

**RUSSIA AND CLIMATE CHANGE NEGOTIATIONS
WITH SPECIAL REFERENCE TO KYOTO PROTOCOL**

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DECLARATION

I declare that the dissertation entitled “**Russia and Climate Change Negotiations with Special Reference to Kyoto Protocol**” submitted by me in partial fulfillment of the requirements for the award of the degree of **Master of Philosophy** of Jawaharlal Nehru University is my own work. This dissertation has not been submitted for any other degree of this University or any other university.


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PREFACE

Climate change, sea piracy, terrorism, food security are the new challenges faced by the new world order of the 21st century. Among these challenges the biggest challenge that haunts human being is climate change. Climate change is one of the major problems, which goes beyond the scope of scientific problems and reflects a complex interdisciplinary problem which covers environmental, economic and social aspect of sustainable development. The world community, since the second half of this century is trying to build consensus, make common understanding, and find comprehensive practical solution for it. From Stockholm (1972) to Durban summits last year number of negotiations has taken place for this complex problem. Kyoto protocol is the first concrete endeavor to bring some tangible change. Kyoto Protocol is first such treaty to set binding emission targets for the countries. Forty four countries including Russian Federation are part of it.

The climate change discourse has enwrapped with number of inextricable and dynamic issue. The countries are divided on issues like fund transfer, technology transfer, base line and time frame for emission reduction. Developed and developing countries are divided on these issues. United States of America, the biggest emitter of green house gases, is reluctant to take any emission cuts but exhorts developing countries to take binding emission cuts. Developing countries stay united and vehemently opposed to any such system that is imperious to their economic growth trajectory. Russian has shown much responsible behaviour by taking emission cuts on one hand and extending support to the cause of the developing countries on the other.

This work delves into the nitty-gritty and nuances of climate change negotiations taking cognizance of all the outstanding issues. It tries to extract the role of Russia in this whole discourse. It expatiates the Kyoto Protocol and find out the real changes it brought about. How far has it been successful in bringing emission level down? Does it have any lesson for future?

The first chapter tries to bring out a brief overview of the major issues, what earlier literature has tried to deal with the issues. The second chapter gives the detail about entire climate change negotiations from Stockholm (1972) to Durban (2011). How the discourse has evolved a general understanding about the issue. It also tries to place Russia's role in this process. Third chapter deals with the details of Kyoto Protocol. It helps in explaining the structural and functional part of Kyoto. The most important flexible mechanisms like Joint Implementation and Clean Development Mechanisms are explained. The benefits to Russia are also explored. The fourth chapter is very crucial in many respects. It explains the role of Russia in bringing about Kyoto Protocol. How far Russia is successful in implementing the Kyoto commitment? A detailed analysis of Russian efforts for implementation of the commitment has been done. A detailed comparative analysis of Russia with major countries is done. Both sector wise and individual gas wise comparison is made in reducing the green house emission.

The conclusion chapter deals with the crux of this debate. How far Kyoto has benefitted Russia? Is Kyoto a success or failure? How far Kyoto is successful in setting examples for future climate change negotiations? Most importantly it argues the role of Russia and its role in any future climate change negotiations.

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ABBREVIATIONS

AAU	Assigned Amount Unit
CER	Certified Emission Reduction
CIS	Commonwealth of Independent States
CS	Carbon Sequestration
CRF	Common Reporting Format
CO ₂	Carbon Dioxide
CH ₄	Methane
CO	Carbon Monoxide
EIT	Economy In Transition
EF	Emission Factor
ERU	Emission Reduction Unit
EU	European Union
GHG	Green House Gas
Gg	giga grams
HFCs	Hydrofluorocarbons
IEA	International Energy Agency
IPCC	Intergovernmental Panel On Climate Change
KP	Kyoto Protocol
LULUCF	Land Use, Land-Use Change And Forestry
Mg	million grams

NIR	National Inventory Report
N ₂ O:	Nitrous Oxide
NOX	Nitrogen Oxides
PFCs	Perfluorocarbons
RI	Resource Inventory
RMU	Removal Unit
SF ₆	Sulphur Hexafluoride
SBDT	Sectoral Background Data Tables
Tg	Terra Grams
UN	United Nations
USA	United Nations of America

Chapter 1

INTRODUCTION

1.1 Background

The modern world is grappling with the dynamic and complex problem of climate change. It has serious implications like temperature increase, rising sea level, ecological imbalance etc .It has political implications, throwing big challenge to world community to come together and solve it. With this objective major international negotiations have taken place to tackle the problem. Climate change is the general rise in the average temperature of the earth's atmosphere. Certain gases like carbon dioxide, methane etc. traps the terrestrial heat going back to atmosphere. This rises the average temperature of the atmosphere. It has spiraling affect on the whole system of the earth. This process is called green house effect. As it does not recognizes any boundary, so all the countries need to work together for safety of their common living pace. In this context the first global summit took place in Stockholm in 1972. Soviet Union/Russia showed its full commitment to combat the menace. It along with 130 other countries participated in it. Since then it has shown its commitment and extended its full cooperation to every global summit and forums. It became party to historic Rio Convention on climate change (1992) and contributed in framing famous "AGENDA 21"- a comprehensive action plan for developing sustainability of planet.

The most important and historic land mark step by Russia was to sign Kyoto Protocol. The negotiations started on 1997 and the Act came in force on 16 February 2005. The act envisages collective reduction of green house gases by the signatory countries to 5.2 percentages of the 1990 levels. Russia under the act has committed to keep its green house emissions at the 1990 levels. Russia has taken concrete steps which have led to decrease in its green house emissions to minus 36 percentages of its 1990 levels. This has proved that Russia is serious for engaging itself to bring down its emission level. It has taken concrete steps in mitigation action plans like promoting Clean Development Mechanism, Joint Investment and Emission Trading. It has framed stringent laws and commissions for monitoring the emission level and mitigating climate change. The annual report submitted to UNFCCC clearly shows the concrete steps taken by Russia.

Russia has played a very key role in the enactment of Kyoto protocol. As per the basic requirement of the protocol, minimum 55 countries, responsible for 55% of global green house emission, need to adopt the protocol to bring it in force. In this context the role of Russian Federation become crucial, as USA has refused to ratify the protocol. Russia is responsible for 17 percentage of global emission level. So without the involvement of Russia Kyoto protocol would have been difficult to fructify. Hence the enactment of Kyoto protocol is unique and historical in the sense that it is only deal till now, in which countries have come together to take binding emission cuts. 43 countries called as Annex-I countries have taken initiatives to bring down the emission cuts. The developing non Annex-I countries, though out of binding regime, have vowed to take effort to help each other in bringing emission level down.

The Kyoto is, to an extent successful in bringing the emission level down. The total Green House gases level by the Annexure I countries have come down. Weather sectorial or gases categories, both of them have shown improvement. The biggest advantage of Kyoto is that it has binding emission cut regime in post Kyoto or Kyoto-2 arrangement. Russia recently tactfully tried to pressurize the biggest emitter countries like USA and Australia to take binding emission cuts. President Putin said “We will move out of Kyoto-2 unless other bigger emitters are not ready to reduce take binding targets”. The same sentiments are expressed by Japan. Canada has in fact opted to pull itself outside Kyoto which makes its involvement murky.

Under such circumstances the biggest emitter of green house gases – USA, Australia including developing countries like China and India are under immense pressure to join the Kyoto arrangements. In recent Durban climate change negotiations held on November 2011 a “Durban Platform” has been set up. The Durban platform will decide the modalities of Kyoto-2 after 2012. All these developments have made Kyoto much more relevant and even more relevant for Russia. Russia is a key contributor to reduction of emission in Kyoto I and its involvement in Kyoto-2 arrangement is inevitable. Its importance increases manifold when 21% of global forest cover, a huge carbon sink source are located there.

Russia's position and participation is crucial in any climate negotiations, as it has 21 % of global forest cover and huge fossil reserves. Its forest cover has tremendous capacity

to absorb carbon emission, thereby making it an “environmental donor” country. Russia as expected has taken the responsibility and has uniquely pushed itself ahead vis-à-vis other countries

The world community is going through dynamic changes as no common ground has been reached on many of the contentious issues relating to climate change e.g. Technology transfer, fund transfer, binding emission cuts. These are the issues without which tackling climate change is a distant dream. Under such developments it is imperative to study the overall climate talk’s trajectory, its dimensions and movements. The role of Kyoto in bringing some tangible change in emission will be benchmark for further climate negotiations. The role of Russia in such important issue which is going to affect each and every individual is not only crucial but needed. Being a important country of the world, the framework of its foreign as well as domestic policy have great political implication and significance.

Still many issues remain unresolved and need greater understanding and cooperation among the countries. The recent move by European Union to link trade, intellectual property rights and WTO issues with climate change negotiations has made the issue much complex the developing world. The most vulnerable, small island nation groups are most vocal against it. The move like putting “carbon tax” on aviation has aggravated the acrimony among the nations. So, the political matrix has become much more complex. Russia could act as a deal maker in such due to its huge forest reserve. Moreover it has shown full commitment in fulfilling Kyoto protocol. It has brought its vision energy in its energy policy of 2035. It has made huge investments in improving consuming its forest reserves which makes it’s a committed partner. So in many of the controversial issues like fund transfer, technology transfer, etc Russia has emphatic presence. The climate change negotiation has gone a long way till now. The recent Rio summit (Rio + 20) could not do much in resolving all the issues.

In the present context when cut off year for the fulfilling the Kyoto commitments is ending in 2012, the world community is struggling to decide the future course of action. It is imperative that certain concrete steps must be taken. Russia as a responsible

industrial emerging economy has high potential to contribute. Russia itself has shown interest in finalizing the contentious issues. Recently Russian president Dmitry Medvedev said that Russia is going to voluntarily reduce 25% carbon emission of 1990 levels, which is seen as a welcome step. Russia is known for its cogent and open policy on fund transfer, technology transfer. Both developed and developing country countries have full faith in Russian commitments. The developing countries consider Russia as their supporter of their issues. Looking at the enormity of the issue, the present study will explore various dimension of climate change and their larger implication on Russian policy formation.

1.2 Review of Literature

The world has seen manifold increase in its population. The increased human activity has lead to many environmental problems. The past century saw dramatic changes. The climate change has emerged as major threat to the world. With increase in global temperature there is increasing danger of submergence of coastal areas, disturbance in ecological balance affecting millions. These problems are of wide implications .They cannot be solved unilaterally. So the world community must take common and coordinated efforts.

The 1972 Stockholm Summit was the historic milestone in this regard. The delegates of 130 countries along with Russia took part and unanimously pledged to work to solve the problems. Ronald B. Winchell (2003) believes that Stockholm Summit was unique in itself as it brought various countries on one platform. Scholars like Henry (2007) and Tipton (2008) are of same view.

The climate change has posed multifarious challenges to Russia, both at policy and mitigation level. The melting in Arctic, Kamchatka's territorial loss, the melting of Siberian permafrost, forest fires etc are the new threats which Russia have to deal with. In this background Russia took significant steps both at domestic as well as global level. Russia became party to all major global environmental negotiations e.g. the Montreal Summit in 1987, Rio Earth Summit in 1992, Kyoto 1997 and Durban etc. Not only had this it also provided active leadership. Robyn Eckersley (2005) in his paper argues that Russian ratification in Rio and Kyoto brings to fruition a decade of complex harrowing

negotiations. Though many U.S. scholars deny the fact. Tepton (2008) in her paper says that Russian assent to Kyoto was not due to its seriousness to the environment but rather the economic gains it is going to have from it. Alian Bernard, Sergey Paltser, John. M. Ruthy, More Vielle argues in their report –‘Russia’s role in Kyoto Protocol’ that it was the huge profit which Russia is going to get from selling of carbon credits which prompted it to join the treaty. Moreover in some quarter it was understood that due to last part of the talks where Russia clinched deal from European Union to support Russia in joining World Trade Organization was the main gain due to which Russia joined the deal. It was not the environmentalist concern of Russia which brought it on board. But one thing is very clear that President Putin was in favour of the deal. It was due to his determination that Russia joined Kyoto Protocol. Undoubtedly Russian efforts in this regard are much better than other developed countries. The issue of climate change has now being much more politicized and is inextricably linked to deeply embedded issues. These issues are dealt elaborated.

There is serious divide between the countries on taking the responsibilities of huge emission. In the recent Durban Summit (2010) and in past Summits, the developing countries are pushing the developed countries to do more as they are the one who are the biggest polluter. Since the industrial revolution developed countries has emitted maximum green house gases. On the contrary U.S, EU and Australia reiterate that China, India, Brazil and other developing countries should contribute equally. Birsmam, Daniel, Evanova (2002) etc are vehement supporter of developing nation while scholars from EU, Australia and US push hard against developing countries.

Secondly, fund transfer and technology transfer are also an important issue. Green technology is expensive for which huge funds are required, which poor countries could not afford. Therefore it is much understood that a green fund is to be created from which money should be transferred to most vulnerable section. For this an adaption fund is provided in Kyoto protocol. The fund is generated from the portion of the proceeds from clean development mechanism. In the Durban summits too, it was decided to create new climate funds. As the adoption fund is very less in comparison to the need of the vulnerable and poor countries. Moreover, in future as the temperature level increases the need for funds will increase many fold. Thus, it is imperative to pool more funds.

So, developed countries need to transfer the technology and fund to developing countries. Russia too is in support with this view. Martinot, Jonathan, Senston and Maddadi (1997) in their paper, focused that new capacity building and new potential will open for Russia and China by the technology transfer as they have to create new capacity to adopt. Robinson, Reddy (2006) and Thov (2007) have also similar view on technology transfer. The much talked “Green Fund” to help developing countries to adapt green technology for reducing emission is still not created. A \$ 100 billion fund was pledged in Copenhagen summit in 2009, but there is no concrete progress on it. In the Durban summit this 100 billion green fund is given legal status. Thus making the beginning of the fund creation for the poor and vulnerable countries. But still this fund is not sufficient looking at the scale of the problem.

Moreover, the issue has become much complex as developed nation are trying to link technology transfer with WTO and patent regime, which is vehemently rejected by developing countries. Sinton and Gautam (2009) and Haddadi (1997) has come out with the conclusion that west is trying to pressurise the developing countries by linking fund and technology transfer with WTO and patent regime. This has made the negotiation more problematic and complex. With emerging controversial issues, things are worsening. EU is of the view that there should be mandatory legal monitoring of the project by western experts. This is rejected by countries like India, China and Brazil.

The base level of emission cuts and targets is also a big point of contention. As under common but differentiated responsibilities the developed countries like US, Russia, France etc are expected to take larger emission cuts as the developed countries has been the biggest emitter of green house gases. The onus lies on them to take deeper emission cuts. But Russia has put forth the view that it has taken emission targets in Kyoto Protocol. So until the EU and U.S. are not going to take serious emission cuts, it is not going to take binding emission cuts. Japan too has supported Russian stand. Canada has pulled itself out of Kyoto. As it argued that Kyoto would prove a land mark deal for the growth of its people and country Developing countries on the other hand are reluctant to take target as they argue that why should be penalized for the act of developed countries. Also this will halt their growth trajectory detrimental for their population. Najan Adil (2005) has well articulated that North (developed) is being tries to victimize by the South,

which want to impose their will on the South. Similarly Agrawal and Narain (1996), Gupta, and Gorge (1996) etc. hold similar view about developed countries. The current environment talks have been stalled due to many factors. There have been grouping among nations. G-77(group-77), LDC (Least Developed Countries), BASIC(Brazil, South Africa, India, China) group, EU-US are the factions which are trying to mould the negotiation in their own ways. Russian stand is very clear-cut in this regard. It has reiterated that it has already taken binding emission cuts under Kyoto Protocol. Any further cuts will only be in reciprocity to the stand of developed countries. If these countries fail to take any emission cuts then this time Russia will refrain to take emission cuts.

In the recent Rio+20 summit held in June 2012 to commemorate the 20 years of the United Nations environment and development summit held in the same year in 1992, a non-binding document. The document “The Future We Want” largely a reflection of ‘Agenda 21’ of UNCED meet. Thus a binding emission regime seems difficult to reach. But voluntary commitment was given by the parties to reduce the emission level. More than 7000 voluntary commitment are registered by various stakeholders, NGOs, civil society, IGOs, the private sector including UN system and governments. Ban ke moon said in conference “I am encouraged by the more than 7000 concrete commitments registered at the conference from governments, business, industry, financial institution and civil society groups, amongst other”. Chaskel Pamela (2005), have elaborately discussed the politics of climate change and argued that fund transfer is being used as an instrument against developing nation by developed countries to somehow tinker the WTO negotiations and restart the Uruguay round. Russia which is not the member of WTO has neutral stand on this issue. It has shown that it is not interested in linking the climate negotiations with the trade talks. Linnerand Merle Jacob (2005) has well discussed the North-South divide in their paper. The differential scientific capacity of Southern and Northern countries continues to be major point of disagreement between North and South and political block and groups such as G-77 appears to continue even in the face of real differences in interest with respect to outcomes of international negotiations.

The major world powers like USA, China, France, Brazil, India, Germany etc are trying

to pull the negotiations in their own terms. The emerging nation groups such as Mexico, Brazil, India, China and South-Africa have joined their hands to stay united in the negotiations while US, Australia and EU are trying to create divide amongst developing nations to gain in the negotiations. This has created complex situation making it difficult to deal with the real issue which can prove detrimental to world at large. “Development Countries are responsible for 60% of the green house gas emission that contribute to climate change, developing countries suffer the worst and first effects of the climate change related disasters, including droughts, floods and storms, because of their geographical locations” (J. Timmons and Bradley C. parks; 2006). The most important Summit on climate change was held in Copenhagen in 2009. In Copenhagen summit green fund of 100 billion was created to help poor countries to adapt green technology. Valentino Piana in his work “Copenhagen green climate fund – A Comment” has explained that why fund is necessary for the real implementation of climate change fights. He argues that “Even of 100% of the 100 billion promised in Copenhagen are given, It would still far too small to address its broad range of chapters of expenditure” (Piana Valentino, 2010). D.R. Ravi Kanth (2010) in his article in Economic and Political Weekly has stressed that this green fund is must to help the poor and vulnerable nations to bring emission level down. He estimated this fund to be more than 1000 billion.

The world is passing through crucial period and all the countries have to take collective action for their common future. Under common but differentiated responsibility developed countries including Russia has to take more responsibility than developing countries. The enormity of the problem could be understood by statement of leading climate scientist Houston (2009), former co-chairman of working group of IPCC that “Human induced climate change must be considered a weapon of mass destruction, which is at least as dangerous as nuclear, biological or chemical weapon or even terrorism”. The Kyoto Protocol period is going to end in 2012. The Rio + 20 summit held recently has opened several new dimensions. Along with the climate change seven priority areas area being identified. This will be most challenging in coming future. These are jobs, urbanization, food security, water availability oceans, controlling disasters. Thus climate change debate has become much wider and comprehensive in nature.

A comprehensive, focused and equitable future plan is inevitable. The existing literature focuses on various climate issues like fund transfer, outcomes of the negotiations, technology transfer etc. The proposed study will make deeper analyses of Russian effort to meet the Kyoto commitment. It tries to locate Russian effort vis-à-vis other countries. The challenges, policy initiative of Russia in post Kyoto dynamics needed to be better researched and explored. In this context the present study will focus on evaluating past studies, assessing present trends and try to explore the forthcoming complexities to Russia and its foreign policy in dealing with the problem of climate change.

1.3 Definition, Rationale and Scope of the Study

The proposed study focuses on the issue of climate change and its repercussions for the world with special focus on Russia. The research examines the major global negotiations to deal with the climate change. The main contentious issues and approach of major countries like USA, China, and India are also dealt with. It puts the main emphasis on Kyoto protocol which came on force in 2005. The study covers the time period of 1997 to 2012 as the Kyoto agreement was initiated in 1997 and its commitment period is going to end in 2012. With Kyoto commitment period of 2008-2012, the study analyses climate policy of Russia, its success and failure, to meet this commitment. The study will bring out the overall Russian approach and its willingness to deal with the climate change

1.4 Research Methods

The study would be qualitative, quantitative and analytical in nature and is based on primary and secondary data on Russia's emission level and cuts. The quantitative part will include graphical representation like line graphs, bar graphs, pie charts etc to show the emission level and other important data. A qualitative assessment of the Russian initiative to deal with climate change, especially in bringing down the emission level is done. The analytical part would include the comprehensive analysis of Russia basic approach to deal with the problems. Its convergence and divergence with other countries on the contentious issues like fund transfer, technology transfer etc. The research would apply various primary and secondary sources. The primary sources will include government official reports, the drafts, the country report of UNFCCC, compilation and

accounting reports, ratification reports, annual green house gases inventory reports submitted to UNFCCC .The secondary sources would include books and articles, newspaper reports and web reports.

1.5 Objectives

1. To discuss the major international climate negotiations from Stockholm to Copenhagen.
2. To highlight the major issues involved in climate change negotiations and Russian stand.
3. To analyse the Russian climate policy in various international negotiations.
4. To analyse the role of Russia in the implementation of Kyoto Protocol.
5. To evaluate the gains and losses to Russia from Kyoto Protocol.
6. To assess the efforts of Russia to deal with the climate change and fulfilling Kyoto commitments.

1.6 Research Questions

1. What are the major issues involved in climate change.
2. What are the effects of climate change on Russia?
3. What policy stand has been taken by Russia in global climate negotiations?
4. How far Kyoto protocol succeeded in curbing emission level?

5. How far Russia has been successful in meeting Kyoto commitments?

1.7 Hypotheses

1. The fundamental source of conflict in climate change negotiations between the Russia and West is fund transfer and technology transfer.

2. Russian mitigation plan of clean development mechanism, joint investment and emission trading has lead to reduction in green house gas emission level and fulfillment of its Kyoto commitments.

Chapter 2

AN OVERVIEW OF CLIMATE CHANGE NEGOTIATIONS

2.1 What is Climate Change all about?

Climate change refers to the increase in the mean temperature of earth's atmosphere. The change in the normal temperature may be due to natural or anthropogenic causes. The earth's average temperature historically has gone through changes earlier too, but the present rise in the temperature is due to human interference. This is not a natural process. Ever since the Industrial Revolution began about 150 years ago, human activities have added significant quantities of GHGs to the atmosphere. The atmospheric concentrations of carbon dioxide, methane, and nitrous oxide have grown by about 31%, 151% and 17%, respectively, between 1750 and 2000 (IPCC report 2000).

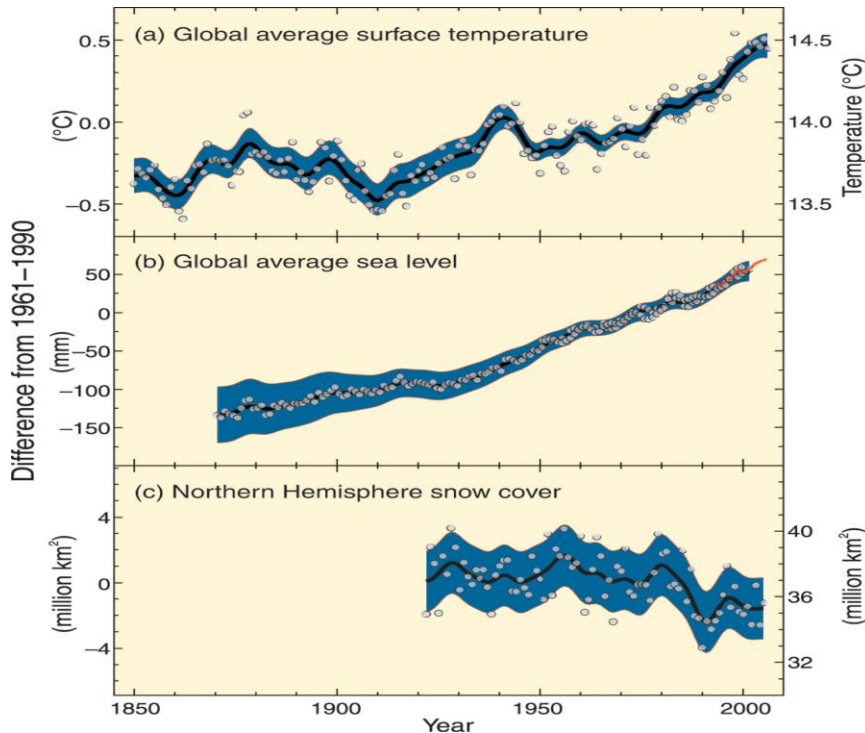
“Annual global growth rates of CO₂ emissions are expected to be around 1.8% from now to 2030 which is comparable to those of Russia, with two thirds of that growth attributable to the developing countries”(Renat Perelet, Serguey Pegov and Mikhail Yulkin,2007:9)

The major cause of worry is the rise in the temperature is basically due to the green house effect. The earth's atmosphere behaves as an envelope which does not allow the terrestrial radiation to go back from the earth. Thus, the increase in concentration of the gases increases the temperature .The increase in temperature has serious physical, social and political implication on the planet. The polar ice is going to melt, which in turn increase the sea level, leading to submergence of the low-lying coastal areas of the world. The biodiversity will deteriorate; ecological imbalance will create anomalies on the earth system.

“The human dimension of climate change emissions is revealed more vividly if they are calculated not only in physical levels but with the reference to the gross national product (GDP) of a country often referred to as carbon intensity.”(Renat Perelet, Serguey Pegov and Mikhail Yulkin, 2007:5)

It is going to have detrimental effect on global economy. Chaotic social unrest in the marginalized and the vulnerable sections of the society are also possible. Climate change

Graph 1:



Source: IPCC fourth assessment

also throws a political challenge to the countries. It has created a great diplomatic and political rift over the issue of bearing the responsibility for mitigation and adaptation.

2.2 The Determinants of Climate Change

The increase in the normal temperature is due to the green house gases. The gases, that do not allow the terrestrial radiation to escape from the earth's atmosphere. These green house gases are Carbon Dioxide, Methane, Nitrous Oxide, Sulfur Hexafluoride, Hydrochlorofluorocarbons (HFCs), Perfluorocarbons (PFCs), water vapor etc. These are the gases which trap the terrestrial radiations and increase the temperature of the earth. This increases the atmosphere's temperature. These six gases are taken into consideration in Kyoto protocol.

2.3 Climate Change Science

Climate change can be natural or anthropogenic. It is general rise in normal temperature of earth's atmosphere. The normal temperature is referred as the average temperature over the period of 30 years. The temperature rise in this average is measured and compared.

The earth is enveloped by the gaseous covering called atmosphere. This atmosphere behaves as a semi permeable membrane due to presence of unique gases. The incoming solar radiations (insolation) are in short wave (short wavelength form). These waves pass through the atmosphere without any hindrance. But, the terrestrial waves which flow from earth to atmosphere are in form of long waves. These long waves are entrapped by certain gases of the atmosphere and thus the temperature of the earth increases. These green house gases are carbon dioxide, water vapor, methane, nitrous oxide, hydroflouro carbon (HFCs), perflouro carbon (PFCs), sulfur hexafluoride (SF₆) , carbon tetrachloride (CCl₄) etc.

Out of these gases water vapor is not considered as green house gas as its concentration is highly variable and its concentration cannot be directly affected. The UNFCCC (United Nations Framework Convention on Climate Change) and Kyoto Protocol takes only 6 major gases, discussed earlier, into consideration.

Out of these gases carbon dioxide is the main gas responsible for the global warming. Since the industrial revolution its concentration has seen multifold increase. This is due to increase in transport activities, industrial activities and numerous household activities such as burning of fossil fuels etc. It is found that agricultural activities are also responsible for emission of green house gas that is methane, which is released from paddy fields or cuddling of cows and buffaloes.

Under UNFCCC the Global Warming has also been taken into consideration. The Green House gas warming potential is taken in reference to CO₂ value. Taking CO₂ value as one the other gases are compared for their potential value. In this context SF₆ has highest Global Warming potential while CH₄ has least as compared to the carbon dioxide.

“In the context of Global Warming time frame is also an important factor which is needed to be taken into account”(Ronald b. mitchel,2003:56). The warming potential of gases

may increase or decrease in the long run. For example, if 500 hundred years are taken into account then warming potential of methane decreases considerably.

At the same time, the warming potential of sulphur hexafluoride rises drastically (over 10,000 times) in same time framework. Thus time frame plays important role in global warming. The rise in temperature is high since industrial revolution (1750). The CO₂ particles per million (ppm) has grown high from 250 ppm (pre industrial period to 350 ppm of CO₂ equivalent in twenty first century). There by leading the increase of 0.6 C in normal temperature of earth.

2.4 Climate Change and UNFCCC

After the Stockholm summit of 1972, the world was desperately in need of a specific body which could work specifically for combating climate change. Then, the Earth Summit took place in 1992. The participating nations reached to an agreement to notch a climate treaty called United Nation Framework for Climate Change.

“In 1992, countries joined an international treaty, the United Nations Framework Convention on Climate Change, to cooperatively consider what they could do to limit average global temperature increases and the resulting climate change, and to cope with whatever impacts were, by then, inevitable” (UNFCCC), http://unfccc.int/essential_background/items/6031.php).

This is the main body which provides the base for the climate talks. The body has the mandate of United Nations. The objective of the organization is to stabilize the amount of greenhouse gas in the atmosphere at a level that would prevent the harmful implication of the climate change. The UNFCCC have no mandatory mechanism to put any binding emission limits. Rather it provides the platform to reach to a treaty for the emission reduction. It is under this framework the Kyoto protocol has come into force.

2.5 The Major Climate Negotiations

In this section it is tried to have a brief look on the climate talks taken place till now. How the climate talks have taken shape till now. Before the Rio Summit, though several treaties took place concerning environment in one or the other level. But very few served the purpose of unified action to combat climate change.

The major environmental negotiations are discussed here.

2.5.1 Stockholm Summit 1972

The Stockholm summit was the first major summit that took place in the capital city of Sweden. This summit is also known by the name United Nations Conference on the Human Environment. It was an international conference convened under the auspices of United Nation. The main outcome of this summit can be attributed to the fact all countries agreed that the climate change is the biggest threat for the mankind and the entire nation together have to work to combat. The Declaration of the United Nations Conference on the Human Environment very specifically declared

“Man is both creature and moulder of his environment, which gives him physical sustenance and affords him the opportunity for intellectual, moral, social and spiritual growth. In the long and tortuous evolution of the human race on this planet a stage has been reached when, through the rapid acceleration of science and technology, man has acquired the power to transform his environment in countless ways and on an unprecedented scale.”(UNEP,<http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=97&ArticleID=1503&l=en>).

2.5.2 Rio Summit – 1992

From 3-14 June 1992, the United Nations Conference on Environment and Development (UNCED) hosted Earth Summit at Rio de Janeiro .The main focus of this conference was the global environment and its relationship between economics, environment and the science in a political context. It took place 20 years after the Stockholm summit held at Sweden. This was huge gathering of the top officials in the sense that government officials from 178 countries and 30,000 individuals from governments, non-governmental organizations, and the media participated in it. The main theme was the question - how to make global environmental system sustainable by the inception of paradigm of sustainable development? The concept envisages that the welfare of the future generation is only possible by judicious growth pattern of the present world. It was an improvement over previous summits. It brought "environment " and " development" closer and

emphasized on the complementary nature of each other. In particular, it widened the scope of global environmental diplomacy and politics by adopting the notion of **sustainable development**. This was also the time when cold war came to virtual end and the interest of the countries across the globe towards the environment has increased many folds. Environmental issues such as ozone depletion and global temperature were on the top in global policy map. Energy sources had become a major concern for economic security in the aftermath of the oil price shocks of 1973–74 and 1980–81.

The Outcome of the Summit

At the end of United Nation Conference and Development, Rio Declaration enunciating 27 principles of environment and development, Agenda 21, and a Statement of principles for the Sustainable Management of Forests, which were all adopted and accepted by consensus of the parties. An institutional framework was also initialized. Global Environmental Facility (GEF) was agreed upon. This was to facilitate the funds for developing countries to reduce their emission levels. Secondly, rules for the United Nations Convention on Biological Diversity were framed. United Nations Commission on Sustainable Development (CSD) was establishment on the basis of the “Agenda 21” recommendations. The most important outcome of the summit was the formation of the United Nations Framework Convention on Climate Change (UNFCCC) .This has proved to be the most important body for fighting climate change. .Beside the institutional structures the Declaration include many progressive approaches such as the polluter pays principle and the precautionary principle (carry out environmental assessments to identify negative impacts and eradicate any potential harms from a project before it is started.

The “Agenda 21” has tried to make a delicate balance between production, consumption, population and earth's carrying capacity. Besides these it also addresses poverty, overconsumption, education, health, cities, agriculture pattern, food, natural resource management and other related issues.

So Rio summit was the path breaking not only in the environmental but also in political terms. It has led to the formation of many of the present multilateral institutional setup which has made deeper impact on the climate change and international relations as well.

Russian Federation took part in it and is a party to it. It not only emphasized the proper implementation of the agenda 21 but also put stress on cohesion and symbolic cooperation among the nation states.

2.5.3 Kyoto Protocol

The Kyoto Protocol is a protocol to the United Nations Framework Convention on Climate Change to reduce the emission of green house gases and thereby bring the global temperature down. The Protocol was initially adopted on 11 December 1997 in Kyoto, Japan, and entered into force on 16 February 2005. Till September 2011 the total number of countries that signed and ratified the protocol was 191. The only country remaining signatory which have not ratified the protocol is the United States. The other UN countries which have not ratified the protocol are Afghanistan, South Sudan and Andorra. In December 2011, Canada renounced the Protocol. Under the protocol 37 countries which are called annexure 1 countries have committed to take the legal binding cuts. These are the developed countries of the world. The reduction in the gases includes 6 major gases which are carbon dioxide, nitrous oxide, methane, Perfluorocarbons, hydrofloro carbon and sulfur hexafluoride.

The collective target agreed to reduce their greenhouse gas emissions is 5.2% from the base year which is 1990 .The commitment period is from the 2008 to 2012. Since the United States of America has not ratified the treaty, the collective emissions reduction of Annex I Kyoto countries is reduced from 5.2% to 4.2% below base year. Under the emission the emission through shipping and aviation is not included but they are in addition to the industrial gases. The treaty also has funding pattern where the adaption fund is being created to fund the green house projects of the developing countries. The proceeds of the adaptation fund will come from 2% of the proceeding of the Clean Development Mechanism. The treaty makes the provision for the funding pattern but the money is given on country basis not on the project basis. The protocols allows for the " flexible mechanism" which are

1. Clean Development Mechanism
2. Joint Implementation

3. Emission Trading

The carbon trading is possible amongst the annexure 1 countries to mitigate their target. Carbon trading is selling of carbon credits by carbon surplus country to a carbon deficit country. Carbon credits are obtained by mitigating the target of Kyoto protocol. Annexure I country need to submit their annual status report of green house inventories of all anthropogenic greenhouse gas emissions sector wise with precise detail. These countries have to nominate a person for creation and management of its greenhouse gas inventory.

Further detail of the protocol are dealt in chapter 4, which deals specifically with Kyoto protocol

2.5.4 Marrakesh Climate Conference-2001

This was another important conference as it stressed on few important aspects of the climate change. The summit took place in Morocco between 29th October to 9th November 2001 under United Nation Framework Convention on Climate Change (COP 7). The main focuses of the summit was to finalize the legal text of the Kyoto protocol which could not be fructified in the previous Bonn summit. This meeting specifically mooted on the issue of finalizing the technicality of the Kyoto protocol and to agree upon the legal text covering all outstanding technical and political aspect of the protocol .While the US was not there, as they had already pulled out of the talks earlier in the Bonn meeting in 2001. The COP7 meeting ended with agreement on ways on how to enforce the Kyoto accord combating climate change. In this negotiation Russia along with Japan, Canada wanted that carbon sink should also be counted while reporting the reduction of the green house emission. The treaty has to be accepted and ratified by 55 countries, responsible for 55 % of emissions. Though the meeting did not get much attention due to United States of America attacked on Afghanistan but the meeting was important, especially with respect to Russia as the important issue of carbon sink came up in the reporting pattern.

There was immense pressure among the countries to come to conclusion to the legal text as it could not let the Kyoto protocol to come in force. At COP-7, countries addressed the remaining important issues, including the eligibility of market-based mechanisms for the establishment of a global carbon market, the Clean Development Mechanism (CDM),

Emissions Trading (ET) and Joint Implementation (JI). The other vital issues were issue of carbon sequestration by forests and other “sinks” and their credit that were included in Kyoto emission targets. Revisiting the terms of reference for the Consultative Group of Experts (CGE) on national communication of developing countries. Issues regarding the least developed countries (LDCs) were also dealt with. “A large group of Latin American countries continued to stress the importance of sinks” (Emily Boyd, Esteve Corbera and Manuel Estrada ,2008:101). These basically include rules for the least developed countries (LDCs) National Adaptation Program of Action (NAPAs), rules for the LDC Fund, the expert group formation of LDC, and mitigation with the Kyoto targets. Though there were several doubts cast on the success of the summit, but at the end the deal was struck. The main issues of market mechanisms, which are clean development mechanism, joint implementation and emission trading, were agreed upon. The rules, procedures and modalities regarding the clearance and acceptance of Clean Development Mechanism projects amongst the developing countries and their purchasing selling of carbon credits were finally resolved.

In the meeting it was decided that the eligibility date of the Clean Development Mechanism will be 2000 provided if they meet the technical requirements as per the protocol.

Despite many successful agreements on the Clean Development Mechanism, major challenges in the meeting were on the decision on the verification and accreditation of carbon reducing projects and their procedure. Certain ambiguity which remained in the meeting which were to be resolved in the next meeting. Though, the agreement on the rules and procedure for Joint Implementation and Emission Trading was less controversial than the CDM. A major controversial point for JI concerned the formation of the supervisory committee.

“The main theme which emerged for these projects was to develop a “track-two” process that would help the developed countries which are not able to meet the monitoring and verification requirements to can carry out JI projects” (Ronald B. Mitchell,2003:13).

This was very crucial issue for Russia and other parties. These were the main discussion

points which took place in the meeting. Though all the issues were not resolved but it could be said that it is one step ahead over the previous Bonn summit. For Russian Federation it was much better deal as the issue of emission trading was resolved to an extent. Also, carbon sink was included for the common reporting format.

2.5.5 Bali Summit 2007

The 13th session of the Conference of the Parties to the United Nation Framework Convention Climate Change (COP-13), took place in Nua Dua, Bali. It was hosted by the Government of Indonesia. Representatives from over 180 countries attended the meeting. Along with the conference meeting of certain other bodies also took place. These include 3rd Meeting of the Parties to the Kyoto Protocol, 13th Conference of the Parties to the United Nations Framework Convention on Climate Change along with other subsidiary bodies and a meeting of ministers. The negotiations were dominated by agenda of finalising the successor to the Kyoto Protocol. The meeting of environment ministers and experts called upon the conference to come together on a timetable, road-map, and 'concrete steps for the negotiations' with a view to reaching an agreement by 2009.

“Initial EU proposals called for global emissions to peak in 10 to 15 years and decline to half of the 2000 level by 2050 for developing countries and for developed countries to achieve emissions levels 20-40% below 1990 levels by 2020”(David free stone 2010)

The United States strongly opposed these numbers, which were backed by countries like Japan, Canada, Australia and Russia. At the end of the summit the “Bali Road Map” was adopted. This was a 2 year process for finalizing a binding agreement till 2009. The Bali Road Map includes the Bali Action Plan (BAP) that was adopted by Decision 1/CP.13.

“This Action Plan included the so-called ‘roadmap’ for the forthcoming negotiations which aimed to develop by 2009 a new regime to take effect after the end of the Kyoto Protocol commitment period in 2012”(David Frestone,2010:2)

.It also included ad-hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol negotiations and their 2009 deadline, the launch of the

Adaptation Fund under protocol, the scope and nature of the Article 9 review of the Kyoto Protocol, as well as main outcomes on technology transfer and on reducing emissions from deforestation. The Bali Roadmap emphasized a new discussion process to be concluded by 2009 to feed into a post-Kyoto (i.e. a post-2012) framework international agreement on climate change. But the conference was also accompanied by controversy, including

- The US position being not in tandem with most of the rest of the world.
- Talk of developing countries' responsibilities (such as India, China, South Africa and Mexico) while rich countries (which are responsible for the problem) have made little progress, themselves.

The frustration was shared by members of G-77, a 130-member bloc of developing countries spanning Africa, Asia and Latin America, to U.S. objections to language used in the final text of the roadmap was best framed by the delegate from Papua New Guinea. "If you cannot lead, leave it to the rest of us. Please get out of the way."

Campaign groups such as "Friends of the Earth" many of whom were present in the talks themselves, were disappointed with the outcome of the summit. As according to them targets were watered down to mere footnotes in the final text. Also mainstream British media, along with other European outlets had been critical of the US stance and tactics.

Looking at the discord among the nations all possible effort was taken for building up the consensus. The result was that it was widely accepted that it is the developed world that has misused and misappropriated the natural resources. So these countries should talk the larger responsibility in taking up the challenge of climate change. In 1997, the Kyoto Protocol became the first accord to set target for reduction by the rich countries. The US still is a leading emitter of green house gas emission and its per capita emission of CO₂ from fuel combustion is about 20 tonnes per year. The per capita CO₂ from fuel combustion is between 6 tonnes and 12 tonnes for most European countries. While the same data for the India and china is much lower which is roughly at 1.1 tonnes for India and 4 tonnes for china.

2.5.6 Copenhagen Summit 2009

This was the most awaited and important summit of the world community. The world community at this juncture was looking for another period for commitment of emission reduction so that the growing temperature could be controlled. The Kyoto protocol though helped in bringing the emission target down but the need of the hour demands deeper cuts. Only comprehensive cooperative approach could be fruitful in controlling the emission level. Under such circumstances the summit took place in Copenhagen, Denmark. Total 192 countries are signatory to climate change convention. More than 14,000 officials, diplomats, advisers, protestors and journalists have attended the summit, joined by heads of state.

The pressure was on the developed countries; especially US were reluctant to take any binding emission cuts. US have put forth the argument that 5% reduction would be lethal to its economy, so it cannot afford to reduce 5% of the emission. Rather United States of America tried to put pressure on the developing countries like India and China, as these are the countries which have high emission level. “The major challenge is that the negotiators must find an equitable way forward that is attractive and compelling to developing countries—especially China but also India, Indonesia, and Brazil”(Robyn Eckersley,2005:5).China has emerged as highest emitter of carbon dioxide in the world. Though some hope has emerged by recent lurch shown by US to take emission cuts in future.

The most important outcome of the summit is that despite the discord in taking legal binding emission cuts, China, India, European nations and many western countries vowed to take concrete steps to reduce the emission. For the first time, the US, China and all other major economies have committed to take concrete steps .They have voluntarily given their emission cuts individually without any compulsory verification by any agency. Also, this summit is important in the context of climate change that for the first time the countries agreed upon fixing the maximum increase in the global temperature to be at 2 degree above pre industrial level. In long term the global temperature will be kept below this level. Meanwhile, many details are still to be refined and formulated. The summit was full of high controversies and many scholars think that it failed on many

counts. Obama was of the view and hinted that it was China which was responsible for the failure of the deal. American officials have sent the signals that the deal is a "meaningful agreement"(Barak Obama at <http://www.guardian.co.uk>) but even then US president thinks that the progress is not enough. Still a long way has to be carried. The United Kingdom prime minister said that the agreement assures that the deal become final. He well articulated in his speech that this is the first step we are taking towards a green and low carbon future for the world, steps we are taking together. But like all first steps, the steps are difficult and they are hard. On the other hand the countries of the BASIC group which are China, South Africa, India, Brazil and the US, remained intact. They stood firmly on the question of the fast finance for the poor countries and lots of churning took place between these countries and finally they came to conclusion that they will take individual emission cut target until the new deal is not finalized.

The French president Nicolas Sarkozy too was in a favor of the individual countries taking voluntary target. The maximum target of rise in the temperature was set till 2 degree Celsius. This disappointed African and other vulnerable countries which had been holding out for deeper emission cuts to hold the global temperature rise to 1.5C till this century. The vulnerable groups formed their own lobby in the summit and they pressed hard for deeper emission cuts. The main argument they put forward that they are the ones who are going to suffer the most in the coming years due to the rising of sea level. But they are not the responsible country for the problem of rising temperature is the vital step and accepted there was a lot more work to be done.

Finance

The commitment of \$30 billion for climate aid between 2011-2012 was the single important concrete outcome Copenhagen summit. But still America and other western countries are reluctant in awarding the so-called 'fast-start' finance, and this delay could make the condition worst if the rifts continue for the long. A fresh fault line opened up in Cancun climate summit after rich countries were accused of not delivering on their promise of \$30 billion in aid to countries that will experience the worst ravages of global warming. Guyana, Bangladesh, Maldives has complained. The Indian environment

minister in the summit Ramesh told the Guardian “We are one year after Copenhagen, and the real issue is: how much of the fast start has been actually disbursed?” (Ramesh 2010) He also complained and spoke on behalf of China, India, South Africa and Brazil – the block of major emerging economies that succeeded in brokering deal with Barack Obama one year back. “Regarding institutions for financing, developing countries have long called for a separate and dedicated fund for the implementation of the climate change regime”(Joanna Depledge,2008:162).Many developing countries wanted that at least \$100 billion to be disbursed till the end of June next year. Japan on the other hand showed negative signal that if developing countries are not coming on the board it will not join the post Kyoto commitment .In the final it was decided that America and other rich countries were to begin mobilizing \$10 billion a year till the end of year 2012 to help safeguard the poorest countries from the effects of climate change.

US officials have reiterated that they are committed to the fund. However, the Obama administration has pledged only \$1.7bn till 2009.

Transparency was also the key issue in the summit. Many countries especially the poor ones alleged that the money transferred to their countries has certain tags attached. As the money which was transferred as aid was also included in the climate accounting pattern .This mixing of the account is kind of deceit by the rich nations. Also the money which was meant for the poorest countries which is, small island nations, low-lying states and sub-Saharan Africa in particular could not be utilized.

The main outcome

The increase in global temperature should be below 2 degrees. This was not in consonance with the 100-plus nations who wanted a lower maximum should be around of 1.5C, including many small island states which fear that even at this lower level their homes may be submerged. No date for the peak year was finalized the text of the Kyoto read as follows “We should co-operate in achieving the peaking of global and national

emissions as soon as possible, recognizing that the time frame for peaking will be longer in developing countries"(The Guardian:2009)

This is quite vague in nature and led to the disappointment to many of those who want nations to set a date for emissions to fall, but will definitely in favor of developing countries who wanted to put the economy first. "Parties commit to implement individually or jointly the quantified economy-wide emissions targets for 2020 as listed in appendix 1 before 1 February 2010". This phrase commits developed nations to start work almost immediately on reaching their mid-term targets. For the US, this is a weak 14-17% reduction on 2005 levels; for the EU, a still-to-be-determined goal of 20-30% on 1990 levels; for Japan 25% and Russia 15-25% on 1990 levels.

The accord makes no mention of 2050 targets, which dropped out of the text over the course of the day. About the forest "Substantial finance to prevent deforestation; adaptation, technology development and fund transfer and technical capacity". This is crucial because more than 15% of emissions are attributed to the clearing of forests. Conservation groups are concerned that this phrase lacks safeguards. Regarding the money it was said in the accord that "The collective commitment by developed countries is to provide new and additional resources amounting to \$30bn for 2010-12 Developed countries set a goal of mobilizing jointly \$100bn a year by 2020 to address needs of developing countries." (Watts J.2009)This is the cash which was very important for the deal. The first section is a quick financial assistance from rich nations to support developing countries' efforts to reduce the green house emission through the Kyoto mechanism in their countries. In longer term, a much higher sum of the money is required in the green climate fund. But the agreement still leaves open the questions that from where the money will come from and what will be its method of utilization.

The Real Gains of the Deal

The Copenhagen Accord, as it was named last night, makes reference to the need to keep temperature rise to not more than 2C and says rich countries will commit to cutting greenhouse gases and developing nations will take steps to limit the growth of their emissions – but sets no targets. Under the accord, countries will set out their pledges for the action they plan to take to tackle climate change, in an appendix to the document, and

will provide information to other nations on their progress. There are promises of short term finance to the tune of \$10bn a year over three years for poor countries to help them fight climate change, and a long term funding package worth \$100bn a year by 2020. There are also references to the importance of reducing deforestation and efforts to give poor countries access to technology that helps them go green.

The Expectation: Failure or Success

Originally, the plan was for the Copenhagen talks to deliver a comprehensive, legally-binding international deal to tackle climate change. But it has been clear for some time that such an agreement would not materialize at these talks. In the immediate run-up to the negotiations, it was hoped a political agreement could be reached, which could then be turned into a legal treaty next year. We did come out of the talks with a political agreement drawn up by leaders and which was eventually accepted by the conference of more than 190 countries this morning, but there are some major loopholes in the deal.

The Unsolved Question in the Summit

The summit leaves few ambiguities. Firstly there is no mention of any long term global emissions cut targets – although the 50% reduction by 2050 was called upon. Even that was dropped at the last minute. This is the emission which is required to meet the 2 degree temperature cap. There is no target set for the developed countries to take in the long term cut. Perhaps more important is the absence of any timescale for when or even if the deal could be turned into a legally-binding treaty. The other question which remained unsolved is about the deforestation. No key outcome was reached that how to tackle deforestation. These questions were left unanswered and were left for the next summit to come into conclusion. Leaders had expected to come to conclusion in Copenhagen for the end of the talks to sign some effective agreement. But nothing was archived in the summit .The summit became contentious and the official from the island nation and small countries began to blame the bigger countries for not taking the matters seriously, in spite of being responsible for the problem. But in later part of the summit eventually US announced it had secured agreement with China, India, Brazil and South Africa (the developing country group) for the deal, which was backed by EU.

The bigger question was that, whether the summit able to put forth any tangible thing forward which would be considered important for the future. Key players, including US president Barak Obama, Prime Minister Gordon Brown, and EU leaders have described it as a "first step" in dealing with global warming. But they themselves have admitted that as it stands, it isn't enough to address the problem. Nevertheless it was a point of satisfaction that at least something was achieved in the summit.

Despite that the climate change campaigner and few countries have reacted sharply, countries – including Bolivia, Venezuela, Cuba and Ecuador have refused to accept it, forcing UN climate chiefs to forge a compromise at the talks in which those who do agree will have to sign up to the declaration directly.

Did Any Progressive was Taken?

Secretary of state of U.K E.D. Miliband said that he wished there had been a timescale for a legally-binding deal, and he reiterated that he will be among those who have said that they would continue to work for that at upcoming climate summits. (E.D. Miliband at <http://www.guardian.co.uk>). Countries like India, Russia, china Mexico, Ukraine etc. have committed themselves to take the negotiation forward in positive direction. Even the UNITED States of America have committed itself for the voluntary action to reduce the green house gases, despite the fact that it always used to lurch away in taking the binding emission cuts. So things have shown positive move though all the outstanding issues have not been solved, still much water have flown since the Rio summit of 1992.

2.5.7 The Durban Summit

The Durban summit is the most recent summit held from 28 November 2011 to 11 December 2011. In addition, the two permanent subsidiary bodies of the UNFCCC – the Subsidiary Body for Scientific and Technological Advice (SBSTA) and the Subsidiary Body for Implementation (SBI) – also organized their 35th sessions along with the Durban summit. The summit was important in itself as it has to decide the new post Kyoto commitment period. Moreover the summit is also important for its decision on the

fund and setting new platform of discussion. The countries agreed to a legally binding treaty which would comprise of all the nations. The member states also resolved to come to conclusion for the next commitment period till 2005. They resolved to have a new commitment period from 2020. The 100billion fund agreed on the Copenhagen summit was given a legal status. It was decided to divulge 100 billion dollar till 2020. The fund will be looked after UNFCCC secretariat and the governing body will be UNFCCC and GLOBAL ENVIRONMENT FUND (GEF).

Temperature limit was endorsed to 2 degree Celsius. The UNFCCC extended the mandates of the two temporary subsidiary bodies – the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol (AWG-KP) and the Ad Hoc Working Group on Long-term Cooperative Action under the Convention (AWG-LCA) – so they were expected to meet as well.

A primary focus of the conference was to secure a global climate arrangements as the Kyoto Protocol's first commitment period (2008–2012) was about to end. It was also expected to emphasis on "finalizing at least some of the Cancun Agreements", reached at the 2010 conference such as "co-operation on clean technology", as well as "forest protection, adaptation to climate impacts, and finance – the promised transfer of funds from rich countries to poor in order to help them protect forests, adapt to climate change impacts. Russia proposed for a "periodic review" from which it will be possible for the countries currently categorized as "poor" could be re-categorized as "rich". This will oblige to shoulder greater obligations in the combat against climate change. Many scholars thought that the proposal could be most contentious in nature it will irk many developing nations. Potentially affected countries, such as China and Brazil, would "push back very strongly". Papua New Guinea put forth the proposal, supported by Mexico, which proposed "last resort" mechanism for breaking any deadlocks in climate change negotiations by a three-quarters majority vote, thus clarifying the decision-making process under the Convention. Describing the proposal as "intriguing", Black noted that although it would theoretically enable developing countries to use their numerical superiority to adopt any kind of world-wide binding obligation, in practical terms they would still need the approval of rich countries to secure funding.

The most bitter showdowns and high drama which preceded the last-minute agreement sidelined two key issues for developing countries — the workings of a Green Climate Fund, which is thought to channel money to help developing countries cope with climate change and how to facilitate technology transfer to poor and developing countries. The biggest problem in the talks is that of how to deal with the technology transfer when the west is trying to have benefit of the intellectual property right. Also the resentment was in some quarters for linking the trade negotiations and WTO talks with the climate change negotiations. Meanwhile Africa, India and others pushed hard for a second commitment on the legally binding Kyoto Protocol. They wanted that the second commitment period should be finalized as soon as possible. As the time is running it would be difficult for the world community to stop the global peaking of the temperature at 2 degree Celsius. And if this happens then result would be catastrophic and would be out of control. The Green Climate Fund, which was agreed at COP 16 in Copenhagen in 2009, and which is intended to provide US\$100 billion by 2020 to help the mitigation and adaptation activities of the world's poorest countries, was launched at Durban.

In practice, however, Durban's only concrete progress relating to the fund was the agreement that it would be overseen by a body under the UN, as desired by developing countries, rather than the Global Environment Facility (GEF), which the European Union and United States wanted.

The final document does not clarify where the money will come from or how much cash, if any, is already there. Other aspects such as the fund's host country, the trustees, or its links with two other key committees — the adaptation committee to oversee adaptation activities in developing countries; and the technology executive committee to oversee technology development and transfer — have yet to be worked out. The more controversial point suggested by developed countries that the fund can be utilized by the private corporate was criticized. The left countries Bolivia, Cuba Venezuela were the most vociferous and vehement to criticize the proposal. Even several civil society organizations criticized a clause which says that the fund will be able to finance private sector mitigation and adaptation activities at national, regional and international levels. There is no mention in the Durban document on the technology transfer of Intellectual Property Right (IPR), a contentious point for developing countries, a sticking point for

developing countries, who say patent restrictions will hinder the flow of green technologies from advanced countries.

So this issue needs comprehensive and broader look. Silvia Ribera, Latin America director of the ETC (Erosion, Technology and Conservation) Group, Mexico, an international NGO working on conservation and sustainable development, said: "Critique of monopoly patents on technologies, and the environmental, social and cultural evaluation of technologies, has been taken out [of technology transfer proposals]. Without addressing these fundamental concerns, the new technology mechanism will merely be a global marketing arm to increase the profit of transnational corporations."

For the technology transfer it was agreed at Durban that a technology mechanism will be fully operational by 2012 to "promote and enhance the research, development, and deployment and diffusion of environmentally sound technologies for mitigation and adaptation in developing countries". But black clouds are still hovering over it. The dead line has almost reached but very less has been achieved. But on the positive side the Durban agreement kick-started the search for opening for the Climate Technology Centre and Network to promote technology transfer between developed and developing countries.

This centre will be devoted to identify climate-friendly technologies; it will facilitate their deployment and adaptation in developing country needs. It will ensure building up of national and regional technology management capacity and also support the research, development and demonstration of new dynamic innovative climate-friendly technologies. In this respect requests for help from developing countries is sought by a large network of institutions, which will include regional climate technology centers, national technology centers, research organizations and other relevant institutions.

2.6 What Next?

After discussing the major climate change it can be said that till now the world climate negotiations have gone in unsynchronized way and there are many discords and problems attached. The rift between the developing and developed countries is apparently widened.

“Current negotiations within the United Nations Framework Convention on Climate Change (UNFCCC) suggest that North–South economic inequality will also play a significant role in the efforts to reach a multilateral agreement on how to proceed after the period of commitment within the Kyoto Protocol ends in 2012”(Bjoˆrn-Ola Linnˆe and Merle Jacob,2005:5)

Under such situation world community has to take recourse to constructive and inclusive talks so that the problem could be resolved with utmost seriousness. For few it was success for few it was failure. Harjeet Singh, Action Aid's International Climate Justice Coordinator, said "The deal has totally failed" (Singh H. 2011) to the media, adding that "there is no money on the table for Africa to start acting on climate change, and the money is in form of pledges — not legally binding. The Green Climate Fund is like an empty shell." (Singh H.2011) but for some it has brought the mixed response and the real outcome has to be tested in future meet Salimul Huq, senior fellow in the International Institute for Environment and Development's climate change group, said: "The Durban agreement keeps the UN Framework Convention on Climate Change process going, but at such a low level of ambition that it is questionable whether it represents sufficient progress compared with previous COPs"

Chapter 3

THE KYOTO PROTOCOL AND RUSSIA

3.1 What is Kyoto Protocol?

The Kyoto Protocol was adopted in Kyoto, Japan, on 11 December 1997. Though it was adopted in 1997 but was finally ratified in February 2005 when Russia adopted the protocol and “operationalised” the Convention. There are two types of countries in the protocol which are categorized in two groups- Annexure 1 and Annexure 2 countries. It commits the industrialized countries to stabilize greenhouse gas emissions to the 5.2 % of the 1990 level. There is some leniency provided to few countries. There are six gases committed in the protocol; Carbon dioxide, Methane, Nitrous oxide and group of three gases Perfluorocarbon, Chlorofluorocarbon and Sulfur hexafluoride. In the convention Russia has committed to stabilize the green house emission to 1990 level. The base year is taken as 1990 for Carbon dioxide, Methane and Nitrous oxide. The base year for group of three gases is taken as 1995. The Kyoto protocol is signed by 192 countries. Annexure 1 includes 37(at present) which are developed countries and countries of economy in transition. Russia is one of them and is counted in annex-I economy in transition category. Overall, these targets add up to an average 5% emissions reduction with reference to 1990 levels over the 5 years period from 2008 to 2012.

Kyoto Protocol was structured on the principles of the Convention. It sets binding emission target for developed countries only. Developed countries are predominantly responsible for such high level of emission. Since the industrial revolution developed countries are continuously emitting the green house gases in the atmosphere. Under Kyoto Protocol, heavier binding emission cuts have been assigned to the developed countries under the principle of ‘common but differential responsibility’ (CBDR). The principle of CBDR recognizes the fact that all the countries have common responsibility for the emission but advanced countries shall have to take the lead. As they are more responsible and capable of reducing the green house gas in comparison to the poor weak and under developed and developing countries.

The back bone of Kyoto protocol

The Kyoto Protocol is made up of vital mechanism that has been built and shaped as a result of almost two decades of understanding, hard work and political will. The core structure of Kyoto Protocol is made up of:

1. Reporting and verification procedures
2. Flexible market-based mechanism
3. A compliance system

The first is binding emissions reduction commitments for developed Annexure 1 countries. This meant that each country has a limited space to pollute. “A greenhouse gas emission (mostly Carbon dioxide) has now become a new commodity which can be traded” (Roman Lokhov and Welsch Heinz :2008). This sets the base for second, the flexible market mechanisms of the Kyoto protocol, based on the trade of emissions permits. Kyoto Protocol countries are bound to meet the emission targets mainly through domestic action that is, to reduce their emissions within their country. If they fail to meet the target, they can meet part of their targets through “market-based mechanisms” provided in the protocol. It promotes Green House Emission (GHG) reduction through most cost-effective methods. In simple terms, it does not matter where emissions are reduced, as long as they are eliminated from the Earth’s atmosphere. This has the similar benefits of stimulating green investment in developing countries and of including the private sector in this endeavor to cut and hold steady GHG emissions at a safe level. It also makes "leap-frogging" more economical that is what makes it possible for a country to remove its older technology by adapting a newer green technology.

Kyoto Protocol has prompted governments to set up legislation and make policies to meet their commitments; to establish a green technology market of investment, and the formation of a carbon market. “The Kyoto Protocol sets up a compliance mechanism which is designed to strengthen the Protocol’s environmental veracity support, carbon market’s integrity and to ensure clarity of accounting by Partie” (Arild moe and kristian Tangen, 2000:45). Its objective is to facilitate, support and impose compliance with the commitments under the Protocol. It is among the most widespread and meticulous systems of compliance for a multi-lateral environmental agreement. A strong and

effective compliance mechanism is the key to the successful implementation of the Protocol.

3.2 Status of Ratification

In accordance with the Article 24 of the Protocol, it was open for signature from 16 March 1998 to 15 March 1999 at United Nations Headquarters for the parties. Till 1997 there were 84 countries to sign the treaty. Countries like United States of America, Australia and Russia were not the signatory to the protocol at that time. As per the Article 22 of the Protocol, any country can accede to the convention after that date also. The Protocol entered into force on 16 February 2005. As per the Article 23 of the convention, the basic requirement of the Protocol to come in force was that at least 55 countries contributing 55 % of the total emission of the world should deposit their instruments of ratification, acceptance, approval or accession. The condition was reached when the Russian federation ratified the Protocol on 16 February 2005. Currently, there are 192 Parties (191 States and 1 regional economic integration organization) under the Kyoto Protocol. The total percentage of Annex I Parties emissions is 63.7%. The only regional organization in the Protocol is European Union.

3.3 Annexure I and Non Annexure I Countries

The Kyoto protocol parties are grouped into two categories- Annexure I and non-Annexure I countries. This category is based on the fact that not all the countries are equally responsible for the green house emission. The principle under standard terms is referred as common but differential responsibility (CBDR). This is based on the fact that rich and industrialized countries are more responsible for the current global emission level. As per the CBDR, the developing countries have suffered a lot. They are not the ones responsible for such high emission as compare to developed countries, but they have to equally suffer due to this problem. And therefore their emission level (both historic and present) is very low as compared to developed countries. The annex-I countries are Austria, Iceland, France, Germany, Russia, Ukraine, Italy, Japan, Netherland, Portugal, Norway, Poland, Romania, Spain etc. Though countries like USA are also developed and highly industrialized but have opted to keep them out of the

Protocol. This is the biggest point of criticism because United States of America is the biggest emitter of green house gases (GHG).

In Annexure I category there is further classification: Annexure A and Annexure B countries. The Annexure A are the countries which have taken binding emission cut commitment, but their economy is not so developed that they could contribute in the funding of developing countries. Thus The Annexure I (A) countries are termed as "Economy in Transition," (EIT). These countries do take emission target but have no liability in funding pattern. The countries included in Annexure I (A) are: Russian Federation, Turkey, Belarus, Bulgaria, Croatia, Czech Republic, Hungary etc. The Annexure (B) countries are Austria, France, Germany, U.K., Ireland, Japan, Portugal, Spain, and Sweden.

3.4 Provisions of Kyoto Protocol.

The Kyoto text is very concise and clear that explains the overall functioning, working rules and regulation of the protocol. Article 1 of the text defines the meaning of the words like Conference of the Parties, Intergovernmental Panel on Climate Change, Montreal Protocol, Parties present and voting Party, Party included in Annex I. Article 2 is very important as it makes certain basic rules mandatory for each party. It reads for the reduction of the emission:

(a) Implement and/or further elaborate policies and measures in accordance with its national circumstances, such as:

- (i) Enhancement of energy efficiency in relevant sectors of the national economy;
- (ii) Protection and enhancement of sinks and reservoirs of greenhouse gases not controlled by the Montreal Protocol, taking into account its commitments under relevant international environmental agreements; promotion of sustainable forest management practices, afforestation and reforestation;
- (iii) Promotion of sustainable forms of agriculture in light of climate change considerations;
- (iv) Research and promotion, development and increased use of new and renewable forms of energy, of Carbon dioxide sequestration technologies and of advanced and innovative environmentally sound technologies;

- (v) Progressive reduction or phasing out of market imperfections, fiscal incentives, tax and duty exemptions and subsidies in all greenhouse gas emitting sectors that run counter to the objective of the Convention and application of market instruments;
- (vi) Encouragement of appropriate reforms in relevant sectors aimed at promoting policies and measures which limit or reduce emissions of greenhouse gases not controlled by the Montreal Protocol;
- (vii) Measures to limit and/or reduce emissions of greenhouse gases not controlled by the Montreal Protocol in the transport sector;
- (viii) Limitation and/or reduction of Methane emissions through recovery and use in waste management, as well as in the production, transport and distribution of energy.

These are the basic expected moves which the Kyoto Protocol seeks from each country to include in their policies.

Article 3 is very important article as it sets the emission reduction, progress of reduction, emission commitment period, and net change in the green house emission by sinks and source mechanism in place. It also makes the meeting of parties and submission of the annual reports mandatory. It also gives mandate to EIT countries to set their base year as it reads “The Parties included in Annex I undergoing the process of transition to a market economy whose base year or period was established pursuant to decision 9/CP.2 of the Conference of the Parties at its second session shall use that base year or period for the implementation of their commitments under this Article”. (UNFCCC 2012a)

This article is also important for Russian federation because it gives some flexibility for EIT countries in mitigating the target as it reads “Taking into account Article 4, paragraph 6, of the Convention, in the implementation of their commitments under this Protocol other than those under this Article, a certain degree of flexibility shall be allowed by the Conference of the Parties serving as the meeting of the Parties to this Protocol to the Parties included in Annex I undergoing the process of transition to a market economy”. The commitment for the successive period is also inherited in this article as it is written in the article that “Commitments for subsequent periods for Parties included in Annex I shall be established in amendments to Annex B to this Protocol, which shall be adopted in accordance with the provisions of Article 21, paragraph 7”. (ibid)

The Article 4 deals with the deeper nuances of the article 3, their reporting to secretariat etc. The detail provisions are as follows:

1. Any Party included in Annex I that have reached an agreement to fulfill its commitments under Article 3 jointly, shall be deemed to have met those commitments provided that its total combined aggregate anthropogenic Carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A does not exceed the assigned amounts calculated pursuant to its quantified emission limitation and reduction commitments inscribed in Annex B and in accordance with the provisions of Article 3. The respective emission level allocated to each of the Parties to the agreement shall be set out in that agreement.
2. The Parties to any such agreement shall notify the secretariat of the terms of the agreement on the date of deposit of their instruments of ratification, acceptance or approval of this Protocol, or accession thereto. The secretariat shall in turn inform the Parties and signatories to the Convention of the terms of the agreement.
3. Any such agreement shall remain in operation for the duration of the commitment period specified in Article 3, paragraph 7.
4. If Parties acting jointly do so in the framework of, and together with, a regional economic integration organization, any alteration in the composition of the organization after adoption of this Protocol shall not affect the existing commitments under this Protocol. Any alteration in the composition of the organization shall only apply for the purposes of those commitments under Article 3 that are adopted subsequent to that alteration.
5. In the event of failure by the Parties to such an agreement to achieve their total combined level of emission reductions, each Party to that agreement shall be responsible for its own level of emissions set out in the agreement.
6. If Parties acting jointly do so in the framework of, and together with, a regional economic integration organization which is itself a Party to this Protocol, each member State of that regional economic integration organization individually, and together with the regional economic integration organization acting in accordance with Article 24,

shall, in the event of failure to achieve the total combined level of emission reductions, be responsible for its level of emissions as notified in accordance with this Article.

The most innovative creation of the Kyoto protocol which deals with the ‘Carbon Trading’ and the method of its trading are given in the Article 6 of the protocol. It reads as follows “For the purpose of meeting its commitments under Article 3, any Party included in Annex I may transfer to, or acquire from, any other such Party emission reduction units resulting from projects aimed at reducing anthropogenic emissions by sources or enhancing anthropogenic removals by sinks of greenhouse gases in any sector of the economy, provided that:

- (a) Any such project has the approval of the Parties involved;
- (b) Any such project provides a reduction in emissions by sources, or an enhancement of removals by sinks, that is additional to any that would otherwise occur”

The article 7 makes it for the countries to make a resource inventory as it reads “Each Party included in Annex I shall incorporate in its annual inventory of anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol, submitted in accordance with the relevant decisions of the Conference of the Parties, the necessary supplementary information for the purposes of ensuring compliance with Article 3” (ibid)

The articles 8 and 9 are important as they set the reviewing mechanism by an expert review team, the review process, the formation of the review team, time frame of the review, action taken after the review. Article 10 along with the Article 4, paragraphs 3, 5 and 7, formulate these

- (a) Cost-effective national, regional programmes to improve the quality of local emission factors, activity data and/or models which reflect the socio-economic conditions of each Party.
- (b) To Formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change and measures to facilitate adequate adaptation to climate change. Sets programmes for agriculture, forestry and waste management, adaptation of technologies and methods for improving spatial planning would improve adaptation to climate change; and to Article 4, paragraph 8, of the Convention.

The Article 12 is also an important article as it defines the clean development mechanism, the purpose of clean development mechanism, modalities of clean development mechanism, certified emission reduction, supervision of the mechanism. This article is very important in perspective of the Russian federation. The article 13 defines the parties to conference, their meeting, their mandate, their functioning, and the powers of the conference of the parties. It reads as follows “conference of parties will Assess, on the basis of all information made available to it in accordance with the provisions of this Protocol, the implementation of this Protocol by the Parties, the overall effects of the measures taken pursuant to this Protocol, in particular environmental, economic and social effects as well as their cumulative impacts and the extent to which progress towards the objective of the Convention is being achieved”. (ibid)

The Article 17 the Conference of the Parties shall define the relevant principles, modalities, rules and guidelines, in particular for verification, reporting and accountability for emissions trading. The Parties included in Annex B may participate in emissions trading for the purposes of fulfilling their commitments under Article 3. Any such trading shall be supplementary to domestic actions for the purpose of meeting quantified emission limitation and reduction commitments under that. The Article 18 deals with the appropriate and effective procedures and mechanisms to determine and to address cases of non-compliance with the provisions of this Protocol. This article tells that non compliance may lead to the removal of the country from the convention. Article 20 deals with the amendment process, agreement, voting manner for taking any decision among the parties. The Article 21 deals with the amendment process in the protocol. The various process of amendment, requirement of the amendment and restriction of the amendment etc. are dealt with in this article.

The Article 24 is important from European point of view as it allows any regional party as a single body to take part in Kyoto Protocol as it reads “Any regional economic integration organization which becomes a Party to this Protocol without any of its member States being a Party shall be bound by all the obligations under this Protocol. In the case of such organizations, one or more of whose member States is a Party to this Protocol, the organization and its member States shall decide on their respective”. (ibid)

European Union is participating in the Kyoto protocol as one separate group as per this article. Lastly, Article 27 is an important clause which is used by Canada recently. It makes provisions for leaving the treaty. According to the article “At any time after three years from the date on which this Protocol has entered into force for a Party, that Party may withdraw from this Protocol by giving written notification to the Depository” (Kyoto Text at http://unfccc.int/essential_background/kyoto_protocol/items/1678.php). These are the broader provisions of the Kyoto dealt in brief. For the detail study the whole Kyoto text is attached as the annexure in the last.

3.5 Kyoto Bodies

Under the Kyoto protocol the key bodies came into existence are discussed here. The main body of the Kyoto protocol is the “The Conference of the Parties (COP)”. The conference of parties serves as the meeting of the Parties to the Kyoto Protocol. This is referred in official terms as the “*Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP)*”.

This is the main body meets annually during the same period as the Conference of parties. The countries and parties which are not Parties to the Protocol are able to participate in the CMP as observers, but without the right to take decisions these countries cannot vote in any decision. The functions of the CMP relating to the Protocol are similar to those carried out by the COP for the Convention. Its first meeting took place in Montreal, Canada in 2005.

The second main body of the Kyoto protocol is Subsidiary Body for Scientific and Technological Advice (SBSTA) and the Subsidiary Body for Implementation (SBI). These are the permanent bodies of the Kyoto formed under the convention. These are the bodies which look about the technical aspect of the green house gases. The reports of the green house inventories are looked into by these bodies. This body is also responsible for the setting the new agenda for the technical aspect of the protocol. It reviews the implementation of the green house inventories of the member parties. The new modalities are also set by this committee. (UNFCCC 2012b)

3.5.1 The Bureau

The Bureau of the Conference of Parties also serves as the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP). However, any member of the COP Bureau representing a non-Party to the Kyoto Protocol has to be replaced by a member representing a Kyoto Protocol Party.

3.5.2 Clean Development Mechanism (CDM) Executive Board

The Clean Development mechanism Executive board supervises the CDM under the Kyoto Protocol and prepares decisions for the CMP. It undertakes a number of tasks relating to the daily- operation of the CDM, including the accreditation of operational entities.

3.5.3 Joint Implementation Supervisory Committee

The CMP has full authority and control over the Joint Implementation Supervisory Committee (JISC), and it also provides guidance JISC .The main function of this committee is to supervises the verification of emission reduction units (ERUs) generated by Joint Implementation projects for reducing the green house gases . The main verification of the joint implementation is also done by this committee. (UNFCCC 2012)

3.5.4 Compliance Committee

The main function of this committee is to look after the compliance of the countries to implement the various programs and effort to mitigate their targets. The compliance regime consists of a Compliance Committee made up of two branches: a Facilitative Branch and an Enforcement Branch.

So, these are the main committees formed under the Kyoto mechanism to look after the functioning of the protocol.

3.6 Kyoto Mechanism

The Kyoto mechanism is a unique innovation in itself. The world community has created a mechanism which can serve the needs of all the countries, as per their capabilities, to

bring down the emission level as fast as possible. As per the Kyoto protocol parties with commitments to limit or reduce greenhouse gas emissions must meet their targets predominantly through national measures within their domestic boundary. If however any country is not able to meet the committed emission level then there are “flexible mechanism” provided in the protocol itself. This will act as an additional means of meeting the targets. The Kyoto Protocol introduced two market-based mechanisms, thereby creating what is now known as the “carbon market.”

These Kyoto mechanisms are:

1. Clean Development Mechanism
2. Emission Trading

To participate in the Kyoto mechanisms, Annex I Parties must fulfill certain basic requirements. Without these any party cannot take part in the mechanism. These are:

- Country must have ratified the Kyoto Protocol.
- Country must have calculated their assigned amount in terms of tones of CO₂-equivalent emissions.
- Party must have in place a national system for estimating emissions and removals of greenhouse gases within their territory.
- Country must have in place a national registry to record and track the creation and movement of Emission Reduction Units (ERUs), Certificate of Emission Reductions (CERs), Assigned Amount Units (AAUs) and Removal Units and must annually report such information to the secretariat.
- They must annually report information of emissions and removals to the secretariat.

The countries following these basic requirements can participate in CDM and ET. These are discussed here one by one.

3.6.1 Clean Development Mechanism (CDM)

The Clean Development Mechanism (CDM) is defined in Article 12 of the Protocol. It is the first global, environmental investment and credit scheme of its kind that provides standardized emissions offset mechanism- certificate of emission reduction. It allows a country with an emission-reduction or emission-limitation commitment under the Kyoto Protocol of annexure 1 countries; reduce their emission by implementing the reduction project in any other country. The project so implemented can earn saleable certified emission reduction (CER) credits. The certificate of reduction will be assigned by clean development executive board. Each certificate of emission is equivalent to one ton of CO₂, which can be counted towards meeting Kyoto targets. This is a mechanism which has many benefits of its own. It is a trailblazer kind of mechanism that can be well implemented on the ground. A country (annex-I) can invest in hydro power, solar energy, tidal energy, geothermal energy etc. The reduction of the emission by this investment will earn that country Certificate of Energy Reduction. These CERs can be counted in the investing country account for the reduction of the emission as if the country has reduced the emission within its boundary. Also if the country is able to produce surplus certificate of reduction then that country can sell these certificate of reduction to the country which is not able to reduce their emission as per the committed levels. thus the country which is not able to meet the emission cut target can purchase the certificate of emission reduction and that will be counted as if the country has itself reduced the emission .Thus the mechanism promotes the sustainable development and emission reduction with ease and simple process. At the same time it also provides industrialized countries some flexibility to meet their emission reduction or limitation targets.

Operating details of the CDM

As per the Kyoto protocol CDM project must provide emission reductions that are additional to what would otherwise have occurred. Not every project is countable in the clean development Mechanism. The projects must qualify through a difficult public registration and issuance process. The approval for the project to be included in the CDM is given by the Designated National Authorities of the concerned country. The whole mechanism is overlooked by CDM Executive Board which is answerable finally to the

countries that have ratified the Kyoto Protocol. The CDM is Operationalised since 2006. At present more than 1,650 projects has already been registered are anticipated to produce CERs amounting to more than 2.9 billion tonnes of CO₂ equivalent in the first commitment period of the Kyoto Protocol of four years between 2008 and 2012. (UNFCCC at http://unfccc.int/kyoto_protocol/kyoto_protocol_bodies/items/2772.php)

3.6.2 Joint Implementation

The joint implementation under Kyoto mechanism is given in Article 6 of the Kyoto Protocol. This mechanism is applicable only for annexure 1 countries of the convention. It allows a country under the binding emission regime to trade carbon amongst them (Annex B Party). The joint implementation can only be done among the developed and industrialized countries. After the implementation of the reduction project the emission reduction units (ERUs) can be earned similar to the certificate of emission reduction (CER) obtained in the clean development project. The main difference between the clean development project and joint emission reduction is that, the former is implemented in the developing countries while the later is implemented in the developed and industrialized countries. Each emission reduction units (ERUs) are equivalent to one ton of CO₂. This emission reduction obtained by the countries is counted in the emission reduction targets of the countries. Thus this mechanism provides a flexible mechanism to the develop countries to meet their emission target. The mechanism also helps the host country by transfer of the technology.

Eligibility and approval

Under the eligibility and approval of joint implementation, the project must provide reduction of emissions by sources category of reduction. The removals of the emission by sinks that is additional to what would otherwise have occurred can be traded. Every Project must be approved by the host country and participants have to be authorized to take Part in the project, provided that they meet the requirements of the protocol.

Track 1 and track 2 procedures

The track 1 procedure in the Kyoto protocol is defined as “If a host Party meets all of the eligibility requirements to transfer and/or acquire ERUs, it may verify emission reductions or enhancements of removals from a JI project as being additional to any that would otherwise occur. Upon such verification, the host Party may issue the appropriate quantity of ERUs”

while the track 2 procedure is defined as “If a host Party does not meet all, but only a limited set of eligibility requirements, verification of emission reductions or enhancements of removals as being additional has to be done through the verification procedure under the Joint Implementation Supervisory Committee (JISC)”.

Thus on analyzing the Kyoto mechanisms, we can say that the Kyoto mechanism has following specific benefits: The mechanism promotes the sustainable development through technology transfer and investment in the energy efficient projects. It helps the countries meet their targets by reducing the emissions by implementing the projects in a very cost-effective means meanwhile giving impetus to the private entrepreneur to innovate and earn profit .The carbon market has emerged as a key tool for reducing emissions worldwide. It was about 30 billion dollars in 2006 and is growing at rapid rate. Under the Kyoto protocol all the Annex I Parties must give information in their national communications to show that their use of the mechanisms is “supplementary to domestic action” to achieve their targets. The facilitative branch of the compliance committee looks after the functioning of the mechanism.

3.7 Reporting and Review of Annexure I Countries under Kyoto Protocol

The reporting pattern of the United Nations framework convention on climate change (UNFCCC) is non-binding in nature. But this is not the case with the nature of Kyoto commitment, its compliance require much more stringent, transparent and open mechanism. The main body for looking into the matters of the deviation or aberration from compliance is enforcement mechanism. The problems relating to compliance have been discussed earlier in detail in this chapter. The review committee under the protocol forwards the report under compliance mechanism. The enforcement directorate, apart

from looking into these matters, also has additional duty of looking into matters regarding eligibility criteria for participation into Kyoto protocol. The national registry, that is to be submitted annually to the secretariat. If there is any problem relating to the submission of National Registry, or there is non-submission of national registry to the secretariat or any discrepancy in it, such may lead to disqualification and therefore suspension of eligibility from protocol. Further the matter is looked into by the enforcement directorate. Enforcement directorate functions as an investigative agency. It does not have any power of its own. The findings of the enforcement are forwarded to the convention of the parties. Where, the final decision is taken by the majority.

The key documents for national green house countries are:

1. IPCC good practice guidance for land use, land use change and forestry (LULUCF)
2. Revised IPCC guidelines for National Green House inventories
3. Guidelines for the preparation of national communication by parties included in Annexure I to the convention, part I UNFCCC reporting guidelines on annual inventories.
4. Guidelines for the technical review of GHG inventories from parties included in Annex-I to the convention.

The reporting and review guidelines are prepared by the subsidiary bodies of the convention. The review mechanism, are primarily important for the Annex-I, countries as they are the one that have taken binding emission cuts under Kyoto protocol. The reports prepared by the subsidiary bodies are finally presented to the conference of parties or CMP, the final decision making body. The guidelines for the green house gas inventory are usually presented in the form of references to the guidelines prepared by Inter governmental panel for climate change (IPCC). (UNFCCC 2012c)

3.7 Funding Pattern under Kyoto Protocol

As per the rules, fund for the developing countries will be provided by annexes II countries. The fund shall be created by these countries to enable the developing countries to meet the challenges of Kyoto protocol and mitigate the adverse effect of GHG emission (As per astute 4.3 and 4.4 of the convention). A financial mechanism is established by the parties. The financial assistance to developing countries is to be channelized through global environment facility (GCF). The convention also specifies that the financial resources from the developing countries shall take route only through the operating of connation's financial mechanism. Also, the protocol specifies that the proceeds of the fund will be collected by the share of the clean development mechanism as per the article 12 of the protocol. The main issues of the funding pattern to the vulnerable countries was resolved in the conference of parties (COP) -4, which was held in November, 1998 in Buenos Aires , Argentina. This is called **Buenos Aires Plan of Action**. Further need was felt to have proper organics institutional mechanism, which can act as a permanent body specifically dealing with the transfer of fund.

So the decision was taken in conference of parties (COP-6) held in Bonn (Germany) in July 2010. The Bonn agreement on Buenos Aires Plan of Action was adopted under this agreement on key issues, including the funding under convention. It was resolved to work upon two detailed decisive of funding under convention and Kyoto protocol, based on the Bonn agreement. Mean while it was decided to establish “**Adaptation Fund**” and “**Convention Fund**” under global environment facility. In July 2011, a decision was taken in forming three new funds (a) a special climate change fund (b) least developed countries fund under connection and (c) an adaptation fund under Kyoto protocol. These funds are managed by a single authority which operates the financial mechanism of connection.

These funding bodies under the connection will have the mandate of financing the activities relating to climate change in the area of technology transfer, adaptation, transport, energy, industry, forestry, waste management and also to assist countries whose economy is primarily based on money generated from fossil fuels. The least developed counties fund will be for specific problems of the LDC defined under United Nations.

The source of this least developed countries' fund will also be generated by the proceeds of the clear development mechanism and other funding sources as well. By 2005, many developed countries had vowed to finance about 410 million dollar to the fund. The Annex-II countries have to report on annual basis to the UNFCCC about the contribution of their financial assistance.

3.9 Role of Russia in Bringing Kyoto Protocol.

Russia has very important Role in bringing the Kyoto Protocol into effect because of the conditionality of its coming into force. As per Kyoto initial talks it was decided that for Kyoto Protocol to enter into force to basic requirement are must

- a) At least minimum 55 countries should ratify the Protocol and
- b) These countries should contribute minimum of 55 percentage of total emission of the world.

This 55 percentage will be counted on the base year 1990. So, Russian federation, which accounted for 17% of the global emission of the world, became very crucial for the Protocol to enter into the force. The importance of Russian Federation is crucial because the biggest emitter of the world the United States of America had denied taking any binding emission cut. "The US and Australia appears to be working in tandem in both their domestic and foreign climate change policy" (Robyn Eckersley, 2005:67). The total emission reduction of United State is about 34% of the 1990 level. So, without the US cooperation it was only Russia which could help in striking the deal. Given the fact that European community and Japan has shown positive response in joining the treaty, it was easier for Kyoto to come into effect if Russia would not have joined it. The US President Bush had already rejected the Protocol as "fatally Flawed". Also in United State, some quarters were skeptical of need of high investment for buying the carbon credits which will prove fatal to their economy. Also, Russia would gain windfall sum of money by selling carbon credits. Russia, along with Ukraine will be the biggest carbon credit seller. This was a point of worry for united state as they thought that this could leads to monopolized behavior of Russia and Ukraine. Both the parties were antagonistic to its ideology and have been former cold war enemies. With the United States in the protocol, estimates of international trading price with optimal

monopolistic behavior, by Ukraine and Russia was in order of 38% (Burniaux, 1998) to 43% (Burnstain et al 1999). Further studies (Manne and Richels, 2001; Bohringes 2001; Blanchard and Cirqui, 2002) have of the same view regarding the monopoly of Russia on withdrawal of United States.

Under these circumstances the key issues which was the pillar for Russian policy to enter into Kyoto protocol were- Firstly, the benefits and welfare that will accrue to some countries due to the trade generated by the climate change mechanism. And the main trading thing that will come is from fossil fuels trading.

“In an interesting reversal of roles, after Russia's accession to the Kyoto Protocol in 2004, seven OPEC countries were inspired to follow and ratify Protocol, demonstrating Russia's newfound role as catalyst for international environmental cooperation.”(Jessica Tipton, 2008:6).

Russia could easily force other Annexure B countries to reduce their energy use by hiking the price of oil and natural gas. This can help Russia to gain huge profit by both declining oil requirements and high energy price. “Russia's economy needs fundamental reform to reduce greenhouse gas emissions,” President Dmitry Medvedev said at the international meeting in Brasilia in April 2010, saying the country could then meet its target of a 25% cut by 2020. Secondly, the banking of emission certificates could be in interest of Parties, keeping it for future use and such banking was allowed in the protocol. This could have enabled Russia to bank its emission certificate to be sold on future date. As all its permits may not sell within the commitment period due to raising price of the permits. And lastly, Russia was apprehensive that though they would gain a monopolistic position in certificate of emission reduction but still the other "flexible mechanism" like "Joint Implementation", “cleared development Mechanism” could offset its power to gain monopoly in the climate change carbon trade. Several studies have found more or less the same result.

The position of Russia in Ratification was much strong though there were some irritants. The main amongst them was non-inclusion of land use, land use change forestry in accounting of the reduction of the emission. This led Russian think tank to keep away from the protocol. As, Russia has huge amount of forestry, if that is not

included in reduction of emission, it will be at great loss to Russia. So Russia pressed for the inclusion of land use, land use change and forestry in the accounting of GHG. As of May 2003, the Kyoto Protocol required only Russian federation to sign the pact, rest of the countries has already signed the pact. The Russian president Putin was in favour of Russia joining Kyoto Protocol. He personally was in favour of Kyoto protocol. "He bargained from European Union to give Russia support in joining World Trade Organization in link of joining Kyoto Protocol". (Roman Lokhov and Heinz Welsch,2008) After the deal with European Union, Russian President on may 2004 for the first time said that "we are for the Kyoto process" and "we will speed up the process Russia's more towards ratifying the protocol". Though he was criticized by some quarters as Russia is more interested in economic benefit than truly committed to environment protection. Green Price spokesman Tim Hollo said "Putin's comments are major inroad for environmentalist and will have an impact on global efforts to reduce green house emission".

Moreover, in joining Kyoto, Russia was going to have double benefit. Firstly it bargained on membership of WTO and secondly it is going to get benefited from the calling of carbon credit. As it was known that Russian emission level was already low than 1990 level. This means that if it enters into Kyoto, it will benefit from selling of carbon credit. So the "main attraction for Russia was "hot air" which it is going to sell"(report on Russia's role in Kyoto protocol by global science policy change,2003). The total amount of this hot air for Russia was estimated about 65 mtc and for Ukraine it is about 190 mtc. And this value for Eastern European countries was 300 mf. So even if all the eastern European countries larch towards European Union still Russia along with Ukraine will have bargaining power. All these things led Russian government to go for the deal and it passed the Protocol on 16 February 2005.

3.10 Russia and Critical Issues of Climate Change

The core interest of Russia is based on social, economical and political interests. From Rio to Copenhagen, Russia has shown very responsible behavior in every climate change negotiations. But as the environment talk's matured, Russian stand and interest began to

solidify. Later after the formation of United Nation Framework Convention on Climate Change (UNFCCC) and Convention of Biological Diversity, Russian minister of environment made it clear that the core interest of Russia in the trade talks is welfare of its own people along with the welfare of world community as a whole. Russia put high stress on the core aspect of climate change like-Conservation, Sustainability, Protection, Inclusiveness, Equality, Adaptation and Mitigation and Time frame.

Russian foreign policy is guided by this interest in any environmental talks. In the Kyoto Protocol too, Russia favored the welfare approach by not letting the poorest countries to take binding emission cuts. On the other hand it was very vocal and vociferous to bring USA into legally binding emission cut region. Russia strongly favours the idea of CBDR under which differentiated responsibility has to be taken by different countries as per their historical background. In this context in the recent Durban Summit too, Russia was in favour of the cause of small Island Nation Group. It is strongly in favour of creating some structure which could fasten the process of verification and mitigation procedure under UNFCCC. Also it is of the view that a strong committed step has to be taken by each and every nation of the world. This problem can only be solved on the basis of family approach where each country is the member of the family and work together to fight against a common threat.

We can say that Russian approach and interest as well, is justified and based in both scientific and human principal. In a way, Russia is one of the leaders in the climate change talks which have worked with diverse and different kind of countries to take some stringent step for the welfare of the world as a whole.

Chapter 4

AN ASSESMENT OF RUSSIA'S EFFORT TO MEET KYOTO PROTOCOL

4.1 Russian Approach towards Signing Kyoto Protocol

Russia from the very beginning is an important player in the climate change talks. The Rio Summit which took place in 1992 has full hearted Russian participation in whole climate change debate. Russia ever since has played very constructive and pivotal work in the climate change negotiation and Kyoto Protocol was no exception to it. During the initial phase of the Kyoto Protocol in 1997, when Kyoto was adopted, Russian official were reluctant to take any legal binding emission cut. The main cause of this reluctance was the attitude of United States of America. Russia was of the view that until US is not coming on the board any deal is not going to fructify. This is because the US is biggest emitter of the Green House Gases. If US is not supporting and taking any legal binding emission cut, no treaty will be effective and no effort will help in reducing the emission. After the withdrawal of USA from Kyoto Protocol in 2002, Russia was unwilling to ratify the treaty. It vehemently criticized the US stand. The emerging reality was that without the participation of Russia it was almost impossible to think for Kyoto to come into force. For Kyoto Protocol to come into force, the implicit condition in the treaty was that at least 55 countries responsible for 55% of the Global emission should ratify the treaty. Otherwise the Protocol cannot come in force. So, if Russia would have not joined the party, Kyoto would have never come into force. However, Russia ratified the treaty for the larger interests of the world community. In ratification of the treaty conflicting interest emerged from within the Russian community. However, long wait of the Russian ratification came to an end and its consent was culminated on three concrete grounds – Environmental, Economic and political.

The then President Mr. Putin's positive attitude towards environmental issues was the main force behind the environmentalist forces. The long historical content of Russia also played a major role. Apart from these, the media and civil society in Russia also played crucial role in bringing Russia's consent to the Protocol.

Economically too, the Kyoto Protocol benefits Russia through surplus carbon credits which would have accrued to it. Russia, on joining, would get fewer targets due to being in the category of economy in transition. Russia also has huge reserves of forest. So it would earn lot of revenues due to high forest area in the country by selling the carbon credits accrued to it. “The main attraction for Russia is a potential sale of “hot air”. a situation when emission quotas appear to be in excess of Russian anticipated emissions due to economic downturn of the 90s (Victoret al, 1998; Paltsev, 2000; Bohringer, 2000).The influence on Russia’s energy sector was also taken into consideration. Russia was given a comparative easy target of reducing their emission levels i.e. to keep its emission at 1990 or below 1990 level. This was an easy target considering the post cold war GHG emission which estimates that there was 25% reduction in the emission in the GHG level in Russia till 1990. Apart from these, the vast forests in Siberia was counted in “CARBON SINK” category which gave Russia at least 5% leverage. So Russia was put in to comparatively easy situation as compared to other western countries. So, it was prudent on the part of Russia to ratify the Kyoto Protocol. As it will help Russia to earn revenues by the mechanism of “CARBON TRADING”, where a country deficit of carbon credit (which could not meet its emission-cut targets) can purchase ‘carbon credits’ from a country which has reduced the emission more than required level. So, Russia will emerge as credit surplus country in Kyoto Protocol. So, it could sell the carbon to the needy country earning thereby higher revenues.

Also, during the second phase of the ratification process where the Annex-1 (industrialized and economy in transition) had to sign the treaty, Russia was in full advantage. As at least countries amounting to 55% emission of the total have to sign the treaty. After the withdrawal of USA from the Protocol, it was only Russia, having 17% if the green house emission could help Kyoto in coming to force. Thus it placed, Russia in greater dominant position. Above all, President Putin himself showed willingness to sign the treaty.

Political factors also played important role in bringing Russia on board .The internal politics also played crucial role. Few ministers were of the opinion that Russia need to do think more before signing the treaty. While, few important ministers were in support of the treaty. These included Deputy Economic Minister Mukhamed Tsikhanov, then Prime

Minister Mikhail Kasianov, Premier Viktor Khustenko and the most important figure was Putin, the then President of Russia. Also, "Given the reality of the Russian political system and the diverse interests of its constituencies, Russia may or may not ratify, use monopoly power or choose to optimally bank permits"(report on Russia's role in Kyoto protocol,2003:7).Thus the support from the strong ministers including president led Russian think tanks to go for the pact. Even the NGO's played important role in making favorable public and political opinion. All these led to final ratification by Russia in 2005.

4.2 Russian Approach towards Disputed Issues

Russian policy toward climate change is guided by strict principles, its internal politics, economic benefits and social considerations. In climate change talks it has shown very consistent approach in its strategy. Here we will discuss Russia's approach in the major issues of climate change.

Fund:

Russia has fully supported that the money should be transferred to the poor countries so that they can mitigate the losses they incur while fulfilling the targets to mitigate the climate change adaptation plans. So, Russia has always been in support for creating the green fund. On the issue of the increasing amount of Green Fund, Russia has reiterated that being a country of "Economy in Transition" it could not afford to contribute too much in the fund. Rather OECD countries should work together for increasing the amount of Green Fund. It has also pointed out that the European countries like U.K., France, Italy, and Germany and United States of America should work together and suffice the Green Fund as these are the countries which are the real culprit.

They have emitted maximum amount of green house emission gases since the industrial revolution. So they should pay more as they have committed maximum damage to the environment. Rationally these are the countries which should contribute more to the Green Fund. Russia have supported for creation 100 billion dollar corpus promised in Durban summit. But on the other hand Russia also called for the developed countries to use this money judiciously. Russia is in favor that this money should be channelized in a

structural way so that this money should be properly used and bring some real change in reducing the emission level. The money could not be given without any responsibility. This money should not be taken for granted and does not mean that the funds will be available forever and for any work.

The developing countries should also have to come one step forward to take up this challenge. Though it is clear, due to historical mistakes, though developed countries have greater responsibilities but on the same time developing countries, at present, are equal partners for higher emission level. Without the contribution and well-coordinated cooperation of the developed and developing countries it is not at all possible for the world to bring this emission level down. If the developed countries keep on decreasing the emission and developing countries keep on increasing there will be no target reduction in the emission level. Therefore Russia has always reiterated that proper utilization of the fund is equally important as the fund transfer in itself. So fund should be definitely created but judicious use of this fund should also be ensured in Kyoto protocol.

Technology Transfer:

Technology transfer is one of the most contentious issues between developed and developing countries. The stand of Russia is very crucial in this regard as it is one of the important Global partners in climate change challenge. In recent years, attention has focused on technology transfer as an instrument to mitigate global environment problems. (Eric Martinot, Jonathan E. Sinton, 1997:363). Since the inception of IPCC (Intergovernmental Panel on Climate Change) in 1988, the technology transfer is perpetual in climate change agenda. Russia along with the other Annexure 1 countries has tried to emphasize on more need of discussion on climate change. Russia though even in the past have provided the technology to the socialist countries without any tag but technology transfer under UNFCCC will be a different deal altogether. So Russia has kept patience in this issue. It has neither taken nor has initiative to support for technology transfer nor did it say anything against this issue. It has followed the policy of wait and watch. Though the technology is being transferred from Clean Development Mechanism (CDM) projects but that has limited scope. The technology transfer has greater repercussion in the trade and intellectual property regime. For this reason European

Union has tried to block this by bringing this or the other reasons. Even the US has supported the European Union. The new hurdle is that trade talks are being tried to be linked with climate change. Russia has not shown any strict stand on this issue.

Base year

“Another , more contentious question is the possibility of changing the current 1990 base year moving it forward to 2000 or even 2005.(Joanna Depledge,2000:156). This question was crucial for Russia. Russia has, as in Kyoto, supported for setting 1990 as a base year for taking any binding emission cuts to 2000, or even 2005. This data was important for Russia in two respects. Firstly, Russia was formed after disintegration of Soviet Union in 1990. So, it would be difficult for the Russia to collect and verify the data of pre-90 era. It is very difficult to find the data of combined soviet. And even if the data is available, then how could the Russian take the responsibility of the emission done by the former soviet parts. Moreover the former soviet countries are also taking part in Kyoto as a sovereign and independent country. So they must take the responsibility of their own part of emission in support of the technology transfer. And when the transfer issue have become complex by linking WTO and climate change talks, the Russian stand has become very much important. But looking on the past track record it can be said that Russian policy on technology will be guided by its core pillars of justice, equity and welfare of the most vulnerable and poor countries .Only time will tell that Russia is going to take what step.

4.3 Russian Efforts in Implementation of Kyoto Commitment

This part of the chapter is going to deal with the real on ground implementation of the programmes. Also, it will try to place Russia on world map vis-a-vis other Kyoto partner in taking tangible efforts to mitigate the Kyoto commitment. As per the Kyoto Protocol, Russia was assigned the target of keeping the Green House emission to 16,617.095319 tonnes of CO₂ equivalent to 0% to the 1990 levels. In other words, it has to keep its emission level to the 1990 level. So under the accounting and compilation report submitted annually to UNFCCC secretariat, Russia has done its best to keep its emission very low. The emission targets were assigned and allocated as per the Article 3, paragraph 7 and 8 and the quantities against which a party's of Annex A are compared for the

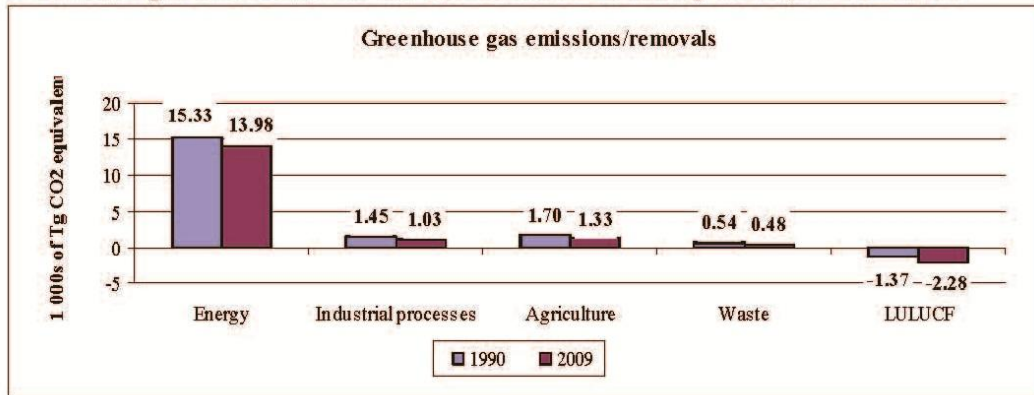
determination of the compliance with Article 3 paragraph 1. So we need to find out that how far Russian Federation has contributed in bringing the emission level down. What are the efforts of Russia in bringing emission down in various sectors and under Kyoto mechanism? There are the 4 major categories under which the emission level has to be shown. There are many sub categories under each major category like Iron and steel, cement etc in Industry sector and thermal, commercial, domestic etc. in Energy sector. Similarly, there are other sub sectors in Agriculture and waste management categories. It must be noted that land use and land use change and Forestry (LULUCF) are included under the emission reduction counting. So, keeping their parameters and Kyoto mandate in mind, our analysis will be based on this. We will analyze the efforts of Russian Federation in this regard. Under the emission reduction protocol, Russian Federation has to submit their inventory report in the following categories.

- 1) Energy sector
- 2) Agriculture sector
- 3) Industry sector
- 4) Waste management sector

Among the above sectors, emission for Annexure I countries is maximum from energy sector. The emission level was 15.33 1000s tg CO₂ equivalent in 1990 which decreased to 13.98 1000s tg CO₂ equivalent in 2009. The second most important sector is Industrial process. The total emission from industrial process was 2.03 1000s tg of CO₂ equivalents in 2009. The total reduction from 1990 level is 0.43 1000s tg of CO₂ equivalent. The least emission for the annex-1 countries is from land use, land use change and forestry (LULUCF) sector. The emission level has in fact declined. The carbon sink from LULUCF sector is increased from 1990 to 2009. Thus, it shows that green cover has increased in these two decades.

Chart: 1

Greenhouse gas emissions/removals from Annex I Parties by sector, 1990 and 2009*



Source: UNFCCC report no. FCCC/SBI/2011/9.

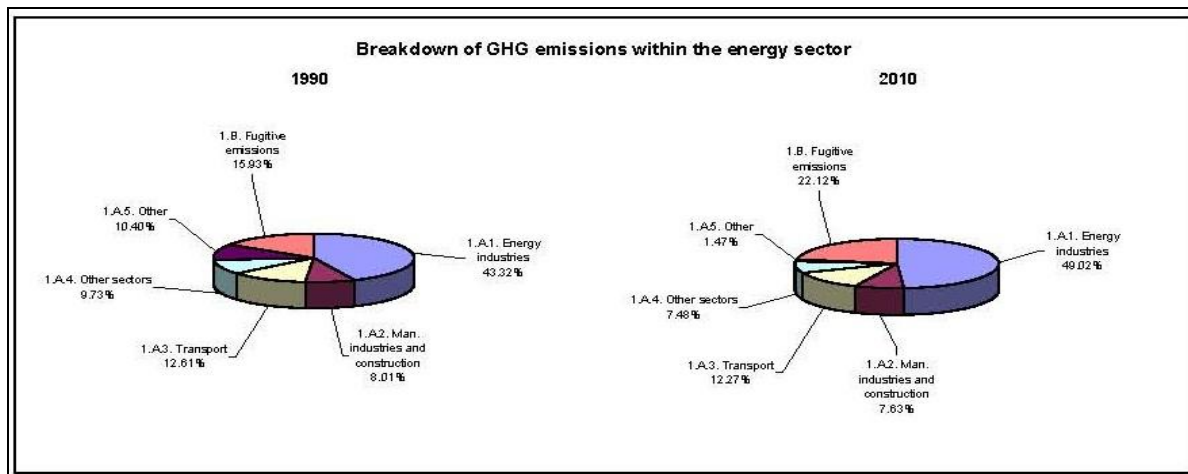
4.3.1 Energy Sector in Russia

The energy sector contributed 81.5% of the green house gas emission for Russian Federation for the base year (i.e. 1990) with CO₂ being the main gas sharing 84.5% of the energy sector's emission. The second most important emitter gas in this sector was methane (CH₄) which contributed 15.3% and 0.2% was contributed by N₂O (nitrous oxide). Russia has reduced its emission in this sector for more than 40%. The base year emission for energy sector was 2,707,695.94 Gg CO₂ equivalents. Russia as per the *“Report of the review of the initial report of the Russian Federation”* has reduced its emission from the energy sectors to 1,728,466.20 Gg CO₂ equivalent in the year 2004. In 2010 the GHG emission from the energy sector get reduced to -33%. This was very good reduction as compared to the other countries. Russia has done quite well in reducing green house emission from energy sector. Looking into the categories wise sub classification of the energy sector, following are the sub categories under UNFCCC secretariat and Kyoto Protocol mandate:

1. Energy Industries
2. Manufacturing Industries and construction
3. Transport
4. Other sector
5. Fugitive emission

Chart:

2



Data Source: UNFCCC http://unfccc.int/files/ghg_emissions_data/application/pdf/rus_ghg_profile.pdf

In 1990 base year, the green house gas emission from these subcategories under the energy sector was as follows. The maximum emission has come from energy industries which contributed 43.2% of the energy sector. The second is Fugitive emission (the emission through levels of gases in Industrial process) contributed to 15.93%. These are followed by transport with 12.61% contribution; manufacturing and construction with 8.01%; ‘other’ sector contributed to 10.40%. This composition of sub sectors has seen change in 2010. In 2010, the energy and industries sector contribution increased from 43.32% in 1990 to 49.02% in 2010. There was sharp decline in other sector. Its contribution decreased from 10.40% in 1990 to 1.47% in 2010. The transport sector’s contribution remained more or less same to 12.27% with slight decline of 0.36% in these 20 years. Construction and manufacturing sector contribution also declined from 8.01% to 7.63% in 2010. So, we find that the biggest contributor of the energy sector is energy industries. The share has in fact increased in Russian green house profile. But, it should be kept in mind that the overall emission from energy sectors has reduced to -33% which is a good contribution from Russian Federation.

The international comparison shows that energy burden on Russian economy has increased due to expressions in the economic development. Being country of “Economy

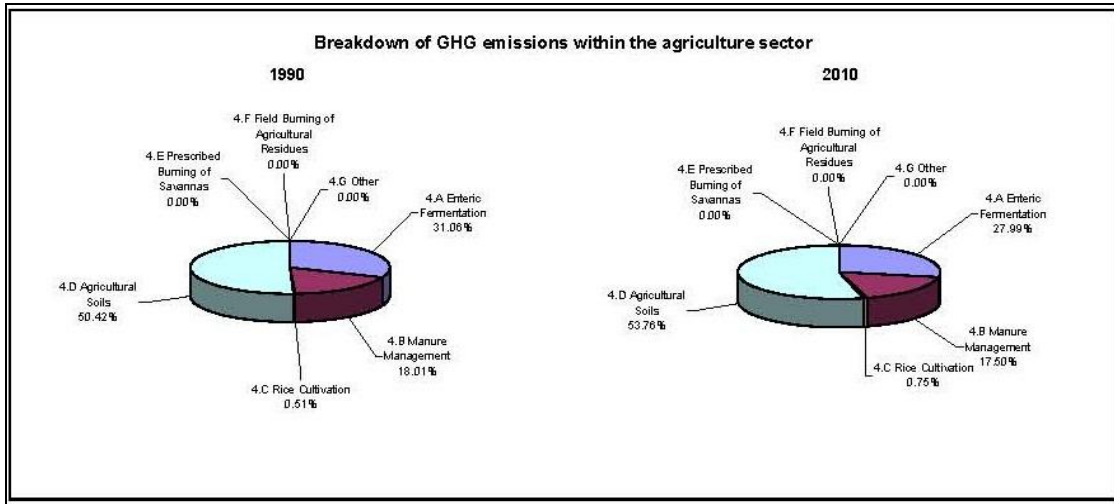
in transition” of Annexure 1 country, Russian Federation got laxity in the first commitment period. But certainly in future Russia has to do much more in order to improve over its present performance. According to the “*energy prospect of 2035 of Russia*”, the world energy growth will increase maximum in Asian countries. The contribution of Russian energy demand is going to decline, but still in absolute term the demand will increase. Russia has taken measures like –energy efficient industrial use, solar energy, use of biofuels, use of modern technology and norms in transport sector. So all this has made change in Russian energy efficiency use.

4.3.2 Agriculture

The agriculture sector contributed to 9.3% of the total emission of Russian federation in 1990. The emission was in tune of 309,368.59Gg CO₂ in the base year. The emission declined to 56.9% of 1990 level. The biggest reduction was in the emission of CH₄ by approximately 59% whereas the emission of N₂O fell by over 50%. On analyzing the breakdown of the agriculture between 1990 and 2010, we get a clear picture that Russia has shown commitment in the reduction of green house emission from these sector, especially from enteric fermentation. The share of emission from enteric fermentation had declined from 31.06% in 1990 to 27.99% in 2010. The biggest contribution of green house gases in agriculture sector is from agriculture soils. More than 50% of the emission comes from this section. The contribution accounted for 53.76% in 2010. The third biggest category is the manure management section. The emission from this section is about 17.50% in 2010 whereas its contribution was 18.01% in 1990.

Regarding the collecting and reporting system in agriculture sectors, Rosstat is the main agency of Russia for collecting agriculture data. It has collected comprehensive data of long period for analysis of policy purpose. Overall the methodological choice made by Russian federation for its emission is consistent with IPCC good practical guidance. The Russian estimation methodology is fully documented with National Inventory Reporting (NIR) of the UNCCC secretariat under the Kyoto Protocol mandate.

Chart: 3



Data Source: UNFCCC http://unfccc.int/files/ghg_emissions_data/application/pdf/rus_ghg_profile.pdf

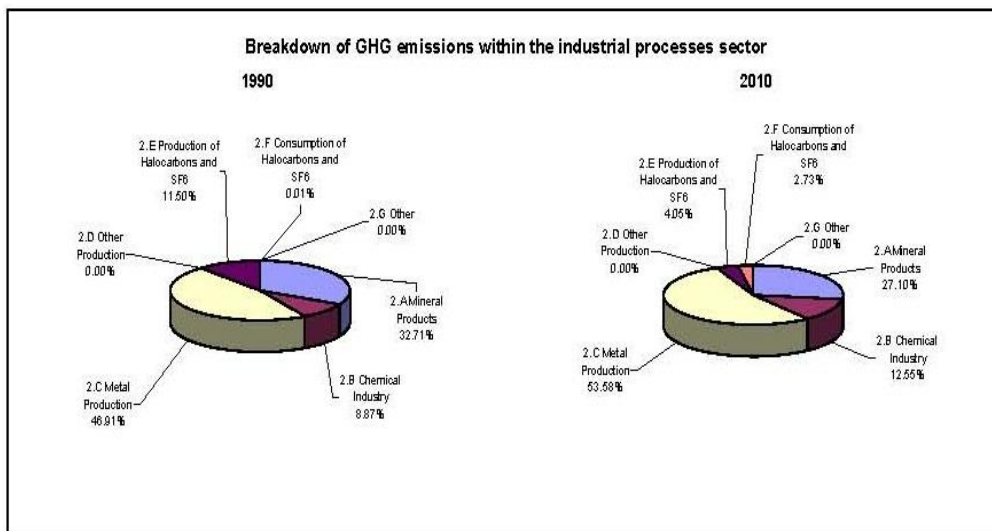
Russian Federation domestically has taken steps for proper documentation of the emission level. The methodology used for enteric fermentation (for methane emission) is an improvement over IPCC good practice guidance in which direct feed intake is estimated indirectly from livestock performance characteristics. And even the emission methods used in manure management (for N₂O) and direct soot emission (N₂O) are in consonance with the good practice of IPCC. This has led to better performance of Russian federation in emission reduction from agriculture sector, which is, -56.9%. The share of green house gas emission for the Annexure 1 parties has declined from 1.70 to 1.33% between the years 1990 to 2010.

4.3.3 Industrial Process

This is an important sector of the green house gas emission in Russian federation. The emission from industrial section for Russian federation in the base year 1990 was 241077.93 Gg CO₂ equivalents. It contributed 7.3% to the total green house gas emission. The total emission reduction from these sectors between the years 1990 to 2010 is -32.9%. The very categorical analysis by the UNFCCC secretariat by the base year have identified three key categories in the Russian federation's industrial sector. These are -

- 1) Iron and steel production
- 2) Limestone and dolomite use and cement production.

Chart: 4



Data Source: UNFCCC http://unfccc.int/files/ghg_emissions_data/application/pdf/rus_ghg_profile.pdf

The main gas pollutant from industrial process is carbon dioxide. The main sub sector of the industrial process in Russia is - Metal production, Mineral product, chemical industry, production of Halocarbon and SF₆, consumption of Halocarbon and SF₆ and others. The biggest contributor to the emission level from industrial process in Russia is metal production. The main metal is Iron and steel production. The emission level from this section is 53.91% in 2010 which was 46.91% in 1990. Mineral products are also the contributor of green house gas mainly CO₂ (Carbon dioxide). The Russian federation's emission from this area has declined from 32.7% in 1990 to 27.1% in 2010. This became possible due to its efforts by introducing clean norms in 2005 in these industries. The third major sources of green house emission are chemical industries in Russia. They mainly constitute dyes, colors, paints, ornaments etc. The contribution from this section was 8.87% in 1990. It increased to 12.56% in 2010. This increase was due to decline in the share of emission from mineral product.

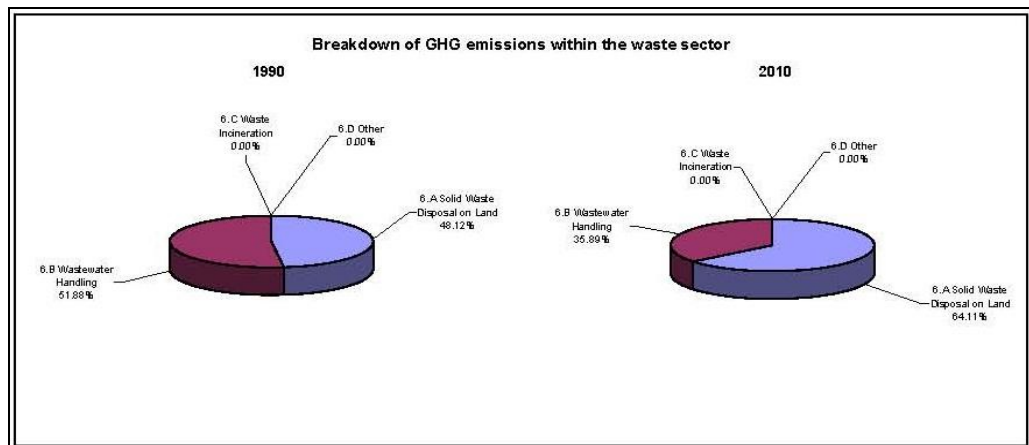
The maximum decline is registered in the Production of Halocarbons and sulfur

hexafluoride. The contribution due to consumption of Halocarbon has increased, though not sharply. The percentage change in the production of Halocarbon and sulfur Hexafluoride is -6.45% between base year 1990 and 2010. This is a good change with respect to decline in the green house gas especially carbon dioxide emission.

4.3.4 Emission from Waste Sector

The emission from the waste management, though contribute very less amongst the other sector, is an important component. But the emission level has increased in this sector. The emission of green house gases from this sector has increased to 23.9% looking at the low base of the sector this increase is not very high. But still the increase is worry some. The total crude emission from this sector in base year 1990 was 64,720.16 Gg CO2 equivalents, which was 1.9% of the total emission. The maximum contribution comes from solid waste management which contributed for 39.6% of the sectoral emission.

Chart: 5



Data Source: UNFCCC http://unfccc.int/files/ghg_emissions_data/application/pdf/rus_ghg_profile.pdf

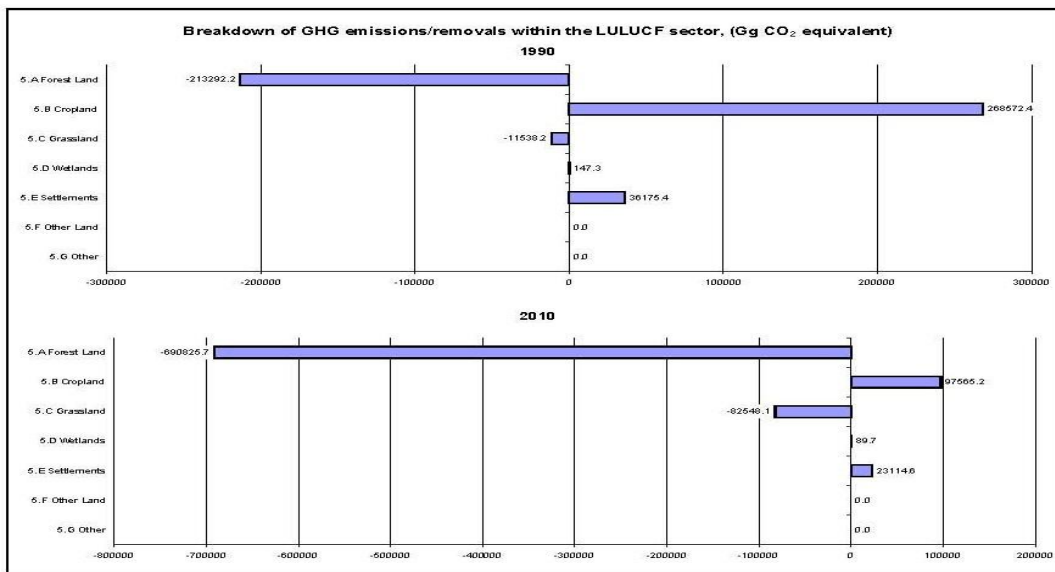
The maximum emission comes from waste water calories which accounts for more than 60% of the waste management. The good thing is that is that the release of green house gases from incineration is least. It is a good sign for Russian waste management planners. The maximum increase in the waste management is in the solid waste management category. The emission increased 16% in this category from 1990 to 2010. This is a big

increase. The increase is mainly due to growth in the urban waste and urban expansion in Russia especially from the western cities i.e. areas west to the Urals. For the solid waste management Russia used country-specific degradable organic carbon (DOC) and IPCC deflate. The municipal house hold waste is taken in the account and industrial study is not taken into account.

4.3.5 Land Use and Land Use Change from Forestry (LULUCF)

Under this category, the emissions are taken into account on the basis of green cover that increased due to expansion of forestry, forest cover, urbanization, land use change such as waste land, cropland, follow land, etc. This is very important category for the Russian’s point of view. The increase in other sectors could be offset by decrease in this sector. Russia has advantage of having world’s largest forest Area in the world. It has huge forest in Siberia, Chucky region. This forest Act as Carbon sects. They help in reducing carbon dioxide from atmosphere.

Chart: 6



Data Source: UNFCCC http://unfccc.int/files/ghg_emissions_data/application/pdf/rus_ghg_profile.pdf

The net emission from land use, land use change and forestry from Russian federation in the base year was 190,271 Gg and this has dramatically decreased to 915.1% in 2010. This is very exceptional decline in the emission level. This is because of this high level reduction that Russia is being able to become carbon surplus country. It has

gained advantage in carbon trade. It has emerged as credit surplus country and managed to sell its credit, which has proved advantageous for the Russian economy.

The forest land in Russia has increased dramatically. This had led to the reduction of 21329.2 Gg Co₂ equivalents in 1990. The decrease of green house gas emission from forest land in Russia reached to 690825.7. The net decrease in CO₂ emission level from 1990 to 2010 is about 477533, which is about 223%. This (increase in forest land) is very advantageous from Russian point of view. This increase in the forest cover of Russia is about 50% of its area, amounting to 809 million hectare of forest land and 20 percent of the world's forest. As per the UN sources the Russian wood demand both for domestic and export sector is going to increase from 75 million under WRME in 1995 to 225 million cubic WRME in 2020. That is going to put huge pressure on its forest in future. But despite that Russia will be able to manage the decrease in forest resources. This is a very commendable work. The ministry of environment and natural resource has said that Russian federation is going to conserve, preserve and increase the forest resource of country. This is going to be a tough future task for Russia.

In other categories of Russian land use, land use change and forestry, the response has been mixed. The emission level has, in fact, has increased due to increase in settlement area. The emission from cropland is managed to be low. The emission level from cropland declined from 268572.4 to 97565.2 Gg CO₂ equivalents in 2010. The grassland area has increased in Russia. It also acts as carbon sink. The total carbon fixation from grassland areas was 115382 Gg Co₂ equivalents in base year 1990. This has shown growth in 2010. The total carbon fixation by grassland in 2010 was reached to 82548.1. Thus forestry and grassland are two areas which have worked in favor of Russia and because of these two categories only; Russian federation has been able to sell carbon credits to other countries. Russian government has done a lot to conserve its forest reserve. It has put emphasis on biodiversity protection, scrubland protection and converting wasteland to forest land or grassland. All three efforts have worked in favor of Russia due to which Russia has helped in decreasing the green house emission level from the globe.

4.4 Russia and Major Countries of the World: A Comparative Analysis in Meeting Kyoto Targets.

In this section a detailed comparative analysis of Russia with major countries of the world is done. This analysis will bring out the position of Russia in meeting the Kyoto targets with other country of the world. Thus, it will help to find out the efforts of the Russian federation vis-a-vis other countries, especially annex- I countries. The whole analysis is divided into two broader categories, as per the Kyoto requirements a) sectoral and b) comparison of gas category. This will help in finding the real efforts to bring temperature down by the major countries of the world. How far Russia has performed compared to other major countries of the world. The analysis is done here under.

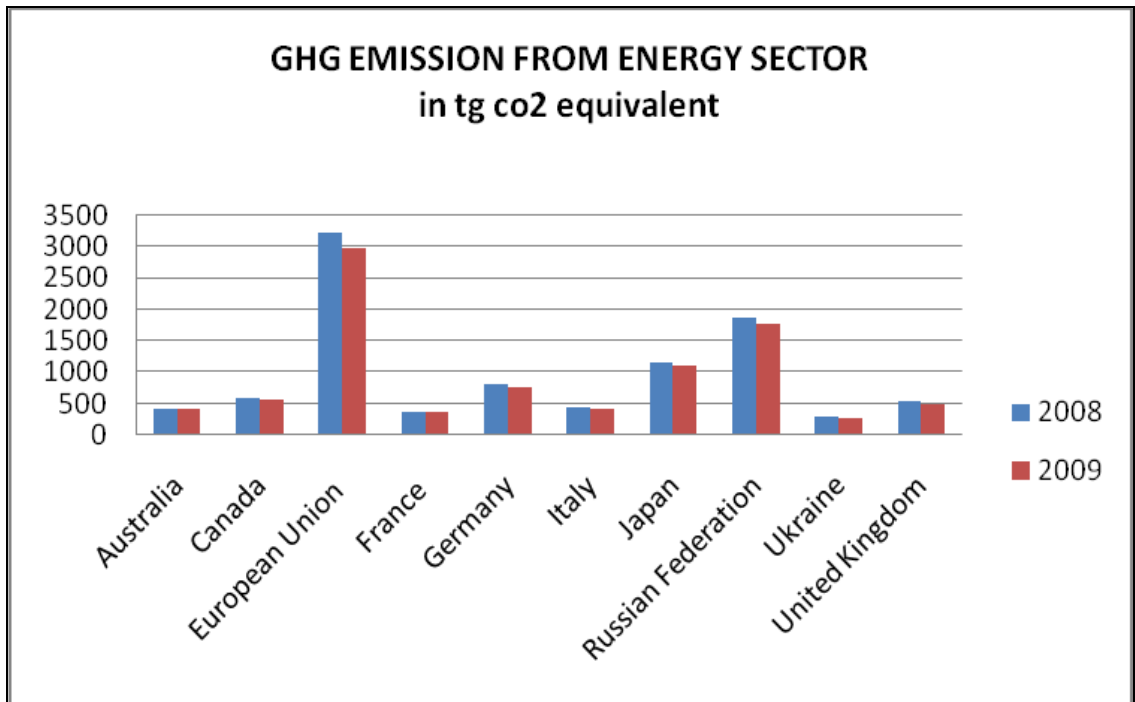
SECTORAL ANALYSIS

Under this section the comparisons are done on the major categories as per the Kyoto requirement. Each category is dealt with the help of the latest data acquired By UNFCCC.

4.4.1. GHG Emission from Energy Sector

The emission from energy sector is very important. This is the sector which forms the back bone of the economy. The emission level from this sector also signifies the impact on economy after decreasing the emission level from this section. On comparison with the major countries of the world, it can be said that emission level from this section is higher. The aggregate emission of Russian Federation from energy sector in 2009 was 1753 to CO₂ equivalents. The emission level is highest after European Union. If European Union is excluded then Russia stands first in the emission level in comparison to major countries. However emission has declined from 2008 and higher improvement is seen when compared with the base year. The other bigger emitters of GHG from energy sectors are Japan, which stands second after Russia. The total emission from Japan in 2009 was 1098 tg of Co₂ equivalent.

Chart: 7

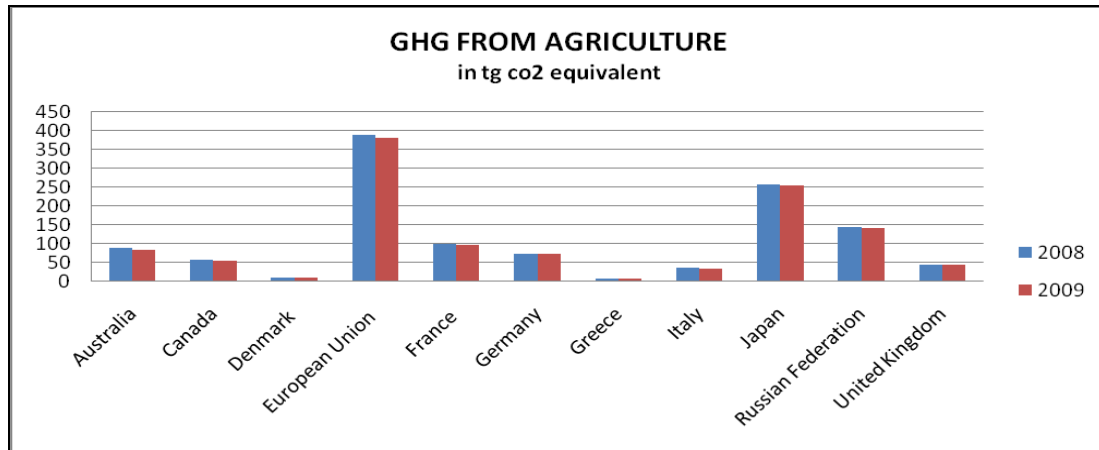


Data source; UNFCCC, [URL:http://unfccc.int/di/FlexibleCADQueries.do](http://unfccc.int/di/FlexibleCADQueries.do)

4.4.2. Agriculture Sector

This is very important sector of emission from Russian federation's point of view. Russian federation have large expanse of grassland and huge cropland area. It helps it in deserving the GHG level. The European countries like France, Germany, and Australia etc. have high intense cropping pattern. Moreover the crop intensity is much more, so the emissions levels are more as compared to Russian federation.

Chart: 8



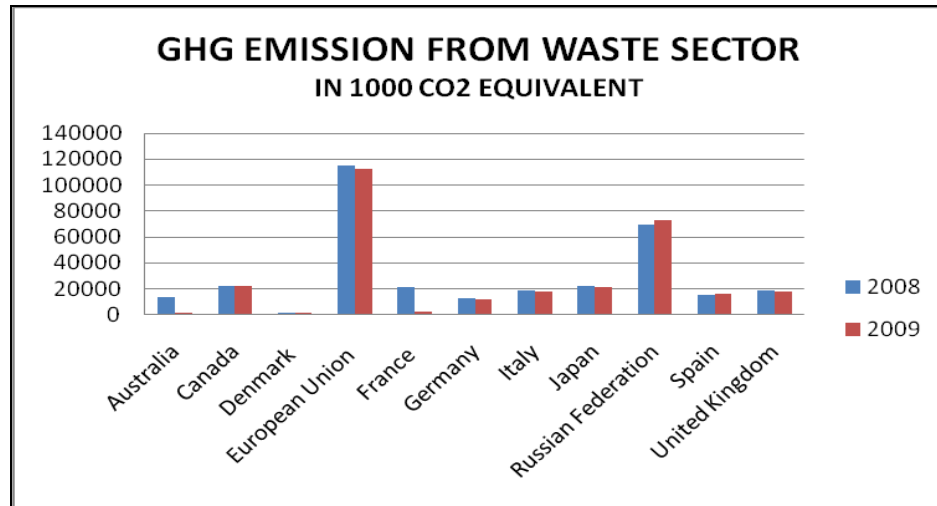
Data source; UNFCCC, [URL:http://unfccc.int/di/FlexibleCADQueries.do](http://unfccc.int/di/FlexibleCADQueries.do)

The analysis of 2008 and 2009 data of green house emission from agriculture sector, it is found that among the major countries of Annex-I, Russian federation is the biggest emitter. The emission of France from agriculture sector is about 10×10^6 Gg co2 equivalents. The emission level of Japan, Italy, Canada, and Australia is less than the Russian federation. Outside Annexure I countries United States of America is the biggest emitter of green house gases from agriculture sector. The emission level of 2008 and 2009 for all the major countries is almost same and not shown much laceration.

4.4.3 Emission from Waste Sector

The emission from waste sector of Russian federation is much higher as compared to the other annexure I parties. Though the emission level of E.U. is maximum but looking at number of countries in it, it is not so higher than Russian federation. The emission through waste is about 60 million CO₂ equaling. The waste emission is much less for Germany, Italy, Spain etc. The waste emission is higher in Russia mainly due to its solid waste management, which contribute more than 50% of the emission of waste sector.

Chart: 9



Data source; UNFCCC, [URL:http://unfccc.int/di/FlexibleCADQueries.do](http://unfccc.int/di/FlexibleCADQueries.do)

Though Russian government has taken several steps like introduction of new norms of waste disposal (*Federal law on waste disposal-2011*), electronic waste disposal system in major cities, top underground disposal of non-bio-degradable high emission emitting waste etc. and increasing the waste incineration process to minimize the emission level. Russia is signatory to “*Joint Convention on the Safe Management of Spent Nuclear Fuel*” and on the Safe Management of Radioactive Waste with many European Countries like Holland, Denmark, Spain etc and these countries have already gaining benefits from these technologies. Russian federation has also adopted it. The emission from waste sector is going to decline very much till 2020.

4.4.4. GHG Removal from Forest Management Sector

The emission reduction from this sector is most important for Russia as it has maximum forest in the world which give it a leverage of reducing CO₂ vis-e-vis other countries among Annex- I countries. Russian federation is far ahead in reducing the CO₂ level from forest management. The total forest management-led reduction in GHG level in 2009 itself was more than 5 million tonnes of CO₂ equivalent. This is much higher as compared to from Germany, Japan and even European Union as a whole, has less reduction of CO₂ level as compared to Russian federation. The total GHG

reduction from forest sector of EU is about 29 million tonnes of CO₂ equivalent, which is about 2 million tonnes less than Russian federation.

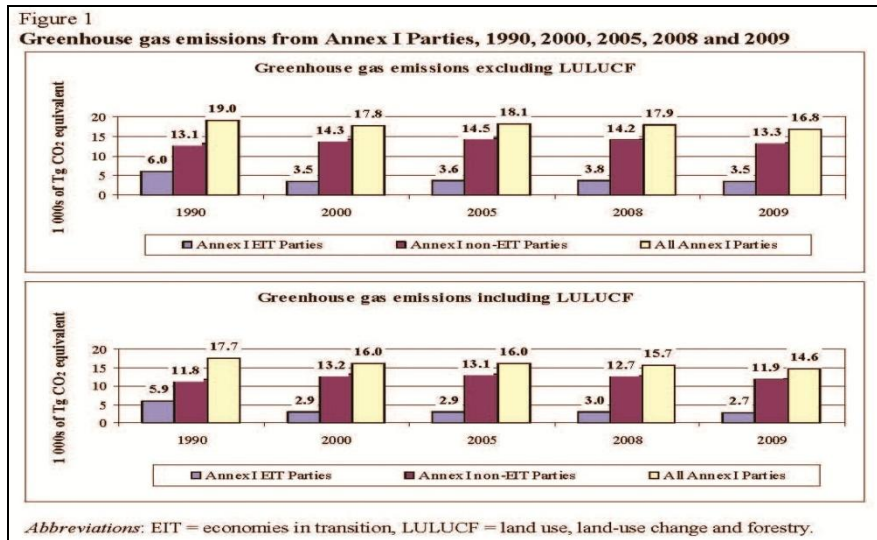
The emission reduction of other developed countries of Annex-I countries is much below when compared to Russian federation. The CO₂ reduction is less than 1 million tonnes of CO₂ equivalent for Japan, Italy, Germany, France, Finland, and Denmark etc. This is where Russia is leading in Kyoto protocol. This is the main strength of Russia for fulfilling the reduction targets of green house gases. And it is because of this high reduction it has been able to offset its increase in other categories such as energy, industry it's and helped make Russian federation as carbon surplus country and therefore gain huge revenue through selling surplus carbon credit. This is the backbone of Russia's emission reduction pictogram in Kyoto proposal which has led to gain lead vis-e-vis other countries.

Also on comparing the 1990, 2008 and 2009 values, we find that the forest area of the Russian federation has increased thus helping it to gain more carbon sink. The forest area has constantly increased in these two decades. Though the increase was at slow pace in 90's but in last decade it has shown rapid improvement. The forest area has increased about 5 million hectares in the year 2009 itself. So, Russian efforts could be graded as better quality as compared to the Italy, France, Germany, Japan and European Union as a group.

4.4.5 Emission from Land Use, Land Use Change and Forestry

This is also very important sector after forest management sector. As this sector is the only sector after forest management which has helped Russia to decrease its carbon dioxide level. Again, in this sector also Russian federation has done well, even better than the European Union. The European Union as a group has reduced much less than the Russian federation alone. The total reduction of green house in 2009 was 519 million tonnes of CO₂ equivalent while for European Union this value was 294 million tonnes of reduction.

Chart: 10



Source: UNFCCC report no. FCCC/SBI/2011/9, 16 NOVEMBER 2011

The difference is very high in this context. The high gains for Russia is due to increase in its forestry land and on the same time it has also reduced its emission from cropland. The reduction from LULUCF for other major annexure 1 countries is much lower in comparison to the Russia. France has done well in this sector. It has left behind even Germany, Japan Italy in this sector. The only country for which the green house emission has increased from LULUCF is Australia. About 26 million tonnes of CO₂ equivalent have increased from its LULUCF though not very high but shows apposite trend of increasing from other countries. Spain and Holland have shown very marginal increase from this sector while counties like Denmark have almost 0.1 million CO₂ equivalent decline from 2008 and 2009.

So, Russian efforts over all have sign of improvement especially in forest management and LULUCF. Russia has emerged as leader in decreasing the emission level but there are certain grey areas too. Like in CO₂ level where the emission levels have seen increasing, the emission of methane has also shown increasing tendency in Russia in future. But otherwise the contribution of Russia in reducing green house gases, though no extra ordinary, but still satisfactory as compared to the other Annex-1 countries.

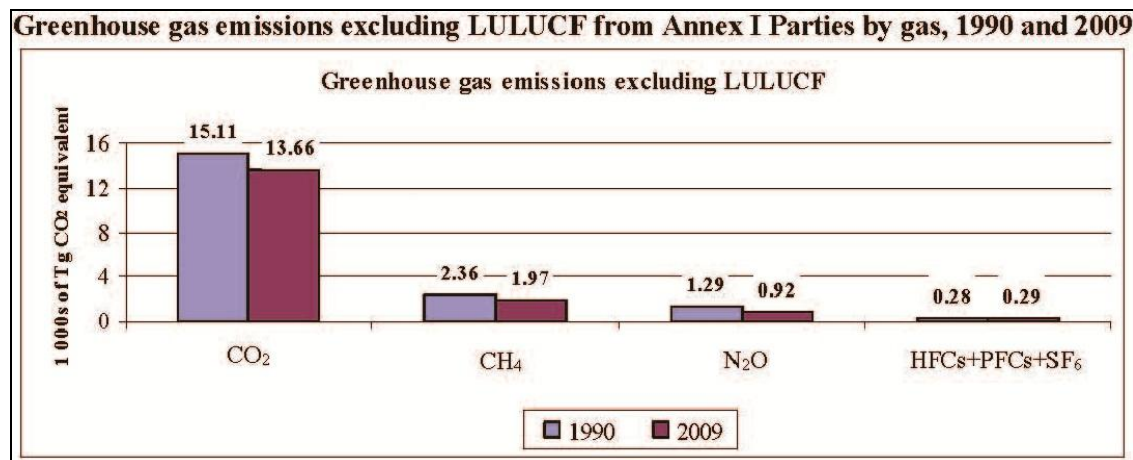
4.5. A Comparison with Major Annexure I Countries on Basis of Reduction of Individual Gases

In this section comparison will be made between the major annexure-I countries including USA in terms of reduction in gases (green house gases) from 1990 base year to 2009. The biggest top 5 emitter of green house gas are USA, China, EU, India while in CO₂ gas, the most responsible gas for the green house gas, China has emerged greatest emitter followed by USA, India, Russia, Japan, Germany and Canada.

Percentage change in sectors of annex-i parties (1990-2009)

Looking at the reduction of emission of Annexure I countries in last two decades, the maximum reduction is seen in manufacturing industries and construction which is about -25%. The reduction from energy industry is less than expected. Only 4.6% reduction has been achieved from this sector. In fact, the emission from transport sector has expanded by 9.9 percentages. This is because of the growing number of vehicles. Much improvement is seen in the improvement of industrial technology. As the emission from “Fugitive emission” sector has declined to 13.75% which is big amount seeing the potential of decline from the sector. So we can say that much work needs to be done in energy and transport section.

Chart: 11

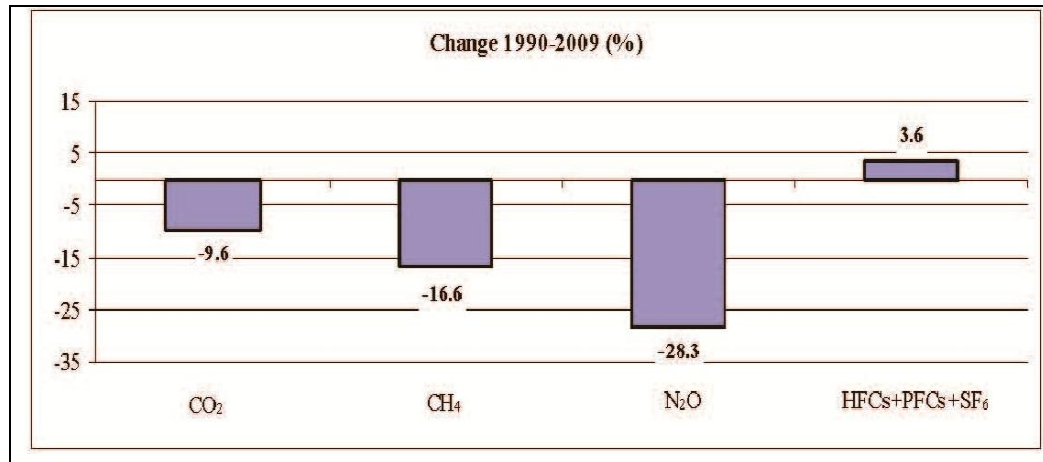


Source: UNFCCC report no. FCCC/SBI/2011/9, 16 NOVEMBER 2011

Percentage change in GHG of annex-i countries (1990-2009)

We can find out on comparing the percentage reduction of gases in last two decade that the maximum reduction in terms of percentage is for Nitrous Oxide. The total reduction is 28.3%. The least reduction is in carbon dioxide which is point of worry as this is the main gas responsible for the green house effect and global warming. Only 9.6% of CO₂ is being reduced from 1990 to 2009. The reduction in methane (CH₄) is about of 3.6%. Most importantly there is rise of 3.6% for group of gases which includes HFCs, PFCs and SF₆. This needs to be looked into serious.

Chart: 12



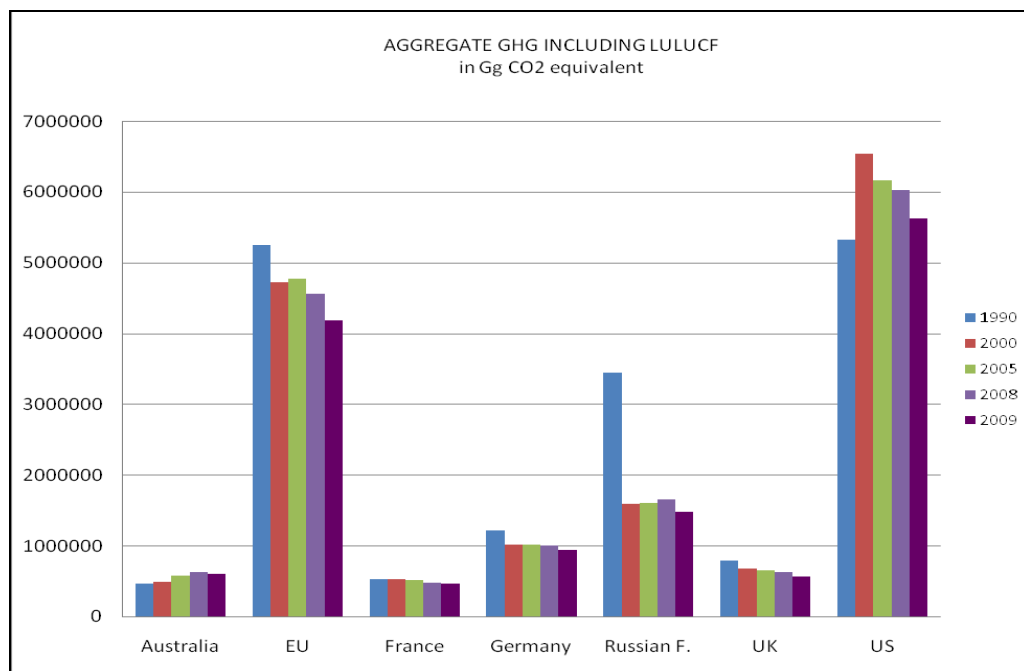
Source: UNFCCC report no. FCCC/SBI/2011/9, 16 NOVEMBER 2011

Firstly, on comparing the **total green house emission** United States of America is the biggest emitter. Even in 1990 it was the leading in emitting green house gas. The emission level of USA in 1990 was in tune to 6 million Gg frames, which tough marginally increased to 6.6 million Gg CO₂ equivalents. The total green house in actual form has increased for US and Australia. The value is decreased for EU, France, Germany, Russia and United Kingdom. The green house emission for Russian federation was 3.36 million Gg CO₂ equivalent in 1990 which declined to 2.04 million Gg CO₂ equivalent in 2000, then again it increased slightly to 2.2 million Gg CO₂ equivalent in 2008 and again in 2009 it declined to 2.12 million Gg CO₂ equivalent. So, Russian green house emission is amongst the lowest in major countries of Annexure-1 countries of Kyoto protocol.

GHG-emission

On comparison of the green house emission of the year 2008, and 2009, we find that the emission level of Russian federation has come down. Though Russian federation still remains biggest emitter of green house gas after European level but still the overall emission level has come down. After European Union and Russian federation, Germany is the biggest emitter of green house gas in 2000 and 2009 as well. The emission level of all the major countries have come down from 2008 to 2009. So it can be said that the entire Annex- I parties have tried to bring their emission level down. But the rate of decline of the green house emission of Russian federation is much better than the counties Spain, France, Grace, Canada and Australia. So over all it can be said that Russian federation has done well in bringing down the emission level. This became possible because of the strong commitment and better coordinated and planned domestic policies.

Chart: 13



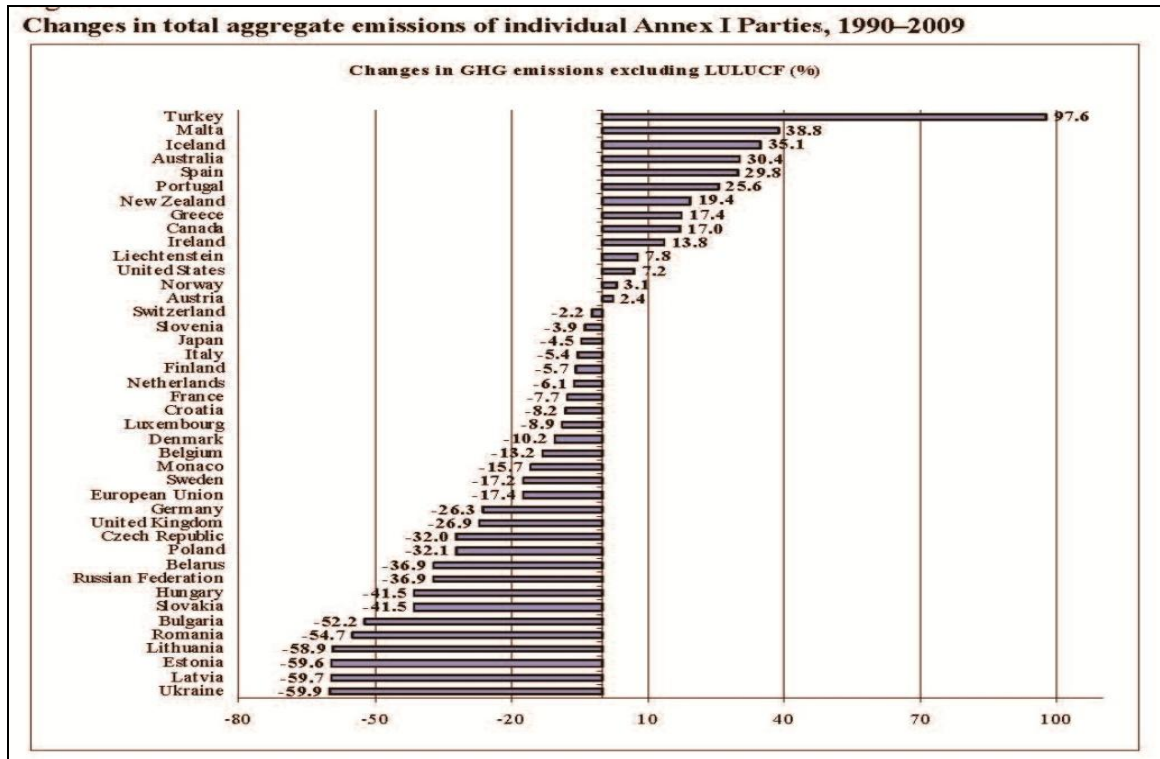
Data source; UNFCCC, URL:<http://unfccc.int/di/FlexibleCADQueries.do>

The GHG emission has declined from 1990 level to 2009. Though, the major trends remain same. That is, the European Union and Russian federation being the biggest

emitter. But the aggregate values have declined much. The Emission of Russian federation declined from approximately 2 million Gg CO₂ equivalents in 1990 to 1.7 million Gg CO₂ equivalents in 2009. If we compare the emission level of 2008 and 2009, the Russian federation emission has come down slightly. Very good performance is shown by Japan in 2000-2009. It has declined its green house emission level from 1990 to 2009 and brought it down from the level of Germany and is very close to France. European Union as group has brought down its emission level too, but the decline in emission is slightly less than the decline of Russian federation.

The level of emission of Australia is more or less same as compared to 1990 and 2009. And even much less change is seen in 2008 and 2009 emission level. The emission level of Canada too has not declined much. This is the reason that recently Canada has decided to quit Kyoto protocol. Canadian prime minister had said that to meet Kyoto commitment it would have to stop its industries and agriculture which is not possible for it. So it has decided to pull itself out from Kyoto protocol. But the report card of Russian Federation is much better as compared to other countries of the annexes I group. Also, being a country of economy in transition, it has done well in comparison to the developed countries.

Chart: 14



Source: UNFCCC report no. FCCC/SBI/2011/9, 16 NOVEMBER 2011

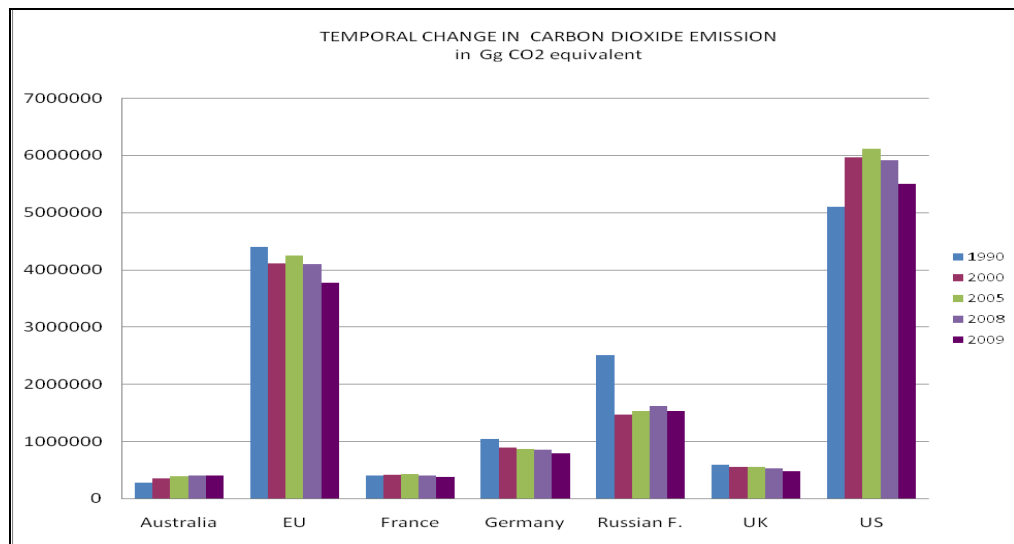
Again, when we compare the values of **aggregate green house emission** including the land use, land use change and forestry, we find that Russian emission, in this case, decline is very high as compared to other countries. The value declines from 3.4 million Gg CO₂ equivalents to 1.4 million Gg CO₂ equivalents. This is very high reduction and is possible only due to huge forest cover in Russia. US have maximum GHG emission level. Its emission level in 2009 stands at 5.6 million Gg equivalents CO₂ followed by Germany, Australia, United Kingdom. Value for European Union is 4.14 million Gg CO₂ equivalent, where is more than the Russian federation emission.

The emission level after inducing land use change and forestry has reduced overall but for some countries it has increased. For Australia and USA it has increased and most importantly this was the reason why US kept itself outside the focus the Kyoto commitment regime. Now coming to **carbon dioxide gas**, which is the most responsible gas for the global warming. In this category too, the biggest emitter is United States of America. In the Annexure I countries, European Union is the biggest

carbon dioxide emitter. Its value for 2009 level is 3.7 million Gg CO₂ equivalents, though declined from 1990 level but still considered high. The biggest decline is found in emission of Russian federation. The emission level declined from 2.4 to 1.5 million Gg CO₂ equivalents between 1990 and 2009.

The only country which has shown increase in the CO₂ emission level is Australia. The emission level for US peaked till 2005 but then it has shown declining trend since then. The emission level for France has remained constant from base year 1990. Countries like Germany & U.K have lower CO₂ emission level as compared to Russian federation. When the emission for CO₂ is taken considering the land use and land use change, the main trend remain same. USA again is the biggest emitter and European Union on second number. The emission level decline is higher for Russian federation.

Chart: 15



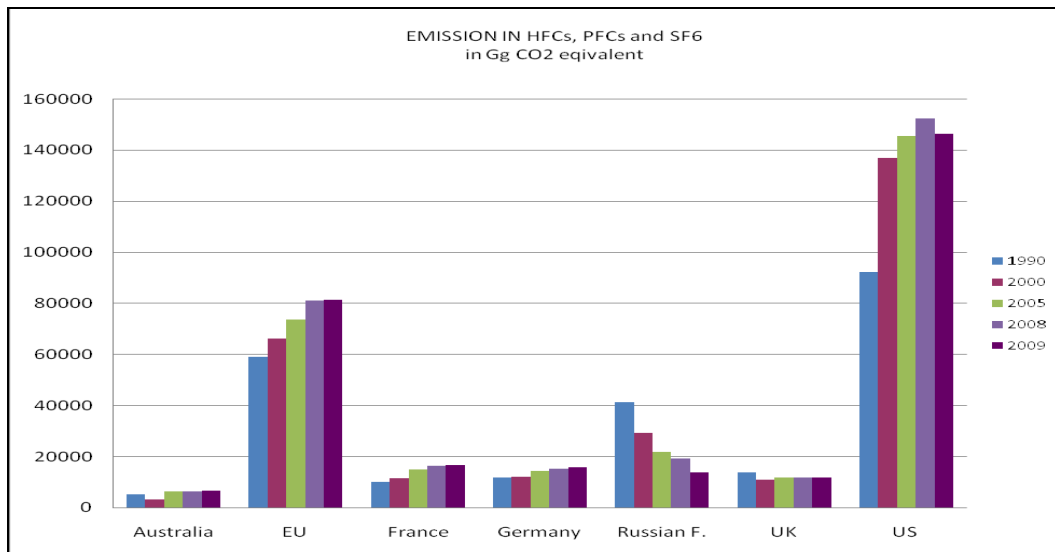
Data source; UNFCCC, [URL:http://unfccc.int/di/FlexibleCADQueries.do](http://unfccc.int/di/FlexibleCADQueries.do)

The decline is very sharp in 1990 and the total emission in this sector was 2.5 million Gg CO₂ equivalent which declined sharply to 0.9 million Gg CO₂ equivalent and reached to 0.05 million Gg CO₂ equivalent. This clearly shows that Russian commitment in reduction of the green house emission. Japan has very close emission level to Russia in this section. The forest cover in Japan is very less which increases its

percentage of emission in this section. The emission of CO₂ for Canada, France and Italy is very less as compared to US, EU and Russian federation.

Now, we will compare the “GROUPS OF GASES” i.e. HFCs (Hydrofluoric Carbon), PFCs (Per Fluoro Carbons) and SF₆ (surfer hexa fluoride). We find a different picture altogether. Most important fact about the group of gases is that in the last two decade where the emission level in this section increased for US, EU, Australia and UK, Russian federation has shown a significant decline in the emission. The emission of these gases has continuously declined in Russian federation. The total emission level of these gases in Russia was about 41293 Gg CO₂ equivalents, which reduced to 29127 Gg CO₂ equivalents in 2000, again declined to 21747 in 2005 and in 2009 it is 13714 Gg co₂ equivalents. While on the other hand the emission level of Germany, France, UK and Australia has increased. The emission level of France and Germany was very less compared to Russian federation.

Chart: 16



Data source; UNFCCC, URL:<http://unfccc.int/di/FlexibleCADQueries.do>

In year 2009, the emission level of these countries has gone ahead of that of Russia. Only United Kingdom has less emission level of these gases than Russian federation. United States of America is the biggest emitter of these gases. The level of these gases has increases consistently for the US. But recently it has shown some decline. The

emission of US declined from 1521826 Gg CO₂ equivalents in 2005 to 146144 Gg CO₂ equivalents in 2009. The emission level of EU as a group has increased consistently. Only recently in last 5 years it has shown some sign of flattening.

So in this section we find that Russia has greater edge over the other countries. As where the rest countries the emission level has increased, CO₂ Russia is being able to decrease its emission level successfully.

4.6 The Overall Analysis of Russian Effort

In this section the overall analysis of implementation of the Kyoto protocol is done. Overall benefits of Kyoto protocol will be evaluated. The overall reduction of the emission of gases and sector wise reduction will also form the benchmark for the evaluation.

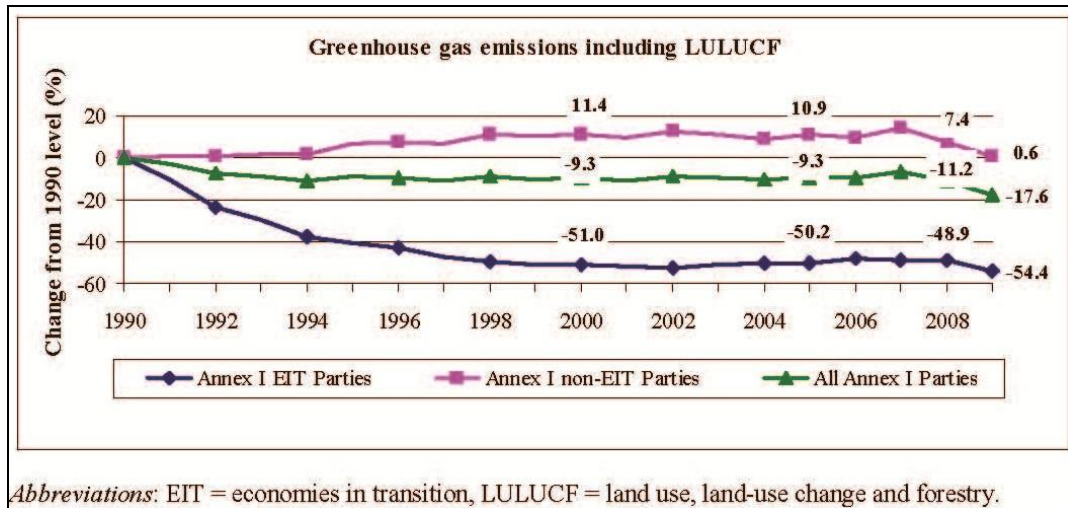
Two decades have passed since the Rio summit took place. Kyoto Protocol seeks to reduce the emission level from 1990 as a base year. In these two decades many efforts have been taken by the countries. So, the real question arises whether the Kyoto protocol has brought changes in the emission levels. Is any tangible improvement is there in our quality? How far the Annexure I countries succeeded in bringing the emission level down? The answer to these questions will be sought in the following analyses. Firstly, comparison among the major categories of the Kyoto is done. Then a detailed comparison is done between the performance of Annex-I and Russian federation. The position of Russia will emerge out in comparison to its counterparts. The gases-wise and sectoral analysis of the Russia and major countries of the world is already been done in the previous section.

Comparison of Annex I, Economy in Transition (EIT) and Non-EIT (1990-2009)

On comparison of economy in transition (EIT) and non-economy in transition it could be said that overall the emission level of EIT countries is less. From 1990 to 2009, the EIT emission levels have always been less than non-EIT countries. Also one more thing is seen from the graph that decline of emission level is steady for Annex I EIT parties right

through the 1990 till 2009. It is not so in case of Annex I non-EIT parties, where the emission level have peaked in 2005 and then shown declining trend.

Chart: 17



Source: UNFCCC report no. FCCC/SBI/2011/9, 16 NOVEMBER 2011

If we took at the emission level from base year 1990 to 2009, the emission level has come down. “Most countries have increased their emissions in the commitment period since 1990 and had to invest in significant mitigation efforts to keep growth of their carbon emission under control” (Elena Lioubimtseva, 2011:3). Looking the emission on sectoral basis, the emission has also reduced. The emission level from energy sectors declined from 15.33% to 13.98% in the period from 1990 to 2009. The percentage from the industrial process is reduced from 1.45% percentage to 1.33%. The emission from waste sector has also reduced. The total emission level in 1990 was 0.54 Gg CO₂ equivalents which reduced to 0.48 Gg CO₂ equivalents. The most important aspect of the Green House Gas reduction is that, the reduction from land area, land use change and forestry has increased at higher rate which means that the Green cover of the world has increased. Despite the fact that population and urbanization have increased, the Kyoto Parties have succeeded in the increment of the green cover. The land use change and forestry sink level has increased from 1.37 Gg CO₂ equivalents to 2.28 Gg CO₂ equivalents.

If the comparison is made on the reduction of individual gases, then, too, picture remains same. The minimum reduction is registered in carbon dioxide. The level of CO₂ has reduced from 15.11 Gg of CO₂ equivalents in 1990 to 13.66 Gg of CO₂ equivalents in 2009. This is a good improvement. Though the decrease is offset by the greater increment of CO₂ level in same time period by developing countries like China, India, Brazil, Mexico etc. and also by United States of America. The level of methane (CH₄), Nitrous Oxide (N₂O) and HFC, PFC, SF₆ have come down in the two credit periods. The percentage change from 1990 level has reduced maximum for Nitrous oxide (N₂O) which is -20.3 percentages from 1990 level. But the level of group of gases (HFC, PFC, SF₆) has increase by 3.6%. The carbon dioxide level has reduced to -9.6% from 1990 level.

In terms of total change in GHG emission among Kyoto countries, the level of emission reduced maximum for Latvia which is in tune of -185.8% followed by Estonia, Lithuania, Romania, Ukraine and Russian Federation. The net emission has increased in Canada, Malta, Australia, Turkey and Spain. This is the reason Canada has opted to pull itself out of Kyoto as it could not bear the huge loss which have occurred by purchase of carbon credit to clear its account. Turkey has maximum increase in the carbon dioxide in both the categories including land use, land use change and forestry.

The emission of Annex-I non-EIT (economy in Transition) is highest among the Kyoto parties. In fact their emission level has increased in last two decade. Though, in last two to three years, it has declined marginally. While, the emission of Annex-I parties has reduced in the last 20 years. This has led to the maintenance of constant emission level for the all Kyoto Parties. Post 2005 when the Kyoto has come in force the emission level has started decreasing. That indicates that Kyoto protocol has led to the decreasing the emission level. Thus we can say that Kyoto has at least set examples for the world community that the serious problem like climate change can be met, if determined and coordinated efforts are taken in right direction. In this respect Kyoto has emerged as a good example for the world community.

Now a comparison is made between the reduction of the gases by Russian federation and Annexure –I countries. This will bring out the role of Russia in bringing the

emission level down. Here the comparison of the reduction of gases in each category is made.

TOTAL GHG (Including LULUCF)

The report card of Russian federation is very good in comparison of Annex-I parties in TOTAL GHG removal. The total reduction of gases is 13.7% for Annex-I countries. Russian has reduced almost 4 times than Annex I countries. The total reduction for Russia is about -54.8%. This is big achievement for Russian Federation and even when LULUCF is not considered the decline for Russia is three times the decline of Annex –I countries. Russian commitment for Kyoto Protocol is unprecedented. It has done excellent job.

PERCENTAGE REDUCTION OF EMISSION(1990 - 2010)		
TABLE NO. 1		
TOTAL GHG (including LULUCF)		
GASES	ANNEX I COUNTRIES	RUSSIA
CARBON DIOXIDE	-12.70%	-64
METHANE	-15.00%	-17.2
NITROUS OXIDE	-26.30%	-48.3
HFCs	128.6	-61.5
PFCs	-76.8	-77.7
SF6	-72.21	-44.9
TOTAL	-13.7	-54.8
Source: http://unfccc.int/di/FlexibleCADQueries.do		

Also remarkable progress is being made by Russia in reduction of HFCs. Where the emission level of HFCs for Annex–I countries have gone up by 128%, Russia is successful in declining its emission from HFCs -61.5% level. The decline in almost all 6 gases is more for Russia than Annex –I parties. The reduction in CO₂ level is remarkable. The reduction is 5 times the Annex I parties. So in total GHG section Russia has done pretty well than the other countries.

While comparing ENERGY SECTOR, we find Russia has done well than other Annex I parties. In energy sector CO₂ reduction for Russia is about 40% while it is just 8% (approx) for Annex I parties. Only in the Nitrous oxide reduction of Annex-I parties is

marginally higher than Russian federation. The emission reduction of Nitrous oxide is about -10.2% and that of Russia is -0.21%.

PERCENTAGE REDUCTION OF EMISSION (1990-2010)		
TABLE NO. 2		
ENERGY SECTOR		
GASES	ANNEX I COUNTRIES	RUSSIAN
CARBON DIOXIDE	-7.60%	-39.4
METHANE	-16.60%	-18.2
NITROUS OXIDE	-10.20%	-8.2
Source: http://unfccc.int/di/FlexibleCADQueries.do		

On comparison of the gases in INDUSTRIAL PROCESS category, the reduction of Russian Federation is much better. The Russian Federation has reduced 33% in comparison of 20% of Annex –I parties. In HFCs also, Russia has reduced this gas to 62% whereas there is increase of 128 percentages for Annex –I parties. Though Russia is lagging behind in case of SF₆ but in rest of the gases it has either done better or close to Annex-I parties. The only grey area is Nitrous Oxide, in which the emission level has increased to 22% for Russia whereas Annex I parties has reduced their emission of nitrous oxide to 71.5%. So Russia needs to work hard in reduction of nitrous oxide (N₂O).

PERCENTAGE REDUCTION OF EMISSION (1990 - 2010)		
TABLE NO. 3		
INDUSTRIAL PROCESS		
GASES	ANNEX I COUNTRIES	RUSSIA
CARBON DIOXIDE	-18.70%	-27.5
METHANE	-28.70%	-20.2
NITROUS OXIDE	-71.50%	22
HFCs	128.6	-61.5
PFCs	-76.8	-77.1
SF ₆	-72.2	-44.9
TOTAL	-20.2	-32.9
Source: http://unfccc.int/di/FlexibleCADQueries.do		

The report card of Russia is better even in AGRICULTURE and land use, land use change and forestry (LULUCF) section. Russia has reduced almost thrice the reduction of

Annex –I parties. The total reduction is about 57% for Russia and 21% for Annex-I parties. Again Russia has reduced its CO₂ level to almost thrice than Annex –I parties. And it has done well even in nitrous oxide (N₂O) section. The reduction of nitrous oxide from agriculture sector for Russia is about 54.3 percentages while it is 22.4 for Annex-I parties.

PERCENTAGE REDUCTION OF EMISSION (1990 - 2010)		
TABLE NO. 4		
AGRICULTURE		
GASES	ANNEX I COUNTRIES	RUSSIA
METHANE	-19.7	-61.5
NITROUS OXIDE	-22.4	-54.3
TOTAL	-21.2	-56.9
Source: http://unfccc.int/di/FlexibleCADQueries.do		

In LULUCF Russian Federation performance is outstanding. Where the emission level of CO₂ has increased to 65.2% for the Annex-I parties, the reduction for Russian federation is 1200.7% which is huge in any comparison.

PERCENTAGE REDUCTION OF EMISSION (1990 - 2010)		
TABLE NO. 5		
LULUCF		
GASES	ANNEX I COUNTRIES	RUSSIA
CARBON DIOXIDE	65.20%	-1200
METHANE	39.40%	4.6
NITROUS OXIDE	31.00%	3.6
Source: http://unfccc.int/di/FlexibleCADQueries.do		

This is due to the decrease in the forest cover for Annex-I parties, while Russia is successful in preserving, conserving and expanding its forest cover. The total reduction is about 915% for Russia. On the contrary, it has increased about 66% for Annex I parties. So in terms of overall reduction of 6 gases committed in Kyoto protocol, Russian federation has done remarkably well in comparison to their counter parts. In almost all the gases and sectors efforts are above average. This shows how much Russia is committed in bringing the emission level down and extending its support to the global effort to combat the menace of climate change.

Chapter 5

CONCLUSION

International politics is undergoing paradigm shift due to strong undertow current of new challenge of climate change. This problem has brought every country of globe together to find a common solution. The complex and dynamic problem of climate change demands some concrete, and path breaking solution. The Kyoto Protocol is unique, innovative and milestone example of multilateral cooperation to combat this challenge. Russian Federation has engaged itself in a constructive way in this endeavour. Russia is not just the part of Kyoto protocol, but a key player in all the climate change negotiation from Rio to Durban. It has emerged as a key player in the post Kyoto protocol negotiations.

In this context multilateral climate change negotiations involving almost all the nation hold importance. Under the aegis of United Nations Environment and Development program the climate change talk have undergone sea change. Russian Federation being the biggest country in the world with maximum forest in the world holds key position, both, in mitigation and adaptation plan and in reduction of green house gases through “carbon sink”. The climate change has very catastrophic effect on human kind. Flood, drought, extreme weather, forest fire, cyclone etc. are the problem that is going to create more than 500 million “climate refugees” in future. Russia is no exception to it. The forest fire, flood, drought, loss to its logging economy, crop failure are the problems which it has to face. Russian Federation has always been vocal about climate change. It has shown full commitment to the world community in Rio-Earth Summit 1992

Kyoto protocol is the first of its kind in history which has many new innovative “flexible mechanisms” to deal with the problem like joint implementation, clean development mechanism and emission trading to deal with the problem. Russia has played central role in bringing Kyoto protocol into effect, as without the involvement of the Russia in Kyoto protocol, the basic requirement could not have been fulfilled. Minimum 55 countries with 55% of the total global emission were needed for Kyoto to come into force. After the refusal of the United States, it was almost certain that without Russia’s help Kyoto is not going to come into force. So Russia emerged as the savior and deal maker in the protocol. Russian contribution is also important in political, environmental and welfarist terms.

Russia has taken the binding emission cuts whereas many of the western nations which are the bigger emitters have denied taking emission cuts. Russian contribution to the deal is importance for various other reasons. Among all the countries Russia is third largest emitter of green house gases (GHG) after United States and China. It is responsible for about 5 percentage green house emission and 6 percentage of carbon dioxide emission of the earth. Secondly Russia has seventeen percentage of the world forest area. That is highest in the world. This huge pool of forest could act as “carbon sink” to capture the atmospheric carbon dioxide, hence beneficial in curbing the level of carbon dioxide from the atmosphere thereby helping in bringing the average temperature of the earth down. Thirdly Russia has huge share in world fossil fuel resources. Russia is the biggest producer of the natural gas in the world at present.

The annual production of the natural gas in Russia is about 3177 giga metric cube natural gas annually. This is huge in any scale. Not only this Russia is second largest oil producer in the world after Saudi Arabia. It has twelve percentage share of the world oil production. The emission level from the fossil fuel is very high so Russia could be an important and strategic player in any future climate change negotiation. So it also holds a strategic asset in future climate dialogue.

In this context any multilateral deal for climate change cannot be successful without Russia’s involvement. In Kyoto protocol Russia has taken a substantive and valuable position despite the irresponsible behavior of the United States of America. The developing countries have very genuine reason not to join the binding emission regime. Taking binding emission cuts will prove detrimental to their economic growth. This stand is being supported by Russia in the Kyoto negotiations. Russia has demanded that in future the biggest emitter from developing nations must take at least minimum binding emission cuts.

Kyoto protocol finally came into effect on 16 July 2005 when Russia ratified it. Before the success and failure of the Kyoto could be analyzed, the world community got entrapped into many complex issues. These are fund and technology transfer from developed to developing and poor countries, for adaptation, and base line for fixing the emission cuts. Apparently in mitigating the challenge every nation is neither capable nor responsible to contribute on equal footing. The developed countries have clear cut edge

over the developing and least developed countries as they have better technology and more resources to take action. Nevertheless, developed countries are the main culprits of the present situation. The irresponsible misuse of natural resources was done by the colonial powers to gain immense and multifold profits through rapid industrialization. Thus the principle of common but differentiated responsibility (CBDR) has been evolved. Russia has fully supported this principle. In fact, Russia is also an “Economy in Transition” country in Annexe-1 of Kyoto, which has helped it to gain some relaxation in mitigation targets? The least developed nations are the worst sufferers and least responsible. So, they are being exempted from taking any binding emission cuts.

Russia has always been vocal about the cause of the least developed countries in this whole debate. Technology transfer is another acrimonious issue between developed and developing countries. To migrate the new challenge the adoption of new technologies are must and inevitable. But these mitigation and adaption technologies bear high cost which is difficult for poor countries to bear. This requires transfer of modern “green technologies” from have’s to have not’s. But the developed world has shown reluctance. Even in recent Copenhagen Summit 2009, they tried to link technology transfer with WTO Intellectual Property Right and patent negotiations. Russia along with developing countries has opposed it. In fact Russia has demanded technology transfer with certain responsibilities, so that misuse of “free access” could be checked. This is criticized by some quarters in developing world. We have to observe how things take shape. The third contentious issue is fixing base line for the emission reduction. Under Kyoto 1990 is taken as the base year. For Economy in transition category certain relaxation is given to keep 1995 as base year for reduction of group of gases, e.g. HFCs, PFCs and SF6. Scholars like Elena Lioubimtseva believe that Russia has been given an easy target. There is demand from some quarters that Russia should not be kept under “Economy in transition category”. Russia has argued that the present economic downturn has led to huge economic losses and Russia is still trying to overcome the economic crisis. So 1990 as a base year, especially for Russian Federation, is a tricky issue. Certainly Post Kyoto treaty is going to have big debate over it.

Irrespective of these contentious issues Russia has done a lot to bring some tangible results. According to Russia’s Ministry of Economic Development (MEDT), the country

has not only met the Kyoto targets but also generated surplus equal to over 3 billion tons of CO₂ equivalent. Russia has established Assigned Amount of Unit (AAU) registry. Russia Federal Service of Hydrometeorology and Environment monitoring, Ministry of Natural Resource of Russian Federation and other related departments have brought normative acts and regulations. Russia has registered more than 50% of world's Joint Implementation (JI) amounting to the reduction of 79.2 mln tons of GHG. These are some institutional changes brought by the Russian government. Many findings have come out on analysis of Reports of UNFCCC like-“National greenhouse gas inventory data for the period 1990-2009”, “Annual compilation and accounting report for Annex B Parties under Kyoto Protocol for 2011”, “Annual status report of the annual inventory of Russian Federation” and GHG Data interface of UNFCCC website.

According to these findings Russia has reduced 54.82 percentage of GHG emission from 1990 level. It was required to bring down the GHG emission level at the 1990 level. The GHG share of Russia has come down from 17% in 1990 to 5 percentage in 2005. It has world's highest “Joint Implementation” (JI) registered, amounting to about 79 million tonnes of Carbon dioxide equivalent. As per Kyoto requirement, the emission has decreased in each sector, both domestically and in comparison to other Annex-I countries. The reduction is 33% in energy sector, 32% in industrial process sector and 59% in agriculture sector between 1990 and 2010. Clearly, Russia has done beyond its commitment in comparison to Turkey, Canada, Spain, Portugal and United Kingdom whose overall greenhouse emissions have in fact increased. On analyzing the individual gases, the reduction is more than the required as per the Kyoto Protocol. Excluding Nitrous Oxide (N₂O) where the emission level has increased, it has come down drastically for other gases. The reduction in Carbon dioxide in energy sector is 39% and from Industrial process it is 26%. The most important reduction of Carbon dioxide is from land use, land use change and forestry category (LULUCF). The total reduction of Carbon dioxide from LULUCF between 1990 and 2010 is 1200%, which is exceptional. This has led Russia to earn huge carbon credits. So we find Russia has done well in each and every category of inventory requirement and exceptionally well in few areas. However we should keep in mind that emission cut targets were kept relatively low for

Russia keeping it in the “economy in transition” category which has been criticised by many western scholars including Elena Liobimtseva of Grand Valley State University. And even the credibility of the green house data is doubted by certain agencies. But even if this argument is accepted then too Russia has reduced its emission far more than the required limits.

However it is also possible to argue that Russia has shown serious commitment towards reducing the emission level. This has raised the country’s credentials in the world. Thus one cannot cast doubts on the Russian willingness to contribute to the climate change challenge. Russia unlike Canada has not pulled itself out from Kyoto Protocol. Countries like United States of America, which is the highest emitter of greenhouse gases in the world, have not taken any binding emission cuts. Russian efforts under such circumstances become more important as it has not only provided leadership but also strengthened the notion that strong commitment is must for dealing with serious challenges.

Whether Kyoto Protocol is a success or a failure is a debatable issue. But for Russia certainly it is beneficial both strategically and economically. Alain Bernard and Sergey Palstev in their paper in Global Science Policy Change conclude by writing that Kyoto Protocol has produced a situation where Russia and Ukraine have acquired windfall surplus in terms of carbon credits. Under such situation Russia can go for business as usual for decades to come. In fact, Kyoto Protocol has made Russia a dominant supplier of carbon credits which can be exercised to increase permit revenue.

The overall success of Kyoto Protocol is questioned by some scholars. It is argued that the Kyoto Protocol is not successful in bringing all the nations on board, especially the biggest emitters, in binding emission cut regime. Though few countries including Russia have decreased their emission level but there are countries which have increased the emission, e.g. Turkey, New Zealand, Malta etc. The emission level of annex-I countries have come down. The Kyoto countries like Japan and Russia are not willing to take any further commitment until and unless United States and China take some binding emission cut. Canada has already left Kyoto which is a great setback for Kyoto. Western scholars like Elina Lioubimtseva have argued that any such model which does not include developing countries like China and India is not going to be successful. A post 2012

agreement without them cannot be functional. Even United States of America has to come on board. Apart from these, issues like technology transfer and differential scientific capacities of southern and northern countries continue to be a major point of contestation between north and south. This is well articulated by scholars Bjorn-ola Linner and Merle Jacob in their paper.

Despite these limitations the benefits of Kyoto Protocol cannot be undermined. It has brought to the fore number of new and interesting insights which hold great promise for future. Irrespective of contestation, Kyoto has come into force. All the major actors acknowledged the need to reconcile environment protection and developmental concerns of south, at least rhetorically. Also, number of important lessons could be ferret out about the interactions of science and policy in this ongoing discourse.

From Russia's point of view Kyoto Protocol has been a game changer, both economically and strategically. Any future multilateral climate negotiation could not be thought of without the involvement of important players like Russia. The position of Russia in this whole discourse of present and future climate change will be determined by following presumptions.

- 1) The future carbon credit allocation for Russia.
- 2) The baseline for measuring the emission trends.
- 3) Assessment and monitoring of carbon stores, sinks and sources.
- 4) The impact of climate change on Russia's economy and environment.
- 5) Vulnerability and adaptation capabilities of Russia to climate change.

The above points along with future political circumstances and Russia's relationship with its key partners will be decisive in future negotiations. Russia till now has been cooperative and serious global partner for combating the challenge of climate change. In fact it has proved itself by implementing Kyoto commitments. International politics is very dynamic and malleable, only time will tell how this kaleidoscopic political matrix will take shape in the whole gamut of climate change negotiations. And certainly, Russia will hold key position in any future discourse.

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