced by the greenhouse effect have different consequences to our climate and to our ecosystems. Warmer climate is melting the ice sheets and glaciers, of course this means that sea levels will rise, but it hides a deeper consequence. While oceans absorb the heat of the sun, ice bodies reflect it, meaning that less ice will produce more warming.⁷ But there is more to it, underneath some frozen areas lies an immense amount of methane stored in the permafrost layer, that if it was to melt, it would be released into our atmosphere enhancing the greenhouse effect and speeding global warming.⁸

Global warming will be accompanied by other problems that we normally forget to link with climate. Access to fresh water will become a problem, since our rivers, which are fed by glaciers will dry, and other water streams will salinize due the sea level rising. Less water will be available for humans and animals, but also for agriculture. Which will be already having a tough time with the extreme weather patterns, which will consist in stronger storms and rainfall and longer drought periods, threatening our food security. The land available for agriculture will be reduced as well, desserts will expand, and soil erosion will be seen in all parts of the globe.

The ocean will suffer as well, some scientists argue that ocean currents—which regulate the warm and cold currents affecting our temperatures—may slow down or even stop, meaning that our climate temperatures will no longer be regulated as we have always known. A warmer ocean will

⁵(Wei-Yin Chen J. S., 2012) Vol.I.p p.4

⁶ *Ivi.* Vol.I.p.3

⁷ (Burroughs, 2001)p.42

⁸ (Flannery, 2015)pp.70-72

lead to ocean acidification, which will promote the perishing of marine ecosystems and mass migrations of other species. For example, Coral bleaching, that at a warmer temperature the coral reef expel the algae which provide its sustainment and eventually will led the coral to perish loosing its color and remaining a white skeleton, hence the name 'coral bleaching'.⁹

We will see the extinction of many species as we all try to adapt to our new climate. As many ecosystems are being damaged as well and we seem to ignore how would this affect us, lets remember that pharmaceutical industry relies on flora and fauna to develop medicines and this will mean that it would not be able to continue to produce some of the medicines that are available to us, and also that the cure to the diseases that have not be found yet may perish within these ecosystems.¹⁰

The United Nations is already talking about 'climate refugees' who will flee from vulnerable and adverse situations in order to find a more prosperous place to live, and those who will loose everything to a climate catastrophe.¹¹ Fatalities associated to the increased temperature will be more common than nowadays, and people in big urban centers will suffer from smog concentration developing respiratory diseases.¹²

The adverse effects of man-made damage raised awareness that mixed in with the turmoil of the 1968, became rapidly strong manifestations. These environmental movements pressured governments and International bodies to pursue an international agreement to protect the environment, respecting the nations powers over their territory but acknowledging the gravity of transboundary pollution. This subject of international law has become an important field that has been developed but still lacks of the correct measures to ensure we remain under 2°

⁹ (Flannery, 2015)pp.42-52

¹⁰ *Ivi.* pp.60-63

¹¹ (United Nations) <http://www.un.org/en/sections/issues-depth/refugees/>

¹² (Godrej, 2003)pp.57-61

Celsius from pre-industrial levels, especially since we can no longer neglect that we must join forces and work together to change our fate.

This paper will study East Asian Countries, focusing in China, Japan, South Korea and Vietnam and their national and international environmental policy development. Highlighting the different historic and socioeconomic background as they develop environmental governance.

In the first chapter, I will outline the most important environmental international conferences and treaties that were achieved under the United Nations to mitigate climate change. I will review the Three Rio Conventions, the most important being the United Nations Framework Convention on Climate Change and that build up to the Kyoto Protocol, the first binding framework towards reducing greenhouse gases emissions to fight global warming and the adverse effects of climate change. And we will follow the 10-year checkpoint of the Rio 1992 Earth Summit that was held in Johannesburg, South Africa, and the 20-year checkpoint that was also held as the first Earth Summit, in Rio di Janeiro, Brazil. Giving stress to the goals and policies that had been set towards meliorating our environment and socioeconomic development.

In the second chapter, my paper will touch the most famous protocols on environmental policy. One that was successful and set the example of what joint cooperation can achieve, the Montreal Protocol, and one that received criticism because of the small achievement goals that it sets, the Kyoto Protocol. Following we will overview the latest attempts to build a legally binding framework, the Copenhagen accord and the Paris Agreement. The Paris Agreement will be discussed lastly, being the most recent and innovative key to reducing global emissions since there is no longer a division between North and South. In which China the biggest GHGs emitter in the world has ratified it and strengthen its role after the decision of the United States to retreat from the agreement.

The East Asian Region has become one of the most competitive and important regions in the world, thanks to their booming economies and fast development. This is one of the reasons their involvement is crucial to achieve the reductions we need to stop global warming. The region is quite versatile having industrialized countries like Japan that as a G8 member has been funding and supporting green safe-and-sound socioeconomic development in developing countries. High technology countries like South Korea that similarly to Japan sought to industrialize fast suffering from aggravated pollution, but has taken the lead as the first non-annex country to submit voluntary emission reductions. And fast developers that have achieved extreme growth and socioeconomic development like China. Last but not least, Vietnam, a country that began developing later since the protracted bellic conflict, which started as one of the world's poorest countries but has achieved great development and seems to be following China's path.

In the third Chapter, I will resume a socioeconomic history to locate China, Japan, South Korea and Vietnam in the environmental state that encouraged them to participate to the environmental diplomacy negotiations. Following with the national environmental regulations that began to be issued after environmental depletion and pollution had been recognized as an imminent problem and later translated to the commitment of these countries to fight against climate change.

Lastly, in the fourth chapter, I will explain the multidisciplinary approach that is involved in the fight of climate change. I will resume mitigation and adaptation measures to governmental management and international cooperation.

I hope this paper portrays the importance of sharing multidisciplinary information and acknowledgment of environmental diplomacy that is a rather new subject and finds many ups and downs due the increased misinformation caused by numerous disciplines that rely under climate

change. And which may lead to deadlock during negotiations, especially between North and South blocks.

Chapter 1: Global Environmental Policy History

1.1. - The United Nations Conference on the Human Environment

After the constitution of the United Nations, its main agenda was aimed to give an order to the International realm in order to prevent any armed conflict and settle ongoing disputes. The United Nations acted as a forum to consolidate prevailing international customs, crystalize forming laws, create new laws to govern the international realm and monitor law enforcement.

In the post era of the second Great War, local groups and international organization such as the Union for the Conservation of Nature (IUCN) began to form up in different countries.¹³ This first group of activism was the reflection of the people's dissatisfaction of the governments decisions made in the pre-bellic and bellic period where the policies aimed production to support the war and no consideration for the environment was taken. With the rapid industrialization of new countries, chemical warfare and the aftermath of war, many countries realized that the environment had suffered and needed to be protected in other to ensure that future generations could enjoy from it. But in the air of the cold war that followed the conclusion of the Second great war, the two main powers – the United States and the Soviet Union– in the fear of future bellic engagement repeatedly performed chemical and nuclear weapons tests aggravated the state of the environment. Agriculture embraced the 'Green Revolution', that introduced genetic modified organisms (GMOs) and chemical fertilizers, that later were found to pollute fresh water

¹³ (McNeil, 2002) p.446

sources and soil, and were discovered to be the cause of cancer, birth defects and other nervous systems alterations.¹⁴

In the 1960's, several years after a busy agenda on policy-making, a wave of environmental concerns inspiring environmental movements reached the global audience. Individuals started taking action creating movements and condensing themselves non-governmental international organizations aimed to protect the environment and its resources that had been measuredly exploited.¹⁵ By the 70's these movements had reached a wide public and made pressure on governments to take action nationally and to reach to a global consent on this crucial matter. The pressure of the public and environmental movements helped the policy-making leadership to acknowledge the necessity to set a 'green agenda'.¹⁶ Once the Cold War atmosphere began to clear out, thanks to the Treaty on the Non-Proliferation of Nuclear Weapons, which was undersigned in 1968 and came into force two years later.¹⁷ A new atmosphere in the international community began to emerge which help expanding the subjects of international law to address a new common preoccupation: the environment.

Although the environment was being protected at a certain level within the United Nations institutions such as the World Health Organization (WHO), the UN Food and Agriculture Organization (FAO) and the UN Educational, Scientific and Cultural Organization (UNESCO). It was addressed for the first time a singular subject during the United Nations Conference on the Human Environment in 1970.

The Conference on the Human Environment, which took place in Stockholm from the 5 to 16 June was the first major Conference

¹⁴ Which was later regulated under international law in 2001 with the Stockholm Convention on Persistent Organic Pollutants that came into force on 17 May 2004.(UNEP)

¹⁵ (McNeil, 2002) p.447

¹⁶ (Focarelli, 2012) p.67, 665.

¹⁷ *Ivi.* p.784

addressing Environmental issues within the United Nations. The Stockholm Conference, exhorted all nations to united all efforts in order to 'Protect and improve the environment for present and future generations'.¹⁸ And stressed that unprecedented anthropogenic changes in the environment were the aftermath of the accelerated rate of development in technology and science, and pointed out '*the evidence of man-made harm ... –that comported– dangerous pollution levels in water, air, earth and living beings; major and undesirable disturbances to the ecological balance of the Biosphere destructions and depletion of irreplaceable resources....*'¹⁹

The Debate was split; strong stress was being made by Developing countries who argued that their main environmental problem was caused by underdevelopment, improper human settlements and sanitation issues. And Industrialized countries were more preoccupied by the possibility of developing countries to pollute their way to industrialization. However the Developing countries could not agree on an unfair policy, that would undermine economic, social development and industrialization, and made clear that since Industrialized countries GHGs emissions are higher than those of developing countries, it should be in their concern to finance and help developing countries to develop their economies in a sustainable way without denying them the right to Industrialize. And also to assist disaster-prone countries and the least developed countries.

The Stockholm Conference calls Industrialized Countries and Developing Countries to address climate change and environmental depletion in joint action. The UN agencies, FAO, WHO and the Economic and Social Council

¹⁸ (Publications, 1972)Declaration on the United Nations Conference on the Human Environment. Principle 1. p.4

¹⁹ Report of the United Nations Conference on the Human Environment. Proclaim number 3 .p.3

ECOSOC, were also called to advice and help developing countries in environmental planning and rural development²⁰, Waste disposal²¹, and improvement of human settlements on squatter areas.²² It also made stress on soil depletion and the use of toxic pesticides²³ that may harm the ecosystem and human health.²⁴

The WMO was called to coordinate a monitoring programme of ten stations in remotes areas away from all source of pollution in order to establish global trends which 'may cause changes in meteorological properties, including climatic changes'²⁵ in order to understand better these phenomena.

²⁰ Report of the United Nations Conference on the Human Environment. p.8

²¹ *Ivi.* p.7

²² *Ivi.* p.8

²³ Persist Organic Pollutants (POPs), such as DDT

²⁴ Report of the United Nations Conference on the Human Environment. p.10

²⁵ *Ivi.* p. 21

1.2. - The United Nations Environmental Programme

The Stockholm Conference established the UNEP, The United Nations Environmental Programme. '[T]he environmental Conscience of the UN System'²⁶, who is in charge of guidance and cooperation in environmental protection, helping nations to build green economies which develop compliance to sustainable socioeconomic development. Nor less that setting a green agenda and promoting the guidelines to environmental protection within the UN.²⁷

Counting with six regional offices, – Africa, Asia Pacific, Europe, Latin America and the Caribbean, North America, West Asia – and headquarters in Nairobi, Kenya, the UNEP encourages, informs and guides member states, representatives from civil society, businesses and other Major Groups and Stakeholders. And hosts the secretariats of many multilateral environmental agreements and research bodies.

The UNEP serves as an authoritative advocate for the environment and focus its work towards climate change, disasters and conflicts, ecosystem management, environmental governance, chemicals and waste, resource efficiency, and environment under review.²⁸

The UNEP was designated to prepare the elements needed, research backup and a draft paper, to line out what evolved to be the Vienna Convention for the Protection of the Ozone Layer of 1985, and its 1987 Montreal Protocol. Mostafa Tolba a pioneer of environmental law and the then UNEP executive director was a key role in achieving the two agreements.²⁹

²⁶ (UNEP, UNEP)<http://web.unep.org/about/who-we-are/overview>

²⁷ Nazioni Unite. L' ABC delle Nazioni Unite. pp.37,38.

²⁸ (UNEP) <https://www.unenvironment.org/about-un-environment/why-does-un-environment-matter>

²⁹ (Ortolano, 1997)p.64

The UNEP having a 'program' status and not being a body of the UN holds weak lobbying power within the United Nations System. In 2007, the French President, Jacques Chirac, called out for the replacing of the UNEP to a new more powerful 'United Nations Environment Organization' this proposal was backed by forty-six countries which included all UE countries but lacked the support of China, the United States and Russia. The Fourth IPCC Assessment Report also highlighted the weak position of the UNEP and called for a '*strengthen international governance of the environment*'.³⁰

³⁰ (Philander, Encyclopedia of Global Warming and Climate Change. Second Edition, 2012). Vol. III. P.1385

1.3. - The Vienna Convention for the Protection of the Ozone Layer

The Vienna Convention for Protection on the Ozone Layer remains the most successful in environmental policy treaty and it is the most universal treaty within the UN being ratified by all members of the United Nations. The Vienna Convention was adopted in 1985 and entered into force on 22 Sep 1988.³¹

The Vienna Convention is the perfect example of the implementation of the 'precautionary principle', since nations reacted to the not yet confirmed by science speculations that man-made hydrocarbons containing chlorine and bromine deplete the Ozone layer, which results in more UV-B rays exposure, since the Ozone does not block some of these rays.³² The alarming consequences that were speculated so far –such as changes in weather and climate, skin cancer, eye cataracts, crop yield reduction, marine life alteration, as well as inhibition of marine phytoplankton oxygen production– were enough to reunite all nations a converge a treaty to prevent ozone depletion by conduction scientific research to understand more about the chemical compounds³³ which deplete the ozone layer and taking preventive measures even when it had been not clear the link between these phenomena.³⁴ Nations put aside the 'wait and see approach' that had been used in the previous international conferences about the environment, embracing a 'better safe than sorry' point of view made the Vienna Convention and its amending protocol, the Montreal Protocol, a role-model to follow in the future of environmental diplomacy.

³¹ (Secretariat)Ozone Secretariat UNEP

³² (Jacobs 2014)pp.161-171

³³ Suspected compounds were: carbon monoxide, carbon dioxide, methane, non-methane hydrocarbon species, Nitrous oxides, chlorine substances such as fully and partially halogenated alkanes , bromine substances, hydrogen substances.

³⁴ (Vienna Convention for the Protection of the Ozone Layer 1985) Annex I.

The Vienna Convention acknowledges the responsibility of States according to the UN Conference on the Human Environment principle 21, which reaffirms national jurisdiction to exploit resources within the national limits and shall *'[n]ot cause damage to the environment of other States or of areas beyond the limits of national jurisdiction'*, and based on this assumption calls for each country to take national action in order to prevent the release of ozone depleting substances³⁵.

The Convention calls upon the parties to cooperate in a information exchange of research in order to produce correct assessments of the man-made effect in ozone depletion, and to take action internally so that policies are able to ... *'[c]ontrol, limit, reduce or prevent human activities under their jurisdiction ... should it be found that these activities have or are likely to have adverse effects resulting from modification or likely modification of the ozone layer'*.³⁶

By reaffirming that the causes are not establish yet, but an imminent treat to our health and environment, the Vienna Convention for the Protection of the Ozone Layer calls all parties to take active action to find and mitigate the causes of ozone depletion, setting an active goal to be pursued in conjunct action with international bodies, scientific committees, the WMO and the WHO and to be further discussed in a Conference of the Parties (COP).³⁷

³⁵ Environmental Policy and Law, Volume 14, Issues 2-2, May 1985, pp. 72-77.

³⁶ (Vienna Convention for the Protection of the Ozone Layer 1985) Art.2

³⁷ *Ivi.* Art. 6

1.4. -The Intergovernmental Panel on Climate Change

The Intergovernmental Panel on Climate Change (IPCC), was created by the World Meteorological Organization (WMO) and the UNEP, according to the UN General Assembly Resolution 43/53 in 1988. The IPCC main objective is to prepare an unbiased report based on scientific research *[o]n all aspects of climate changes and its impacts, with a view of formulating realistic response strategies'*³⁸, to inform politicians and civilians on the scientific discoveries in climate change.³⁹

The IPCC is not a research body, but rather gathers up scientific, socioeconomic, and technic information from thousands of worldwide researchers, who specialize in a variety of subjects. The IPCC revisions the information and assembles it in a wholesome objective report. This report is apolitical, however it is published with the intention of guiding policy makers and the public to give up-to-date information on the state of climate depletion and the consequences of climate change.⁴⁰

The revisions of the scientific reports sent to the IPCC are divided into three work groups. Greenhouse gases, aerosols, process and modeling, climate change and observations on climate variation, are reviewed by the Working Group I, which has concluded that anthropogenic related GHGs emissions are causing abnormal concentrations in our atmosphere resulting in global warming. Working Group II is in charge of the revision of climate change impact on agriculture and forestry, ecosystems and water resources, human settlements, oceans and coastal zones, water bodies, glaciers and permafrost. Working Group III covers the mitigative and adaptive aspect of energy, human activities.⁴¹

³⁸ (IPCC) p.2

³⁹ (Lanza) p.83

⁴⁰ ABC p.58

⁴¹ (Philander, Encyclopedia of Global Warming and Climate Change. Second Edition, 2012).Vol. II. P.778

The First IPCC Assessment Report was handled in 1990 and recapitulated the state of climate change, environmental impact assessments, economical and social assessments and problem-solving strategies and strategies aimed to mitigate the problems.⁴² It emphasized the relations between man-made changes in the environment and climate change. With larger green house emissions and less carbon storage the use of fossil fuels and large-scale deforestation, backlashed further accumulation of green house gases, aggravating the effects of climate change.⁴³

The Second IPCC Assessment Report came five years later, was used a guide for the negotiations of the Kyoto Protocol at the COP 3 in 1997, stressed the importance of mitigating climate change bringing to light the *'[s]erious socioeconomic and environmental impacts, especially for developing countries.'*⁴⁴

The Third IPCC Assessment Report was issued in 2001, one of the most shocking statements in the report was that the earth's global surfaces is expected to increase from 1.4 to 5.8 Celsius degrees by 2100 and this scale of temperature change has been experienced in the previous 10,000 years.⁴⁵

In 2007 the Fourth IPCC Assessment Report was presented to the UN Assembly with more shocking facts: 11 of the latest 12 years were registered as the hottest years since 1850, glaciers and frozen water bodies declined and sea level rose, intense droughts were registered as well. The IPCC the same year received the Nobel Peace Prize with the United States 45th Vice-President Al Gore for its efforts on addressing climate change.⁴⁶

⁴² (Lanza) p. 83

⁴³ (McNeil 2010) pp. 83-84

⁴⁴ (Philander, Encyclopedia of Global Warming and Climate Change. Second Edition, 2012).Vol. II. p.779

⁴⁵ *Ivi.* p.780

⁴⁶ (Philander, Encyclopedia of Global Warming and Climate Change. Second Edition, 2012).Vol. II. p. 80

The last Assessment Report is the 2014, Fifth IPCC Assessment Report, which like the previous assessment reports brought more alarming information. The warming changes made by the emission of GHGs, will bring *'[l]ong-lasting changes in all components of the climate system, increasing the likelihood of severe, pervasive and irreversible impacts for people and ecosystems.'*⁴⁷ Global warming will continue melting the glaciers and ice bodies and the access to fresh water will become an issue, due the high evaporation and salinization linked to sea level rising. The ocean will continue to warm and ocean acidification will damage marine ecosystems.⁴⁸ Food security will likely be compromised since the extreme precipitation levels which are expected to be constant and more violent to the pattern previously known.⁴⁹

The Fifth Assessment Report stressed the importance of mitigation and adaptation methods, and urges to change drastically the number of GHGs emissions in the next few decades. In order to prevent damage to the ecosystems, biodiversity and human settlements which likely suffer from the adverse effects of climate change. The most preoccupant statement made was that even when man-made GHGs emissions were to stop, *'[m]any aspects of climate change and associated impacts will continue for centuries'*.⁵⁰

The IPCC will continue providing policy-makers with its Reports and Assessments reports in order to educate not only them but also the public to the consequences of our actions to the environment. The Sixth Assessment Report is it expected to be issued in 2020, and we can only hope that by the 30th anniversary of the Rio Earth Summit of 1992 our heads of state will embrace a new era of international environmental policy.

⁴⁷ (Intergovernmental Panel on Climate Change, 2014)p. 8

⁴⁸ *Ivi.* p.10

⁴⁹ *Ivi.* pp.15,20,26-30

⁵⁰ *Ivi.* p.16

1.5. - The United Nations Conference on Environment and Development

The United Nations Conference on Environment and Development (UNCED), also known as Earth Summit or Rio Conference, Rio Summit, was held in Brazil, Rio de Janeiro from 3-14 June 1992.

It was the first conference dedicated to the environment that proposed legally binding documents commonly known as the Rio Conventions – The United Nations Framework Convention on Climate Change and the Convention on Biological Diversity – which were opened to signature during the Conference, and the Convention to Combat Desertification which text was proposed during the Convention.

There are two non-legally binding important documents resulting from the Rio Conference: the 'Rio Declaration on Environment and Development' and the 'Agenda 21'. These two documents define the guidelines that should be taken into consideration for future development. To assure the compliance of these two agreements, the United Nations established a Commission on Sustainable Development (CSD). The Rio Conference also sought to forge a legal document on Forest Principles that at the end remained just as a statement that reinforces the importance of Forest protection.⁵¹

Japan, who had stepped aside of the environmental protection leadership after the economic crisis, renewed its commitment to Environmental Protection during the Earth Summit. Declaring that the Official Development Assistance (ODA) environmental projects would be increased to 900 billion to 1 trillion yen to help developing countries to cope with environmental problems and preserve the ecosystems. By 1995

⁵¹ (Philander, Encyclopedia of Global Warming and Climate Change. Second Edition, 2012)p.1209

the goal amount was exceeded, 1.5 trillion were used to promote environmental ODAs.⁵²

⁵² (Hidefumi Imura, 2005)p.143

1.5.1. - Rio Declaration on Environment and Development

The Rio Declaration, reaffirms the content of the Stockholm convention of 1972, and called all nations 'to build upon' the convention and *'[e]stablish a new and equitable global partnership through the creation of new levels of cooperation among States, key sectors of society and people'*.⁵³ The twenty-seven principles, proclaimed within the Rio Declaration, tie down a scheme to facilitate international environmental policy-making and facilitate a sustainable development system.

The most relevant principle is the 'Common but differentiated responsibilities principle', was clinched in Principle 7 of the Declaration. Although all nations are to compel to 'conserve, protect and restore the health and integrity of the Earth's ecosystem'⁵⁴, diverse responsibilities await each nation, since the 'different contributions' to the environmental depletion made by different States.

In order to assist the least developed and environmentally vulnerable countries, special priority should be taken. All nations are pleaded to exchange scientific and technological knowledge, in order 'to strengthen endogenous capacity-building for sustainable development' since poverty is one of the main causes of vulnerability.⁵⁵

Principle 3 reminds that 'the right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations. The following two principles recall that development should not diverge from sustainable development and environmental protection, and that eradicating poverty should be considered as an indispensable requirement for sustainable development'⁵⁶

⁵³ (UNEP)Rio Declaration on Environment and Development. Preamble.

⁵⁴ *Ivi.* Principle 7

⁵⁵ *Ivi.* Principle 9

⁵⁶ (UNEP) Rio Declaration on Environment and Development. Principles. 3-5.

The path of pursuing of a sustainable environment economic system should be accompanied by effective national and local environmental legislations. Nations are expected to cooperate to inform other nations when natural disasters occur and all measures to prevent adverse cross-border effects. The 'polluter pays' formula should be internalized, however the 'precautionary approach' should be applied according the states capabilities, in order to prevent 'serious or irreversible damage' and the lack of scientific research to backup should not be consider an excuse to post-pone the preventive measures.

Governments shall use environmental impact assessments to ensure that any action take is compelling to environmental sustainability. Nations should raise public awareness in their communities, and incorporate the women, youth and indigenous communities.

To *'[f]urther develop ... international law in the field of sustainable development'*⁵⁷ states and people shall cooperate in good faith. And the Nations are welcomed to resolve their controversies peacefully, preventing warfare, which is 'inherently destructive of sustainable development'.⁵⁸

⁵⁷ *Ivi.* Principle 27.

⁵⁸ *Ivi.* Principle 24.

1.5.2. - Agenda 21

The Agenda 21 defines the objectives to achieve sustainability, it highlights that social and economic development is crucial as much as conservation and management of resources for development. It calls upon people and governments, and non-governmental organizations to take global action to reach an equitable sustainable development.

The '[A]genda 21 addresses the pressing problems of today and also aims at preparing the world for the challenges of the next century. It reflects a global consensus and political commitment at the highest level on development and environment cooperation'.⁵⁹ It outlines a plan addressing all issues concerning sustainability and it recommends an approach to solve each individual problem to facilitate undertaking steps and internal adaptation.

The importance of social and economic development are highlighted as a primal priority and it recommends that states encouraging poverty eradication, especially through providing basic education to prevent illiteracy – without discriminating youth, women and indigenous people–, higher education – in order to promote research– and raise awareness among the people.⁶⁰

It encourages states to develop a sustainable planning and managing of land. Big cities, where most of the population congregates, should have a urban plan of human settlements that contemplates proper shelter, access to a clean water supply, sanitation, management of waste and sewage in order to not have harmful repercussions on the human health. As for rural land management, governments should encourage the reduce of migration to urban areas by adopting policies that favor the access to

⁵⁹ (UNEP) Agenda 21. Chapter 1, Preamble 1.3.

⁶⁰ *Ivi.* Chapters 3, 24, 25, 26.

land, and education and financial aid to promote self-sufficient and environmentally friendly agricultural practices

Agricultural and Business Industries in action with the governments should follow a sustainable pattern and prevent pollution of the environment with hazardous wastes, toxic chemicals and radioactive waste. Reforestation should be practiced in order to prevent the spread of desert and soil degradation. Developing Countries shall be aid financially and trained in nuclear programs to prevent calamities due to hazardous leaks of radioactive waste. Biotechnology and scientific research should be provided to develop a 'sound development'.⁶¹

The Agenda 21, acknowledges the global scale of our environmental problems and calls upon to respect the Montreal Protocol to the Vienna Convention Ozone layer reduce green-house gases emissions (GHGs) and harmful chemicals in order to protect the ozone layer and prevent global warming and encourages the use of renewable energy sources. Special attention is drowned toward the ocean pollution, over-fishing and marine ecosystem degradation.

Preventing and reverting climate change is stressed as an imminent action to undertake to preserve Biodiversity, species and ecosystems since they require balance in order to be preserved and assure that future generations will not be denied their right to them. Climate Balance is important to human kind, and we shall protect our home and those more in need, developing countries and small island states, that could suffer more from global warming derived natural disasters.⁶²

⁶¹ (UNEP) Agenda 21 Chap. 7,8,11,12, 16, 18-22, 32.

⁶² *Ivi.* Chap. 8,9, 15, 17.

1.5.3. - Framework Convention on Climate Change (UNFCCC)

The UNEP and the WMO prior the adoption of the text of the UNFCCC pointed out the guidelines for a future international environmental treaty, equality in responsibilities but different in action planning according to the development of each country, sustainable growth and a 'better safe than sorry' approach on the doubts not yet confirmed by science.⁶³

By the End of 1990 the UN General Assembly created an intergovernmental committee to favor the negotiation of the UNFCCC. The text was discussed in 5 meetings from February 1991 and May of the following year. Finally the text was adopted the 9 May 1992, and open to signature during the Rio Conference in June of the same year, and further on the same year in the UN. The Convention became into force the 21 March 1994, and since had been ratified by 197 parties.⁶⁴

The adoption of the convention is a well-purposed guideline but lacks in deadlines, thus being considered 'soft-law'.⁶⁵ As the first legally binding document in this field, many speculations were made, and the insufficient will of commitment of the US, made this agreement to be 'better than nothing'. Since a more efficient and rigid agreement may have discouraged governments to ratify and comply with the Treaty.⁶⁶

The Convention divided the countries in three groups with different responsibilities according to the development level. The first group, Annex I countries, is composed by Industrialized countries and countries in with economies in transition to industrialization – East Europe countries, Russia and Ukraine–, who are asked to bring emissions of GHGs to the levels of 1990. Annex II countries, only industrialized countries,

⁶³ (Lanza) p.84

⁶⁴ (UNFCCC)

⁶⁵ (Philander, Encyclopedia of Global Warming and Climate Change. Second Edition, 2012). Vol.III. p.1386

⁶⁶ (Lanza). p.86

should also make efforts to transfer clean technologies to 'Non-Annex countries', which are developing countries who and are not obliged to cut GHGs emission but are strongly recommended to do so and with benefit of the support of Industrialized countries to achieve GHGs emissions reduction.⁶⁷

The convention calls to all members to participate in a 'Conference of the Parties' common known as COP, to further develop international environmental policy and the monitor the compliance to the goals set by the UNFCCC.⁶⁸ In order to build up to the UNFCCC, parties are supposed to communicate a national inventory of emissions that fall aside of the Montreal protocol to create a basis on the objectives to be prepare during the Conferences of the Parties.⁶⁹

The subsidiary body for implementation was established in order to review 'effective implementation of the convention'. And the subsidiary body for scientific and technological advice was established in order to advice in multidisciplinary matters and provide of assessments to ensure the parties understanding in implementation and methodological questions.⁷⁰

⁶⁷ (Lanza) pp.86-87

⁶⁸ *Ivi.* p.87

⁶⁹ (UNFCCC, Unfcc.int) UN Framework Convention on Climate Change. Art 12

⁷⁰ *Ivi.* Arts. 9 and 10

1.5.4. - Convention in Biological Diversity CBD

The Convention on Biological Diversity was opened to sign at the Rio Convention, it now counts with 196 Parties⁷¹ and came into force in 29 December 1993.⁷² The objective of the Convention is *'[t]he conservation of biological diversity, the sustainable use of its components and the fair equitable sharing of the benefits arising out of the utilization of genetic resources.'*⁷³ This is to be achieved by technology and resources transfer and sharing, in view of 'appropriate funding'.

Aware of the lack of research and information, the CBD institutes a 'Subsidiary Body on Scientific, Technical and Technological Advice', with a multidisciplinary character which will prepare a report on the work progress of the convention and will provide with 'scientific and technical assessments of the status of biological diversity'.⁷⁴

A Financial Mechanism will provide help in order to share and transfer technologies to ensure that all parties, specially developing countries, are taking means to identify and monitor the conservation of biodiversity in-situ and ex-situ. Educational programs, scientific training and public awareness are also crucial in Biodiversity preservation; local populations who have a close relationship with nature shall be informed and educated in the matter.⁷⁵

The parties shall meet when called upon, in a Conference of the Parties, and each Party shall submit a Report *'[o]n the measures which it has taken for the implementation of the provisions of this convention and their effectiveness in meeting the objectives...'*⁷⁶ By doing so, a dialoging will

⁷¹ (CBD)

⁷² (CBD, cbd.int)

⁷³ (Nations, 1992) art.1

⁷⁴ *Ivi.* art.25

⁷⁵ *Idem.*

⁷⁶ (Nations, 1992) art.26

expand our knowledge and might help us to prevent and restore when possible the biodiversity.

United action between International, regional and local organizations, non-governmental organizations and states is required to preserve the Biodiversity, Parties are to promote such relationships and encourage their work.⁷⁷

⁷⁷ *Idem.*

1.5.5. - The UN Convention to Combat Desertification UNCCD

The Convention to Combat Desertification has been ratified by 196 parties and came into force in December 1996.⁷⁸ It addresses the problem of desertification, land degradation, soil erosion, long-term loss of natural vegetation and serious drought that is consistent in developing countries and least developing countries, particularly in Africa. Since its establishment there have been held 13 Conference of the Parties in order to address expansion of deserts, land degradation and drought.⁷⁹

It calls upon the International community *'[t]o combat desertification and/or mitigate the effects of drought'*⁸⁰, acknowledging that these phenomena undermine sustainable development and aggravate poverty, health conditions, nutrition and food security, and nonetheless create further problems of migration and displacement of persons.

The parties are compelled to design and implement projects to combat and mitigate desertification and drought in order to rehabilitate, conserve and manage land and water resources in a sustainable way, and by doing so improving the community living conditions.

The parties use the channels established by previous bilateral and multilateral financial mechanism to mobilize financial resources to combat and mitigate the effects of desertification and drought. The same way parties *'[s]hall encourage the conduct of joint programmes, particularly in the fields of research, training, systematic observation and information collection and exchange, to the extent that such activities may contribute to achieving the objectives of the agreements concerned.'*⁸¹

National action projects are to contribute with the enhancement of

⁷⁸ (UNCCD, UNCCD.int)

⁷⁹ (Unccd)

⁸⁰ (UNCCD) UN Convention to Combat Desertification. Preamble

⁸¹ (UNCCD) UN Convention to Combat Desertification. Art. 8.1

'[c]limatological, meteorological and hydrological capabilities and the means to provide for drought early warning'.⁸²

⁸² *Ivi.* Art. 10d

1.6. -World Summit on Sustainable Development WSSD

The World Summit on Sustainable Development, commonly known as Rio +10, took place in Johannesburg, South Africa from 26 August to 4 September 2002. Although the WSSD did not result in a legally binding document, it reassures the continuous pursue of the 'outcomes of the major United Nations conferences and international agreements since 1992'.⁸³ The Plan of Implementation of the World Summit on Sustainable Development draws the guidelines that in conjunction of previous reached agreements States shall follow. Confirming the important role of the Agenda 21 and the Millennium Development Goals, the plan of implementation calls States, International Organizations, NGOs, Agricultural and Business Industries, and all people to take action and ensure the compliance of these goals.

It acknowledges globalization's positive outcomes – trade, investments, capital flow and advances in technology–, at the same time, points out that developing countries face up challenges and difficulties to handle this kind of opportunities. It suggests that production and consumption patterns should reach out for sustainability in their production processes.

According to the three pillars of sustainable development, –economic development, social development and environmental protection– States and Industries should prevent further natural resources degradation, invest in renewable energy sources and protect the biosphere from hazardous contamination. Poverty eradication and proper human settle development assuring clean water and reducing health hazards are a priority. Particular attention is to be made in Africa and Small Island States, who are the most vulnerable and require financial aid and guidance in order to assure compliance.⁸⁴

⁸³ (UN) Plan of Implementation of the World summit on Sustainable Development. Introduction, point 1.

⁸⁴ (UN) Plan of Implementation of the World summit on Sustainable Development.

Japan communicated in this occasion the 'Environmental Conservation Initiative for Sustainable Development', taking a step back on financing developing countries environmental projects and stressing the importance of these countries of taking self-initiative to solve environmental depletion.⁸⁵ In contrast to Japan's announcement, the 'Initiative for Development in East Asia' was announced. This initiative is aimed to fight climate change, biodiversity and forest loss in developing countries in the East Asian region.⁸⁶

⁸⁵ (Hidefumi Imura, 2005)pp.143-144

⁸⁶ *Ivi*. p.336

1.6.1. - The Johannesburg Declaration

The Johannesburg Declaration explains our ambitions and a guideline in order to achieve them, and makes a walk-through of the achievements in the field of international environmental policy made since the first Conference on the Human Environment and the later Rio Conference, which has a 10 year gap from the Johannesburg Conference (hence its nickname 'Rio+10').

In the Johannesburg Declaration it has been stressed that in order to be able to assure our future generations to *'[i]nherit a world free of the indignity and indecency occasioned by poverty, environmental degradation and patterns of unsustainable development'*⁸⁷, we shall *'[a]ssume a collective responsibility to advance and strengthen the interdependent and mutually reinforcing pillars of sustainable development – economic development, social development and environmental protection – at the local, national, regional and global levels.'*⁸⁸

Going down the time line, it looks back on the achievements made with the milestone of the UNFCCC at the Rio Conference and the Agenda 21, and the path we have walked since the first Conference on the Human Environment, Stockholm Conference in 1972, and it calls to urgent action to be taken to prevent further damage to the environment.⁸⁹

It recognizes *'[t]hat poverty eradication, changing consumption and production patterns and protecting and managing the natural resource base for economic and social development are overarching objectives of and essential requirements for sustainable development.'*⁹⁰

⁸⁷ (UN)Johannesburg Declaration n. 3

⁸⁸ *Ivi.* n.5

⁸⁹ *Ivi.* n. 8-9

⁹⁰ (UN)Johannesburg Declaration n.11

1.7. - The United Nations Conference on Sustainable Development UNCS D

Also known as Rio+20, the United Nations Conference on Sustainable Development (UNCS D) took place in Rio de Janeiro, Brazil from 13-22 June 2012, 20 years after the first Rio Conference. Rio+20 was not aiming to draw up any new treaty; it sought the purpose of being a moment to review all the efforts that had been made in the last twenty years. During the Conference, themes such as the green economy and the institutional framework for sustainable development were reviewed to expand the understanding and lessons learnt in the last two decades.⁹¹

'The Future We Want' is a non-legally binding document that resulted from the Conference. It renews the political commitment to pursue sustainable development, recalling and reaffirming the previous Conventions, Treaties, Declaration plans and Implementation plans in environment and sustainable development, such as the Stockholm Conference, the three Rio Conventions, the Agenda 21 and the Millennium development goals.⁹²

It acknowledges that since the first Rio Conference in 1992, there has been an uneven progress pursuing sustainable development and it stressed out that *'...[p]overty eradication, changing unsustainable and promoting sustainable patterns of consumption and production, and protecting and managing the natural resource base of economic and social development are overarching objectives of and essential requirements for sustainable development.'*⁹³

It calls for an 'urgent and ambitious action' to combat Climate Change and its negative impacts that undermine and threaten Developing Countries,

⁹¹ (Philander, Encyclopedia of Global Warming and Climate Change. Second Edition, 2012)p.1208

⁹² (UN)The Future We Want

⁹³ *Ivi*. Statement n. 4

Least Developed Countries and Small Island States, which are more prone to natural disasters derived from Climate Change.

And it reinforces the parameter of not surpassing 2° to 1.5° Celsius above the pre-industrial levels of global average temperature. In order to compel, states should reduce GHGs emissions, adopt renewable energy sources, reforest, afforest and forest restoration to improve carbon capture. Prevent land degradation, contamination and desert enlargement. Implement the strategic plan for biodiversity and respect the CBD and the CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) to prevent further damage and extinction of biodiversity.⁹⁴

It encourages policies for green economy, sustainable development and poverty eradication. All levels of government and legislative bodies, International financial institutions, business, industries and stakeholders should promote, and when feasible, assist in the transition to a sustained and inclusive economic growth.

The Commission on Sustainable Development, established by the Rio Summit in 1992, was replaced by ‘an universal intergovernmental high level political forum’, which should build up the CSD previous work and will ‘provide a dynamic platform for regular dialogue, and stocktaking and agenda setting to advance sustainable development’.⁹⁵

⁹⁴ (UN)The Future We Want

⁹⁵ *Ivi.* point n.85b

Chapter 2: Reaching Agreements and Amending Protocols: Building a legal frame of action.

2.1. - The Montreal Protocol

Ratified by the 197 parties to the Vienna Convention for the Protection of the Ozone Layer, the Montreal Protocol of 1987. It is a legally binding document aimed to reduce and eliminate gradually the ozone depleting substances. After its agreement the 16 September 1987, it came into force the 1st January 1989.⁹⁶

The universality of the Montreal Protocol lays down on the Vienna Convention for the Protection of the Ozone Layer, encouraging all parties to adopt its text by the 'common but differentiated responsibilities', which gives developing countries flexibility to transition at a ease step.⁹⁷

The main ozone depleting substances (ODSs) are chlorofluorocarbons (CFCs), which are substances that along the halon group, when reaching the stratosphere react chemically with ultra violet rays and release chlorine that further reacts and depletes the ozone layer. ⁹⁸

The Montreal Protocol has been amended in London 1990, Copenhagen, 1992, Montreal 1997, Beijing 1999.⁹⁹ The previous amendments change the goals of the Montreal Protocol as new scientific research linked the substances previous permitted with ozone and climate depletion. The London 1990 amendment introduced the Multilateral Fund for the Implementation of the Montreal Protocol who is in charge of helping financially developing countries to comply to the protocol and financing

⁹⁶ (Focarelli, 2012) p.675

⁹⁷ (Roberts 2017)

⁹⁸ (McNeill 2000)p.143

⁹⁹ (Ralph Luken, 2006) p.244

⁹⁹ *Idem.*

⁹⁹ (Roberts 2017)

development and implementation of investment projects aimed to reduce ODSs and reduce global warming potential.¹⁰⁰

In the beginning the Montreal Protocol designed CFCs to be banned for import and production, and admitted Hydrofluorochlorocarbons (HCFCs) replace CFS, even when CFCs are less harming to the ozone layer they promote climate depletion. HCFCs where later substituted by Hydrofluorocarbons (HFCs), which cause no harm to the ozone layer, but still largely promote green house effects in the atmosphere.¹⁰¹

The last amendment to the Montreal Protocol, the Kigali Amendment, was agreed in October 2016 and will come in to force the 1 January 2019, with the primary goal to phase-down HFCs which are 'super' green house gases and thus preventing that climate change become the price of restoring the ozone layer.¹⁰²

¹⁰⁰ (Roberts 2017)

¹⁰¹ *Idem.*

2.2. - The Kyoto Protocol

The Kyoto Protocol of 1997 is an amending protocol to the UN Framework Convention on Climate Change. The Kyoto Protocol text was discussed during the UNFCCC Third Conference of the Parties at Kyoto, Japan (COP3).¹⁰³

The Kyoto Protocol was highly criticized for the relative low commitments that it aims to achieve, and after the United States, the main polluter accountable of the 36% of the global quotas, opted to not ratify it in 2001, speculation began to raise of whether the Protocol was ever come in to force. In 2004, Russia, who was hostile during the discussion of the text, ratified it and hence reaching the 55% of the global emissions quotas that had been required by the protocol in order to come into force. The Kyoto Protocol came in to force eight years later from the text signature of the 22th February 2005.¹⁰⁴

The Kyoto Protocol assigns different responsibilities to the three categories of states. Industrialized Countries and countries with economies in transition, Annex 1 Countries, are obliged to reduce during the 2008-2012 the emissions of GHGs, –carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆)– the 5,2% of the emissions levels in 1990.¹⁰⁵

These objectives are to be reached with the help of the three ‘Cap and trade’ mechanisms¹⁰⁶ introduced by the Kyoto Protocol, the International Emissions Trading (IET), the Clean Development Mechanism (CDM) and the Joint Implementation (JI).¹⁰⁷

¹⁰³ (Elisa Bignante, 2014)

¹⁰⁴ *Ivi.*

¹⁰⁵ (Focarelli 2012)pp.676-677

¹⁰⁶ In the fourth chapter these ‘cap and trade mechanisms will be explained in detail.

¹⁰⁷ (Focarelli 2012) pp.676-678

The International Emissions trading allows the Annex 1 Countries to sell the remaining allowed quotas that that party was allowed to pollute.

Joint Implementation is a mechanism that allows Annex 1 Countries to develop projects within the Annex 1 Countries in order to reduce GHGs.

A difference is made with the Clean Development Mechanism which allows Annex 1 Countries to cover its own national quotas in non-annex 1 countries, where is more economically reasonable to reach quotas with a lower financial investment, since is quite affordable and easy to invest in developing countries and have more emissions reductions than in industrialized countries where it would be quite expensive to reach the same emissions reductions.

This helps to reach a global reduction of GHGs at a more affordable manner than stopping economic expansion in Industrialized countries.¹⁰⁸

The CDM however slows down the transition of Annex 1 into cleaner technologies. In 2009 around 850 projects were approved, mainly in the biggest developing countries, China, India, Brazil and South Africa.¹⁰⁹

¹⁰⁸ *Ivi*. p. 678

¹⁰⁹ (Giddens 2011)

2.3. - The Copenhagen Accord

The UNFCCC Conference of the Parties of December 2009 (COP15), led to an informal agreement that outline the goals the parties had for a post-Kyoto era.

The Copenhagen Accord was drafted by the some of most pollutant countries –The BASIC group: China, India, Brazil and South Africa and the United States– and was rushed into a possible adoption in a fast negotiation, resulting in the non-formal adoption of the Accord.

The Copenhagen Accord acknowledges the importance maintaining the global temperature under 2° Celsius, but it lack to set legally binding reduction targets, the countries are only to list the objectives to be reached by 2020.¹¹⁰ The same way, a financial aid for developing countries estimated US\$30 billion to further be expanded to US\$100 billion was set but it is not clear where the money should be raised from and how it should be used.

A Reducing Emissions from Deforestation and Forest Degradation plus Conservation mechanism (REDD) was clinched as an important role to reduce and remove GHGs.¹¹¹

The most important aspect of the Copenhagen Conference of the Parties was commitment of non-annex countries to participate and start taking responsibilities to mitigate Climate Change. However ambitious goals often scare away countries afraid to comply with these commitments.¹¹²

¹¹⁰ (Regina Betz 2014)

¹¹¹ *Ivi.*

¹¹² (A. Ghezloun 2013)

2.4. - The Paris Agreement

The Paris Agreement was reached in the 21st UNFCCC Conference of the Parties (COP21), which took place from 30 November to 12 December 2015, in Paris, France. The Paris Agreement came into force the 4th November 2016. As of today, 16 February 2018, 174 parties have ratified the Paris Agreement.¹¹³

The Paris Agreement (PA), is a legally binding document, however it does not provide binding fixed amounts of emissions reductions. The parties are responsible of fixing and declaring their self-declare reduction contributions that are the 'Intended Nationally Determined Contributions'.

The Paris Agreement has been criticized because it has failed to set legally binding GHGs emissions quotas for each nation. To many, the Paris agreement is a success, compared to the previous failure at Copenhagen. The PA is helping us to build a framework towards a low carbon economy system, by set legally binding responsibilities to each nation to declare intended Nationally Determined Contributions (INDCs). And a legally binding checkpoints down the road to assure that these national emissions quotas are in compliance, strengthening the framework of action and preparing us to a new agreement that may be solidify but all the efforts achieved under the PA. The PA is the representation of the acceptance of commitment and national interests towards mitigating global warming and climate change, is an enormous improvement that has been highly awaited.

The Article 2 of the agreement fixes 2 degrees Celsius as the maximum global temperature 'above pre-industrial levels' and aims to 'limit' the temperature to increase to 1.5 degrees Celsius, *'[r]ecognizing that this*

¹¹³ Last Accessed (16/02/2018) http://unfccc.int/paris_agreement/items/9444.php

would reduce the risks and impacts of climate change.¹¹⁴ The 2° Celsius maximum has been adopted according the IPCC assessments reports that provide evidence that an increased temperature above 2° Celsius will have irreversible changes to our environment.

Besides reducing GHGs emissions, the Paris Agreement seeks to amplify the resilience and adaptation to the negative impacts of climate change. In order to identify and build up adaptation and mitigation capacity the Paris Agreement has set up a 'Paris Committee on Capacity building' which will put special attention to the compliance of its guidelines in developing countries and vulnerable regions.¹¹⁵

According the Common but differentiated principle, Developed Countries are to take the lead in green house gases emissions reductions and sustainable development, as well to assist financially and provide aid and information to Developing Countries encouraging by doing so their compliance to the outlines of the Paris Agreement.

In June 2017 the president of the United States, Donald Trump, conveyed its intention to withdraw from the Paris Agreement. Raising preoccupation that other high GHGs emitters like India and China will follow the US steps. China's involvement as a leadership in Climate Change is extremely important since its GHGs are the highest among all countries. China has taken the US retreat as an opportunity to take the lead in climate change, the Chinese Premier Li Keqiang stated, '*[C]hina will stand by its responsibilities on climate change,*' after meeting the German Chancellor Merkel in Berlin in a press conference, before attending a summit of EU officials in Brussels the same month.¹¹⁶

¹¹⁴ (Paris Agreement UNFCCC)

¹¹⁵ Last Accessed (16/02/2018)

http://unfccc.int/cooperation_and_support/capacity_building/items/1033.php

¹¹⁶ Last Accessed (16/02/2018) <https://www.reuters.com/article/us-eu-china/as-u-s-retreats-eu-and-china-seek-climate-leadership-at-summit-idUSKBN18R3A4>

The 23th Conference of the Parties took place in Bonn, Germany, the last November of 2017. The Executive Secretary of the UNFCCC, Patricia Espinosa, stated with the opening statement of the ceremony, her hope to begin a 'era of implementation' that hand in hand with the Sustainable Development Agenda clears a '*path forward to truly address climate change and sustainable development.*'¹¹⁷ She stressed as well her preoccupation towards the current events caused by climate change such as increased suffering to extreme weather, sea level rise and ocean acidification. '*Other disturbing phenomena will continue unless we act*' she followed her strong statement reaffirming that '*we no longer have the luxury of time. We must act now*'. Espinosa reaffirmed the goal of the COP23, which was to ensure that the PA guidelines are completed and strengthen, meeting all the goals proposed. Closing her statement, the Executive Secretary of the UNFCCC, invited all governments and stakeholders to fulfill not only the promises made at Paris, but also those set 25 years ago in the Earth Summit of Rio the Janeiro.¹¹⁸

¹¹⁷ (COP 23 Opening address by Patricia Espinosa, Executive Secretary United Nations Framework Convention on Climate Change, 2017)

¹¹⁸ *Idem.*

Chapter 3: East Asian Countries Socioeconomic History and Climate Change Policies

In this paper, the focus will be on four countries of the East Asian Region, – China, Japan, South Korea and Vietnam– we will consider the contrast in terms of scientific development, industrialization, and their responsibilities within the international community since the differences in their development and historic elements that shaped their actual environmental state and environmental policies.

Japan is an industrialized and South Korea is an high technology developing country, both are democratic countries with high technology implementation, where in contrast, China and Vietnam are communist developing countries which early national policies that were merely aimed to achieve a fast development at any cost, and saw an industrial revolution process model as the Russian and England's, as a required state to reach industrialization.¹¹⁹

All these differences gave these countries a different profile that we see reflected in their positions in the negotiations of environmental related treaties. However is in their common interest as neighbor countries to develop a greener community, to avoid contemporary problems –such as pollution export also called transboundary pollution a common problem in Japan and Korea– and future damage to the region's ecosystems that may obstacle the development of the region.

¹¹⁹ (Meisner 2010) p.183

3.1 Location of the environmental state in a socio-historical context

a) The People's Republic of China

After a long period of government instability and civil war, the Communist party proclaimed the People's Republic of China the 1st of October of 1949. China was in severe conditions, famine was widely spread and the modern industry was quite reduced and mostly concentrated in the territories held by foreigners¹²⁰ due the several decades of foreign invasion, and the civil war between the Nationalist party –the Kuomintang– and the Chinese communist party.¹²¹

The Chinese Communist Party as Meisner explains *'[i]nherited not only one of the most lagging behind economies in the world, but an ruined economy.'*¹²² China was in need of foreign aid in the military and economic fields. The agrarian reform of June 1950 was promulgate in an air of instability and foreign pressure, at the time of promulgation of the agrarian reform, the Chinese army of liberation assisted North Korea and push back to the 38 parallel the American forces, whose action seemed provocative and made the Chinese fear of an invasion to Chinese territory.¹²³ The Chinese participation to the Korean War also prolonged the Chinese civil war, since the US declared the neutrality of the Taiwan Strait, hence protecting the deposed Chinese Nationalist Government who sought exile Taiwan.¹²⁴

In an atmosphere of turmoil the agrarian reform sought its way to impulse the Chinese agrarian economy, the fields were divided within the active peasants and the society was organized in communities, that

¹²⁰ (Meisner 2010) p.157

¹²¹ *Ivi.* p.164

¹²² *Ivi.* pp.158, 165

¹²³ *Ivi.* pp. 169,171

¹²⁴ *Ivi.* p.171

helped to reaffirm the communist party leadership and was a crucial point in the development of the Chinese economy in the years to come.¹²⁵

The results of the new reform were the base of the rapid Chinese industrialization that was financed by the surplus created from the fields and powered by the people that were no longer suffering from extreme famine.¹²⁶ The first Chinese five-year plan (1953-1957) announced by the end of the agrarian reform pointed out the guidelines for the Chinese industrial development, based on a soviet model and with the aim of developing the heavy industry by supporting the growth at with an agrarian economy.¹²⁷ During this period, the Chinese agrarian production rose up to the highest levels before the bellic period, and amazing growth was reached in the steel, iron and electricity industry, obtaining thus the double of industrial production compared to the pre-five-year plan period.¹²⁸ Serious environmental issues, linked to the rapid industrialization and urbanization of the territory, followed this amazing growth.¹²⁹ Mao Zedong was impelled to build a 'socialist', 'powerful' and 'rich' nation that the Marxist theory supposed to have a developed industrial economy.¹³⁰

With announcement of the Second Five-Year plan in 1957, the campaign of "the Great Leap Forward" began taking action the next year¹³¹, which ultimate utopic objective was to impulse a better agrarian yield and industrial performance to *[p]roduce more, faster, better and at a better price*¹³². Mao Zedong was convinced that China could transition rapidly to industrialization through increasing its heavy industry production. Steel Industry was supposed to increment its productivity by 19% which amounted 6,2 million metric tons, later he raised the number to 12

¹²⁵ (Meisner 2010) p.176

¹²⁶ *Ivi.* p.178

¹²⁷ *Ivi.* p.180

¹²⁸*Ivi.* pp.180-181

¹²⁹*Ivi.* p.181

¹³⁰ *Ivi.* p.182

¹³¹ *Ivi.* pp.182,203

¹³² (Meisner 2010) p.203

million tons and finally idealizing to arrive to he production of 12 million tons.¹³³

To facilitate the organization for the performance of the Great Leap Forward, the people were organized in cooperatives ¹³⁴ , and a mobilization campaign began in order to facilitate manpower concentration in the urban areas. The people were encouraged to look for raw iron and build 'steel furnaces in the backyards'. ¹³⁵This mobilization was later reflected with the low yield due the departure of manpower, and was aggravated by the meteorological events –typhoons, drought and floods– in 1960.¹³⁶

There was an incremented productivity during the Great Leap Forward period, labor-power doubled, mainly because of the mobilization campaign.¹³⁷This campaign was destined to fail due the lack of realism, and an extreme famine due to the severe drought that for two years consistently diminished the harvest.¹³⁸ It was also during these period that Mao realized the importance of scientists and scholars, announcing the 'hundred flower campaign' in 1956 which was misunderstood as a speech right, and many literates wrote critiques towards the Chinese Communist Party, which were there found and prosecuted for conspiring against the Party, or sent to a rehabilitation in the rural area. ¹³⁹

In Mid 1960, the scientific aid from the URSS who had been helping with engineers and scientist project was suspended; this reflects the aggravating relationship between Moscow and Beijing.¹⁴⁰ Between two months the Sino-Soviet relations broke and were resumed only in

¹³³ (Roberts J., 2001)p.325

¹³⁴(Meisner 2010) p.207

¹³⁵ (Roberts J., 2001)p.325

¹³⁶ (Meisner 2010) pp.217, 227

¹³⁷ (Roberts J., 2001)p.325

¹³⁸ *Ivi.* p.193

¹³⁹ *Ivi.* pp.321-322

¹⁴⁰ (Meisner 2010) p.227

1985.¹⁴¹ A shift in the political sphere brought a program for the construction of small-scale rural industries, and a higher alphabetization and schooling level in the rural area; these programs were launched along the Great Leap Forward.¹⁴²

The Cultural Revolution started in 1966 and continued until 1969. It began with the auto-critique of one of the Chinese communist party members, who shared a different opinion on whether China should have supported the Vietnamese Liberation Army that was being bombarded by the US Army. The Auto-critique led to further critiques to university professors and soon the movement was embraced by students that violently shamed people who were 'suspected' of failing to follow the Chinese Communist Party and were part of the 'old four': old ideas, old culture, old manners and old habits.¹⁴³

During this period, technology development was almost dependent of the Soviet scientist, who was no longer available; the Cultural Revolution pushed scholars into a corner and undermined the Chinese technologic development. Deng Xiao Ping and Zhou En Lai did not fail to notice the importance of an intellectual elite.¹⁴⁴ After Mao's Death in 1976, Zhou En Lai pointed out the 'Four Modernizations': Agriculture, Industry, Defense and Science along with Technology.¹⁴⁵ Deng Xiaoping, whom never not the Chinese Premier but had a heavy influence within the party began announcing campaigns aimed to promote the socioeconomic development.¹⁴⁶

After the conclusion of the Sino-Japanese war, the communist party lined out the plan for the Chinese recovery and the development of the country. The Chinese party favored the fast industrialization, and saw it as a step

¹⁴¹ (Roberts J., 2001)p.329

¹⁴² (Meisner 2010) p.266

¹⁴³ (Roberts J., 2001)pp.336-338

¹⁴⁴ *Ivi.* p.342

¹⁴⁵ *Ivi.* p.346

¹⁴⁶ (Roberts J., 2001)p.348

that society must take in order to become a strong country. Many were the policies that aggravated the environment, the extermination of the plagues and abandoned the fields to produce iron. A famine period and the Cultural Revolution that was witch-hunt followed this period. China's development was at the expense of the environment. And when China attended the first Stockholm conference, it made clear how important the principle of 'common but differentiated responsibilities' was in order to get the Chinese diplomats to engage in the negotiations as China would have not give up developing to fix the environmental problems caused by industrialized countries.

b) Japan

After a long period of a conservative international policy, Japan began its industrialization with the beginning of Meiji period in 1868. In the precedent 'sakoku period'¹⁴⁷, the Japanese researchers of the Occident stressed highly that Japan was in need to develop as the western countries in order to prevent colonization and unfair treatment.¹⁴⁸ Japan decision to open to west and undersigned unfair treaties and implemented an international policy aimed to makeup and get better fair treatment at an international level. This approach to development was grasped in the Meiji period, were Japan imported knowhow from the Occident to reinforce the army and the industry, in the fear to be treated like China in the opium wars.

The Meiji Restoration (Meiji Ishin) brought a 'revolution from above'¹⁴⁹, the new order that centralized the powers aimed to make Japan a rich nation with a strong army.¹⁵⁰The Japanese Emperor Hirohito pronounced the first Asian modern constitution in 1868, declaring a new form of state highly contrasted by the feudatory system that ruled Japan in the previous centuries.¹⁵¹ With the new constitution a new fiscal reform, rights and duties came along, for all the people who were no longer divided in classes. In fact the samurai class, who was in charge of keeping the peace was no longer needed, since the new government sought to form an army based on the western model, introducing a military conscription ruled by the new constitution.¹⁵²

¹⁴⁷ Period of barely no exchange contact to almost all the rest of the world that lasted almost two hundred years until 1854, Kanagawa Treaty is the reference for the new 'Kaikoku' Period. (Rosa Caroli 2004) p.131 (Hidefumi Imura, 2005)p.16

¹⁴⁸ (Caroli 2004) p.125

¹⁴⁹ The term is to refer the guidance of the government in the industrialization revolution. Since it was the government to promote a counsel? (Rosa Caroli 2004) p.146

¹⁵⁰ (Caroli 2004) pp.138,139

¹⁵¹ *Ivi.* pp.141,155

¹⁵² (Caroli 2004) pp.142,146

Japan's foreign policy was aimed to revision the 'unfair treaties' that were imposed by the western powers. In order to do be able to compete with the western powers, Japan was to industrialize rapidly and gain a strong national economy based initially on agriculture.¹⁵³ The state saw the western nations as inspiration, and 'imported' the knowhow –machinery and human resources– to promote the industrialization. The government promoted the creation of efficient infrastructure and base industries such as the textile and building sector.¹⁵⁴

The Japanese capitalism was a "Capitalism without capital".¹⁵⁵ The economic policy guided by the government consisted of a high taxation and low wages; this permitted the import of high technology machinery and the export of Japanese textiles to compensate the expenses of the first.¹⁵⁶ By 1897, Japan economy was vantage by the adoption the gold standard.¹⁵⁷ During the First Great War the Japanese economy was based of the export of textiles – particularly silk – at a low price helping them to be competitive in the foreign market.¹⁵⁸

The contact with the western world was highly encouraged by the government, many books were translated in order to learn the western ideology, also exchange students went to western countries to learn knowhow, along a diplomatic mission¹⁵⁹ to change the 'unequal treaties', that although were not successful in the diplomatic field, brought back to Japan resourceful knowledge.¹⁶⁰ The Educational system reform of 1872, helped building a strong nationalism and supported the idea of a modern nation, and was crucial to support Japan's imperialism.¹⁶¹

¹⁵³ *Ivi*. p.143

¹⁵⁴ *Ivi*. p.146

¹⁵⁵ *Ivi*. p.162

¹⁵⁶ *Idem*.

¹⁵⁷ *Ivi*. p.164

¹⁵⁸ *Ivi*. p.169,170

¹⁵⁹ Iwakura diplomatic mission

¹⁶⁰ (Caroli 2004) p.147

¹⁶¹ *Ivi*. p.152

Japanese imperialism was founded in the 'social Darwinism' that saw Japan as leader to '*[g]uide to civilization the societies of oriental Asia*'¹⁶²... '*[t]owards the independence from western colonialism*'.¹⁶³ This theory was later reassured by annexing Taiwan and the invasion of China in the next decade.¹⁶⁴ As the first Asian nation to defeat a western power, the Japanese people expected to be treated as an equal power within the international society after having defeated Russia in 1905.¹⁶⁵ This was followed by an alliance treaty with the United Kingdom, the biggest international power, which came into force in 1902 that opened the possibility of reviewing the unequal treaties signed before.¹⁶⁶

When Japan proposed an 'unequal treaty', the Shimonoseki Treaty, to China, but the western powers made Japan give up the Liaoning peninsula.¹⁶⁷

The Japanese expansionism helped reassure the Japanese economy, with the capital investment in the Japanese colonies (Taiwan and Korea), the puppet state of the Manchukuo and the occupied Chinese territory.¹⁶⁸ During the First Great war, the economic development was slow but steady; it was during this period that the textile sectors leaved the spotlight to the metal-mechanic and heavy industry sector.¹⁶⁹ Japan position by the end of the first Great War was to the Japanese eye equal to the western powers, and taking advantage of the Allied powers, reconsolidate its expansionism invading the Chinese Shandong peninsula in 1915.¹⁷⁰ The 1929 Wall Street market collapse affected the Japanese economy that comported a reorganization of the industry and the financial system during a period of economic recession.¹⁷¹ In next

¹⁶² *Ivi.* p.157

¹⁶³ *Ivi.* p.167

¹⁶⁴ *Ivi.* p.157

¹⁶⁵ *Ivi.* p.164

¹⁶⁶ *Ivi.* p.165

¹⁶⁷ *Ivi.* p.163

¹⁶⁸ *Ivi.* p.173

¹⁶⁹ *Ivi.* p.174

¹⁷⁰ (Caroli 2004) p.183

¹⁷¹ *Ivi.* pp.204-205

following years the government focused major aids to the army and naval army preparing for the upcoming invasion of central China in 1937.¹⁷²

By the time of Japan's surrender to the allied powers, the country was in famine and the infrastructure was highly damaged. Hiroshima's and Nagasaki's nuclear detonations immediate damage was evident, however Japan was to struggle for decades from the environmental damage of the toxicity of the Nuclear bombs, until this day the repercussions of the radioactivity can be seen.

¹⁷² *Ivi*, p.207

c) Republic of Korea

The Korean Choson Dynasty (1492-1910) that had been benefiting Chinese protection as suzerain state¹⁷³ was overthrown by the Japanese Empire that annexed Korea in 1910, and it remained a Japanese colony until Japan's defeat in 1945.¹⁷⁴ The first attempt invading the Korean peninsula in 1894 started the first Sino-Japanese war that ended in with next year with the defeat of China and Japan's imposing the an unequal treaty to China, the Shimonoseki Treaty. The Korean King, Kojong, managed to escape and return to his palace in 1897 his wife had died under Japanese hands, and continue his reign until the next invasion.¹⁷⁵ In the years to follow Japan beat Russia, and Japan's interest on the Korean peninsula was reinforced with a protectorate that was pushed even further in the following years, leaving the Korean king to abdicate in favor of his son, who was lastly the one to dismantle the Korean army. In a matter of time Korea was annexed formally as a colony in 1910.¹⁷⁶

During this period of colonization Korea was exploited in order to supply for the Japanese expansionism¹⁷⁷, which led Korean people to suffer from repression and injustice that encouraged many resistance movements.¹⁷⁸ Japan aimed a policy of assimilation towards Korea; Caprio explains that Japan was willing to culturally absorb Koreans into the Japanese race.¹⁷⁹ The process of assimilation comported diverse policies aimed to impose Japanese culture to the new colony, including reforms such as the 1920, which aimed to increase education of children that was not at the same level in Japan, but was an important part of the development of Korea in the years to come.¹⁸⁰

¹⁷³ (Seth, 2016)p.155

¹⁷⁴ (Riotto, 2005)

¹⁷⁵ (Seth, 2016)p.156

¹⁷⁶ *Ivi.* pp.157-158

¹⁷⁷ (Lee, 1984)p.313,319

¹⁷⁸ *Ivi.* pp.314-315

¹⁷⁹ (Seth, 2016)p.111

¹⁸⁰ (Seth, 2016)pp.113-114

Korea and the other Japanese colonies 'benefited' from the colonization period, the so-called 'colonial modernization' that shaped the economies and infrastructure, and helped building sanitary, educational, commercial systems with 'colony investments'. These opportunities built the basis that smoothed the process of entering the 'modern world' that saw an incredible socioeconomic development¹⁸¹ Korea became one of the 'most intensively developed countries in the world', and soon became an strategic asset to Japanese economy. Between 1920's and 1930's Korea received a flow of capital investment which promote the opening of factories and mills, nevertheless Korea continue providing labor force and raw materials to Japan. ¹⁸²

The imposed 'revolution from above' and assimilation process help built a nationalism that saw many repressions during the Japanese colonization period.¹⁸³ Nationalist movements began with the protectorate period at the beginning of the 20th century. Censure and unfair arrests came in wave in 1911 and stopped with the colonization period, leaving many nationalists to find refugee outside of Korea.¹⁸⁴

When the news of the Japanese surrender Koreans welcomed with joy the end of 36 years of colonial rule. Many Koreans that had sought refugee abroad and others in the peninsula began organizing a supplementary government with the intention of declaring independence.¹⁸⁵

The Korean fate was decided with the Cairo Declaration in 1943, which stated that Korean independence would come after a provisional trusteeship until elections took place when Koreans were capable of 'self-government'.¹⁸⁶ The Soviets arrived from the north and proceed until

¹⁸¹ *Ivi.* pp.126-127

¹⁸² *Ivi.* p.131

¹⁸³ *Ivi.* p.130

¹⁸⁴ *Ivi.* p.158

¹⁸⁵ *Ivi.* p.171

¹⁸⁶ (Seth, 2016)p.172

occupying Pyongyang, while the US armies arrived a month later and spread troops in the south, dividing the peninsula at the 38th parallel.¹⁸⁷ This division was a 'temporary' measure that was to be solved with the Moscow Agreement in 1946, but the negotiation ended up with a deadlock between the Soviet and US diplomats.¹⁸⁸

By 1948 elections were authorized in order to create an independent government. The elections took place in May and on July 17 a constitution was promulgated. The Korean Republic came to be on August 15 and gained international recognition rapidly.¹⁸⁹ Aggravating relationship between the North and the South led to believe by summer 1949 that only war could bring unification.¹⁹⁰

The Communists who were aiming to overthrow the new South Korean government, On June 25, 1950, attacked at the 38th parallel pushing the Republic of Korea army to the southeast of the country. The UN provided with an 'assistance UN army' composed by sixteen different countries to fight back the communist attack and regain the power on the South.¹⁹¹ The negotiations for an armistice began the 10 July 1951.¹⁹²

Korean economy had become highly dislocated since it was developed to support the economy of Japan thus being dependent from it. According Lee, "*[T]he contours of Korea's economy had taken shape abnormally, with emphasis on war-related industry and a high degree of reliance on Japan. Accordingly, the severance of all ties with Japan following liberation inevitably dealt a severe blow to economy.*"¹⁹³

¹⁸⁷ (Lee, 1984)p.374

¹⁸⁸ *Ivi.* pp.376-367

¹⁸⁹ *Ivi.* p.379

¹⁹⁰ (Seth, 2016)p.186

¹⁹¹ (Lee, 1984)p.380

¹⁹² (Seth, 2016)p.189

¹⁹³ (Lee, 1984)p.375

South Korea's situation was also aggravated by the conflict between North Korea. At the end of the Korean War, the state began a developing process that aimed rapid growth of public corporations in railway, electricity, and agriculture industries, focusing on the industries that provided public goods. The US provided financial aid for the reconstruction of the Korean Economy after the Korean War (1950-1953), this aid amounted the 72% of the investments between the 60s and the post-war period.¹⁹⁴ The mining industry was once of the industries that received heavy investment since coal was the primary source of power, and it was the ground industry, which helped build other industries and saw the introduction of new factories of the light industry and pursued an export-oriented development strategy.¹⁹⁵ A second period of early industrialization (1962-1971) pursued rapid industrialization of the manufacturing sector and the heavy and chemical industries. A third more mature industrialization period (1972-1992) the heavy industry which was developing at a fast pace began to have some tensions since there was an over financing which counterproductive, in this period the government promoted the private sector and promote the national market.¹⁹⁶ It was in this last period that the most environmental depletion was caused, as a response, the government instituted the Office for the environment in 1980, which was promoted to Environmental Ministry in 1990.¹⁹⁷ The fourth period (1993-1998) saw the intervention of the International Monetary Fund to avoid national bankruptcy in 1997, and slowly began to take off again during the 2000 with the expansion of the 'Korean Wave', that promote not only Korean Culture but also Korean technology.¹⁹⁸

South Korea's economic miracle relied on the family-owned conglomerates the so-called 'chaebols' like Samsung. Which with a loan of

¹⁹⁴ (Giacomo Corna-Pellegrini, 1997)p.26

¹⁹⁵ (Seth, 2016)p.279

¹⁹⁶ (Giacomo Corna-Pellegrini, 1997)pp.31-34, (Seth, 2016)p.281

¹⁹⁷ (Giacomo Corna-Pellegrini, 1997)p.43

¹⁹⁸ (Seth, 2016)p.281

the from the Long Term Credit Bank of Japan, started reverse-engineering Japanese products that although under patented overseas, first were sold in Korea and rapid technological development helped rapidly to market its products to be exported.¹⁹⁹ The Chaebols shinned with is innovative technologies and a strong organization system made them achieve further success.²⁰⁰

As Ingyu Oh and Hannah Jun remark, South Korea's development unlike Japan's, was '*far more rampant and disparaging than in Japan, Taiwan, Hong Kong, or Singapore.*'²⁰¹ In the 1970s, Korea saw a transformation of its environment due a rapid construction of light industry factories, with a massive migration from the rural side to urbanized centers. These lightweight industries took the place of farmlands that were 'bulldozed' and replaced later by new factories for the heavy and chemical industries. Leaving South Korea highly damaged with environmental pollution and landscape destruction.²⁰²

¹⁹⁹ *Ivi.* pp.296,301

²⁰⁰ *Ivi.* p.301

²⁰¹ *Ivi.* p.297

²⁰² *Idem.*

d) Socialist Republic of Vietnam

Similar was the Vietnamese situation that was the country that had the longest bellic engagement and saw the end of the Vietnam War around the 1970 just when all the peace, and environmental movements arose.

During the 19th Century, Vietnam shifted from a suzerain state of the Chinese Empire to a French Colony.²⁰³ Vietnam had always had a strong desire for independence. China had attempted to annex the Vietnamese territory in several occasions but the Vietnamese people fought back and accepted to become a suzerain state of China and adopt the Chinese manners. During the Second Great War, once the Germans invaded France and the Vichy regime was established, the French colony was soon reached by Japanese troops that backed up the Vichy regime.²⁰⁴ The Viet Minh, the League for the Independence of Vietnam, guided by the communist leader Ho Chi Minh was waiting for an opportunity to overcome the foreign control and declare a Socialist Republic.²⁰⁵

Suddenly with the two nuclear bombs of Hiroshima and Nagasaki followed by Japan's unconditional surrender the war came to an end in the summer of 1945. The Viet Minh seize the power the 19 August, with the Japanese forces being imprisoned. The 2 September of 1945 Vietnam Ho Chi Minh declared the independence of Vietnam using part of the Declaration of Independence of the United States –*"All men are created equal. They are endowed by their Creator with certain inalienable rights, among them are Life, Liberty, and the pursuit of Happiness."*– to make a call for international recognition.²⁰⁶

²⁰³ (Neale, 2008)p.17

²⁰⁴ *Ivi.* p.29

²⁰⁵ *Ivi.* pp.27,29,30

²⁰⁶ (Neale, 2008)p.33

However Vietnam faith was already set up, it was to remain a French colony. The Nord was to be 'liberated' by the Chinese army and the South by the British army, and then handled back to France.²⁰⁷ The French were not welcomed in Vietnam, a constant guerilla that lasted 8 years opposed the French regime.²⁰⁸

In 1949 when the Chinese communists took power of China, the Viet Mihn began receiving weapons to support their independence movement. The Vietnamese communist party began winning extreme popularity and many new enrollments.²⁰⁹ In 1954 after defeating the French military base of Dien Pien Phu, the Viet Mihn negotiated in Geneva the future of the governance of Vietnam. During the negotiations for the end of the Korean War, it was decided that Vietnam was to be divided as Korea at the 17° parallel, in the North the communists, and in the south a US guided government. And elections would have taken place in two years, but they never took place.²¹⁰ Ngo Dinh Diem, whose government was being aided by the US, and as Neale states, guided the south of Vietnam, it would not probably be able to last if without the US support.²¹¹ In the North the Viet Mihn was already by 1957 after years of confronting the French regime, starting an Agrarian Reform in the regions under their control, to help diminish the inequalities between people.²¹²

The Viet Mihn was waiting for the elections to be held, but that moment did not arrived, so the strategy was to pressure the elections rather than fighting another revolution. In the South new political organizations began to form, but were rapidly suppressed by Diem's government, by 1956 all communist cells that sought to held elections were arrested or had seek refugee in Northern Vietnam or remained undercover in the villages. The movement in the south was desperately in need of help that

²⁰⁷ *Ivi.* p.34

²⁰⁸ *Ivi.* p.37

²⁰⁹ *Ivi.* p.38

²¹⁰ *Ivi.* pp.40,41,42,44

²¹¹ *Ivi.* p.45

²¹² *Ivi.* p.39

the Hanoi was not supplying and had begun to fight autonomously. By 1959 Hanoi decided to support the southern guerilla movements in order to eliminate the secret police in the South, and build a liberation front that joined all classes like the Viet Minh.²¹³

The during 1947-1960, anti-communist movements spread across the United States, and the people began to believe that it was a 'duty' to protect the world's right to 'liberty' from oppressive communist regimes. Americans who followed communist ideals were pointed out as soviet spies, and the Cold War fog inspired propaganda politic campaigns to spread the notion of the evil communist danger.²¹⁴

By 1965 the guerilla forces of the National Liberation Front had reached 250,000 soldiers, and Diem's army was seeking to retreat from the conflict and not willing to die for Diem's cause. The United States saw that Diem's regime and organized a coup d'état, killed Diem and tried to find the ultimate right puppet by organizing two more coups d'état to continue exercising power behind the Vietnamese curtains.²¹⁵

The United States began bombarding North Vietnam the 2nd of March 1965. In Vietnam, as Neale explains, more than 8 million bombs were released. Which is three times of all the bombs use by all the parties involved in the Second Great War, and amounts the explosive power of 640 Hiroshima atomic bombs. The air raids killed about 2 million civilians and Vietcong guerilla fighters. The Vietcong fighters were about 300 thousand, which were in a 4 to 1 ratio when the most American troops were in Vietnam, which amounted to 500 thousand soldiers.²¹⁶

Many reasons led the US to accept defeat and decided to leave Vietnam. The Tet offensive of 1968, which was launched by the Vietcong during the lunar New Year attacked the main cities, Hue and Saigon, and inspired a

²¹³ (Neale, 2008)pp.41,46-48,68

²¹⁴ *Ivi.* pp.56,57

²¹⁵ *Ivi.* p.68-71

²¹⁶ (Neale, 2008)p.82

series of events in many countries that called for revolution and peace.²¹⁷ Combined with a wave of resistance from the American Army that was not willing to fight anymore, increased protests in the Motherland to stop the Vietnam war and the normalization of the Sino-American Relations after the visit of President Nixon to China in 1972.²¹⁸

During the Vietnam War, the jungles were burned to deprive the guerrilla soldiers of refuge, napalm use was highly spread, many anti-personnel mines were buried which are still active to this day, chemical weapons like Agent Orange were sprayed massively causing toxic effects in human health and the environment was vastly damaged.²¹⁹

When in 1975 North Vietnam marched to the South, providing the South with a communist leadership but remaining still a separated country. Without the US food supply, the North had to provide for the whole country, many fields were destroyed and many farmers had left the land to seek refuge. The United States had broken the promise made during the Paris Peace accords 5 million dollars as a war reparations, and aggravated the Vietnamese situation with 20 years of commercial embargo and financial aid.²²⁰ During this period until the unification of Vietnam in 1976, the Vietnamese leadership was receiving Soviet and Chinese aid, the state of relations between these two countries was agitated as both countries were seeking to obtain the supremacy in the communist sphere.

The Viet Minh had not reunited the South and the North, which remained still two countries under the instruction of China, who had just reestablished diplomatic relations with the US and had pressure the Vietnamese leadership to respect the Paris Agreements. When in 1976 the Vietnamese reunified the country, China stopped all the food supplies

²¹⁷ (Montessoro, 2002)p.284

²¹⁸ (Neale, 2008)pp.168-179

²¹⁹ *Ivi.* p.186

²²⁰ *Ivi.* pp.188-189

and financial aid that had been giving to Vietnam, beginning a famine period.

The Five-Year Plan for the Vietnamese economic development adopted after the reunification was emphasized on the developing of the heavy industry, but the leadership had a hard time building a socialist agriculture in the South. In order to provide food for the people the Vietnamese sought soviet help and signed the Mutual Defense treaty in 1978.²²¹

The Sino-Vietnamese relationship had decayed since the reunification of Vietnam and after establishing close relations with the Soviet Union, China began backing up the Cambodian Khmers Rouges government, which began raiding the Vietnamese territory, this comported a Vietnamese invasion of Cambodia and a subsequent Chinese invasion of the Vietnamese territory. What this meant to Vietnam was that the relations it had been able to establish were compromised and the International community called for a retreat, which took place only in 1989.

The 1990s brought a new perspective for the Vietnamese socioeconomic development and cooperation within the international community, Vietnam embraced the a market-based economy and began to follow the path of development that other Asian countries have followed by attracting foreign investment to its territory.²²²

²²¹ (Lam, 2010) Kindle locations 14522-14549

²²² (Lam, 2010) Kindle locations 14577-14618

3.2 Incorporation of the green agenda into the national development plan.

a) The People's Republic of China

China has emerged as an important figure within the international environmental community, being responsible for the largest GHGs emissions in the world, suffering of serious pollution and environmental depletion, the Chinese policies are trying to shift the Chinese economy towards a sustainable greener economy.

The attention to the environmental policy was drawn in the late 70s after the participation to the first concert on the environment, the U.N. Conference on the Human Environment on 1972. The Chinese position was very rigid and portrayed a clear message: China had no intention to compromise its development; it was an unfair position towards the developing states. With the new guideline policies, the four modernizations 四个现代化 and the Chinese Economic Reform 改革开放, that opened a door to a market economy and the special zones , attracted foreign investments, China's environment began rapidly to change and the environmental situation continued to be further aggravated.

In 1973, one-year prior the Stockholm Conference, the First National Conference on Environmental Protection took place joining in a new field the previous regulations of water, soil, and forestry conservation. The following year the co-ordination for environmental protection at a national level was assigned to the new created Environmental Protection Leading Group established under the State Council.²²³ These were first steps on regulating environmental depletion, although China had regulated natural resources and urban planning before.

²²³ (ZHANG, 2001)p.123

Contemporaneously to the new Chinese Economic Reform, new legislations aimed to safeguard the environment began to be issued. The State reinforced its role in protecting the environment and preventing and eliminating environmental depletion with the article 26 of the Constitution of the People's Republic of China.²²⁴ In 1984 the law-making body, the National Environmental Protection Commission (NEPC) under the State Council was given a national level work sphere²²⁵. And in 1994, the NEPC changed once again name to the National Environmental Protection and Resources Conservation Commission (NEPRCC) that in cooperation with other ministries are in charge of the policy-making for environmental protection and resources conservation and management.²²⁶

To supervise the regulatory system and engage monitoring law enforcement, the Environmental Protection Agency (EPA) was introduced under the Ministry of Urban and Rural Construction in 1982. In 1988, the EPA became an agency changing its name to the National Environmental Protection Agency (NEPA), and later the same year became a ministry level State Environmental Protection Administration (SEPA) showing the concern of the government towards environmental governance and protection.²²⁷

Along the SEPA, departments at each level of government²²⁸ are responsible for monitoring and enforcing the SEPA's guidelines; these departments are the Environmental Protection Bureaus (EPBs) and the Environmental Protection Offices (EPOs). Some industries and big factories also count with an Environmental bureau, which in cooperation with the EPOs and the EPBs to implement the pollution regulations and collaborate for a more responsible waste treatment technology.²²⁹

²²⁴ (ZHANG, 2001)p.123

²²⁵ Previously known as the Environmental Protection Commissions (EPCs)

²²⁶ *Ivi.* p.123

²²⁷ *Idem.*

²²⁸ Provincial, city, county, district, town and village.

²²⁹ (ZHANG, 2001)p.123-124

The government at different levels can deliberate legislations. The National People's Congress has issued laws for environmental protection, regulating air pollution, and resources conservation. The State Council issues administrative regulations such as the Pollution Levy System, and the ministries and councils under the State Council can perform the same task. At a local level, the local government and local people's congress can formulate regulations. The regulatory framework is mainly divided into Environmental pollution and prevention and treatment, rural ecology and biodiversity conservation and the rational exploitation and utilization of natural resources.²³⁰

The Environmental Protection Law of the People's Republic of China was emitted in 1979 as a trial version that gained full legal status in 1989. During the trial period, the 'Three old systems' – environmental impact assessment (EIA), the Pollution Levy on discharges in exceeding of standards and 'the three synchronizations' – were first introduced. After the trial law was formalized the 'Five New Systems' were introduced: target responsibility system for environmental protection, the system for the quantitative examination of comprehensive improvement of urban environments, the pollution discharge permit system, the system of centralized pollution control, and the time-limited treatment of pollution. Finally, the cleaner production and 'Total Emission Control for Major Pollutant Discharges (TEC)', sum up to the ten major Chinese environmental policies.²³¹

In 'Three Old Systems' we can find the environmental impact assessment that accompanies every new construction project and the renovation of old urban areas and must be approved by a city of local EPBs and EPOs depending on the nature of the EIA project.²³² 'The Three Synchronization' policy follows up, that requires that along the construction project, the pollution treatment facilities design, construction and operation should

²³⁰ *Ivi*. p.124

²³¹ *Ivi*. p.123,124

²³² (ZHANG, 2001)p.124,125

be planned in all new factories and modifications or expansions of already existing factories.²³³ The last of the 'Three Old Systems' are the Pollution Charges that are established by the environmental protection laws and require that industrial wastewater, air pollution, solid waste and noise do not exceed the standard limit. In the case of exceeding, the polluter is to pay a 'normal fee' and other 'four small pieces' fees when the pollution is consistent and when the amount exceeds the double of the standard limit. Other fines are charged to the illegal discharges polluter and environmental accident. Is important to remember that this law has been enforced since the first trial environmental law in 1979.²³⁴

The 'Five New Systems' are composed by the discharge permit system (DPS) that required than exceeding sized waste load must be granted a permit to being discharged.²³⁵The Environmental Responsibility System (ERS) that assigns the environmental quality and targets reaching responsibility to the officials in the local government. An environmental assessment is conducted annually evaluating air, water, solid waste, noise, afforestation and other indicators such as socio-economic are taken in count. This is the Quantitative assessment of urban environment and is conducted in 32 mayor cities; provinces and autonomous regions can also conduct this kind of assessments. The Limited Time Treatment (LTT) sets a deadline to revert the extreme pollution of towns, industrial enterprises, river, lakes and ocean bays. And the centralized pollution control (CPC) is a system that regulates the waste discharge at a regional level to ensure its efficiency.²³⁶

The two last guidelines issued by the NEPA are the Total emission control for major pollutants (TEC), that states the emissions target including waste treatment requirement, and the cleaner production program which

²³³ *Ivi*. p.125

²³⁴ *Idem*.

²³⁵ *Idem*.

²³⁶ (ZHANG, 2001)pp.125,126

calls for high technology incorporation in order to consume less energy and raw materials and produce less emissions.²³⁷

The protection of the environment has been taken with the pass of time more and more seriously, becoming a 'main theme' of the Five-Year plans (FYP).²³⁸ Especially since the 9th Five-Year Plan for the Economic and Social Development of the Public Republic of China (1996-2000), that sought to stop industrial pollution by setting in the 9th Five-Year Plan for the National Protection of the Environment and Long-term objectives for the year 2010 the goal of '*[p]reventive and controlling measures of air, water, but also hazardous and radioactive waste*'.²³⁹ And with the 'one control, two standards' principle provided the basis to shut down more than 84,000 polluting and inefficient factories, that had meet the standards not only at a national level but also locally.²⁴⁰

The 10th FYP for the National Protection of the Environment was issued along the 10th FYP (2001-2005), and joint efforts to better the urban quality, setting emissions reduction quotas, saw the construction of water treatment facilities and strengthen the supervision of the polluting industries to commit to the national standards. Clean Technology projects were welcomed, as well, new protected areas and projects of reforestation aimed to confront the soil erosion.²⁴¹

The 11th FYP (2006-2010), in contrast to the previous FYPs grasped the importance of not only 'solving' the environmental issues but also acknowledge the consequences of this issues at a socio-economic development level. Thus becoming so far 'the most important document in environmental matters'²⁴², and opening a new era in the Chinese policy towards the environment, rather than just focusing in sustainable

²³⁷ *Ivi.* pp.126,127

²³⁸ (Costa, Lazzerini e Soriani 2011) p.6

²³⁹ *Ivi.* p.10

²⁴⁰ *Idem.*

²⁴¹ (Costa, Lazzerini e Soriani 2011)pp.10,11

²⁴² *Ivi.* p.11

development.²⁴³ It sets the steps to be followed in order to build a 'harmonious socialist society', developing the areas which development has fallen back. Bringing new infrastructure such as electricity, roads and water to facilitate the development of 'key sectors' industries. A polluting control index was set for each percent of GDP, while not giving up the national economic growth and seeking a responsible 'concept of scientific development'. The 'socialist development of the rural areas' was to be pursued with the reform of the property system, that would be enforced by the promotion courses about sustainable agriculture and natural fertilizers that would have granted a 'Green Certificate' at the end of the course, and could be used as loan-granters.²⁴⁴

The 12th FYP regulates the period from 2011 to 2015 recapitulates the goals set by the 11th FYP to further confirm that 'all targets and key task for environmental protection' have been achieved. The 12th FYP acknowledges that rural environmental pollution has worsened overtime, especially soil and groundwater pollution due to heavy metals, chemicals and POPs.²⁴⁵ It points out that environmental pollution is threatening human health, public security and social development. An reminds the importance of Deng Xiaoping theory and the 'Three represents' ²⁴⁶ to be the guidelines to improve scientific development, uplift ecological civilization, address environmental problems and strengthen capacity building to help reduce environmental hazard which is an imminent threat to Chinese development.²⁴⁷

The 12th FYP aims to promote scientific development in order to meliorate environmental protection practices. The implementation of scientific development is seen as an important key in the transformation

²⁴³ (Qin, 2015)pp.170,173

²⁴⁴ (Costa, Lazzarini e Soriani 2011)p.12

²⁴⁵ (Ministry of Environmental Protection of The Peoples Republic of China, 2011)p.2

²⁴⁶ Coined by the 5th President, Jiang Zemin, which states that the Chinese Communist Party should always represent, the requirements for Chinese economic development, cultural development and the interest of the people of China.

²⁴⁷ (Ministry of Environmental Protection of The Peoples Republic of China, 2011)p.3

of economic development towards an 'ecological civilization'.²⁴⁸ To ensure the transition to this new era, prevention and control measures are to be implemented; environmental impact assessment and law enforcing are outlined as key factors to ensure compliance of the environmental protection plan.²⁴⁹ The main objectives for the 12th FYP are to reduce the discharge of mayor pollutants, ensure water security in urban and rural areas, effective control the reduction of pollution by heavy metals, POPs, hazardous chemical and wastes; reverse environmental depletion and improve nuclear and radiation safety.²⁵⁰ The 12th FYP, aimed also at reducing carbon emissions, instituted a 'mandatory 'Cap-and-trade' emissions trading pilot scheme in seven provincial regions²⁵¹ by 2013 and if implementation was successful was to expand it nationally by 2015'.²⁵²

The 12th FYP assures that 'a strengthen environmental cooperation' will be pursued as well internationally. International cooperation with other nations and international organization will be promoted and the implementation of international conventions will continue actively. China pledges to adjust tariff policies on import and export of energy-intensive and high-emissions products to ensure energy efficiency not only in China but also other developing countries. And aims to '[b]an the introduction of products, technologies and facilities failing to meet environmental protection standards and vigorously promote green trade.'²⁵³

The 13th FYP (2016-2020) is the current plan in action and has continued to carry forward the emission trading system. Under the emissions trading are it is aiming to establish new projects to ensure emissions do not increase by establishing a budget and implementing other pilot projects. Financial instruments and taxes will play a mayor role in

²⁴⁸ *Ivi.* pp.1-2,4

²⁴⁹ *Ivi.* pp.4-5

²⁵⁰ *Ivi.* pp.5-6

²⁵¹ Beijing, Tianjin, Shanghai, Chongqing, Shenzhen, Hubei, Guangdong.

²⁵² (Qin 2015)p.179

²⁵³ (Ministry of Environmental Protection of The Peoples Republic of China, 2011)p.48

promoting reduction of emissions. The 13th FYP has provided an environmental tax that will be integrated to enhance the protection of the environment and ecological conservation.²⁵⁴

An 'eco-compensation mechanism' will continue to raise compensation standards towards sensitive and vulnerable ecosystems in river basins and ecosystem depletion areas. This mechanism will work together with different tools, technology, industry, financial funding to complement each other and achieve the ultimate goal of protecting the environment and conserve ecosystems and biodiversity.²⁵⁵ A special stress has been made to the prevention and mitigation of environmental risks and hazardous related accidents.²⁵⁶

The 13th FYP recapitulates the success of the previous five-year plan which had achieved all major targets and tasks, at the same time underlines the importance of the environment in order to achieve a balanced, coordinated and sustainable economic and social development, acknowledging that China was many environmental problems in different areas and stages of development.²⁵⁷ The mayor achievement of the last FYP was the drop of fine particular matter PM2.5 air pollution on average of 23.3% in the Beijing-Tianjin-Hebei region, Yangtze River Delta and Pearl River Delta, and of 23.6 in other 74 monitored cities. The reduction of air pollution saw also a reduction of acid rain of 30%. Water quality, waste management and hazardous waste disposal saw remarkable achievements. And pollution control and emissions reduction obtained overachievements, due the equipment of 99% desulfurization and 92% denitrification implants of the coal-fueled power plants, achieving low emission energy production.²⁵⁸

²⁵⁴ *Ivi.* p.168

²⁵⁵ *Ivi.* pp.168,170

²⁵⁶ *Ivi.* p.147

²⁵⁷ (Ministry of Environmental Protection of The People's Republic of China, 2016)pp.91,94

²⁵⁸ *Ivi.* pp.92-93

Ecosystem, desertification and soil erosion as well protection of endangered species has been taken in account in the last two plans, which has saw the achievement of the improvement of 100,000 km² desert land and 266,000 km² of reduced soil erosion. Natural reserves have been expanded to 14.8% of the land area

The Chinese environmental framework has amended the major environmental laws, the Environmental Protection Law, the Law of Prevention and Control of Air Pollution, the Regulations on Safe Management of Radioactive Waste and Air Quality Standard. And during this FYP there are new expected amendments for the Environmental Protection Law that aims to integrate an environmental protection inspection and enhance the ecological compensation mechanism.²⁵⁹

Lastly, China has acknowledge its role in the international community and aims to promote a 'green Belt and Road Initiative' strengthening bilateral cooperation and multilateral cooperation especially with the ASEAN. A new campaign of 'Green Silk Road Envoys' will promote China's interests and points of views as well will promote ecological and sustainable development sharing China's experiences in the field in the international community. And will continue to build upon the existing international environmental treaties and international organizations projects.²⁶⁰

During the COP 3 in Kyoto that aimed to legally binding emissions reduction, the Chinese delegate Zhong Shukou reinforced China's view toward the 'Common but differentiated responsibilities' stating: "[I]n Industrialized countries two people drive a car, yet they want us to give up taking the bus in order to prevent global warming".²⁶¹ An Indian delegate then explained that mitigation of global warming in developing countries could promote tensions that may obstacle national growth and

²⁵⁹ *Ivi*, p.94

²⁶⁰ (Ministry of Environmental Protection of The People's Republic of China, 2016)pp.113.114

²⁶¹ (Pinchera, 2004) p.118

the eradication of poverty.²⁶²In fact this was the approach of developing countries during the early stages of environmental diplomacy, underdevelopment and poverty were major issues and at the top of the developing countries' national agenda. With the acceptance of the threat that environmental degradation on the Chinese society, China's leadership began changing its negotiation scheme. China has an important role being part of the G77+ China, which in international negotiations represents the interest of the South block of developing countries, which main goals is receive the support from developed countries in order to enhance capacity-building and provide guidelines, technology transfer and financial support to reduce emissions. China has recognized the importance of setting voluntary emissions reductions and advocates for this cause.²⁶³ China has sent its INDCs, which claim that China's highest emission peak will be achieved by 2030 and it is committed to apply the 'best efforts' to reduce the intensity of its emissions earlier. Carbon Dioxide emissions per unit of GDP will be reduced by 5% from the 2005 level, and to increase clean energy around 20% to replace fossil fuels in the primary energy consumption. Forestry will be one of the main CO₂ reducing elements, as the Chinese government seeks to 'increase forest stock volume by around 4.5 billion cubic meters on the 2005 level.'²⁶⁴

The Chinese approach to environmental treaties has shifted from a rigid point of view where engaging in such treaties would prevent national growth, to a point of view that benefits from the mechanisms set by the environmental treaties and takes advantage of the financial funds in order to develop a more efficient industrial economy based on cleaner technologies.²⁶⁵ The government in fact favorites the projects that it retains more important especially energy projects. Although China is the

²⁶² *Ivi*. p.119

²⁶³ (ICCG) China Country profile

²⁶⁴ (Department of Climate Change)p.21

²⁶⁵ (Wei-Yin Chen, 2012)p.251

greatest polluter, it is also the country that hosts the most projects to develop a cleaner economy and a more efficient energy producing system.

b) Japan

Japan economic growth went from suffering highly from pollution, since industrial areas were near high-populated areas not only the environment but also the health of the population was at risk, and then being able to limit and manage pollution without giving up economic growth.²⁶⁶ Japan's progress can set a leading example for developing countries to become ambitious on implementing environmental policies to fight pollution while develop, rather than wait for being developed and then implement.

As Hidefumi explains, “[A]t the end of the 1960s, Japan was considered among the most polluted countries in the world. A decade later, it was beginning to achieve recognition for its environmental cleanup efforts. Today, in many areas, although certainly not at all, Japan is an environmental technology and policy leader.”²⁶⁷

After a period that saw many human diseases caused by the pollution caused by the industries. During the period of economic expansion until 1968 the industries discharged hazardous waste into the water creating the conditions to human intoxication diseases. The Itai-itai disease (literally it hurts, it hurts) caused by cadmium poisoning attributed to a mining company that polluted the water basin. The Yokkaichi asthma that was caused by the sulfur dioxide released by the industries that amounted to 7 times higher of nowadays maximum standard and 30 times higher than the current emissions. And the most famous, the Minamata disease, caused by mercury poisoning that was discharged in the streams.²⁶⁸ It was in this atmosphere that the Environmental Agency

²⁶⁶ (Hidefumi Imura, 2005)P.1

²⁶⁷ *Ivi.* p.2

²⁶⁸ *Ivi.* pp.24,25

that came to life in 1971 in order to create policies for pollution mitigation and environmental protection.²⁶⁹

The wide spread of access to television helped also to raise awareness and impulse local activism that translated into a green agenda part of political campaigns.²⁷⁰ Soon a new wave of environmental protection policies began to be conceived.²⁷¹ The most important was the 'Basic Law for Environmental Pollution Control' of 1967²⁷², along with other 14 laws to control pollution and environmental protection. The Basic law draw an outline of regulations and emissions, along with the projects for development of pollution control facilities with the purpose of monitoring and enforcing the compliance of the law, it protected air, water and soil pollution, noise, vibration, ground subsidence and offensive odors.²⁷³

By 1970s until 1980s, Japan had '*[o]ne of the world's strongest environmental regulations*'²⁷⁴ without leaving aside economic development.²⁷⁵ Japan attended the Stockholm Conference of 1972 and as member of the Organization for Economic Co-operation and Development (OECD), that had just forged the "polluter pays principle", Japan felt pressure to comply to a foreign standard of environmental policy thus was highly encourage to begin becoming 'greener'.²⁷⁶

Pollution, however, was not the cause that sought its reduction. The Japanese Government began acting policies towards energy conservation and energy efficiency after the 1973 oil crisis that resulted in a reduction of pollution. But was set off by the dependence that Japan had on the import of energy to support its development that amounted the 85% at

²⁶⁹ (Takao 2012) pp.8,56

²⁷⁰ *Ivi.* p.2

²⁷¹ (Hidefumi Imura, 2005)p.25

²⁷² (Takao 2012) pp.4,5

²⁷³ (Hidefumi Imura, 2005)p.29

²⁷⁴ (Takao 2012) p.2

²⁷⁵ *Ivi.* p.1

²⁷⁶ (Hidefumi Imura, 2005)pp.29-30

that time.²⁷⁷ After the second oil crisis in 1979, the government accompanied the new Energy conservation law with financial incentives to meliorate the energy efficiency system in the industry, households, and even consumer products.²⁷⁸ As Takao explains, rather than environmental policy it was *'[c]onceived ... as industrial policy for managing Japan's energy demand/supply structure.'*²⁷⁹

As a matter of fact, Japan has acted a voluntary reduction approach to regulate CO2 emissions, is thanks to the consumer behavior, infrastructure and energy-efficiency that the Japanese emissions are rather low compared to other industrialized countries.²⁸⁰ During the 80s the government sought to pair up the industries and technologic research to develop a cleaner economy, encouraging them with financial incentives such as loans and tax reductions and a 'collaborative government-industry-university research opportunity'.²⁸¹

In the 1990s more attention has been paid to global issues, the basic environmental law and the basic environmental plan were issued in the 'lost decade' of economic regression. The Sustainable development concept was introduced along fighting pollution in order to prevent rather than mitigate, bringing to the table a new approach on environmental policy.²⁸² Japans prefectures and local governments also played an important role; many have been the cases of local governments enforcing law that are higher in ambition than the national standard.²⁸³

The 1990s saw the instauration of an international environmental policy regime, beginning with the Montreal protocol of 1986, the instauration of the IPCC, the UNFCCC and its COP 3, that was hosted in Tokyo in 1997.

²⁷⁷ (Takao 2012) p.4

²⁷⁸ *Idem.*

²⁷⁹ *Ivi.* p.5

²⁸⁰ *Ivi.* pp.5,8

²⁸¹ *Ivi.* p.6

²⁸² (Hidefumi Imura, 2005)p.7

²⁸³ *Ivi.* p.6

This period brought the new Environmental basis law that is inspired to a green economy and sustainable development, and aims to promote this dream at an international level.²⁸⁴

Japan as major industrialized powers has always felt the pressure to fill up his international responsibility to continue to be acknowledged in the international community.²⁸⁵ Japan's environmental foreign policy has been a 'two-level game', where national and international policies align, as national policies tend to influence international legislations and vice versa.²⁸⁶ A clear example is the adaptation of the Japanese products to the international standards 'ISO14000', set after the Rio Conference of 1992, in order to avoid the discrimination of the Japanese products in the international market for not complying with the international standards.²⁸⁷ Japan as major industrialized powers has always felt the pressure to fill up his international responsibility to continue to be acknowledged in the international community.

After a decade of being quite passive within the international environmental policy, Japan offered to host the UNFCCC COP 3, and as the host country it was highly aware of the importance to conclude the conference with an outcome document. Although, the Japanese approach towards the climate change commitments were mostly toward a non-binding objective but rather at a 'pledge and review' contribution basis, and had stated that Japan could have committed to a 6.5 percent reduction. The EU had in mind a reduction of 15 percent, but Japan having in mind the business interest and its close relations with the US, decided to lower the reduction to 5 percent hoping that the US would have ratified, which was not the case.²⁸⁸

²⁸⁴ (Hidefumi Imura, 2005)pp.39-40,72

²⁸⁵ (Takao 2012) p.7

²⁸⁶ *Ivi.* p.3

²⁸⁷ *Ivi.* p.6

²⁸⁸ (Takao 2012) pp.12,13

In 1990 a non-really successful attempt 'action program to arrest global warming' was decided. With the ratification of the Kyoto Protocol in 2003 the previous Law for promoting measures to cope with global warming was amended to pursue the protocols emissions targets.²⁸⁹ The law foresees, actions to be followed by the national and local government, the industries and citizens, as well an educational program to raise awareness and promote a 'greener' lifestyle was introduced. The Global warming Prevention Headquarters were set after the COP3.²⁹⁰

Japan is part of the Umbrella Group which is a coalition of non-EU developed countries, which position stressed that major developing countries should have binding responsibilities in a scheme Kyoto-like annex-1 countries. The Umbrella Group is responsible for 30% of the global emissions being one of the most important coalitions during the last negotiations of the Paris Agreement. Japan had sent in its INDCs before the COP 21, which are not complying with the calculations to remain under 2° Celsius.²⁹¹

Japan has stated in its INDC submission, that Japanese per capita emissions are the among the lowest in developed countries, and that Japan's energy efficiency is one of the highest in the world, leaving Japan in a position where abatement cost are higher in comparison with other developed countries. Japan has reaffirmed its intention to reduce GHGs emissions by 2030 the 26% according 2013 standards, and has designated the energy sector as one of the targets to be transformed in order to achieve reductions, along with LULUCF removal projects.²⁹²

²⁸⁹ (Hidefumi Imura, 2005) pp.168-169

²⁹⁰ *Ivi*. pp.176-177

²⁹¹ (ICCG) Japan Country Profile

²⁹² (Japan's Ministry of Environment)pp.2-8

c) Republic of Korea

Korea's economic policies after the end of the Korean War sought to industrialize rapidly the nation, with an early stage where agriculture provided for the industrialization, a middle stage that saw the fields transform into factories of the light industries and a later stage that saw the heavy and chemical industries overcome the light industries. It was in this last period that Korea's environment became dangerously polluted. The period between 1960s and 1980s was a lapse of time that changed the image of the environment and shifted the perception of the environmental issues within its citizens.

South Korea's early national environmental laws were, the Waste Clean and the Waste Management Acts of 1961, the Social Pollution Prevention Act of 1963, the same year Act relating to Toxic and Hazardous Substances. Which began building a guideline to address the pollution linked to industrialization.²⁹³ By the 1970s the industrialization process had included the chemical and heavy industry, contributing to a rapid depletion process of the environment and began to be pointed out by concerned citizens.

In 1977 the Environmental Conservation Act introduced the first form of environmental impact assessment was introduced in the name of 'prior consultations' that had to be made along the project development. The enforcement of environmental assessments was reinforced one again in 1981, with the 'Framework Act on Environmental Policy', and in 1993 with the expansion of the fields to be considered with the emanation of the 'Act on Assessment of Impacts on Environment, Traffic and Hazards, that once again modified in 1999 and included a 'Prior Environmental

²⁹³ (Ministry of Environment Republic of Korea, 2001)p.71

Review'.²⁹⁴ An important event was the adoption of the Environmental Pollution Preservation Corporation Act of 1983 that aimed to constrain corporations to take responsibility on the damaged to the citizens and the environment.²⁹⁵

The 1990s were a period that started to see a bigger change in the perspective on environmental law. That increased the number of environmental laws; especially by applying the polluter pays principle, and the act relating the punishment for environmental crime. Other laws regulated environmental impact assessment and environmental corporation management, creating a framework for the industry to follow and commit to a new path of environmentalism. South Korea who had developed to a high technology innovative country, did not fail to adopt an act to help the environment with act relating to environmental technology support and development.²⁹⁶

Seoul has been struggling with air pollution, acid rain and yellow dust and air pollution that are transported by the air from the Chinese Hubei region dessert and the highly industrialized Chinese coastline.²⁹⁷ Seoul began the implementation of the local agenda 21 in 1996, pursuing 'environmentally sound and sustainable development' that mitigates environmental degradation, enforcing the 'polluter-pays-principle' and fostering cooperation with international bodies.²⁹⁸

After hosting the 1998 Olympic games and portraying a highly polluted industrialized Seoul, a change in the environmental assessment for the 2002 Soccer World Cup help to achieve an environmentally friendly construction of facilities to host the games.²⁹⁹ During these years Korea

²⁹⁴ (Jeonghwa Yi, 2011) p.908,909

²⁹⁵ (Ministry of Environment Republic of Korea, 2001)p.71

²⁹⁶ *Idem.*

²⁹⁷ (Choi, Yearn Hong, 2008)pp. 44-45,47

²⁹⁸ *Ivi.* pp.49-50

²⁹⁹ (Choi, Yearn Hong, 2008)pp.7,70

sought to change the image of South Korea overseas proposing a 'cleaner version of itself'.

Korea ratified the UNFCCC in December 1993 as a non-annex 1 country, meaning that it had no responsibilities to comply with emissions reduction and that it could benefit of the Clean Development Mechanisms. A Government Body on Measures to combat climate change was established in 1998 in order to have reinforcing action and serve as a forum for the different ministries, industry stakeholders, scholars and scientists to provide with the measures to develop a 'perfect fit' national action plan. This action plan was drawn the same year, but started taking action in early 2000. The main feature was a voluntary emission control that was harsh on non-energy efficient products in the market and an overall encouragement from the government to adopt ecofriendly features in the industry. Energy efficiency became the most important aspect in order to achieve a green economy. The Korean National assembly to guide the collaboration of government, industry and NGOs to sustainable development and fighting climate change established an ad-hoc committee during the following years.³⁰⁰

In 2008 the government began pursuing a 'Green Growth Strategy' to shift towards a more sustainable economy development and energy efficiency targeted to mitigate the adverse effects of climate change and the imported energy consumption patterns that arose preoccupation since the rise in oil price during mid-2000s.³⁰¹ The following year the recently created 'Presidential Committee on Green Growth' announced the first-five year plan for green growth, and a formal legislation, the Framework Act on low carbon and green economy was issued shortly after giving a legal frame of action to new agenda.³⁰²

³⁰⁰ (Ministry of Environment Republic of Korea, 2001)pp.17-18

³⁰¹ (Jae-Seung Lee, 2016)p.22

³⁰² (Jae-Seung Lee, 2016)p.22

The government focused more on the 'low carbon town' implementation of the existing infrastructure, granting loans and financial aid to improve the energy efficiency and reduce thus carbon emissions. Several projects such as the 'Resource Circulating Ecotown', and the 'Climate change adaptation model City' were prepared to promote the adaptation at a local level, however many cities due the lack of information and the short terms set by the government, who was pressuring the schedule to see high results in a short amount of time, were not able to find a plan that fitted all the necessities at a local level.³⁰³

Along the pursue of a low carbon and greener economy, the Korean Ministry of Environment in 2009, provided the first outline guide for GHG emissions assessments. With the purpose of "create awareness about climate change mitigation"³⁰⁴, this guide ensures that the projects estimated GHGs emissions are at the lowest point they could be and that energy efficiency is being considered in development projects of all areas.³⁰⁵ The Korean efforts to comply to the Copenhagen accord were to reduce the voluntary reduction the 30% of the "business-as-usual level by 2020", pursuing the highest amount recommended made for developing countries made by the IPCC.³⁰⁶

The following year, the Ministry of Environment established the 'Greenhouse Gas Inventory and Research Center of Korea' that is in charge of setting GHG reduction goals, keep a data record, and submit a 'National Inventory Report'.³⁰⁷ GHG emission permits trading was legislated by the Act on the Allocation and Trading of Greenhouse Gas Emission Permits of 2012.³⁰⁸

³⁰³ *Ivi.* pp.23,25

³⁰⁴ (Jeonghwa Yi, 2011) p.909

³⁰⁵ *Idem.*

³⁰⁶ (Ministry of Environment Republic of Korea, 2015) p.1

³⁰⁷ (Ministry of Environment Republic of Korea, 2015)p.2

³⁰⁸ *Ivi.* p.16

Climate change adaptation has been integrated in the Korean agenda since 1999, with the first 'Comprehensive Plan on Climate Change Adaptation', and second plans which focused on mitigation. The third plan began focusing in both mitigation and adaptation. The fourth 'National Comprehensive Plan on Climate Change Adaptation' that covers the 2009-2030 period was issued by the end of 2008. The Presidential Committee on Green Growth instituted the Korean Adaptation Center for Climate Change. It analyzes data and performs assessments and collaborates with international organizations.³⁰⁹

The National Climate Change Adaptation Plan is reformulated every five years in order to reformulate according to the circumstances and the environmental urgent matters. It evaluates the circumstances through the lenses of different ministries and sectors. The following sectors are responsible for the implementation plan and feedback report according to the National Adaptation Plan, Health, Agriculture and fisheries, Water management, disasters, Forest and ecosystems, national land and coasts, Industries, Infrastructure and international cooperation and monitoring and prediction.³¹⁰

After the Fukushima Nuclear Crisis in 2012, The Green Party of Korea was established. It did not was able to gain a significant amount of votes, but has an important policy claim 'implementing a nuclear-free energy changeover by 2030'.³¹¹ Before that as Norbert Eschborn highlights, *"[I]nsufficient number of studies can be explained by the fact that there has almost never been any attempt for political empowerment of environmental movements in Korea, and also very few cases of environmental candidates with green value entering the political institutional circles, thus failing to gain attention from scholars."*³¹²

³⁰⁹ *Ivi*. p.7

³¹⁰ (Norbert Eschborn, 2015) pp.9,18-19

³¹¹ (Norbert Eschborn, 2015) pp.5,7-8

³¹² *Ivi*. p. 10

South Korea was the first non-Annex 1 country to declare voluntary emissions reductions with a pledge made in Copenhagen. Before the COP21 that reached the Paris Agreement, Korea had already sent its INDCs that aim to reduce by 37% the emissions on a business as usual scenario. South Korea also stated that given the high-energy efficiency it would be less easy to achieve the reductions. And outlined that emission reductions is in line with Korea's Framework Act on Low carbon, Green Growth.³¹³ Energy efficiency remains an important priority to South Korea, since its economy is 'extremely susceptible to changes on the energy market'. Korea way to compensate this dependence has a fixed aim towards nuclear power production which power plants are to be 'enlarged until 2029'.³¹⁴

³¹³ (Republic of Korea) pp.1-4

³¹⁴ (Nobert Eschborn, 2015) p.6

d) Socialist Republic of Vietnam

The Vietnamese case is quite particular, Vietnam had barely no financial aid the American embargo that lasted twenty years and the international community also gave Vietnam the cold shoulder after the Vietnamese invasion of the Cambodian territory in 1977. In early 1990s Vietnam began building up international ties, and participated at the 1992 Rio Conference, ratifying the UNFCCC in 1994.³¹⁵

In few decades Vietnam has successfully transition from a centrally planned economy to a market economy. Vietnam went from being one of the world's poorest countries to become a lower-middle-income country. This rapid economic development has comported a fast industrialization and urbanization, but agriculture remains still important. In order to achieve economic goals and increase yield the farmers use high-intensity non-sustainable methods that promote soil erosion and water contamination. Urbanization rate in Vietnam is one of the fastest in the world, urban centers and factories also contribute to soil, water, and air contamination due to the increased infrastructure and poor waste management.³¹⁶

Vietnam is an extremely susceptible country to climate change, different studies have estimated that if sea level were to rise one meter, half of the agricultural land of the Mekong delta would be submerged and would comport a 7 million people relocation and other 14.2 millions residents would have flooded homes and businesses. Vietnamese government is highly active in to mitigation and adaptation measures to prevent such calamities.³¹⁷ Vietnam has taken advantage of the Red, Mekong and Pearl

³¹⁵ (Ministry of Natural Resources and Environment. Socialist Republic of Viet Nam, 2003)p.

³¹⁶ (Asian Development Bank, 2013)pp.1 -3

³¹⁷ (Asian Development Bank, 2013)p.8

Rivers, and has invested into hydropower that is a key energy producing activity that significantly helps satisfying Vietnam's energy demand.³¹⁸

The first environmental protection and pollution standards were issued in mid-1990s. The 'Law on Environment Protection' was adopted to use strategic environmental impact assessments to guide the management of the environment, the Department of Natural Resources and Environment who is in charge of analyzing and approving the projects, has difficulties due the overload of project and few staff to follow all projects.³¹⁹

In 2005 the National Council of Sustainable Development was brought to life in order to monitor the implementation of the Strategic Orientation for Sustainable Development, which is the Vietnamese National Agenda 21. A National Target Program to Respond to Climate Change was approved by the Prime Minister, which draws Vietnam's objectives towards National Emissions Reductions. Other important national strategies such as, the 'Strategic Orientation for Sustainable Development in Vietnam of 2004, and the 'National Strategy for Environmental Protection long-term plan vision to 2020' and the National Strategy on Climate Change for 2050 and the Vision to 2100 National Target Program to Respond to Climate change of 2008, completed the guidelines for socioeconomic sustainable development, climate change mitigation and adaptation, and environmental and biodiversity protection.³²⁰

Vietnam has been able to seize the benefits of the Clean Development Mechanism and has been granted many projects under the World Bank and Asian Development Bank, The UNFCCC Adaptation Fund and Global Environmental Facility Trust Fund, the Green Climate Fund, Japan's ODAs, and the Nordic Development Fund. Most of these projects and financing funds have been use to develop the agriculture and natural resources,

³¹⁸ (Philander, Encyclopedia of Global Warming and Climate Change. Second Edition, 2012)p.1435

³¹⁹ (Asian Development Bank, 2013)p.17

³²⁰ *Ivi*. pp.12-13

energy, transport, urban centers and water management and climate change adaptation and mitigation, helping to guide Vietnam in a different direction than its communist big brother, China. This early stage of financing and guidance has help Vietnam to meliorate its condition although many is to be achieved yet the Vietnamese government and leadership have acknowledge the importance on pursuing a green economy to protect its territory from the adverse effects of climate change.³²¹

In the agricultural and rural development sector, the projects are aimed to strengthen policies and management capacities of the water resources and irrigation systems, and promoting climate-resilient in drought and flood periods especially in the Mekong area. In the Energy sector, energy efficiency and renewable energy are the main projects, specializing mainly in hydroelectric power plants. Transportation, whose emissions are almost as great as energy production emissions, has received projects to help build efficient urban transport networks to encourage public commuting. The Urban sector, where 70 percent of the population in concentrated has become as well a sector to receive projects and loans to improve the a sustainable and climate-resilient socioeconomic development and build a strong waste management system.³²²

In 2008, a National Target Programme on Climate Change and Sea-Level Rise was instituted to develop projects to mitigate and adapt the highly risk prone provinces and then to expand nationally. Fomenting sustainable agriculture and providing with energy-efficiency and better infrastructure is part of these projects. The Adaptation project 'Live Safely with Flooding', has been instituted by the government to cope with the persistent floods and ensuring better risk management responses.³²³

³²¹ (Asian Development Bank, 2013)pp.49-53

³²² *Idem.*

³²³ (Marquina, 2010)p.402

In the last years Vietnam has planned on reducing GHGs emissions by implementing reforestation projects, this initiative has been supported by the World's Bank Forest Carbon Partnership Facility, which compensates developing countries for achieving GHGs reductions.³²⁴

Vietnam as part of the Paris Agreement submitted its INDC, which gives special accent to financial aid, declaring that Vietnam's INDCs includes two different types of contributions, unconditional and conditional. Unconditional contributions are to be achieved using national implementation, and will reduce by 2030 the 8% of GHGs of a business as usual scenario. On the other hand, the Vietnamese government declares that Vietnam is able to reduce 25% of the GHGs, the conditional contributions, which could be implemented '*if new and additional international financial support, technology transfer and capacity building are received*'.³²⁵

The document that was submitted contains as well an overview on the damage scenario that could be caused by climate change and sea-level rise. And points out that the Vietnamese people have suffered in the past 30 years the annual loss of 500 lives due to climate change related catastrophes that also saw thousands of citizens injured and comported an annual loss of 1.5% of Vietnam's GDP. The Vietnamese document stresses that the climate change mitigation and adaptations aspects have been included in the national agenda and that Vietnamese is addressing the Climate change issue on a long-term view with the National Climate Strategy 2016-2050. And it remarks the forest protection, afforestation and reforestation effort made under the REDD+ initiative. Vietnam has accredited and registered 254 CDM projects most of them aimed towards the energy sector which will remain a main sector to seek for emissions reductions to achieve de INDCs.³²⁶

³²⁴ *Idem*.

³²⁵ (Vietnam) p.2

³²⁶ (Vietnam)pp.2,7

Chapter 4: Adapting and Reverting to the Effects the New Climate

The East Asian region due to its long coast lines which concentrate highly populated cities will likely be affected by rises in sea levels, deltas and costal flooding, increased intensity cyclones and precipitation due the increased vaporization of ice bodies causing flooding, soil erosion and landslides. Extreme weather is one of the effects of climate change, bigger tropical storms, summer monsoons, typhoons could become a frequent phenomena and could affect highly the population, infrastructure, agriculture yield, and provoke soil erosion in these countries. Heat waves can lead to wildfires of the rich combusting peat land and dry vegetation of the southern East Asian region that comports further GHGs emissions.³²⁷ Access to fresh water will become an issue, due the reduction of the mountain glaciers, evaporation and salinization of the fresh waters caused by floods.³²⁸

Other important aspects to be considered are food security, and health security. The First could be affected by the reduction of crop yield and livestock damage due to climate disasters. The second, due to warmer conditions could lead to spread tropical diseases such as malaria and dengue fever.³²⁹ During a disaster situation, other diseases could be spread by the lack of hygiene, medical facilities and proper forced migration refugee settlements.³³⁰

Climate change effects are already taking place and mitigations should be followed with adaptive measures in order to ensure the lowest damages possible. Although stopping all GHGs emissions is unrealistic and would

³²⁷ (Marquina, 2010)p.397

³²⁸ *Ivi.* p.394

³²⁹ *Ivi.* p.395

³³⁰ *Ivi.* p.396

be indeed expensive, not adapting to climate change could cause equivalent loss damages.

4.1. - Mitigation

GHGs can be sank naturally in the carbon cycle, when GHGs emission surpasses the quotas that can be sank remain in the atmosphere producing an enhanced green house effect. Mitigating global warming can take two approaches, the first being reduce of GHGs emissions and the second is related to the carbon cycle itself. Whether is through reforestation or accelerating the carbon cycle. Mitigation policies and development policies should follow a win-win or no-regrets approach which delivers 'net economic multiple benefits' at a low risk.³³¹ Economic development and environment are concepts that became bifurcated, but they can and work intrinsically to build a sustainable development path for humanity.

As developing countries economies grow, the demand for increased energy supply raises, *'[a]ccording the International Energy Agency IEA, global energy demand will grow by two thirds from the current demand in 2030.'*³³² This energy demand is normally almost satisfied by non-renewable energy sources such as coal, petroleum, and natural gas. The international community should use the CDM and carbon taxes to regulate the price of 'clean energy' in order to make it available at competitive price thus encouraging developing countries to provide a greener alternative to develop sustainably.³³³

Transactions in the market of emission allowance are called Emissions Trading systems that can help Climate Change mitigation.³³⁴ This can be achieved by implementing efficient economic tools implying pollution allowance, such as the carbon tax and the cap-and-trade system. The first consists on introducing a tax on GHGs emissions, by doing so polluting

³³¹ (Philander, Encyclopedia of Global Warming and Climate Change. Second Edition, 2012) Vol. II. P.1019

³³² (Pinchera, 2004)p.130

³³³ *Idem.*

³³⁴ (Wei-Yin Chen, 2012)p.238

will become expensive thus discouraging industries persistent pollution. The second sets a limit (cap) on the total emissions, GHGs emitters would pursue to reduce emissions and sell their 'rights' to pollute at the highest bidder in the market. These two economic systems could be implemented together to achieve higher GHGs reduction.³³⁵ To function correctly, Environmental Agencies should issue a strong law enforcing mechanism and controls, market permits transfers inventories and discharge monitoring in order to ensure compliance can be met.³³⁶ Amending the UNFCCC that outlined the target of reducing GHGs emissions, the Kyoto Protocol was adopted in 1997 at the third COP, calling only into force in 2005. The Kyoto Protocol sets objectives to Industrialized Countries (Annex-1) with binding emissions reduction targets to reduce GHGs and provide with a work frame guideline to achieve their reduction objectives, the flexible mechanisms.³³⁷

Under the Kyoto Protocol different GHGs reduction mechanisms can be used to meet the binding reduction quotas: the 'Joint Implementation', which allows Annex 1 countries to pursue reducing quotas in other Annex 1 countries. The 'Clean Developing Mechanism' introduces 'Certified Emission Reductions' (CERs) that are carbon credits earned from projects developed in 'non-annex 1 countries', which are developing countries that have not legally-binding responsibilities in the light of the 'common but differentiated responsibilities'. Annex 1 Countries, can trade with each other the 'Assigned Amount Units' that have been spared with domestic policy efforts, using the International Emissions Trading mechanism.³³⁸

The Clean Developing Mechanism fosters sustainable development in developing countries (Non-Annex 1 countries). The transfer of cleaner technologies can come from public or private bodies that setup investment projects to reduce GHGs emissions. The certified emissions

³³⁵ (David Goodstein, 2013)pp.55,57-61

³³⁶ (Ortolano, 1997)p.226

³³⁷ (Wei-Yin Chen, 2012)p.245

³³⁸ *Ivi*. pp.246-247

reductions obtained by these projects can then be used to fulfill one's emission quotas or sold to the highest bidder in the market.³³⁹

China has been the country that host most CDM projects amounting in 2009 of 72%.³⁴⁰ The Chinese government biases projects that enhance energy efficiency and energy security, more than half of all hydroelectric power projects are located in China.³⁴¹

Reforestation, Afforestation and Forest protection projects are regulated by the 'Land Use, Land-Use Change, and Forestry' (LULUCF). This category of CDM projects aims to promote the increase the yield of carbon sinking through enhancing forestry development. The Certificated Emissions Reductions obtained through LULUCF projects are temporary credits that can be accounted at the end of the project and at the end of the commitment project.³⁴² 'Reduced Emissions from Deforestation and Degradation' (REDD), although not included under the Kyoto protocol, have been integrated in the voluntary market and were discussed strongly in the COP 15 at Copenhagen.³⁴³

A voluntary Cap-and-trade market can be expected from the east-Asian region in the near future, South Korea is already implementing a national emissions trading system, and voluntary carbon credits markets can be also found in China, were the Tianjin Climate Exchange and China Beijing Environmental Exchange, which are affiliated with the most famous Chicago climate Exchange emissions trading system, are trading voluntary emissions reduction credits. We can expect this markets to achieve a regional status as time and efforts consolidate this new economic tool.³⁴⁴

³³⁹ (Wei-Yin Chen, 2012)pp.247,248

³⁴⁰ *Ivi.* p.250

³⁴¹ *Ivi.* p.251

³⁴² *Ivi.* p.260

³⁴³ *Ivi.* pp.260-261

³⁴⁴ (Wei-Yin Chen, 2012)pp.259,261

This systems leave room for creativity, from deciding whether permits should be assigned freely or sold in an auction process, to deciding who many quotas should be available in the market;³⁴⁵ this local based Kyoto protocol-like approach can be more efficient in industrialized economies and fast growing economies. Whose economies are strong enough and would not have an undermining effect to their socioeconomic development.

The pollution allowances concept create a contrast with the 'Polluter pays principle' (PPP) which basically demands the polluter to provide indemnity for the pollution provoked, while the pollution allowances give the illusion of a 'right to pollute', since there is a cost to the pollution process it could be seen as well as a institutionalized PPP.³⁴⁶

In Milan, at the COP9 a new method that may be adopted in the future was proposed, the so-called 'Contraction & Convergence'. Which aims to 'contract' the GHGs emissions in order to maintain the global temperature beneath 2° Celsius, and 'convergence' in to a global emission quota fixed per capita. This personal carbon quota adopts the same system as the cap-and-trade but on an individual basis.³⁴⁷

Scientists offer a remedy to global warming by manipulating the environment on a large-scale level. Climate Geoengineering include approaches like using mirrors outside of our atmosphere to reflect the sun's long-wave rays. Or using an enhanced man-made albedo, such as sulfur stratospheric aerosol injections that would reflect the sunrays and cooling the earth. Climate Geoengineering offers viable options, however there might be negative outcomes to blocking the sun rays, the weather pattern may be affected consequently disrupting food security mainly in Africa and Asia were the agriculture depends highly on monsoon rains, or even inducing other problems in the ecosystem and biodiversity damage.

³⁴⁵ (Ortolano, 1997)p.227

³⁴⁶ *Ivi.* pp.242-243

³⁴⁷ (Pinchera, 2004)pp.165,168-169

Other alternatives offered by climate geoengineering aim to enhance the biological process of carbon dioxide removal, for example enhanced weathering which is an expensive process of promote mineral sequestration of CO₂. The most famous and viable option may be Ocean Iron Fertilization, which seeks to stimulate phytoplankton production – which carries photosynthesis and particulate organic carbon that sinks into the ocean layer– by adding iron into iron-deficient ocean areas, like the southern ocean.³⁴⁸

Carbon Dioxide capture and geological storage (CCS) could help reduce more than half of fossil fuel emissions by the end of this century. The process consists in capturing the CO₂ emissions from fossil-fueled large factories and store as geological sinks in petroleum fields, saline aquifers and coal deposits. Geological reservoirs can store carbon dioxide for many centuries thus being a perfect technology alternative to reduce GHGs. Gas and coal fueled power plants, cement industries, steel industries and high emission facilities are perfect candidates for the CCS implementation.³⁴⁹

An important aspect of climate change mitigation is energy efficiency, that by enhancing the infrastructure, energy policies and energy management can reduce the amount of emissions released. By incorporating energy efficiency in the infrastructure, buildings can cut the energy consumption for heating and cooling purposes.³⁵⁰ Equipment and lighting improvements such as LED bulbs and green labeled equipment, according to the EIA, can cut energy consumption by 75% percent. Simple actions like changing indoor light bulbs can accumulate and provide a high energy saving yield.³⁵¹ Adopting national regulations can encourage machinery and fuel energy efficiency. China, Japan, the US and Canada have introduced mandatory fuel economic standards for the energy use of

³⁴⁸ . (Pinchera, 2004)p.170

³⁴⁹ (Wei-Yin Chen J. S., 2012) Vol.3 p.1407

³⁵⁰ (International Energy Agency, 2017)p.67

³⁵¹ *Idem*.

trucks, which amount the 43 percent of the total road transport oil consumption. On the same line, the UE, India South Korea and Mexico might be introducing the alike national standards.³⁵²

Better infrastructure in the urban development such as an efficient public transportation network that relies on non fossil fuels can encourage the population to move in collective form, where there is a lack or an inefficiency in an incomplete transportation network singular commuting will be preferred thus emitting more GHGs. There are many aspects to energy efficiency that can trigger a 'snow ball effect' and make large difference in the overall GHGs count.

After the Great East Japan Earthquake, Japan, who was among the top energy-efficient countries in the world successfully implemented more energy efficiency methods in order to assure energy security and prevent blackouts due the damage of the nuclear plant of Fukushima Daiichi.

Energy compensation was achieved by increased power generations from coal, oil and gas plants for energy production. And by energy saving campaigns to keep the air conditioning with a higher temperature and by changing the dress code in the companies to short sleeves. Industries were also restricted to save 15% of energy consumption until in 2016 slowly the situation went back to normal.

Energy consumption in Japan continues to decline even after energy conservation measures were no longer an extreme necessity.³⁵³

Nuclear energy was the most looked forward clean energy. But if nuclear technology was to supply our whole demand of energy, many plants should be built considering that the average life of a nuclear plant facility is 30 years. No GHGs are emitted during the process of power generation itself. But uranium mining and transport and nuclear power plant

³⁵² *Idem.*

³⁵³ (International Energy Agency, 2017)p.33

construction, does release emissions and the enrichment of uranium process releases CFCs, which are Ozone depletion substances.³⁵⁴

Nuclear waste is highly radioactive and toxic, disasters such as the Three Mile Island 1979, the Chernobyl 1986 and Fukushima in 2011 have taken the toll on the environment and population of the area that have suffer from radiation exposure related diseases and had to be relocated to other areas to avoid further radiation exposure.

Climate change itself may be a reason for a further nuclear energy decline. Adverse climate, like earthquakes, tsunamis, floods and drought, may compromise the effective functioning of the plants. Not only the location of nuclear plants but also the nuclear waste disposal should be carefully planned carefully sealed and deposited in disaster safe underground storages, waste leakages or malfunction of the plants can damage our environment and health with no mitigation measures available to remedy for the damage caused.³⁵⁵ Knowing the adverse and toxic effects of nuclear power we should apply a better safe than sorry approach and implement other energy sources no matter the different economic cost of pursuing other system rather than nuclear power.

Power production can rely on to many different methods. But fossil fuels remain so far the most spread in use since clean energy production infrastructure requires experts and a high investment and the power produced may not be the most affordable in the market.

The geothermal energy is a long known usage of the thermal heat release by the earth's core. Natural hot springs and vapor releases have been used for many centuries, in China many artificial hot springs have been develop by drilling procedures. Heat pumps could be used to provided heat and cooling in buildings, in countries like Iceland heating is provided

³⁵⁴ (Philander, 2012)pp.1034-1038

³⁵⁵ (Quaschnig, 2010)pp.16,18

almost by geothermal energy.³⁵⁶ Geothermal power generating facilities can utilize the hot steam by canaling the steam to spin turbines, this method is called Steam flash power generation.³⁵⁷

Bioenergy, for example, could utilize the organic waste from agriculture– which is one of the most GHGs emitter industry– that releases heat while decomposing giving it a second chance to do well in this world. The process of organic matter decomposition releases heat and also comports GHGs emissions, this process could be implemented in factories where there is plenty of food waste.³⁵⁸

Wind energy may represent one of the best renewable energy production options available. Inhabited places like the Chinese Gobi desert could be used to build up wind energy fields and offshore facilities, this seems a good alternative to compensate the land use problem that many people have pointed out.³⁵⁹

Wind energy seems a more environmentally friendly alternative than hydroelectric energy. The construction of ‘Three Gorges Dam’ in the Chinese Yangtze River, has revealed to be ecosystem depleting, causing loss of biodiversity, increasing of drought in the nearby areas and the relocation of people affected by the project.³⁶⁰ The Three Gorges hydroelectrical power plant generates energy thanks to the melting of snow bodies, which provide water to the Yangtze River, the water flow due to the melting, and evaporation of water bodies may suffer power yield in the future.³⁶¹ Hydroelectric technology could be applied also to provide energy derived from the sea tide and wave (Wave-Tidal Energy). Tidal technology captures seawater when the tide is high to then release it back

³⁵⁶ (Wei-Yin Chen J. S., 2012) Vol.3 pp.1329-1330

³⁵⁷ *Ivi.* P.1331

³⁵⁸ (Pinchera, 2004)pp.134-35

³⁵⁹ *Ivi.* pp.131-132

³⁶⁰ (Hvistendahl)

³⁶¹ (Philander, Encyclopedia of Global Warming and Climate Change. Second Edition, 2012)Vol.I.p.16

through channels that contain turbines, which spin generating energy. However Wave energy remains high cost, and Tidal energy is environmental unfriendly hence they are rarely used.³⁶²

Solar Energy on the other hand has many application fields, from providing water heating and thermal heating, to energy power production and concentrating solar power. Solar panels have become more popular year-by-year in house and buildings. Solar chimney power plants could be built in arid areas to utilize the room that is needed to place the plant infrastructure that in other regions may restrict land usage.³⁶³

So now where do we store all this energy? Unlike fossil energy, renewable energy must be stored or spread in a large electrical net that arrives at each energy socket for us to use. The use of lithium-ion batteries is the most spread but if not properly recycled they can be toxic in the environment. The waste and the damage cause toxicity of some components of the batteries have severe impacts in the environment and ecosystems. The improper recycling and disposal into the land fields has become a wider waste stream since the common usage of these batteries in almost any electronic device.³⁶⁴

Scientists claim that hydrogen could be our answer, they describe hydrogen as *'[t]he ultimate fuel'... the most clean and effective way to store and use energy.*³⁶⁵ Hydrogen can fill almost all the fossil fuel usages; it produces heat and can be used as fuel for transportation. The most innovative feature are hydrogen fuel cells, that produce energy with out emitting GHGs, and hydrogen electrical conductivity that could be applied to transport energy to all corner of the earth. However the hydrogen technology should be further investigated in order to comply the 'better

³⁶² (Pinchera, 2004)p.135, (Quaschnig, 2010)pp.21-22

³⁶³ (Pinchera, 2004)p.132-134 (Quaschnig, 2010)pp.26-27

³⁶⁴ (Anna Boydena, 2016)pp.188-189

³⁶⁵ (Pinchera, 2004)p.136

safe than sorry' principle, since it could enhance ozone layer depletion when released in pure form in the atmosphere.³⁶⁶

³⁶⁶ *Ivi*, pp.137-139

4.2 Adaptation

Adaptation is the process of adjusting to the new conditions, it may be embracing a new change or finding resilience to cope with an adverse situation, this applies to all fields related to climate change, a few examples could be sociology, economics, culture, biology and engineering.³⁶⁷

In other to cope with climate change Nations should begin formulating no-regret and win-win policies aimed to be enhance 'adaptation capacity'³⁶⁸ to the extreme weather conditions and natural disasters, infrastructure, agriculture, migration, damage loss and other aspects are needed to be considered in order to prevent and minimize risk damage losses. Adaptation projects should be aimed to assuring that the population does not suffer from socioeconomic, demographic and health-related problems, as well as offering access to livelihoods, well-being and enjoyment of the basic human rights, should be considered as part of the adaptation projects. As Melissa Nursey-Bray states, adaptation should be planned on the basis of 'previous experiences in relation to disaster management', adaptation should be planned in advance and be focused 'where the greatest risk is present', and developing our knowledge on adapting technologies in order to support adaptation processes is imminent.³⁶⁹

The UNEP adopted in 2001 a seven-step adaptation framework for sea-level rising and climate changes. It consists in defining the problem, selecting the appropriate adaptation method, testing the efficiency of the

³⁶⁷ (Philander, Encyclopedia of Global Warming and Climate Change. Second Edition, 2012). Vol. I. p.4

³⁶⁸ The IPCC defines it as 'the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences.'

³⁶⁹ (Philander, Encyclopedia of Global Warming and Climate Change. Second Edition, 2012). Vol. I. p.7

method, select scenarios that can benefit from it, conduct a biogeophysical and socioeconomic impact assessment, conduct autonomous adjustments assessments and evaluate the adaptation strategies.³⁷⁰

Extreme weather conditions, such as warm spells, heat waves and droughts that will cause more evaporation of water bodies resulting into heavy precipitation, floods and stronger tropical cyclones with a higher wind speed. This extreme weather will cause in drought period increased risk of peat land wildfires. And during monsoon season will cause heavy floods, landslides, and increased tropical cyclones such as 'El Niño Southern Oscillation', –which in Asia is associated with dry spells–coastal erosion and inundations. This imbalance will affect food security, reducing the yield of crops and water security, due to the evaporation, reduction of glaciers and salinization of fresh waters.³⁷¹

'Low-regrets measures such as early warning systems, sustainable land usage and planning, ecosystem management and restoration, improvements to health providing structures, water supply, sanitation and irrigation and drainage systems, climate-proofing of infrastructure, development and enforcement of building codes and better education and awareness should be implemented in the early stages of adaptation policy.³⁷²

So that damage-prone zones can cope with the causalities by applying disaster risk management and adaptation measures in order to prevent inequalities due to the problems related to climate change adaptation and provide post-disaster assistance, recovery and reconstruction.³⁷³ Soft measures such as beach nourishment, coral transplanting can be used to

³⁷⁰ (Philander, Encyclopedia of Global Warming and Climate Change. Second Edition, 2012). Vol. I. p.5

³⁷¹ (Intergovernmental Panel on Climate Change, 2012) pp.15,225

³⁷² *Ivi.* pp.16,17

³⁷³ (Intergovernmental Panel on Climate Change, 2012)p.10

adapt to sea-level rising, in places where there is an imminent threat, hard measures can be taken such as building seawalls and coastal dykes, Japan and the Netherlands are countries already implementing hard measures in places where flooding is expected.³⁷⁴

The Asian territory includes mega-deltas, which are extremely prone to high-hazard river and coastal flooding. Typhoons and Hurricanes can cause infrastructure and human losses, and comport the relocation of the population affected by the climatic event. Flash floods are a problem in Vietnam and in the Chinese region of Xinjiang, which cause landslides, yield and livestock loss. Being of high impact on the local community.²⁵⁴

*As '[N]atural disasters will influence population mobility and relocation affecting host and origin communities.'*³⁷⁵ China has begun incorporating adaptation measures to cope the flood problem by reinforcing the infrastructure with disaster risk prevention in high-vulnerability communities.³⁷⁶

Rice, which is the main grain and highly important to the Asian diet is highly susceptible to temperature changes, heat waves and drought can affect the crops, especially in the Mekong area were the crops are 'rain-fed'. Food security in a globalized world economy can aggravate the condition of the local communities.

Fresh water reservoirs can also become overexploited in drought periods due to its scarcity and become an issue that promotes dispute in the communities. Serious drought can induce grassland and plantations fires that can take harsh tolls on the climate producing soil degradation and further population dislocation.³⁷⁷

³⁷⁴ (Philander, Encyclopedia of Global Warming and Climate Change. Second Edition, 2012). Vol. I. p.7

³⁷⁵ (Intergovernmental Panel on Climate Change, 2012)p.16

³⁷⁶ *Ivi.* p.415

³⁷⁷ (Intergovernmental Panel on Climate Change, 2012)pp.255,399

Disasters can become high in economic and human loss even in non extreme events conditions, the importance of effective capacity building to cope with high risk events and low risk events is detrimental for building adaptation and resilience and assure thriving through the hardships.³⁷⁸ Underdevelopment still is a major problem in China and Vietnam and the rural areas are the most vulnerable areas of the country that are lacking in good infrastructure and can suffer severe damage even with low-intensity natural disasters.

Assuring efficient contingency and emergency plans as evacuations, shelter facilities, food and water supply for population and livestock are adaptive measures that governments should implement, along with an education plan to raise awareness on how to behave in such events assuring efficiency in the execution of the emergency plans. Cooperation and technology transfer should be promoted at an international level to build up coping abilities and resilience in the vulnerable areas.³⁷⁹

All the environmental regulating treaties and conventions offer a vague legal framework in the matters of disaster mitigation and relief. The three Rio Conventions regulate a part of the environmental mitigation and adaptation process with a soft-law provision.³⁸⁰ Is the 2005, Tampere Convention on the Provision of Telecommunication Resources for Disaster Mitigation and Relief Operations, the only multilateral treaty that addresses mitigation relief as a primary subject.³⁸¹

The effort of the international community was declared in the *'[M]illennium Declaration adopted by 189 nations in September 2000: "We recognize that, in addition to our separate responsibilities to our individual societies, we have a collective responsibility to uphold the principles of human dignity, equality, and equity at the global level. Global challenges*

³⁷⁸ *Ivi.* pp.33-34

³⁷⁹ *Ivi.* pp.17,36,

³⁸⁰ *Ivi.* p. 407

³⁸¹ (Intergovernmental Panel on Climate Change, 2012)p.p402

must be managed in a way that distributes the costs and burdens fairly in accordance with basic principles of equity and social justice. Those who suffer or who benefit least deserve help from those who benefit most".³⁸²

The Millennium Declaration further states that 'efforts will not be spared' to provide the assistance and protection to civilian population suffering from natural disasters. International relief, assistance and humanitarian assistance are keys forms of solidarity in post disaster management. Pre-disaster investments remain the most important so far to reduce the magnitude and gravity of the events. Explicitly in vulnerable zones and poverty spread zones is imminent to avert disaster response and intervention projects in shared responsibility efforts.³⁸³

According to the 'polluter pays principle' (PPP), industrialized countries are responsible being them to promote climate change to this extent and should be the most contributing parts to the mitigation and adaptation process to alleviate the developing countries and vulnerable zones prone to disaster.³⁸⁴

The 1990s were designed the International Decade for Natural Disaster Reduction. The first World Conference on Natural Disaster Reduction took place in Japan in 1994, and resulted in the 'Yokohama Strategy and Plan of Action'. In 2000, The UN International Strategy for Disaster Reduction (UNISDR) was introduced giving along the technical and scientific focus of the Yokohama Strategy and Plan of Action a more complete scheme including social action, collaboration approaches, sustainable development encouragement, guidance on disaster risk reduction.

The second Conference, also held in Japan, resulted in the non-legally binding 'Hyogo Framework for Action' that was adopted few weeks apart

³⁸² *Ivi*. p.400

³⁸³ *Idem*.

³⁸⁴ *Idem*.

of the Indian Ocean Tsunami giving thus a more complete soft-law framework of action for the countries that were suffering.³⁸⁵

³⁸⁵ (Intergovernmental Panel on Climate Change, 2012)pp.37,403

4.3 International Cooperation

Under the United Nations many agencies, programmes and projects with a multidisciplinary approach aim to tackle climate change. The UN Development Programme (UNDP) fights to eradicate poverty in order to enhance the adaptation capacity of vulnerable communities by promoting projects for mitigation and adaptation using the Least Developed Countries Fund, the Special Climate Change Fund and the Strategic Priority on Adaptation.³⁸⁶

The Association of Southeast Asian Nations (ASEAN) has adopted measures in order to mitigate the peat land wildfires that affect the southern East-Asian region, especially Indonesia, since 1995 with the Regional Haze Action Plan, the 2002 ASEAN Agreement on Transboundary Haze Pollution and the 2006 ASEAN Peatland Management Strategy. In order to prevent the 'Haze' emissions caused by the combustion of the peat lands, a three-way approach was settled. Prevention, mitigation and monitoring programmes were instituted at an intergovernmental level. The initiatives of the ASEAN have been persistent in the environmental, energy efficiency, food and health security.³⁸⁷ Joining forces to pursue climate mitigation along with the ASEAN +3, which is composed by China, Japan and South Korea, could enhance the information and technologies to build strong resilience to climate change. The environmental issues had not been properly acknowledge until the 2002 Environment Ministers Meeting in Vientiane, were *'[t]ransboundary haze, nature conservation and biodiversity, coastal and marine environment...'*³⁸⁸ were discussed.

³⁸⁶ (Philander, Encyclopedia of Global Warming and Climate Change. Second Edition, 2012). Vol. III. pp.1382-13283

³⁸⁷ (Marquina, 2010) pp.219,339-340

³⁸⁸ (Marquina, 2010) p.220

The UN Economic and Social Commission for Asia and the Pacific (ESCAP) holds Ministerial Conferences on Environment and Development. With a similar subject ECO ASIA, 'Environmental Congress for Asia and the Pacific', and the 'Asia Pacific Economic Cooperation' (APEC) are forums open to dialogue of climate and development issues, which meets on a yearly basis since 1991.³⁸⁹

Japan has acknowledged that encouraging greener projects overseas will help diminish the environmental impact in its own territory. As Hidefumi states, Japan holds a primary role in the pollution control in Asia, encouraging research in the field and monitoring networks and developing cooperation projects in the region initiative should be taken.³⁹⁰ Another initiative to mitigate global warming along the environmental programs is the Kyoto Initiative to fight climate change that is an extended and reinforced version of the 1997 program 'Initiatives for Sustainable Development' that aimed at reducing air, water, soil pollution, implement waste management, mitigate climate change, protect the environment implementing afforestation and raising awareness in the public.³⁹¹

Since transboundary Air pollution is in common interest, Japan created the East Asia Acid Deposition Monitoring Network (EANET) that brings scientific experts from East Asian countries including, China, Japan, South Korea and Vietnam, to study and develop environmental projects.³⁹²

The largest funder of environmental projects is the Global Environmental Facility (GEF) it was established in 1991 and is an independent financial organization, which guides and provides developing countries with economies in transition with sustainable development projects. And it is also the financial mechanism for the UNFCCC, CBD, UNCCD, and the

³⁸⁹ (Hidefumi Imura, 2005)p.141

³⁹⁰ *Ivi.* p.4

³⁹¹ *Ivi.* p.143

³⁹² *Ivi.* p.336

Stockholm Convention on Persistent Organic Pollutants. The GEF works with international bodies such as the UN Agencies and banks, and national agencies in order to execute the projects with efficiency. The projects implemented are aimed towards climate change, biodiversity, land and ozone degradation.³⁹³

The United States and Australia, after deciding not to ratify the Kyoto Protocol, began pursuing a Climate Change mitigation voluntary accord outside the UN. In 2005 an agreement was reached between seven countries, the United States, Australia, Canada, India, China, Japan and South Korea. The Asia-Pacific Partnership on Clean Development and Climate (APP) offers a forum to declare voluntary emissions reductions, energy efficiency, meliorate air conditions by enhancing development with clean technologies. The APP's work plan aims to eradicate poverty and provide energy security in the most sustainable form by introducing cooperative action to attract foreign investment that embrace sustainable development.

The Asia-Pacific Energy Technology Co-operation Centre was introduced at the first meeting of the parties in 2007, the collaboration projects fall mostly in climate change mitigation, clean development, clean energies and sustainable architecture planning. In this forum the parties share their current environmental state and the current projects towards the problems of the current state, as well their share knowledge regarding the technologies and experience on how projects can be improved. After summarizing and reviewing all aspects of the technical field, '[a]n action plan identifying specific opportunities for cooperation through possible, ambitious, and realistic goals' is developed.³⁹⁴

³⁹³ (Intergovernmental Panel on Climate Change, 2012) pp.410-411

³⁹⁴ (Philander, Encyclopedia of Global Warming and Climate Change. Second Edition, 2012)Vol.I.pp.81-82

Japan has a lineup of bodies delegated to promote and assist environmental policy overseas during international environmental negotiations. The Ministry of Foreign Affairs is appointed the formulation, direction and execution of the Official Development Assistance (ODA) and its loans provided in grand part by the Japan International Cooperation Agency and the Japan Bank for International Cooperation. The Japan International Cooperation Agency provides technical cooperation, technology transfer for socioeconomic development to the ODAs projects.³⁹⁵

By 1990 the Ministry of Foreign Affairs also integrated the 'Ambassador for Global Environmental Issues' figure. The 'Green Aid Plan' guided by the Ministry of Economy was formulated with the purpose of transferring Japanese technologies to the industries of developing countries to help them incorporating measures against industrial pollution. China was one of the first countries to benefit from this project in 1992 where the flue-gas desulfurization technology was transferred by Japan. Around the same years the then called Environmental Agency', that became the Ministry of the Environment in 2001, raised the status of the former international cooperation division to a 'Global Environmental Department' so a more independent role in the negotiations of international environmental policy could be taken thus enhancing the leadership of Japan in this subject.³⁹⁶

With the Japan China Peace and Friendship Treaty of 1978, the Sino-Japanese relations began to build up after a long period of resentment due the Sino-Japanese war.³⁹⁷ China has been benefiting as the largest for the ODAs recipient to fight pollution which stopped for 5 years after the Tian'an men incident, once resuming the sponsorship Japan began giving more priority to ASEAN and Chinas environmental projects. An amendment to the ODA Charter was made in order to list the priorities of

³⁹⁵ (Hidefumi Imura, 2005)p.147

³⁹⁶ (Hidefumi Imura, 2005)pp.138-139

³⁹⁷ *Ivi*. p.149

the recipient projects: poverty reduction, improving living conditions, sustainable growth, mitigating climate change and other environmental problems, disaster prevention, protection of forests, infectious diseases, natural disasters, peace building among other initiatives.³⁹⁸

In 1996, the first 'Japan China Comprehensive Forum on Environmental Cooperation' took place in order to discuss cooperation projects, the next month a 'Japan China Friendship Environmental Protection Center', whose building was sponsored by the Japanese government, opened to facilitate Nippo-Chinese environmental cooperation and conduct national research on environmental policy and administration.³⁹⁹ The 'Model cities program' was proposed and agreed with the 'Japan China Environmental Cooperation Toward the 21st Century agreement'. This Cities – Chongqing, Guiyang and Dalian– have stronger environmental regulations to mitigate air pollution and acid rain.⁴⁰⁰ By 2000 China had already achieved a remarkable growth and Japan issued a statement to announce that Japan was to diminish its assistance in the Economic Cooperation Program for China in 2001.⁴⁰¹

Sino-Nippo-Korean relations have been improving since the First Tripartite Environmental Ministers Meeting held in Seoul in 1999. Japan, China and Korea meet on a yearly basis to discuss the cooperation to develop environmental sound industries and the soil degradation and sand-dust problem in Northwest China and also to exchange information about the implementation of IEAs such as the Kyoto Protocol.⁴⁰²

As Hidefumi explains, “[C]ountries such as China are making an effort to nurture environmental industry, encouraging the development of their own environmental technologies.”⁴⁰³

³⁹⁸ *Ivi.* pp.144,146,149

³⁹⁹ *Ivi.*p.149

⁴⁰⁰ *Idem.*

⁴⁰¹ (Hidefumi Imura, 2005)p.150

⁴⁰² *Ivi.* pp.140,142

⁴⁰³ *Ivi.* p.141

Environmental NGOs after the Japanese rapprochement to the environmental agenda in the 90s have become active cooperation bodies overseas.⁴⁰⁴ Environmental Nongovernmental Organizations (ENGOS) play a strong lobbying role in the international environmental policy building process, helping governments to reaffirm their positions and informing the civil society to build pressure towards reaching commitments. This lobbying power is built differently in each NGO, protests and demonstrations are common forms of activism, but many NGOs focus also on the education aspect and take a diplomatic approach in order to fulfill their aspirations. ENGOS can be local based or have an international level, however international ENGOS tend to add more pressure since their globalized aspect that can be broadcasted, using a point and shame method.

ENGOS as Greenpeace with strong activism and support in all continents have programs to raise public awareness and seek to enforce environmental policy building. Other nongovernmental organizations (NGOs), such as the World Wildlife Fund of Nature (WWF) and Friends of The Earth, have interest in the research to the anthropogenic effects of the environment and biodiversity. The WWF have successfully lobbied the protection the ecosystems like the Great Barrier Reef World Heritage Area that saw the protection of 33 percent from fishing activities, which former protection area was only 4.5 percent. Friends of the Earth also include the human rights part of environmental protection advocating strongly for clean sustainable equal development to ensure that all populations enjoy human rights and a safe and sound environment.⁴⁰⁵

The cooperation between national governments, international organizations and NGOs is important to achieve the goals that better

⁴⁰⁴ *Ivi*, p.139

⁴⁰⁵ (Philander, *Encyclopedia of Global Warming and Climate Change*. Second Edition, 2012). Vol. II. pp.1023-1028

reflect the priorities of all parties. Is important to build up on these relations in order to mitigate climate change.

Conclusion

Environmental International Law has been enforced nationally and international has built upon the previous guidelines, however the compliance to the commitments remains uncertain and relies completely into the national governments. An increased depletion of the living conditions of the citizens has arised a new approach towards the international negotiations on the environmental development and environmental protection.

China has emerged as a key role in the International environmental community and the ties within the East Asian region have meliorated with the pass of time. Japan ODAs helped to promote a cleaner China in the early stages of development and technology transfer became soon crucial to limitate Chinese and regional environmental depletion.

However all the efforts summed up, are still not enough to make up for the environmental degradation in these countries, many health related problems are still an issue to be solved. High technology can help to improve the life of the citizens and it has become an important part on the climate change talk. Scientific research is one of the most financed subjets related to climate change. Enhancing policy management and compliance should be at the top of the agenda in the East Asian region.

While some countries like Japan and South Korea are widely implementing a local agenda 21, China and Vietnam keep on focusing on the mayor cities, while rural areas are becoming more and more polluted due to underdevelopment and poor agriculture techniques.

The East Asian Region has a long diplomatic history, which is completely different from the Western model of diplomatic realtions. This Asian model of relation is based on Confucianism, an ideology widely know in

this region, which enforces the role of 'paternity' in other to 'care' for the other. This is one of the reasons that the East Asian region was able to develop miraculously, the economic market was controlled by family-owned enterprises.⁴⁰⁶ This model of relations and the traditional way of thinking can help the East Asian Region to develop an environmentally friendly green economic region using a 'joining forces' '团结 tuanjie' approach to resolve the environmental pollution problems and offer relief assistance in case of environmental disasters.⁴⁰⁷

The international law has grown to be an integrated multidisciplinary regulating framework, which regulates not only our states of affairs, but also our surroundings. Environmental International law, has achieved many key points that are building up to a harder core of legal framework to stop global warming and climate change. We can be optimistic and embrace what we have achieved, looking forward to implement what it has to be done in order to control earth's temperature warming under 2° celsius from pre-industrial revolution levels. Our we can throw ourselves in the negativity and fatality of what it would represent. National governments are becoming aware that it is in their national interest to join forces to mitigate climate change. However there are many issues unsolved, the North and South gap is still big.

As the Ban Ki-Moon the former Secretary-General of the United Nations stated during the 66th addressing of the General Assembly, *'[S]aving our planet, lifting people out of poverty, advancing economic growth... these are one and the same fight. We must connect the dots between climate change, water scarcity, energy shortages, global health, food security and women's empowerment. Solutions to one problem must be solutions for all.'*⁴⁰⁸

⁴⁰⁶ (Joseph E. Stiglitz, 2001)p.272. In China and Vietnam the Guanxi model, in Japan the Zaibatsu the Keiretsu, and in Korea the Chaebols.

⁴⁰⁸ (United Nations) Ban Ki-Moon address speech to the 66th General Assembly.

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Grantham Research Institute on Climate Change and the Environment

<http://www.lse.ac.uk/GranthamInstitute/>

International Center for Climate Governance

<http://www.iccgov.org/en/>

Time	Series Name	China	Japan	Vietnam	Korea
1990	CO2 emissions (metric tons per capita)	2.151570906	8.873292835	0.313855299	5.760374252
1990	Electric power consumption (kWh per capita)	510.6198549	6805.540041	94.94264041	2373.214406
1990	Electricity production from oil, gas and coal sources (% of total)	79.59206011	65.56373968	38.1522866	43.77105655
2015	Electricity production from oil, gas and coal sources (% of total)	..	82.14488915	..	68.05683221
1990	Energy use (kg of oil equivalent per capita)	766.9953294	3551.161773	261.928551	2167.339608
2015	Energy use (kg of oil equivalent per capita)	..	3428.557216	..	5413.347857
1990	Foreign direct investment, net inflows (BoP, current US\$)	3487000000	1777361196	180000000	788500000
2016	Foreign direct investment, net inflows (BoP, current US\$)	1.70557E+11	34904736088	12600000000	10826600000
1990	Forest area (% of land area)	16.73800762	68.43115743	28.7658607	66.03773585
2015	Forest area (% of land area)	22.18966958	68.46061005	47.64408037	63.43865408
1990	Forest area (sq. km)	1571406	249500	93630	63700
2015	Forest area (sq. km)	2083213	249580	147730	61840
1990	GDP (current US\$)	3.60858E+11	3.13997E+12	6471740806	2.79349E+11
2016	GDP (current US\$)	1.11991E+13	4.94016E+12	2.05276E+11	1.41125E+12
1990	GDP growth (annual %)	3.907113896	5.5723983	5.10091814	9.811229684
2016	GDP growth (annual %)	6.689349894	1.031614569	6.210811668	2.82772231
1990	Marine protected areas (% of territorial waters)	0.4	5	0.3	3.3
2016	Marine protected areas (% of territorial waters)	3.766775077	0.493492038	0.560849723	1.630492643
1990	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	100	96.46	100	100
2015	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	100	98.42	100	100
1990	Population living in areas where elevation is below 5 meters (% of total population)	6.026227245	12.39851646	37.05687016	3.319294658
2016	Population, total	1378665000	126994511	92701100	51245707
1990	Rural land area (sq. km)	8868577	260649.5938	318130.0938	77155.28906
1990	Rural land area where elevation is below 5 meters (% of total land area)	0.907172261	0.937934773	14.60795907	2.31154926
2017	Surface area (sq. km)	9562911	377962	330967	100280
1990	Terrestrial and marine protected areas (% of total territorial area)	12.38	1.97	1.58	1.85
1990	Urban land area where elevation is below 5 meters (% of total land area)	0.258707371	2.497860979	0.797865179	0.635875186
	Data from database: World Development Indicators				
	Last Updated: 02/16/2018				