In 1992 at the Rio “Earth Summit”, the world community adopted the United Nations Framework Convention on Climate Change and achieving the Framework Convention’s objective eventually required major reductions in global emissions of greenhouse gases compared with both present-day levels and future projected levels of emissions. Virtually all the world’s countries have ratified the Framework Convention and by ratifying, the developed countries committed themselves to adopting policies and measures to limit greenhouse gas emissions and to protect and enhance carbon sinks, with the aim of reducing emissions.

In the mid-1990s, it became clear that the voluntary emissions targets agreed under the Framework Convention were not going to be met. The Conference of the Parties to the Framework Convention agreed, in a decision known as the Berlin Mandate to begin a process to enable the Conference of the Parties to take appropriate action. Meanwhile The IPCC finalized its Second Assessment Report in December 1995 concluding that “the balance of evidence suggests that there is a discernible human influence on global climate.”

Thus, with the adoption of the UNFCCC in 1992, which established the objective of avoiding dangerous human interference with the global climate system, governments’ negotiation efforts have focused on operationalizing this goal. And the first legally binding result has been the Kyoto Protocol which was agreed upon in 1997 and came into force in 2005, with its First Commitment Period in effect from 2008 to 2012.

5.1 Kyoto Protocol

The Kyoto Protocol is considered as the world’s first international agreement to tackle climate change, and an important tool that governments around the world have used since it was made law in 2005. The Kyoto Protocol was adopted at COP-3 in December 1997, which commits its Parties by setting internationally binding emission reduction targets. Recognizing that developed countries are principally responsible for the current high levels of GHG emissions in the atmosphere as a result

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of more than 150 years of industrial activity, the Protocol places a heavier burden on
developed nations under the principle of “common but differentiated responsibilities.”

The Kyoto Protocol was actually issued on December 11, 1997. The actual
effectiveness of the protocol did not occur until February 16, 2005, when a sufficient
number of nations ratified the agreement. The rules for implementing the protocol
occurred in 2001 at the COP7. These rules are known as the “Marrakesh Accords.”

The countries that had ratified the Framework Convention agreed to a first
text of a Protocol to the Framework Convention. The key commitment agreed to was
that developed countries would take on legally-binding emissions targets for an initial
“commitment period” from 2008 to 2012, subject to ratification by individual
countries and the Protocol’s entry-into-force.

Both the Kyoto Protocol and its parent Convention share the ultimate
objective of stabilizing atmospheric GHG concentrations at a level that will prevent
dangerous anthropogenic inference with the climate system and hold that this should
be achieved within an appropriate timeframe allowing for the natural adaptation of
ecosystems to climatic variability, ensuring food security and supporting sustainable
economic development. The major difference between the Protocol and the
UNFCCC is that, while the latter merely encourages industrialized countries to
stabilize greenhouse gas emissions, the Protocol legally binds them to do so. The
detailed rules for the implementation of the Protocol were adopted in Marrakesh in

An important feature of the Protocol is that it shifts the burden onto the
industrialized countries to commit themselves to specific, legally binding emission
reduction targets. It was the first agreement to impose binding restrictions on GHG
emissions. The Protocol requires that developed countries cut their carbon dioxide and
other greenhouse gas emissions by an average of 5.2% from their 1990 levels in the
five-year period between 2008 and 2012. The United States was required to cut its
greenhouse gas emissions by 7% below 1990 levels. By the year 2012, Japan was
required to cut emission 6% below 1990 levels and the 15 nations of the EU required
cutting emissions by 8%. Thus, the Kyoto approach was to saddle countries with
mandatory emission targets, which would force them to apportion these in turn among
their major polluters.\(^3\) This reduction target itself was the result of a hard-fought

\(^3\) Available at http://www.cbc.ca/news/background/realitycheck/sheppard/20060519.html
political compromise driven by the economic interests of the world’s largest polluters. Moreover, these reductions targets are based on a veto mechanism- if a country does not consent, the emission target cannot be raised.4

Under the Protocol, countries must meet their targets primarily through national measures. However, the Protocol also offers them an additional means to meet their targets by way of three market-based mechanisms: (i) International Emissions Trading (IET); (ii) Clean Development Mechanism (CDM); and (iii) Joint implementation (JI). The mechanisms help to stimulate green investment and help Parties meet their emission targets in a cost-effective way.5

The parties can meet their obligations either by reducing their emissions or increasing their removals by sinks or both. The protocol seeks to limit, however, the type of sinks that could be used to offset emissions to “direct human-induced land-use change and forestry activities.” that is afforestation, reforestation, and deforestation. Both emissions by sources and removals by sinks are to be reported "in a transparent and verifiable manner" to be reviewed by expert teams pursuant to the decisions of the Conference of the Parties. The Conference of the Parties must decide how land-use. Land-use change and forest (LULUCF) activities could be used as credits against the Assigned Amounts (AAs) of emissions prescribed in Annex I.6

5.1.1 The General Principles

The general principles of the Kyoto Protocol address GHG reductions by developed countries and the ability to develop credits for emissions reductions and the trading of allowance and offsets internationally. These provisions led to the emergence of the international “carbon market,” named after the trading of credits that are measured in carbon dioxide equivalents, thus the term carbon credits.

Goals were set for developed countries, listed in Annex I of the UNFCCC and Annex B of the Kyoto Protocol.7 These “Annex I” countries that ratified the treaty

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5 Kyoto Protocol available at https://unfccc.int/kyoto_protocol/items/2830.php
7 Annex B: Signatory parties to the UNFCCC are categorized according to their respective priorities and commitments under the protocol based on a construct of “common but differentiated responsibility”. Annex I includes Industrialized nations and countries with economies in transition to a market economy (EIT parties) that have agreed to reduce emissions committed to the adoption of national policies to limit anthropogenic emissions and to protect and enhance sinks and reservoirs of GHGs. Annex II parties consist of the industrialized countries of Annex I, but not those with economies in transition. Under the Convention developed countries are required to provide the
were supposed to meet specified targets for GHG emissions from a 1990 baseline of the estimate emissions for that country for that year. The goal was to reach these targets by 2012 but many of the nations have not reached these goals.\textsuperscript{8}

According to Article 3 of the protocol, the Parties included in Annex I shall, individually or jointly, ensure that their aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A do not exceed their assigned amounts, calculated pursuant to their quantified emission limitation and reduction commitments inscribed in Annex B and in accordance with the provisions of this Article, with a view to reducing their overall emissions of such gases by at least 5 per cent below 1990 levels in the commitment period 2008 to 2012.\textsuperscript{9}

Within the overall emissions reduction commitment among Annex B parties of at least 5 percent below 1990 levels between 2008 and 2012, no uniform target for each member state was officially established. Instead individual targets were negotiated, based upon national ability to reduce emissions and the probable impact on domestic economy.\textsuperscript{10}

necessary framework to finance emissions reducing activities in developing countries and the resources to facilitate their adaptation to global climate change. Additionally, Annex II parties are obliged to take “all practicable steps” towards the promotion of the advancement and transfer of environmentally sound technologies to EIT member states and developing nations. Non-annex parties recognized under the UNFCCC, predominantly developing nations, are not restricted by the Protocol. Many are perceived to be particularly vulnerable to the potential effects of climate change in small island states, low lying coastal regions and areas particularly disposed to desertification and drought. Others are more susceptible to the adverse economic impacts of responding to these changes, being heavily dependent on national income from the fossil industry and commerce.

Annex B of the Kyoto Protocol provides an inventory of 37 parties bound to a reduction commitment and their respective quantified emissions limitation as a percentage of their base year emissions which, in some circumstances, equates to a net increase in overall emissions. The Annex identifies EIT parties and is essentially interchangeable with Annex I of the UNFCCC with the exception that Belarus and Turkey are not included in Annex B, as they had not yet ratified the Convention at the time of Kyoto, in addition to those parties whose recognition under Annex I was accepted during the proceedings.

\textsuperscript{8} Scott D. Deatherage, “Carbon Trading Law and Practice”, Oxford University Press, 2011, pp. 42-43
\textsuperscript{9} Annex A: A “basket” of six long-lived greenhouse gases and halocarbons are recognized under the Kyoto Protocol, defined in Annex A of the Text of the Protocol along with defined sectors and source contributions including emissions from fossil fuels, industry, and land use change and forestry. Despite the fact that the quantities in which they are emitted are far smaller than that of carbon dioxide, molecule for molecule, the five non-CO\textsubscript{2} GHGs are far more potent in terms of their contribution to anthropogenic climate change, accountable for 37% of the total radiative forcing of historical emissions with an expected contribution exceeding 20% of projected warming for the 21\textsuperscript{st} century. Present atmospheric concentrations of nitrous oxide (N\textsubscript{2}O) are far greater than pre-industrial levels and recently recorded values for methane (CH\textsubscript{4}) exceed the natural maximums of the last 650,000 years. https://studentjournals.plymouth.ac.uk/index.php/pss/article/viewFile/242/271
5.1.2 Implementation through the ‘Kyoto Flexibility Mechanisms’

The Protocol imposes an obligation upon the developed countries to reduce emissions at the domestic level through energy efficiency, replacing fossil fuels with renewable energy, clean production methods, etc. Through the notion of “common but differentiated responsibility” the Kyoto Protocol demanded more of industrialized nations while providing flexible market based mechanisms by which a collective emissions reduction could be met. These included Emissions Trading, Joint Implementation (JI) and the Clean Development Mechanism (CDM). Annex B parties can supplement their domestic activities towards meeting their reduction commitments by adding “emissions credits” to their assigned amounts.

Recognizing the global nature of climate change each of these was designed to encourage the least costly of emissions reduction strategies, regardless of location, while promoting those actions which best enhance development through technological advancement and economic investment, essentially defining an atmospheric commons. Each mechanism was intended to impede the rate of increase in GHG concentrations and necessarily involved private entities acting on an international level to cap and report their emissions.

Detailed provisions for the implementation of the Protocols’ flexibility mechanisms were adopted at COP7 in 2001 (“Marrakesh Accords”). Emissions trading and the formation of carbon market are likely to form the foundation for subsequent commitment periods.  

The Protocol provides that its member States can implement its rules either individually, through national measures, or jointly, by means of the three market-based “Kyoto Flexibility Mechanisms” via which countries can limit their emissions: first, Joint Implementation, second, the Clean Development Mechanism, and third, Emissions Trading. The idea is to stimulate “green” investment and help Parties to meet their emission targets in a cost-effective way.  

5.1.2.1 Joint Implementation Mechanism (JI)

Article 6 of the protocol allows trading of a certain type of carbon credit among the countries listed in Annex I of the Protocol which is built directly on the wording of UNFCCC, Article 4(2) (b) which envisages that countries listed in Annex I...
I may act individually or jointly to meet their emission reduction objectives. Article 6 of the Kyoto Protocol allows any Annex I country to transfer to, or acquire from, another Annex I country, reductions of GHG emissions, described as Emission Reduction Units (ERUs), achieved by project activities.\(^\text{13}\)

Introduced in Article 6 of the Protocol, Joint Implementation (JI) is one of two innovative project based mechanisms feeding into the carbon market enabling cooperative emissions reducing activities to be put into practice. A project-based mechanism, whereby one developed country – with emissions caps – can work with another to reduce emissions or enhance sinks, and share the resulting emission reduction units accordingly.\(^\text{14}\)

This program is referred to as “Joint Implementation” and the credits known as Emissions Reduction Units (ERUs), may be traded among Annex I countries for projects that have achieved GHG reductions. The countries involved in a transfer must be in compliance with their obligations under the Protocol, and must be implementing an active program to reduce their emissions to meet their Kyoto obligations to reduce GHG emissions. Private parties may engage in the trading of ERUs as well.\(^\text{15}\)

JI means that Annex I countries with emission reduction or limitation commitments under the Kyoto Protocol (Annex B) can participate in emission reduction or removal projects in other Annex I countries. Moreover, they can also authorize legal entities, such as private investors, to participate in actions leading to the generation, transfer, or acquisition of ERUs.

Each ERU is equivalent to one tonne of $\text{CO}_2$, which is then counted towards meeting the country’s Kyoto targets. The main idea is that this offers industrialized States a flexible and cost-efficient means of fulfilling a part of their Kyoto commitments, while host States benefit from foreign investment and technology transfer. The main eligibility requirement for a JI project to gain approval is that it must create an “additional reduction”, that is, a reduction in emissions by sources, or an enhancement of removals by sinks, that is additional to what would otherwise have occurred.

\(^{15}\)Scott D. Deatherage, supra note 7, pp. 44-45
There exist two procedures for establishing a JI project: Track 1 and Track 2. Track 1 implies that if host States meet all of the eligibility requirements to transfer and/or acquire ERUs, they may assess emission reductions or removals by a JI project on their additionality in comparison to normal occurrences. Upon such verification, States hosting the projects can issue the appropriate quantity of ERUs. The Track 2 procedure on the other hand regulates situations in which host States merely meet a limited set of eligibility requirements.

In these cases, assessment of the additionality of emission reductions or removals is done through the verification procedure under the JI Supervisory Committee. Under this procedure, an independent entity accredited by the JI Supervisory Committee has to determine whether the relevant requirements have been fulfilled before host States can issue and transfer ERUs. Currently more than, 196 projects under JI Track 1 have met with automatic approval, while about 26 projects under Track 2 fulfilled the relevant requirements to be approved. However, ERUs started to be issued for a crediting period starting after 2008.16

These ERUs may be generated by any projects that reduce anthropogenic emissions of designated GHGs or which enhance the anthropogenic removal by sinks of such gases. The key feature of this mechanism is that all the emission reductions need to be brought about, and verified, by investments in specific projects.

Joint implementation offers Parties a flexible and cost-efficient means of fulfilling a part of their Kyoto commitments, while the host Party benefits from foreign investment and technology transfer.

Eligibility and approval

A JI project must provide a reduction in emissions by sources, or an enhancement of removals by sinks, that is additional to what would otherwise have occurred. Projects must have approval of the host Party and participants have to be authorized to participate by a Party involved in the project.17

It is also subject to a number of further requirements. First, these projects require the express approval of both the State Parties acting as transferor and transferee. The Protocol uses the term ‘Parties’, hence both States must be parties to the Protocol.

16 Freya Baetens, supra note 12, p. 7
17 ‘Joint Implementation’ from unfcc.int website available at https://unfccc.int/kyoto_protocol/mechanisms/jointImplementation/items/1674.php
Second, the reduction of GHGs that take place as a result of the project must also be ‘additional’ to any that would otherwise have occurred.

Third, no State Party can acquire ERUs if it is not itself in compliance with a number of other obligations under the Protocol.

Finally the acquisition of such ERUs is not a substitute for domestic action to reduce GHG emissions, for all such acquisitions must be ‘supplemental to domestic actions.’

Most of the parameters for JI projects are left to the host party to define in the approval and verification of activities as no comprehensive international guidelines have been established. The Protocol contains provisions for the inclusion of land use, land use change and forestry activities (LULUCF) in calculating carbon mitigation efforts. Under JI Annex B parties are permitted to implement projects which enhance the anthropogenic removal of atmospheric GHGs by sinks to generate ERUs. Quantified emissions reductions achieved through the Protocols flexibility mechanisms and their trade between parties are monitored and tracked independently through a computerized International Transaction Log (ITL). Supplementary to individual national registries the ITL is expertly reviewed under the UNFCCC to ensure compliance.

The mechanism was established on the grounds that further reductions by parties that had already introduced national measures to limit growth in their GHG emissions would be expensive relative to countries that had as yet taken no action. It is therefore arguably more lucrative to reduce missions in countries where there exist opportunities for improving efficiency or establishing the infrastructure necessary for renewable energy systems in place of outdated technologies. Eligible projects include fuel substitution to less carbon intensive alternatives, improvements in the transport sector and reductions in methane emissions.18

Thus, the JI Mechanism entitles a developed country to claim credits to offset its own emissions by investing in climate-friendly projects, such as reforestation or clean energy facilities, in other developed countries. The saved emissions will then be sold as ‘carbon credits’ to developed countries in need of these credits to meet their cutback targets allowing the polluters to purchase rights to further pollute the environment. It is imperative that restrictions be imposed upon the amount of carbon

18 Penny Lambert, supra note -10, p. 292
credits that can be sold in order to prevent exploitation of this scheme besides encouraging countries to promote domestic reductions in GHG emissions.

In order to make it clear that the full risk of any non-compliance with other provisions of the Protocol rests entirely with the acquirer of the ERUs the Protocol goes on to provide that where an issue of noncompliance is raised, transfer and acquisition transactions may continue but entirely at the risk of the acquirer. The final issue of importance is that although the Protocol talks clearly about Party-to-Party transactions it does envisage others such as the private sector (or even international organizations, such as the World Bank) participating in the financing and organizing of such projects. Article 6(3) permits any party to authorize a legal entity to participate in ‘action leading to the generation, transfer or acquisition’ of ERUs, provided however that that authorization is under the responsibility of the authorizing State Party.19

5.1.2.2 Clean Development Mechanism (CDM)

The Clean Development Mechanism (CDM) was created within the Kyoto Protocol, together with emissions trading and joint implementation and is intended to lower the cost to industrialized countries of complying with commitments to reduce emissions of greenhouse gases. The CDM was also established as a means of involving developing countries in the effort to combat climate change and to ensure that these efforts contribute to global sustainable development.

The Clean Development Mechanism allows the richer Annex I countries to meet their climate targets at a lower cost than would be possible at home by buying reductions from developing countries by:

i. sequestering emissions from the atmosphere, e.g. by planting trees,

ii. reducing current emissions, e.g. through an energy efficiency scheme,

iii. displacing new emissions, e.g. by reducing the need for new fossil fuel use by building a power plant that uses renewable energy.

In return, the industrialized countries receive Certified Emission Reductions (CERs) certificates, which are really permits that enable the countries to emit an amount equivalent to the CDM reduction they helped finance and offset their emission targets. The advantage of this mechanism is that it reduces the pressure on industrialized countries to take action in order to reduce their own emissions.

19 David Freestone, supra note 13, pp. 9-10
Annex I countries, or their investors, can participate in projects in non-Annex I countries to create saleable CERs. Like an ERU, each CER is equivalent to one tonne of CO$_2$ and counted toward the country’s Kyoto targets. They can be earned either through emission reduction projects, for example, rural electrification projects using solar panels or the installation of more energy-efficient boilers, or through projects that enhance the sequestration of greenhouse gases through the creation of sinks, for example, afforestation or reforestation projects. The operating details of CDM projects function differently from those of JI projects although additional reduction remains the main requirement. If CDM projects succeed in a detailed public registration and issuance process supervised by the Designated Operational Entity, they will be approved by Designated National Authorities. The mechanism is overseen by the CDM Executive Board, which is ultimately answerable to the countries that have ratified the Kyoto Protocol. However, public funding for CDM activities cannot result in the diversion of official development assistance. The CDM system has been in operation since 2006 and thousands of CDM projects had been registered with the CDM Executive Board.

However, most projects are still in the construction phase and have yet to start producing CERs. These projects are anticipated to produce CERs amounting to more than 2.7 billion tonnes of CO$_2$ equivalent in the first commitment period of the Kyoto Protocol, 2008–2012.\(^\text{20}\)

In particular, emissions reductions achieved via the CDM must provide real, measurable, long-term benefits in terms of mitigating climate change and be additional to those that would have occurred if a given project had not been undertaken.\(^\text{21}\)

A project-based mechanism where certified projects proposed by developed countries or companies from those countries can be used to reduce emissions in developing countries. The developed country or company earns certified emission reduction units, which may be used against the country’s own reduction commitment. CDM is primarily focused on development aid and secondly on emission reduction.\(^\text{22}\)

Essentially the CDM is joint implementation between an industrialized nation with an emissions reduction commitment and a developing country without one.

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\(^{20}\) Freya Baetens, supra note -12, pp. 7-8


\(^{22}\) Supra note -14
Under Article 12 the purpose of the CDM is to promote sustainable development through investment in clean technologies and activities while providing Annex B parties with cost effective opportunities to achieve their emissions targets with CERs. Unlike Article 6 for JI projects, advocating both the improved reduction of emissions and enhanced removal by sinks of atmospheric GHGs, Article 12 only states that CDM activities must deliver additional reductions.\textsuperscript{23}

With permission of the party countries, private entities may transfer CERs as well. The CDM provides a mechanism for projects to be implemented in developing countries and the reductions in GHG emissions to be incorporated into a kind of currency of carbon credits and CERs and then monetized through the transfer process of the Kyoto protocol from developing country to developed country, where they can be used as a percentage of the offsets needed to meet compliance obligations in that country. Therefore trading of CERs has grown dramatically since its inception under the Kyoto.

Sustainable development is an important requirement of the CDM set up under the Kyoto Protocol. It helps to maintain environmental integrity and should be assessed rigorously prior to any investment in a CDM project. The benefits include certainty in CDM application, reduction of risk to investors, developers and owners, and the provision of cost-free assistance to developing countries, which could reduce the enormous divide between the North and the South. The Kyoto Protocol leaves the assessment of sustainable development as a sovereign matter to its State parties, which unfortunately has led to a “race to the bottom” among developing countries keen for investment at any cost.\textsuperscript{24}

In a number of other respects CDM projects resemble Article 6 projects. Participation in CDM projects must be voluntary; projects must manifest real measurable and long-term benefits relating to mitigation of climate change; and a project activity generating CERs must be ‘additional’ to that which would have occurred in its absence. Participation in the CDM is also open to the involvement of private and/or public entities, subject to the guidance of the Executive Board. More significant however is the absence from Article 12 of the express distinction (made in Article 6) between emission reduction activities and those designed to enhance

\textsuperscript{23} Penny Lambert, \textit{supra} note -10, p. 292

\textsuperscript{24} Barry Kantor, ‘Sustainable Development within the Climate context; South North and the Clean Development Mechanism’, \textit{UN Chronicle}, Vol. XLIV, No. 2, June 2007, p. 68
anthropogenic removal by sinks of GHGs. The COP/MOP has overarching responsibility to provide ‘authority and guidance’ and is responsible for elaborating ‘modalities and procedures’ for the operation of the CDM. At COP 7 it was decided that ‘afforestation and reforestation’ projects were CDM eligible and the modalities for such projects were finalized at in Milan in December 2003, although the COP has yet to reach final decisions on whether other sink projects will be CDM eligible in the longer term.\(^{25}\)

The protocol also specifies that a share of all proceeds from CDM projects should be allocated to offering financial assistance to developing countries particularly vulnerable to the adverse effects of climate change. The Adaptation Fund is reliant on a two percent levy on all certified emissions reductions derived from the CDM. In order for a party to be in compliance with the Protocol in meeting its reduction commitments its total emissions must not exceed its assigned amount during 2008-2012. The instruments of JI, emissions trading and the CDM can both add to and subtract from this allocation.\(^{26}\)

The most important aspect of CDM is the fact it is to be used by Annex I countries to finance emission reductions in countries which have not made commitments under the Protocol to meet GHG emission reduction targets, i.e., developing countries which are not listed in Annex I.\(^{27}\)

Article 12(2) sets out clearly the objective which is ‘to assist Parties not included in Annex I to achieve sustainable development and in contributing to the ultimate objective of the Convention, and to assist Parties included in Annex I in achieving compliance with their commitments under Article 3.’

Further, while such projects were meant to be partnerships between the developed countries and the governments of the developing countries, the mechanism has only assisted the richer countries in benefiting at the expense of the world’s climate. The developing countries are perhaps unaware of the fact that under this mechanism, they will end up exhausting all the foreign funds and cheap options for reducing emissions in the present. Therefore, if they accept mitigation targets in the future, there will be no economic incentive or interest for the industrialized countries to invest in these countries. They will also be left with no credits to clean up their own

\(^{25}\) David Freestone, supra note 13, pp. 10-11
\(^{26}\) Penny Lambert, supra note -10, p. 292
\(^{27}\) David Freestone, supra note 13, p. 10
emissions in earlier CDM projects. Therefore, they should be permitted to create CERs even without foreign investors and sell them in markets provided there are strict international rules for project baseline determination (which is presently absent in the Protocol) and independent verification.

Criticism of the CDM process

Unlike Joint Implementation and emissions trading where carbon credits are offset by a comparable deficit, CERs generated through CDM projects are additional to the assigned amount of the acquiring party, increasing the aggregate assigned amount for Annex B. Effectively the CDM allows for industrialized nations to continue emitting at their original level provided they offer financial support for reductions elsewhere. This “pay to pollute” mentality externalizes the costs of climate mitigation, outsourcing responsibility by affording no incentive to decide on the best practices in terms of efficiency and sustainability.

Furthermore, Article 12 allows Annex B parties to log CERs generated from projects implemented prior to the first commitment period in achieving their reductions commitments for that time. This pre-commitment banking increases legitimate emissions even more allowing industrialized nations to take less domestic action. The CDM been criticized by some NGOs for purportedly being too lax and letting projects slip through the review process without much oversight and that do not produce real GHG emission reductions. In reality, those involved in the process, including project developers, investors, and buyers of carbon credits seeking approval through the CDM, often see the process as being bureaucratic, slow, and overly concerned with matters that make little difference in the verification of real GHG reductions.

Criticism of the CDM process has been growing as it has become increasingly inefficient and bureaucratic. The International Emissions Trading Association (IETA) has issued a report with fairly strong criticisms of the CDM process and how the Executive Board and its staff manage the process. At present industrialized nations are responsible for a proportion of historical per capita emissions far greater than developing regions. It can be argued that the CDM impinges on a nation’s right to develop raising the notion of what has been termed “CO2lonialism”.

28 Scott D. Deatherage, supra note 7, p. 49
29 Penny Lambert, supra note 10, p. 293
5.1.2.3 Emissions Trading (ET)

The third Flexibility Mechanism is Emissions Trading (ET), which implies that Annex I countries, or their investors, that want to emit more than they have been allocated in Annex B to the Protocol, may still fulfill their commitments by buying extra emission rights from countries or investors that have excess capacity because they have emitted less than their allowance, the so-called assigned amount units (AAUs).30

Since carbon dioxide is the principal greenhouse gas, it is now tracked and traded like any other commodity in the carbon market although, of course, this is a sale of intangible commodities and emissions never actually change hands.

Not only actual emission units are traded under the Emissions Trading scheme, but also removal units (RMUs) based on land use, land use change and forestry activities such as reforestation, ERU generated by JI projects, and CERs generated from CDM projects. These unit transfers are tracked and recorded by the Kyoto Protocol’s registry system and international transaction log. To avoid overselling of units and subsequently being unable to meet their own emissions targets, member States are required to reserve a minimum level of emission units in their national registry, the so-called “commitment period reserve”.

The Protocol provides one other type of carbon credit and trading mechanism. The trading of credits is limited to Annex B countries, which are those that are part of the Annex I to the UNFCCC, and these credits are the Quantified Emissions Reductions and Limitations Commitment which the countries in Annex B have committed to and are set out in Annex B. Article 17 of the Protocol provides for the Conference of the Parties to define “the relevant principles, modalities, rules and guidelines, in particular for verification, reporting and accountability for emissions trading.” The parties included in Annex B of the Protocol can then participate in the trading of emissions credits as one means of meeting their obligations under the Protocol. The trading of credits must be supplemental to the domestic programs in these countries to reduce their emissions, which must be the main process of reducing emissions.

In addition to CERs and ERUs, countries that are parties to the Protocol and Annex B, may actually sell the assigned amount of GHGs to their country. These

30 Freya Baetens, supra note 12, p. 8
units are known as Assigned Amount Units (AAUs). These, one country’s GHG limits would decrease and one could increase. Generally, this has only been accomplished where the AAUs are “greened” by devoting the sales proceeds of the selling country to GHG reduction activities. Another little known unit is the removal unit (RMU) that on the bases of land use, land-use change, and forestry (LULUCF) activities such as removals by sink. These sinks may the land-use change and forestry activities, limited to afforestation, reforestation, and deforestation.31

Emissions trading permits pollution reductions by allowing a country can purchase another country’s ‘unused’ emissions. This is particularly useful for the industrialized countries that are unable or unwilling to commit to carbon reductions at home in the short term. Emissions banking are another mechanism, which allows a country that emits less than its target to carry forward the surplus to the subsequent period. There was also a proposal for the introduction of emissions borrowing, which would allow a country that exceeds its target to borrow on future emissions rights. As the commitment to reduce environmental damage would be deferred by such borrowing, this proposal was not accepted.

As with the CDM, the JI’s uniqueness lies in its novel project approach. When it comes to accessing low-cost emission reduction opportunities in the poorer-developed countries within Annex I (generally called Economies-in-Transition), the goal of the UNFCCC was to create a system by which this could be exploited with the help of funds from richer developed countries.

In exchange for these funds, offset credits i.e., ERUs are generated. One ERU technically allows the holder to offset one metric tonne of CO₂ (equivalent) of their own emissions.

JI projects can be undertaken in Annex I/EIT countries as long as they meet certain eligibility requirements: that the host country is a Party to the Kyoto Protocol with committed assigned amounts; that it has in place a national system for the estimation of anthropogenic emissions by sources and sinks and that it has a national emissions registry that all emitting bodies are signatories of. If these cannot be guaranteed, then a JI project is still possible, but only under the Track 2 scheme.32

31 Scott D. Deatherage, supra note 7, pp. 45-46
Thus, Under Article 17 of the Protocol, parties included in Annex B are permitted to partake in the trade of emissions credits supplemental to domestic reduction efforts to fulfill their emissions commitments. Surplus units of a country’s assigned amount, equivalent to one tonne of CO\textsubscript{2} permitted but not utilized, can be sold to parties exceeding their reduction targets, in so doing creating a carbon market. In addition to units from actual emissions reductions, those generated from land use change and forestry activities, joint implementation projects and the clean development mechanism can be transferred from one party to another. As an effort to ensure a country’s emissions credits are not oversold, rendering itself unable to meet its own reduction targets, a commitment period reserve of carbon assets is required of all parties to be maintained in its national registry to a value of no less than 90 percent of its assigned amount.

Trade in carbon as an instrument of policy towards the achievement of individual targets redistributes emissions between parties while maintaining an approved total allowance and can occur at both regional and national levels. While introducing the notion of additionality, Article 17 is brief and neglects to define the proportion of a commitment permitted to be achieved through emissions trading. Countries radically opposed to domestic cuts, most notably the US, are resistant to negotiations of a quantitative cap on supplemental emissions trading.\textsuperscript{33}

5.1.2.3.1 Carbon credits

The Kyoto Mechanisms had put a market value on GHG emission reductions even before the Kyoto Protocol entered into force although it is only a modest first step in tackling the problem. The idea of carbon trading really took off in the Kyoto protocol, Emission trading schemes had an important impact in making companies internalize and integrate a price for GHG emissions into their operations. Trading in carbon credits, allowances and emission rights now forms part of the GHG emissions management of most major industrial GHG emitters and very few corporate players today have not yet engaged in this fast growing market, which has been expanding exponentially for more than five years. The trading of carbon credit has lost much of its exotic flavor and is considered a serious factor in the closely related oil, gas and electricity markets.\textsuperscript{34}

\textsuperscript{33} Penny Lambert, supra note -10, pp. 290-291
\textsuperscript{34} David Freestone, supra note 13, p. 10
Several type of carbon credits established under the Protocol have been introduced above, CERs, ERUs, and AAUs. In 2003, the 9th COP created to additional type of units, Temporary CERs (tCERs) and Long-Term CERs (ICERs). Both of these units are associated with land use and forestry projects under the CDM.\textsuperscript{35}

The treaty set up a system wherein member states could trade credits to none another to meet treaty established quotas for the reduction of greenhouse emissions. One credit is considered equivalent to one ton of carbon dioxide emissions.\textsuperscript{36}

Carbon Credit\textsuperscript{37} method of green house emission reduction is a process whereby a central authority (usually a government agency) sets a limit or cap on the amount of a pollutant that can be emitted. Companies or other groups that emit the pollutants are given credits or allowances, which represent the rightly to emit a specific amount. The total amount of credits cannot exceed the cap. Limiting total emissions to that level, companies that pollute beyond their allowances must buy credits from those who pollute less than their allowances or face heavy penalties. This transfer is referred to as a trade. In effect, the buyer is being fined for polluting, while the seller is being rewarded for having reduced emissions. Thus, companies that can easily reduce emissions will do so and those for which it is harder will buy credits, which reduce greenhouse gasses at the lowest possible cost to the society.\textsuperscript{38}

Carbon credits are a key component of national and international emissions trading schemes. They provide a way to reduce greenhouse gas emissions on an industrial scale by capping total annual emissions and letting the market assign a monetary value to any shortfall. Credits can be exchanged between businesses or bought and sold in international markets at the prevailing market price.

In 2005, the Sustainable Development Commission (SDC) recommended that Government should fund research into the concept of personal carbon trading

\textsuperscript{35} Scott D. Deatherage, supra note 7, p. 46
\textsuperscript{36} ‘Carbon Credits: Trading for Greener Future’, Competition In Focus, December 2007, p. 40
\textsuperscript{37} A carbon credit is a generic term for any tradable certificate or permit representing the right to emit one tonne of carbon dioxide or the mass of another greenhouse gas with a carbon dioxide equivalent (tCO2e) equivalent to one tonne of carbon dioxide. Carbon credits and carbon markets are a component of national and international attempts to mitigate the growth in concentrations of greenhouse gases (GHGs). One carbon credit is equal to one metric tonne of carbon dioxide, or in some markets, carbon dioxide equivalent gases. There are also many companies that sell carbon credits to commercial and individual customers who are interested in lowering their carbon footprint on a voluntary basis. These carbon offsetters purchase the credits from an investment fund or a carbon development company that has aggregated the credits from individual projects. Buyers and sellers can also use an exchange platform to trade, such as the Carbon Trade Exchange, which is like a stock exchange for carbon credits.

\textsuperscript{38} Available at http://en.wikipedia.org/wiki/Carbon_project
(sometimes referred to as ‘personal carbon allowances’), as a radical but exciting proposition that could be a major part of an economy wide ‘cap and trade scheme’ for carbon emissions. This would enable us to achieve guaranteed, annual cuts in our national carbon budget, and could become a key element of complying with legally-binding cuts in emissions.

One of the decisions that is worth mentioning here is that the Marrakesh Accords provided that land use changes under the CDM would be limited to afforestation and reforestation, and that avoided deforestation would not be permitted to qualify as a CDM offset project. In later COP/MOP meetings, allowing Reducing Emissions from Deforestation and Forest Degradation (REDD) to produce carbon credits through offsets has become an important part of these discussions of a post-Kyoto treaty. 39

Thus, by 2012, developed countries were expected to reduce their collective emissions by 5.2% from 1990 levels, each country being committed to a particular figure. The emissions covered by the Protocol are not only carbon dioxide, but also methane, nitrous oxide, hydro fluorocarbons, per fluorocarbons and sulfur hexafluoride. These commitments would be reckoned on a net basis, considering sinks as well as sources, and each country must credibly measure its contribution and meet its commitment.

Countries could fulfill their commitments jointly (such as with regional agreements) and they may improve the efficiency of compliance through “flexibility mechanisms”. 40

Under the Protocol, countries’ actual emissions have to be monitored and precise records have to be kept of the trades carried out. The Registry system track and record transactions by Parties under the mechanisms. The UN Climate Change Secretariat, based in Bonn, Germany, keeps an international transaction log to verify that transactions are consistent with the rules of the Protocol and Reporting is done by Parties by submitting annual emission inventories and national reports under the Protocol at regular intervals. A compliance system ensures that Parties are meeting their commitments and helps them to meet their commitments if they have problems doing so.

39 Scott D. Deatherage, supra note 7, p. 47
40 Supra note 14
5.1.3 Compliance Mechanisms under the Kyoto Protocol

The compliance regime of the Kyoto Protocol stands as unique in the world of international environmental law and at the forefront of multilateral environmental agreements. The compliance mechanism proposed under the Kyoto Protocol at the negotiation at Bonn envisages the establishment of two branches - the enforcement branch and the facilitative branch. The branches will comprise of one member each from the five UN regional groups, one from small island developing states, and two each from industrialized and developing countries and will take decisions by consensus, failing which a majority of three-quarters will be required. The Enforcement branch will prescribe ‘restorative’ consequences for countries that default on their obligations.

An industrialized country, which emits more than the amount allowed by the Protocol in the first commitment period, can borrow from its assigned amount for the second commitment period at a rate of 1:3. The defaulting country will also develop an action plan, which will be assessed and reviewed by the enforcement branch to correct its default, giving priority to domestic policies and measures. Moreover, the country will not be allowed to participate in emissions trading.

The Facilitative branch will be responsible for assisting countries in complying with the following obligations:

i. meeting their emission reduction commitments,

ii. establishing a national system to estimate GHG emissions and their absorption by sinks,

iii. providing information to ensure compliance with emissions reduction objectives.

This branch will also promote compliance by warning countries of their potential default at the earliest.41

In 2001, governments met in Marrakech, Morocco, at the seventh Conference of the Parties to the UNFCCC to complete negotiations on the operational details for commitments on reducing greenhouse gas emissions, set out in the UNFCCC’s Kyoto Protocol. Marrakesh Accords translate the Bonn Agreements into a legal text of some complexity, suggesting ‘more possibilities for hidden meanings, ambiguities and “agreements to disagree” than the Kyoto Protocol’.

41 Supra note 36, p. 75
The Accords provide the necessary closure to negotiations on key issues, which now permits countries to initiate the process of ratification of the Kyoto Protocol. The result at COP-7 represents the finale in what has been a politically, scientifically and legally challenging decade for climate change research and policy.

The Marrakesh Accords established a Compliance Committee that will function through a facilitative branch and an enforcement branch. The facilitative branch will assist all Parties in their implementation of the Protocol, through the facilitation of financial and technical assistance. The Marrakesh Accords set out decisions on reporting whereby Parties are required to report annually on sinks activities, including how these activities are directly human-induced, but failure to meet the quality thresholds will not endanger eligibility to participate in the mechanisms. Sinks estimates should include information on how inventory methodologies have been applied, as well as information to allow units and areas of land to be identifiable. The Marrakech Accords are not just about the implementation of the Kyoto Protocol, but also the fulfilment of Convention commitments, some of which have been relatively unexplored up until COP-7, e.g., adaptation.

A major component of the Marrakesh Accords relates to the rules for implementation of the Kyoto Protocol's 'flexibility mechanisms', the establishment of a compliance mechanism (potentially one of the most important aspects of the Marrakesh Accords) and the elaboration of permissible land-use, land-use change and forestry activities. Building on the Bonn Agreements, the Accords also consolidate matters under the Convention relating to funding arrangements and capacity-building provisions for developing countries, and provide guidelines for the preparation of National Adaptation Programmes for Action (NAPAs). The Accords also provide guidelines on national systems for the estimation of anthropogenic sources of greenhouse gas emissions, the preparation of information required for fulfillment of the reporting obligations under the Protocol, and performance of reviews by expert review teams under Article 8. In essence, the Marrakech Accords have established an effective and functional climate management regime.

The Kyoto protocol has dramatically changed the landscape of terrestrial...
carbon science. One of the most technically demanding issues in the Kyoto protocol, it has given rise to a multitude of questions in both the policy and scientific domain. Under the Kyoto protocol, the capacity of the terrestrial sink to absorb carbon, and the use of this capacity to offset fossil fuel emission, has become a major focus of the attention of the research community. To a large extent it is the projected cost of CO$_2$ emission reduction by sinks that makes it the subject of so much attention by policy makers. Crucial questions faced by the negotiators in the Hague during COP6 deal with the amount of flexibility countries are allowed to achieve the emission reductions they agreed in Kyoto. However, a true reduction in the fossil fuel emissions is the key to a sustainable future. The terrestrial biosphere may help to alleviate some of the problems in the short terms, but in the long terms, major changes in the energy policies and changes in lifestyle will be needed.\footnote{Han (A. J.) Dolman, "Terrestrial sinks in the Kyoto Protocol; Tool large to be ignored, too small to be sufficient?" Change 54, Oct-Nov 2000, p. 11.}

The human enhancement of global warming leading to climate change is seen as a worldwide problem. Policy responses have been led by international negotiation, but are qualified or indecisive at the national level, and so far largely ineffective. The principal focus has been on reducing carbon dioxide and other GHG emissions.\footnote{Supra note - 143}

The Kyoto Protocol to the United Nations Framework Convention on Climate Change will strengthen the international response to climate change it contains legally binding emissions targets for Annex I (industrialized) countries. By arresting and reversing the upward trend in greenhouse gas emissions that started in these countries 150 years ago, the Protocol promises to move the international community one step closer to achieving the Convention’s ultimate objective of preventing “dangerous anthropogenic interference with the climate system”.\footnote{http://unfccc.int/essential_background/background_publications_htmlpdf/climate_change_information_kit/items/305.php accessed on 22nd Feb. 2014}

5.1.4 Kyoto’s failure

The Kyoto was a “make-or-break” moment in the development of the international climate regime. Had the parties to the convention not been able to reach an agreement in Kyoto it is likely that the global effort to limit GHG emissions would have fallen apart. While there has been some success in climate change mitigation, global emissions of greenhouse gases continue to rise. International action under the UNFCCC must be guided by the best available science. Increasingly frequent and
progressively more severe impacts of climate change make the need for urgent action abundantly clear.

The Kyoto Protocol, which is currently the only binding agreement under which developed countries have committed to cut their greenhouse gas emissions, has been extended for a period of eight years from 1 January 2013. Whilst the continuation does maintain some degree of forward momentum, it will not result in a major reduction in emissions, as many developed countries have not signed up to the second commitment period. Countries that have signed up include the EU, Norway and Australia; whilst those who have not include the US, Japan, Canada and Russia.

As the Protocol only covers around 15 percent of emissions, forging an agreement that encompasses a much greater proportion of emissions will be a key focus of future negotiations. A critical challenge will be the distinction between developed and developing countries, as the world has changed enormously since the UNFCCC was negotiated in 1992, yet the classification of countries has remained the same.

The Kyoto Protocol includes firm commitments to curb emissions only from developed countries, but does not include the United States, and has no meaningful consequences for noncompliance. Additionally, the regime, which allows for numerous exemptions regarding greenhouse gas emissions, fails to provide emerging big emitters like China and India with meaningful targets and incentives to curb their emissions. The United States and Australia originally opted out of Kyoto because of the exemptions granted to China, India and developing countries. They also claimed, along with some economists, that it would cost jobs and damage their countries’ economies. However, Australia later signed Kyoto after a change of leadership in 2007, and the US has recently begun working towards its own climate bill.

The Kyoto’s Protocol asked developed nations to reduce their total emissions between 2008-2012 by 15 percent of 1990 levels. But the sad fact is that none of them achieved it. In fact, 2006 was the year with highest emission so far. Between 1990-2005, rich countries emissions went up by 11% while the overall emissions from that growth-related energy sector increased by 15 per cent. And now, the IPCC says that unless the Global GHG emissions started growing down by 2015 and are reduced by
at least 50 percent by 2050, global temperature rise cannot be kept within two degrees Celsius. This is the tipping point after which major disasters are forecast.\(^{47}\)

Developed countries have reiterated their commitment to scale up climate finance, mobilizing US$100bn per year by 2020, but practical commitments were scarce and few nations made any pledges that cover the period between 2013–2020. A number of European countries, including the UK, Germany, France and Denmark announced concrete finance pledges for the period up to 2015, totaling approximately US $ 6 billion. The lack of further finance commitments was seen as a major disappointment from developing countries.

Much of the negotiation focused on the inclusion of ‘loss and damage’ proposals within the outcome document. This term refers to the dispersion of funds to vulnerable communities for the loss and damage caused by climate change. A particular opponent of this term was the US, who did not want any language connoting legal liability to be included in the text, as this could result in unlimited amounts of litigation. Whilst no international mechanism on loss and damage was set up in Doha, the possibility of setting one up in the future has been included in the agreement, a point that will undoubtedly is a major focus of COP19 in Poland.

At present the Kyoto Protocol lacks a substantive non-compliance mechanism with binding consequences for failing to meet individual commitments. The notion that as an international agreement the Kyoto Protocol is legally binding is largely misleading in that if a party exceeds its assigned amount the penalties associated with non-compliance are no more regulated than the initial emissions reduction commitment. Furthermore, the individual party is responsible for setting the limitations for subsequent commitment periods and can use this to compensate for any penalty accrued from the previous providing only a weak incentive to comply with the obligations of the Protocol.\(^{48}\)

After the failure of the Kyoto Protocol, the world gathered at the Indonesia province to work out another arrangement that will work from 2013. An attempt was made at the Bali to have a new global order diluting the multilateral principles of Kyoto’s protocol. Pressure was brought on India and China for making emission

\(^{47}\)Jayalaxmi K, “Time to think different and be tough with polluters” Deccan Herald dated Dec 23, 2007, p.7

\(^{48}\)Supra note - 156
reduction commitments. The 2009 deadline for reaching a post-Kyoto agreement, established at COP 13 in Bali in 2007 was missed, and since the end of 2012, the voluntary emissions reductions commitments from the Copenhagen Accord have become the de facto global climate regime.

The first phase of Kyoto which was to expire in 2012 has to be carried on till the next agreement would be drafted. It has had its successes and difficulties, and many countries’ emissions have actually increased since ratifying the Kyoto Protocol. Many other countries (such as most European countries, the UK and Scotland) have however succeeded in reducing their emissions. Most people agree that the Kyoto Protocol has been an important step towards recognizing and tackling the problem of climate change. It put climate change on the worldwide agenda for governments.

Most people also agree that not enough has been done to avoid dangerous climate change and that the original Kyoto targets were not strict enough. Since the first Kyoto, climate science has become more alarming and predictions of warming have become more severe. It is now widely held that temperatures are rising and, to prevent the climate from becoming dangerously unstable, emissions will need to be reduced by at least 80% around the world as quickly as possible.

Many people criticized Kyoto because its mechanisms created a carbon marketplace, where carbon credits could be traded. This allowed richer nations to avoid cutting their emissions and, in some cases, disguise an increase. Other major criticisms included that the original targets of 5.2% would make little impact on the main cause of climate change human induced emissions. Some also argue the protocol does not go far enough to curb greenhouse emissions and avoid dangerous climate change.

The current bias towards short-term targets does not provide an impetus to make the investments in long-term infrastructure changes, such as energy, transport and buildings, which are needed to bring sustainable reductions in greenhouse gas emissions.

The Kyoto Protocol has been widely criticized for its unambitious emission reduction targets, insufficient incentives to encourage developing nations to move to a

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50 Supra note - 148
52 Supra note - 143
low carbon economy, overly complicated policy tools, lack of measures to support adaptation to climate change, and ineffectual enforcement mechanisms

In a nutshell, we continue to cause this problem faster than we act to avoid it. If this continues we will all pay a heavy price in terms of the socio-economic ‘damages’ of climate change. The main problem of the present approach is that parties (countries) are still negotiating what they perceive are their own interests or their own group interests. We all know that we must come together into a unified reckoning, but there seems to be an inability to come to order within the limits that now constrain us all. Yet the Kyoto Protocol is seen as an important first step towards a truly global emission reduction regime that will stabilize GHG emissions, and can provide the architecture for the future international agreement on climate change.

5.2 Adaption and mitigation

Due to time-lags in the materialization of some climate change impacts, the IPCC warns that atmospheric warming and sea level rise could continue for centuries even if GHG concentrations were stabilized today. It advises that more extensive adaption measures than those that are currently being practiced would be necessary in order to reduce vulnerability to climate change, regardless of the mitigation methods adopted. Therefore, for the present generation and the next, adaptation strategies will be at least as crucial as mitigation strategies.

What is important is to bring the countries of the world into an emissions-control regime by getting them to agree to take the first steps, and then to revisit this agreement as the science develops and the consequences of a warming are felt. Moreover, mandatory limits, even if they are relatively weak at present, send signals to the markets that the era of fossil fuels is over. New investment will move away from fossil fuels toward renewables, bringing about technical innovation and lower prices. However, the more likely outcome is that the attempt to control GHG emissions will fall apart.

Traditionally it is said that there are three options in responding to climate change: prevention, mitigation, and adaptation. But if the science is at all credible, then for some time prevention has not been an option. There is a lot to be said for adaptation. Most countries are not currently well adapted to the variability that is part

53 Supra note - 144
54 Supra note - 151
55 Ibid, pp. 55-56
56 Clark A Miller and Paul N Edwards, supra note 13, pp. 304-305
of a stable climate regime. But a policy of adaptation without mitigation runs serious practical and moral risks. The practical risk is that a GHG forcing may drive the climate system into some unanticipated, radically different state, to which it is difficult to adapt. The moral risk is that a policy of adaptation will be one that hits the developing countries hardest. For a global policy of adaptation is an expression of the “the polluted pay” principle rather than the “polluter pays” principle. This is because adaptation policies are typically national or sub national and require resources and knowledge. Since the developed countries have resources and knowledge, they will succeed in adapting to climate change. Since the developing countries do not have (the right sort of) resources and knowledge, they will suffer the worst effects of climate change.

Parties to the UNFCCC have agreed that future global warming should be limited to below 2.0 °C, relative to the pre-industrial level for which robust adaptation measures be adopted along with mitigatory measures. Mentioned only in five places in the UNFCCC text, and fewer in the Protocol text, adaptation has now gained recognition as a necessary element in the package of actions to minimize impacts of climate change.

Adaptation to global warming is a response to climate change that seeks to reduce the vulnerability of social and biological systems to climate change effects. Even if emissions are stabilized relatively soon, climate change and its effects will last many years, and adaptation will be necessary. Climate change adaptation is especially important in developing countries since those countries are predicted to bear the brunt of the effects of climate change. Adaptive capacity is closely linked to social and economic development.

The economic costs of adaptation to climate change are likely to cost billions of dollars annually for which the Donor countries have promised an annual $100 billion by 2020 through the Green Climate Fund for developing countries to adapt to climate change.

Adaptation

The Kyoto Protocol, like the Convention, is also designed to assist countries in adapting to the adverse effects of climate change. It facilitates the development and deployment of technologies that can help increase resilience to the impacts of climate change.
The Adaptation Fund was established to finance adaptation projects and programmes in developing countries that are Parties to the Kyoto Protocol. In the first commitment period, the Fund was financed mainly with a share of proceeds from CDM project activities. In Doha, in 2012, it was decided that for the second commitment period, international emissions trading and joint implementation would also provide the Adaptation Fund with a 2 percent share of proceeds.\[57\]

Another policy response to climate change, known as climate change mitigation is to reduce greenhouse gas emissions and/or enhance the removal of these gases from the atmosphere (through carbon sinks). Even the most effective reductions in emissions, however, would not prevent further climate change impacts, making the need for adaptation and that in the absence of mitigation efforts, the effects of climate change would reach such a magnitude as to make adaptation impossible for some natural ecosystems. For human systems, the economic and social costs of unmitigated climate change would be very high.\[58\]

Climate change mitigation are actions to limit the magnitude and/or rate of long-term climate change. Climate change mitigation generally involves reductions in human (anthropogenic) emissions of greenhouse gases (GHGs). Mitigation may also be achieved by increasing the capacity of carbon sinks, e.g., through reforestation.

Examples of mitigation include switching to low-carbon energy sources, such as renewable and nuclear energy, and expanding forests and other "sinks" to remove greater amounts of carbon dioxide from the atmosphere. Energy efficiency may also play a role, for example, through improving the insulation of buildings. Another approach to climate change mitigation is climate engineering.\[59\]

Today, there is a far stronger international consensus that adaptation and mitigation are not mutually exclusive options, but rather different responses to climate change that are necessary because mitigation alone will not reduce the need for societies to adapt to climatic changes which are already underway. This policy consensus is likely only to grow stronger, given the momentum that adaptation has gained in policy formulation, research and the international climate change negotiations for a successor instrument to the Kyoto Protocol.\[60\]

\[57\] Supra note 5
\[60\] Benjamin J Richardson (et, al), supra note 15 , p. 132
5.3 Post Kyoto

Following the adoption of the Kyoto Protocol, negotiations continued on the subsidiary rules, guidelines and methodologies called for by the protocol text.

5.3.1 Bali Climate Change Conference

The UNFCCC Bali Climate Change Conference (COP13) has attracted a great deal of attention because of the release of the Fourth Assessment Reports by the Intergovernmental Panel on Climate Change (IPCC) and also because of the fact that the year 2007 was the year immediately preceding the beginning of the first commitment period under the Kyoto Protocol, i.e., 2008-2012.\(^\text{61}\)

The Kyoto period was set for 2008 to 2012, and at the end of this period the Protocol was set to expire. Two major meetings of the countries of the United Nations were set to attempt to negotiate a post-Kyoto treaty, or to extend the Kyoto Protocol. These meetings were held in Bali, Indonesia, in December 2007 and in Copenhagen, Denmark, in December 2009. Neither resulted in a treaty, but some progresses was made in each toward what may follow Kyoto.\(^\text{62}\)

The Bali Road Map was adopted at the 13th Conference of the Parties and the 3rd Meeting of the Parties in December 2007 in Bali. The Road Map is a set of forward-looking decisions that represent the work that needs to be done under various negotiating “tracks” that is essential to reaching a secure climate future.

The Bali Action Plan is divided into five main categories: shared vision, mitigation, adaptation, technology and financing. The shared vision refers to a long-term vision for action on climate change, including a long-term goal for emission reductions.\(^\text{63}\) The principal outcomes of the Bali conference were, first, a process to determine the GHG reduction commitments of industrialized countries (Annex I) under the Kyoto Protocol, beyond 2012 and second, the commencement of a comprehensive dialogue on long-term cooperative action to address four major building blocks of climate change, i.e. GHG mitigation; adaptation to climate change impacts; technology development and cooperation; and finance.\(^\text{64}\)

The Bali Action Plan had been adopted to secure full, effective and sustained implementation of the Convention through long-term cooperative action now, up to and beyond 2012. The Bali Action Plan was highly ambitious. In terms of the time

\(^{61}\) H.A.C. Prasad, J. S. Kochher, supra note 57, p. 10
\(^{62}\) Scott D. Deatherage, supra note 49, p. 47
\(^{63}\) https://unfccc.int/key_steps/bali_road_map/items/6072.php accessed on 22nd Feb. 2014
\(^{64}\) H.A.C. Prasad, J. S. Kochher, supra note 57, p. 10
lines it spelled out, it may have been overly optimistic and underestimated the complexity both of climate change as a problem and of crafting a global response to it.65 The Bali Action Plan, are what also has been called the “Bali Road Map,” was to lead to a final negotiation and agreement in Copenhagen in 2009.

5.3.2 The Copenhagen Accord

In December 2009, the UN convened again to attempt to negotiate a new treaty to extend or to replace the Kyoto Protocol. The negotiations were difficult and controversial. The outcome was only an unenforceable agreement on several points.

One of the major points was that developed countries commit to emissions targets for 2020 by January 31, 2010. The reductions once agreed to, were then subject to the issue of verification, which China apposed in its country.

One of the more difficult negotiating points was emissions in developing countries as China and India did not want to commit to caps on emissions. The agreement was that developing nations were to “implement mitigation actions,” known as Nationally Appropriate Mitigation Actions (NAMAs) to reduce growth in their carbon emissions. The least-developed and smaller nations were allowed to reduce emissions voluntarily and with international financial support.

The agreement also recognized the importance of reducing emissions from deforestation and forest degradation and “the need to enhance removals of GHG emissions by forests.” The agreement also recognized that a program known as Reducing Emissions from Deforestation and Forest Degradation (REDD) should be established “to enable the mobilization of financial resources from developed countries to help achieve” this goal.66

5.3.3 The Cancun Agreements on December 11, 2010

The Cancun Agreements constituted a significant achievement for the UN climate process. They form the pillars of the largest collective effort the world has ever seen to reduce emissions, in a mutually accountable way, with national plans captured formally at international level under the banner of the UNFCCC.

The Cancun Agreements also included the most comprehensive package ever agreed by governments to help developing nations deal with climate change. It encompassed finance, technology and capacity-building support to help such countries meet urgent needs to adapt to climate change, and to speed up their plans to

65 Supra note 63
66 Scott D. Deatherage, supra note - 49, pp. 41-51
adopt sustainable paths to low emission economies that could also resist the negative impacts of climate change.

The Cancun Agreements were a set of significant decisions by the international community to address the long-term challenge of climate change collectively and comprehensively over time and to take concrete action immediately to speed up the global response to it.

The agreements, reached in Cancun, represented key steps forward in capturing plans to reduce greenhouse gas emissions, and to help developing nations protect themselves from climate impacts and build their own sustainable futures. The Cancun Agreements’ main objectives cover:

i. Mitigation
ii. Transparency of actions
iii. Technology
iv. Finance
v. Adaptation
vi. Forests
vii. Capacity building

To establish effective institutions and systems which will ensure these objectives are implemented successfully and to set up the Green Climate Fund to provide support to developing countries to assist them in mitigating climate change and adapting to its impacts.67

5.3.4 Durban Outcomes

The UN Climate Change Conference in Durban was a turning point in the climate change negotiations. In Durban, governments clearly recognized the need to draw up the blueprint for a fresh universal, legal agreement to deal with climate change beyond 2020, where all will play their part to the best of their ability and all will be able to reap the benefits of success together.

In short, all governments committed in Durban to a comprehensive plan that would come closer over time to delivering the ultimate objective of the Climate Change Convention: to stabilize greenhouse gas concentrations in the atmosphere at a level that will prevent our dangerous interference with the climate system and at the same time will preserve the right to sustainable development.

Moreover, even if the two-degree scenario is met, developing countries, especially the poorest and most vulnerable, will still need much more support to adapt to the change that is already embedded in the global climate system.68

The Durban outcomes looked to address these challenges in a more connected way by embodying a road map for implementation over a longer time horizon than has commonly been the case in the history of the Convention. On this map, four main areas of coordinated and complementary action and implementation, designed also to build and preserve trust among countries, were agreed.

1) Second commitment period of the Kyoto Protocol

   The continuation of the current international legal system through a second commitment period of the Kyoto Protocol, under which developed countries commit to greenhouse gas cuts and which enshrines existing accounting rules and models of international cooperation that may inform future efforts.

2) Launch of new platform of negotiations

   The launch of a new platform of negotiations under the Convention to deliver a new and universal greenhouse gas reduction protocol, legal instrument or other outcome with legal force by 2015 for the period beyond 2020.

3) Conclusion in 2012 of existing broad-based stream of negotiations

   A decision to conclude within 2012 the work of the existing broad-based stream of negotiations that includes all member nations under the Convention. This included work to make existing national emission reduction or emission limitation plans more transparent. It also encompasses the launch and long-term implementation of the comprehensive global support network that will deliver funding and technology to help developing countries build their own clean energy futures and construct societies and economies resilient to climate change.

4) Global Review

   To scope out and then conduct a fresh global Review of the emerging climate challenge, based on the best available science and data, first to ensure whether a maximum two-degree rise is enough or whether an even lower 1.5 degree rise is required, and then to ensure that collective action is adequate to prevent the average global temperature rising beyond the agreed limit.69

69 Ibid
5.3.5 The Doha Climate Gateway

At the 2012 UN Climate Change Conference in Doha, Qatar (COP18/ CMP8), governments consolidated the gains of the last three years of international climate change negotiations and opened a gateway to necessary greater ambition and action on all levels. Among the many decisions taken, governments:

1. Strengthened their resolve and set out a timetable to adopt a universal climate agreement by 2015, which will come into effect in 2020.
2. Streamlined the negotiations, completing the work under the Bali Action Plan to concentrate on the new work towards a 2015 agreement under a single negotiating stream in the Ad hoc Working Group on the Durban Platform for Enhanced Action (ADP).
3. Emphasized the need to increase their ambition to cut greenhouse gases (GHGs) and to help vulnerable countries to adapt.
4. Launched a new commitment period under the Kyoto Protocol, thereby ensuring that this treaty's important legal and accounting models remain in place and underlining the principle that developed countries lead mandated action to cut greenhouse gas emissions.
5. Made further progress towards establishing the financial and technology support and new institutions to enable clean energy investments and sustainable growth in developing countries.  70

5.3.6 Warsaw Outcomes

At the UN Climate Change Conference in Warsaw, governments took further essential decisions to stay on track towards securing a universal climate change agreement in 2015. The objective of the 2015 agreement is twofold:

i. First, to bind nations together into an effective global effort to reduce emissions rapidly enough to chart humanity's longer-term path out of the danger zone of climate change, while building adaptation capacity.
ii. Second, to stimulate faster and broader action now.

To these ends, governments agreed to communicate their respective contributions towards the universal agreement well in advance of the meeting in Paris in 2015. Further, the required monitoring, reporting and verification arrangements for

70 https://unfccc.int/key_steps/doha_climate_gateway/items/7389.php accessed on 22nd Feb. 2014
domestic action have been finalized for implementation, thereby providing a solid foundation for the 2015 agreement.

Importantly, further progress was also made in helping countries, especially the poorest, adapt to the impacts of climate change and build their own sustainable, clean energy futures. In a breakthrough outcome, the rulebook for reducing emissions from deforestation and forest degradation was agreed, together with measures to bolster forest preservation and a results-based payment system to promote forest protection. The Green Climate Fund, planned to be a major channel of financing for developing world action, will be ready for capitalization in the second half of 2014.

Additionally, governments agreed on a mechanism to address loss and damage caused by long-term climate change impacts. The most recent climate science shows that human-generated climate change is beyond doubt, but we have a limited time to keep warming to a maximum of under two degrees. However, global greenhouse gas emissions need to peak this decade, and get to zero net emissions by the second half of this century. To achieve this, it is critical that action is taken and coordinated swiftly at all levels: international, domestic, business and finance.

For this reason, COP19 in Warsaw also provided a showcase for climate action by business, cities, regions and civil society. The solutions to climate change are already clear and the world has the money and technology, the knowledge and models to succeed. The results of effective climate action are also clear: immediate,

Pre-Paris Process

At the Nineteenth Conference of the Parties to the UNFCCC (COP 19) in Warsaw in 2013, the COP invited arties to communicate their “intended nationally determined contributions” to a 2015 agreement well in advance of COP 21 and for those “ready to do so,” by the first quarter of 2015. These are to be communicated “in a manner that facilitates the clarity, transparency and understanding of the intended attributions,” without prejudice to their legal nature. The COP also requested the ADP to identify by COP 20 in Lima “the information that Parties will provide when putting forward their contributions.”

Governments are in the process of negotiating a new universal climate change agreement, which is set to be adopted in Paris in 2015 and enter into effect in 2020. Based on views and proposals from governments, the Co-Chairs of the Ad Hoc Working Group on the Durban Platform for Enhanced Action (ADP), the body tasked
with the negotiations, have made key material available in advance of the next

\subsection*{5.3.7 Future after Kyoto}

The strengths and weaknesses of the Kyoto Protocol must be carefully
assessed in designing future agreements to tackle climate change. The Kyoto
Protocol’s main strength may lay in its emissions trading feature—a key for cost-
effectiveness, environmental effectiveness, and equity. Its main weakness may lay in
the incapacity of Kyoto-type targets to deal with the uncertainties surrounding climate
change—especially on the side of abatement costs. A mere extension of the current
protocol seems unlikely to effectively tackle climate change.

Even ignoring the difficulties of entry into force, one must admit that the
Kyoto Protocol was never intended to provide the definitive set of solutions to
achieving the ultimate objective of the UNFCCC, namely, stabilizing atmospheric
concentrations of greenhouse gases. New steps will be needed. At best, Kyoto is only
from the Kyoto Protocol: Implications for the Future, p.1}

The Kyoto Protocol will likely be considered in the future as an important step
towards effective climate change mitigation because it introduced emissions trading.
This transformation, however, cannot pretend to bring a definitive solution to the
question of incentives. It results from the prisoner’s dilemma structure of providing a
global public good: all “players” (i.e., countries) have an incentive to “defect” from
cooperating while only global cooperation can bring a better collective outcome. In
the absence of a supra-national authority or a credible threat capable to modify that
structure, however, there might be no definitive response. Identifying ways of
reducing the disincentives for some and providing incentives to others might be the
best that analysts can do. The rest belongs to policy makers, their sense of
responsibility, and ultimately to the citizens of the world.\footnote{Ibid, p. 10}

The effectiveness of an international agreement is a function not only of the
stringency of its commitments but also the levels of participation and compliance by
states. If an agreement establishes strict commitments, which limit flexibility, then
this tends to discourage participation, reducing the agreement’s effectiveness. But if
an agreement gives states flexibility to do whatever they please, it may provide little value-added.\textsuperscript{74}

In order for the agreement to come into effect in 2020, at the end of the second commitment period of the Kyoto Protocol, subsequent COP meetings need to work on finalizing effectively and jointly.

5.4 Regional level framework to combat Global Warming

Climate change is seen as a worldwide problem and the principal focus has been on reducing carbon dioxide and other greenhouse gas emissions as they have a global impact, unlike some other forms of pollution. Whether they are emitted in Asia, Africa, Europe, or the Americas, they rapidly disperse evenly across the globe. This is one reason why efforts to address climate change have been through international collaboration and agreement. Policy responses have been led by international negotiation, but are qualified or indecisive at the national level, and so far largely ineffective.

Although climate change agreements have been reached through international approaches through the principal forum (UNFCCC) and the Kyoto Protocol, the policy measures to meet the obligations and objectives set by such agreements have been implemented at the national or regional level.\textsuperscript{75}

International environmental provisions, such as adaption and mitigation of climate change, are better dealt with through regional cooperation than through a global treaty. To be effective, international environmental agreements (IEAs) need to achieve broad participation. For example, no international regime on climate change will be fully effective without the involvement of countries that have not yet committed to reduce emissions levels under the Kyoto framework, such as China, India, other developing countries, the United States, and Australia.\textsuperscript{76}

A global IEA might achieve very little and at worst, could fail to enter into force. It is therefore interesting to consider whether two or more regional treaties might be more successful than a single global treaty. Regional cooperation to deal with climate change is already taking place.

\textsuperscript{74} Daniel Bodansky, Elliot Diringer, Building Flexibility and Ambition into a 2015 Climate Agreement, June 2014, p.3
\textsuperscript{75} Supra note – 143
\textsuperscript{76} http://folk.uio.no/gasheim/AFHMJM06.pdf accessed on 22\textsuperscript{nd} April 2014
5.4.1 Group of 8 (G8)

The Group of 8 (Canada, France, Germany, Italy, Japan, the Russian Federation, the United Kingdom, and the USA) hold annual economic and political summit meetings of the heads of government with international officials.\(^{77}\)

The 2005 meeting held in Gleneagles, Scotland under the UK Presidency placed Climate Change and Africa as joint priority agenda items. Throughout the preceding year a series of events were held in preparation for the final summit in July.

In February 2005, the Scientific Conference on Climate Change was held at the Hadley Centre for Climate Research and Prediction in Exeter, where the latest scientific understanding of climate change was discussed. The proceedings of the meeting include a discussion of technology options, which recognizes that the potential contribution of nuclear energy is almost without technical limits.\(^{78}\)

A ministerial roundtable meeting of Energy and Environment Ministers held in March 2005 involved 20 countries, including Brazil, China, India, Mexico and South Africa. The meeting concluded that the countries shared common goals of:

i. creating the conditions for economic development and poverty eradication by improving the accessibility and affordability of modern energy services;

ii. providing security of supply with energy systems that are resilient, reliable and diversified; and

iii. protecting local and global environmental quality, including addressing greenhouse gas emissions.

The Gleneagles Summit itself was distracted by other events and as a result limited progress was made in discussions on climate change. However, it was agreed that the topics of energy and climate change would continue to be discussed at future G8 meetings.

The meeting of G8 in St Petersburg, Russia in 2006 focused on global energy security and climate change. There was agreement that the G8 would take action in the following key areas: Increasing transparency, predictability and stability of global energy markets; improving the investment climate in the energy sector; Enhancing energy efficiency and energy saving; Diversifying the energy mix; Ensuring physical security of critical energy infrastructure; reducing energy poverty; Addressing climate change and sustainable development.

\(^{77}\) Supra note – 143
\(^{78}\) Ibid
Included in the details of what was proposed to address these key areas included an endorsement of nuclear energy: “Those of us who have or are considering plans relating to the use and/or development of safe and secure nuclear energy believe that its development will contribute to global energy security, while simultaneously reducing harmful air pollution and addressing the climate change challenge.”

The agreement highlighted the INPRO project and the Generation IV International Forum, interim solutions to address back-end fuel cycle issues and the importance of independent effective regulation of nuclear installations. The agreement also highlighted the USA GNEP proposal and the complementary proposals by Russia and the IAEA.

Global energy security and climate change were discussed further at meetings in Germany (June 2007) and Japan (2008). Discussions also took place among the broader G20 group.

5.4.2 European Union (EU)

In many respects Europe has been a leader in promoting action on climate change. In March 2000, the European Climate Change Programme was launched by the European Union to coordinate EU efforts to reduce greenhouse gas emissions, including an emissions trading scheme within the EU that was implemented in 2005.

In March 2007 the European Council endorsed the European Commission’s Strategic Energy Review and agreed on a unilateral cut of 20% in EU greenhouse gas emissions by 2020, relative to 1990 levels. The previous commitment was 8% reduction by 2012. This required strengthening and extending carbon trading arrangements as well as deploying low- or zero-carbon technology. The European Council also endorsed the objective of making a 30% reduction in greenhouse gas emissions by 2020 and said that it would commit to this 30% target if other developed countries committed to comparable reductions in emissions and the more advanced developing countries (e.g. India, Brazil, and China) “contributed adequately according to their responsibilities and respective capabilities”. French President Chirac described the outcome as “one of the great moments of European history.”

The European Council also set a target of meeting 20% of EU energy needs from renewables by 2020, leaving individual countries to decide their own policies in such a way as to allow nuclear power as part of their energy mix to be taken into

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79 Ibid
80 Ibid
consideration in allocating individual country targets for renewables. The Council noted “the European Commission's assessment of the contribution of nuclear energy in meeting the growing concerns about safety of energy supply and CO2 emission reductions” and it acknowledged the role of nuclear energy “as a low CO2-emitting energy source.” In the event the 2008 policy set was “20-20-20” – 20% reduction in CO2 emissions, 20% of electricity from renewables and 20% improvement in energy efficiency by 2020.

The European Commission’s 2030 Policy Framework for Climate and Energy in January 2014 moved away from major reliance on renewables to achieve emission reduction targets and allows scope for nuclear power to play a larger role. It is focused on CO2 emission reduction, not the means of achieving that, and allows more consideration for cost-effectiveness.

The centerpiece is a binding 40% reduction in domestic greenhouse gas emissions by 2030 (compared with a 1990 baseline) which will require strong commitments from EU member states. Current policies and measures if followed through should deliver 32% reduction by then, so 40% “is achievable” and widely supported. It implies a 43% cut from 2005 for CO2 in sectors covered by the EU emissions trading scheme (ETS). There are to be no post-2020 national renewables targets, and individual states are free to use whatever technology they wish to achieve emission reductions in the longer term, though a 27% “headline target at European level for renewable energy” is included. The framework also proposes reform of the ETS to make it the principal driver of climate policy (see Emission Trading section above), and it drops a binding energy efficiency target and a directive for use of biofuels in transport.

Impetus for the profound change in emphasis from the 2008 policy framework appears to have come from EU member states which are winding back renewables programs due to escalating costs. The International Energy Agency has pointed out the huge difference in energy prices between USA and EU, with gas prices three times as high and electricity twice as high in the EU. The EU is evidently concerned about loss of international competitiveness and the increasingly chaotic retreat from subsidy schemes related to its 2020 renewables target. More generally, it acknowledges that “the rapid development of renewable energy sources now poses new challenges for the energy system”.
The key change from 2020 goals is “providing flexibility for Member States to define a low-carbon transition appropriate to their specific circumstances, preferred energy mix and needs in terms of energy security and allowing them to keep costs to a minimum.” An early test of this will be approval for UK plans to set long-term electricity prices to enable investment in nuclear plants.

The WNA said that the “flexible” approach outlined allows nuclear power to play an expanded role in decarburizing electricity supply. The ambitious target “is a bare minimum if the EU wishes to achieve its objective of an 80% reduction by 2050, and do its part in averting a 2°C rise in global temperatures. Unfortunately the target of 27% for renewable energy continues to undermine the possibility for cost efficiency in meeting the carbon target. It also again demonstrates an unjustified preference in EU policy for renewable energy over other carbon reduction pathways – such as nuclear energy – regardless of cost, maturity and the preferences of individual Member States.”

However, only weeks later the EU parliament in a non-binding resolution voted by 341 to 263 to claw back some of the previous provisions by changing the EC draft policy to call for binding national targets of 30% of power from renewables (not 27% overall) and reinstating the energy efficiency goal to 40% improvement by 2030, along with the EC 40% greenhouse gas reduction. Member states can however go with the EC draft policy rather than this. A final agreement needs to be signed off in mid-2014.81

5.4.3 Asia Pacific Partnership (APP)

The Asia-Pacific Partnership on Clean Development and Climate, known informally as APP, is a non-treaty partnership established by Australia, India, Japan, China, South Korea and the United States in July 2005 and launched in 2006. The Partnership involved countries that account for about half of the world's population and more than half of the world's economy, energy use, and greenhouse gas emissions. In October 2007, Canada joined APP.

The objectives of the partnership included are,

i. To work together and with private companies to expand markets for investment and trade in cleaner, more efficient energy technologies, goods, and services in key sectors.

81 Ibid
ii. To work with multilateral development banks on financing for initiatives and programs identified by the task forces that will expand the use of technologies and practices designed to promote objectives of the Partnership.


In April 2011 the APP wound up, though some programs continued under other auspices. The APP Power Generation and Transmission Task Force was transitioned into a new "Global Superior Energy Performance Partnership (GSEP)" that will form part of the Clean Energy Ministerial that had been established in 2010. The Clean Energy Ministerial initiative includes representatives from 24 governments representing 70% of global GDP and 80% of global greenhouse gas emissions.  

5.4.4 The BASIC Countries

The BASIC countries (also Basic countries or BASIC) are a bloc of four large newly industrialized countries – Brazil, South Africa, India and China – formed by an agreement on 28 November 2009. The four committed to act jointly at the Copenhagen climate summit, including a possible united walk-out if their common minimum position was not met by the developed nations.

This emerging geopolitical alliance, initiated and led by China, then brokered the final Copenhagen Accord with the United States. Subsequently, the grouping is working to define a common position on emission reductions and climate aid money, and to try to convince other countries to sign up to the Copenhagen Accord. However, in January 2010, the grouping described the Accord as merely a political agreement and not legally binding, as is argued by the US and Europe.

Furthermore the grouping discussed the possibility of providing financial and technical aid to the poorer nations of the G77, and promised details after their Cape Town meeting in April 2010. This move was apparently intended to shame richer nations into increasing their funding for climate mitigation in poorer nations.  

At the April 2010 meeting in Cape Town, environment ministers from the four countries called for a legally binding global agreement on long-term cooperative

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82 Ibid
action under the UN Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol, to be concluded at the next UN Climate Change Conference in Cancun, Mexico in November 2010, or at the latest in South Africa by 2011, saying that slow legislative progress in the United States should not be allowed to dictate the pace of global agreement. The group’s post-meeting statement also demanded that developed countries allow developing countries “equitable space for development” as well as providing them with finance, technology and capacity-building support, based on their “historical responsibility for climate change”.

Technical cooperation among the countries appears to be following, as in May 2010 South Africa, Brazil and India announced a joint programme to develop satellites.84

5.4.5 The BRICS

In the past two decades, Emerging economies (particularly BRICs, namely China, India, Brazil, Russia) have risen to become major economic powerhouse in the world. As their economies go, so goes global warming. They have poised to become the world’s major emitter of greenhouse gases (GHG). In the ongoing UN climate change negotiations, Brazil, China and India are the leaders of the developing countries coalition--- G77.85

The BRICS’ position traditionally has been that global climate change mitigation must be addressed principally by wealthy industrial nations, which have not only the wealth and technology to provide solutions, but also the moral responsibility to do so because they have produced perhaps as much as 80% of the GHG emissions to date. However, some developing countries seem to be accepting they have to contribute to climate change mitigation, e.g., China. Other BRICS are also making efforts. The more vulnerable they are to climate change, the greater incentive there is for the BRICS to accept binding GHG emissions cuts.86

BRIC governments, in recent years, have all showed new flexibilities in the negotiation. The evolving policies and changing interests of BRIC are crucial to the overall success of post Kyoto international climate change negotiation.

84 Ibid
85 http://citation.allacademic.com/meta/p_mla_apa_research_citation/4/9/9/9/1/p499913_index.html accessed on 12th March 2014
The BRICS today are amongst the largest GHG polluters in the world. The impact of BRICS countries on climate change will be considerable, just as the impact of climate change on BRICS countries will be as well. BRICS countries have called on developed countries to do more to reduce greenhouse gas emissions and negotiated emissions targets that are on an equitable level. Meanwhile, China has set goals for clean energy and energy security through its five-year plan, and is the leading producer of wind turbines and solar panels.\textsuperscript{87} Without their efforts, climate change mitigation will be very difficult in the near future.

5.4.6 SADC – Southern African Development Community

The Southern African Development Community (SADC) has been in existence since 1980, when it was formed as a loose alliance of nine majority-ruled States in Southern Africa known as the Southern African Development Coordination Conference (SADCC), with the main aim of coordinating development projects in order to lessen economic dependence on the then apartheid South Africa. The founding Member States are: Angola, Botswana, Lesotho, Malawi, Mozambique, Swaziland, United Republic of Tanzania, Zambia and Zimbabwe.

SADC member States are taking bold steps to ease the impact of climate change as evidence points to continued warming and drier conditions across the mainland countries. Increasingly violent cyclones are forecast to hit the island and coastal states, especially in the Mozambique Channel.

Announcing various measures to address global warming in the region, SADC leaders have called for urgent global action, and local solutions to the climate menace.\textsuperscript{88} They prepare to deal with the impacts of climate change, while also noting the challenges of low adaptive capacity by commitment to the UNFCCC and the Kyoto Protocol - the current global framework for reducing GHG emissions by 2012.

The evolution of international climate change law, like other fields of international environmental law, has been shaped greatly by the political struggles between the North and South and tensions within these geo-political grouping. Although developing countries overwhelmingly ratified the UNFCCC of 1992 and the Kyoto Protocol of 1997, their commitment was secured principally on the basis that

\textsuperscript{87} Rafael Leal-Arcas, “The BRICS and climate change”, Centre for Commercial Law Studies (CCLS), Queen Mary, University of London, London, 3JB, UK, Published online: 27 Aug 2013, p.1

\textsuperscript{88} http://www.unep.org/roa/amcen/Projects_Programme/climate_change/PreCop15/Proceedings/Regional%20frameworks/SADC.pdf accessed on 12th March 2014
the industrialized countries of the North would take primary responsibility for reducing global GHG emissions, as well as furnishing the financial and technological resources to enable the South to develop sustainably without heavy reliance on fossil fuels. Informed by the principles of ‘intergenerational equity’ and ‘common but differentiated responsibility’, this approach in the UNFCCC and Kyoto Protocol has been justified on the basis that the industrialized countries have been the main contributors to global warming and remain the predominant GHG polluters.

It would be extremely hard to get developing countries to take on commitments, even on a voluntary basis, since developed countries are supposed to take the lead in combating climate change, as enshrined in the Convention.

Though regional and global developments have taken place which establishes significant limitations on the rights of states in the emission of green house gases the problem of climate change still requires much human ingenuity to be solved because of the scientific, technical and ethical issues it raises.

Normative challenges that climate change law poses to a world community deeply divided, not just between the North and South, but also among countries and regions within these groups, and internally within countries.89

89 Ibid, p. 15