CHAPTER – 7

FINDINGS, CONCLUSIONS AND SUGGESTIONS
CHAPTER - 7

7.0 FINDINGS, CONCLUSIONS AND SUGGESTIONS

Findings, conclusions and suggestions of this study have been presented separately for following three broad areas followed by overall concluding paragraphs:

i) Global Carbon Finance Market

ii) Carbon Finance Business of World Bank

iii) Carbon Finance Market in Indian Context

7.1 Global Carbon Finance Market

Carbon finance, which has its roots in the Kyoto Protocol’s market-based mechanisms, is now a proven tool to support GHG mitigation and sustainable development. Carbon Finance is the generic name for the revenue streams generated by projects from the sale of their greenhouse gas emission reductions or from trading in carbon credits such as CERs. The experience has shown how carbon finance revenues can enhance the overall viability of GHG reducing projects and, because payments are performance based, how it creates positive incentives for good managements and operational practices to sustain emission reductions overtime. Carbon finance operations has demonstrated opportunities for collaborations across sectors, and has served as a catalyst for the incorporation of climate friendly technologies in the projects relating to Rural Electrification, Renewable Energy, Energy Efficiency, Urban Infrastructure, Waste Management, Forestry and Water Resource Management.
7.1.1 Findings

The overall value of the global carbon finance market from trading of all types of emission reduction credits including European Union Allowances (EUAs) under the European Union Emissions Trading Scheme (EU ETS); Verified Emission Reductions of voluntary markets; and also transactions under the Kyoto Protocol i.e. Certified Emission Reductions (CERs), Emission Reduction Units (ERUs), and Assigned Amount Units (AAUs), has reached to US$ 142 billion in the year 2010 from US$ 11 billion in the year 2005.


As on December 31, 2010, a total of 2703 projects have been registered by the CDM Executive Board as CDM projects worldwide with expected average annual Emission Reductions of 419,622,727. The project for GHG emission reduction by thermal oxidation of HFC 23 in Gujarat, India was the first registered CDM project of the World, which was registered on March 08, 2005, for three million Certified Emission Reductions (CERs). The Annex I parties associated with this project are Switzerland, United Kingdom of Great Britain and Northern Ireland.

Out of the above 2703 CDM registered projects, 1479 (54.73% of total) are located in East Asia and the Pacific region, followed by 620 (22.94%) projects in South Asia region and 496 (18.34%) projects in Latin America and the Caribbean.

Among the regions where very small number of the projects have been registered are Middle East and North Africa region with 49 number,
Africa region with 39 number and Europe and Central Asia region with only 20 number registered projects.

In the global CDM experience, China’s role is striking with its highest share of 42.25% of the total projects in the CDM portfolio and other large player in the field are India and Brazil with share of 22.12% and 6.73% respectively.

Activities under the Kyoto Mechanism have largely focused, at least initially, on the simplest projects to bring through the CDM system, those with lowest abatement costs and largest volume potential. Renewable energy projects e.g. Hydro, Wind, and Bio-Mass are the most popular types of projects in the CDM. As per statistics as on December 31, 2010, the Energy Industries (Renewable/Non Renewable sources) sector has attracted the largest number of CDM projects with percentage of registration as 64.72%. Waste management Sector is the other most popular sector with percentage of registration as 15.67%.

Analysis of distribution of registered projects activities by Sectoral Scopes indicates that the sectors which are not reaching their full potential include energy demand; mining/mineral production; metal production; fugitive emissions from production and consumption of halocarbons; and forestry i.e. afforestation and reforestation.

Further, not even a single project has been registered in three sectors namely energy distribution, construction and solvent use.

A total of 496,178,287 CERs equivalent to 496.18 million tons of carbon dioxide equivalent has been generated and issued up to December 31, 2010 by the CDM projects registered all over the world.

The projects registered in China has generated and issued 53.50% of the
total issued CERs up to December 31, 2010 followed by Indian registered projects with a share of 16.59%. China and India emerged out as the major beneficiaries of the Carbon Finance Market and thus has contributed maximum in mitigation of climate change.

The study further finds out that Multilateral Development Banks (MDBs) are playing key role in combating the menace of climate change by providing financial assistance as well as assistance in capacity building.

The MDBs, individually and collectively, recognized the challenge of climate change and its potentially adverse implications for their respective development, transition, and poverty-reduction agendas. Virtually all the MDBs have included energy efficiency as a key component of their development strategies and assistance efforts since the early 1990s. Later on all the MDBs have defined new initiatives designed to help their clients mitigate the impact of their past and future development programs on climate change. Those regions where the impact of global warming is already apparent, the MDBs are also increasingly helping their clients to adapt to the new, higher-risk environment. As part of this process the MDBs have set themselves a number of targets:

- The European Bank for Reconstruction and Development (EBRD) Sustainable Energy Initiative (SEI) commits the institution to more than doubling its investments in energy efficiency and cleaner energy to over €1.5 billion in projects, with total costs of over €5 billion.

- The Asian Development Bank (ADB) is in the process of expanding its clean energy operations to reach US$1 billion a year.
• The European Investment Bank (EIB) has adopted ambitious renewable energy targets, has adjusted its product offering so as to enhance its support for climate change mitigation, and works closely with the EU Commission’s climate-change policy agenda, including support for the EU’s flagship program that plans to support up to 12 carbon capture and storage power plants.

• The African Development Bank (AfDB) has announced a program to provide financial support to 5 to 10 climate “adaptation” projects a year.

• The Inter-American Development Bank (IDB) is in the process of establishing targets for expanding its sustainable energy operations to reach up to US$ 1.5 billion per year over the period of 2008-2012.

• The World Bank Group (WBG) is committed to increasing its energy efficiency and renewable lending by 20 percent a year. Further, the Carbon Finance Unit of World Bank has played an important role in stabilization of global carbon finance market in its initial stages and thereafter in its development, which has been discussed in detail in Para 6.2 of this chapter.

7.1.2 Conclusions

The overall worldwide carbon finance market is growing since beginning and the volume of the market which was merely US$ 11 billion in the year 2005 has grown to US$ 142 billion in the year 2010. However, the growth, which was significant during the years 2005 to 2008, has slowed down in the year 2009 because of market turmoil and recession worldwide. Annual value of global carbon market shows that 2010 was
a watershed year as the market ended the five years trend of growth with a slight decline of 1.4% as market valued at US $142 billion as against US $144 in 2009.

The time series analysis of the volume of Global Carbon Finance Market over a period 2005-2010, reveals that trading volume has increased on an average by US$ 28.09 billion per year. Based on this analysis the volume of global carbon finance market is expected to be about US$ 439.04 billion in the year 2020.

The value of the global carbon finance market through sale of ERs under Project Based Mechanisms of Kyoto Protocol have increased from US$ 540 million in the year 2004 to US$ 33.49 billion in the year 2008. After the boom in 2008, trading volume including secondary CERs stalled in 2009, remaining just above one billion tons. The heavy decline in the prices of primary and secondary CERs caused overall market value to drop more than 37% to US$ 20.91 billion. Further, during the year 2010 the market for Project Based Mechanisms of Kyoto Protocol increased a little to US $ 21.10 billion because of increased volume of ERs transacted.

Working with the Kyoto Protocol’s CDM has been a challenging, yet rich in learning and a successful experience. The mechanism has provided an important catalyst for development finance while simultaneously supporting GHG mitigation and sustainable development.

The CDM has supported basic development needs and broader socio economic benefits, such as improving energy access and services as in the case of Nepal bio gas project which has so far installed around 20,000 bio gas plants in the country, providing solutions for the solid waste management problems so often associated with the increased
urbanization of developing countries, reducing local air and water pollution and generating heath benefits e.g. through waste water management projects, generating employment, and improving livelihoods e.g. through reforestation projects

The Kyoto Mechanisms have also played an important role in contributing to technology transfer such as the solar home system project and energy efficient lighting projects in Bangladesh. Forestry projects such as the soil conservation project in Moldova, have demonstrated the synergies between carbon sequestration and the promotion of other environmental services and improving rural livelihoods. One of the very important and note worthy contribution of Kyoto Mechanisms is raising the climate change awareness worldwide which led to building capacity in developing countries to use carbon finance to support GHG reductions.

Clean Development Mechanism (CDM), one of the main and only mechanisms of Kyoto Protocols which allows generation of Certified Emission Reductions (CERs) from projects within developing countries, developed under a “learning-by-doing” philosophy have exceeded expectations not only in terms of number of projects registered and expected annual CERs but also in terms of the awareness and capacity building it has generated. It has certainly provided significant experience in the development, evaluation, implementation and monitoring of GHG reduction projects.

The global economic down turn, regulatory delays and absence of clear policy and regulatory signals beyond 2012 have negatively impacted the CDM market of CERs. The economic down turn caused industrial output and emissions of the industrialized countries to fall in 2009,
considerably easing the compliance needs which lead to decreased demand for CERs. On the supply side, origination activities also declined in 2009 as the financial institutions and private investors deleveraged and redirected their position away from risky investments towards safer investments because of financial crisis all around, leading to a major reduction in the capital inflow to developing countries. The complexities and changing nature of regulations at UNFCCC for CDM, inefficiencies in the regulatory chain and capacity bottlenecks caused delays and have negatively impacted the projects. It now takes over three years for the average CDM project to make its way through the regulatory process and issue its first CER. At the same time, the non-clarity on the post 2012 international climate change regime, has further resulted in the decline of overall CER market.

The study also reveals that Carbon finance is facing an uncertain future. Only two years remain before the end of the first commitment period of the Kyoto Protocol, and the future shape of the international community’s commitment against climate change is still unclear – affecting investment decisions and slowing the growth of market mechanisms. Carbon market proponents are fast at work ensuring that the Kyoto Protocol’s emissions offsetting systems survive longer than the treaty itself. Government of UNFCCC parties are well aware that if they fail to either renew or replace the 1997 global warming agreement by Dec. 31, 2012, a huge part of the global emissions trading regime will be disrupted.

Last year, in the beginning 2010, the offices of the U.N. Framework Convention on Climate Change (UNFCCC) conducted a legal study of the Kyoto Protocol in an effort to tell member nations what to expect?, should the treaty be allowed to expire with no replacement. The study
pointed out that there may be a “gap” between December 31, 2012, and when a new arrangement can be agreed upon, because of slow and painful international negotiations going on in this regard.

The development during UN Climate Change Conference, Bali, Indonesia held during December, 2007 and UN Climate Change Conference, Copenhagen, Denmark during December, 2009 for ensuring that Kyoto Protocol’s CDM for emission reductions survives beyond December 31, 2012, cannot be considered encouraging. However, UN Climate Change Conference in Cancun, Mexico held during December, 2010 delivered balanced package of decisions, restoring faith in multilateral process. The Conference ended with the adoption of a balanced package of decisions that set all governments more firmly on the path towards a low-emissions future and support enhance action on climate change in the developing world. UNFCCC Executive Secretary, Ms. Christiana Figueres through a press release immediately after closing of the Conference informed that “Cancun has done its job. The beacon of hope has been reignited and faith in the multilateral climate change process to deliver results has been restored. Nations have shown they can work together under a common roof, to reach consensus on a common cause. They have shown that consensus in a transparent and inclusive process can create opportunity for all.”

During the Cancun Conference, Nations launched a set of initiatives and institutions to protect the poor and the vulnerable from climate change and to deploy the money and technology that developing countries need to plan and build their own sustainable futures. And they agreed to launch concrete action to preserve forests in developing nations. They also agreed that countries need to work to stay below a two degree temperature rise and they set a clear timetable for review, to ensure that
global action is adequate to meet the emerging reality of climate change.

Parties meeting under the Kyoto Protocol agreed to continue negotiations with the aim of completing their work and ensuring there is no gap between the first and second commitment periods of the treaty.

An immediate fund of $30 billion from industrialized countries was established to support climate action in the developing world up to 2012 and the intention to further raise $100 billion in long term by 2020 are among some of important decisions taken in the Conference. In the field of climate finance, a process to design a Green Climate Fund under the Conference of the Parties, with a Board with equal representation from developed and developing countries, was also established.

Leaving aside the agreements made during the Cancun Conference, the World Bank on the other hand is actually leading the effort to guarantee the CDM’s survival. It recently announced new funds allocated for post-2012 carbon credit purchases, which are made available to member countries and companies facing reduction requirements. Officials at the bank say they are very actively working to ensure that the CDM survives even if the Kyoto Protocol dies, focusing their expansion efforts on the poorest nations. The World Bank has explicitly told the projects it supports that funding will be available to purchase credits well into the post-2012 period despite the fact that there may be no buyers then.

The Bank’s Carbon Finance Unit made news when it announced from Washington, D.C., during February, 2011 that it had allocated $147 million to “Tranche 2” of its Umbrella Carbon Facility, a fund for purchases of CERs from project backed by the World Bank. These funds have been earmarked specifically for CERs generated from 2013 to 2018.
The private sector has also come forward to supplement the World Bank’s efforts. Since end of January, 2011 Inter Continental Exchange (ICE), which operates the European Climate Exchange and the Chicago Climate Futures Exchange, began offering trades in CER futures for delivery from 2013 to 2020. ICE’s main competitor Green Exchange (Green X) quickly followed the suit and has launched its “CER plus” futures contracts since February, 2011. Actions by the World Bank and the private sector Exchanges reflects that the CDM will continue post-2012 and thus addresses to the immediate concern of all the CERs generators worldwide.

7.1.3 Suggestions

On the basis of the present study the following suggestions are being made to further fine tune the CDM and plug the gap so that the full potential of this mechanism can be realized, which will pave the way to meet the challenges of climate change:

i) The CDM has achieved impressive results with more than 2700 registered CDM projects and almost equal number of projects in pipeline expected to be registered. However, the rules, modalities and procedures which were developed to ensure genuine registration and issuance of Carbon Credits, have inadvertently resulted in excessive delays and bottlenecks. The long time frame associated with the CDM approval process now amounting to approximately 18 months is undoubtedly reducing the impact of the CDM. There is a strong need that the CDM Executive Board, UNFCCC Secretariat and the international community should take initiatives to streamline registration and issuance processes.
ii) Efforts need to be made without delay to enhance confidence in the eyes of CDM Executive Board with respect to performance of the Designated Operational Entities (DOEs) as well as their accountability so as to cut down delay in registration of a project even after the validation by DOEs.

iii) To facilitate project implementation and verifications by DOEs for issuance of Carbon Credit the project entities need to carefully integrate their CDM project's motoring plan into their operation work plan and ensure that the relevant staff is familiar with the CDM monitoring requirements. At the same time, there is a need that CDM monitoring requirements specified in methodologies should be reviewed and revised to ensure that these are consistent with actual sector /industry and country practices to the extent possible.

The entire burden of delays should not borne by the project entities. The successfully registered projects should be allowed to start generating CERs from the date of their submissions for registration rather than the date of registration.

iv) Frequent revisions in CDM rules leads to uncertainties in registration of projects. Regulatory reliability is also needed in the form of more predictable and objective rules and guidance. It is understandable that periodic reviews and revisions of CDM rules, procedures and methodologies to take care of practical realities and maintain the environmental integrity, are necessary but the timing, the process and the triggers (i.e. necessity) to initiate such reviews should be clear at the outset and should not be arbitrary.
v) The low carbon project alternatives are generally capital intensive such as renewable energy and the Carbon Finance alone can not overcome the financial barriers associated with these project alternatives in the developing countries. Accordingly, better ways need to be found out to leverage the synergies between different financial instruments (e.g., commercial loans and other long term debts) and carbon finance.

vi) It cannot be debated that environmental integrity is essential for the CDM, the climate regime as well as the carbon market. The CDM take care of environmental integrity through the demonstration of additionality i.e. providing evidence that the emission reductions from the project are additional to what would occur without it. The concept additionality is attractive in theory but its demonstration has turned out to be very challenging to implement which is always questionable leading to rejection of large number of projects. Therefore, it is urgent to make changes to ensure that the concept of additionality is implemented in a more practical, workable and transparent manner. It is suggested to review the implementation of the concept of additionality to reconcile with the reality that a good and effective climate reducing project also needs to be a technically and financially sound. This means moving away from the current additionality assessment focused on individual investment decision towards objective and more easily verifiable technical criteria through standard baseline accompanied by automatic additionality for activities meeting clear criteria and to be implemented in clearly specified
geographic region. For example, there could be automatic additionality clearance for particular activities such as Renewable Energy Project to be implemented in clearly specified geographic regions i.e. say for example in India or Mexico etc.

vii) Some of approved methodologies have been widely used and have facilitated the uptake of many projects but a large number of methodologies are overly complex, conservatives and restrictive thereby limiting their applicability. The rule makers need to collaborate with industry / sector specialist to ensure that methodologies particularly the monitoring requirements are consistent with exiting industry / sector practices, standards and reporting guidelines.

viii) Under the CDM methodology development occurs through a “bottom up” process where individual project participants accompanied by a concrete project proposal develop and submit a methodology for approval by the CDM Executive Board. There are no patents or fees that go to compensate methodology developers. As such, there is no advantage for those that develop methodologies but there are costs and risks associated. As per the experience of World Bank a new methodology cost approximately US$ 1,25,000 and takes approximately two years to develop from inception to approval. Moreover there is also a 50% risk that the methodology may be rejected. Therefore, it is suggested that the development of methodologies should be viewed as a public good since once a methodology is approved it can be used by any other project developer. There is a need to come out with clear incentives to
the developer for developing broader and more widely accessible methodologies. Further, there is a need to consider a "top down" approach based on greater standardizations of base lines, benchmarks and default values wherever appropriate drawn from already approved methodologies instead of present approach of "bottom up" process.

ix) In the global CDM experience, the role of China is striking as its share in the CDM portfolio is very large. One of the important factors which can be attributed to the success of China is the capacity developed and the overall CDM support structure to facilitate CDM activities in China. The capacity of the country to implement and follow through with projects is one of the main factors for successful CDM projects. Accordingly, at the host government level, capacity to create the required structure and clear regulatory frameworks to attract carbon finance is critical. A lot is required to be undertaken by the governments of developing countries in these respects.

x) The study shows that the performance of LDCs projects lacks behind that of CDM projects located in other parts of the world even after these projects enter the CDM pipeline. Longer delays in implementation of projects are common and the key CDM milestones i.e. registration and issuance of CERs tend to take longer time to reach the LDCs. The following statistics (updated as on March, 2010) illustrate the situation:

- Only 15 (0.73%) of the CDM register projects are hosted by LDCs. Further, because they tend to be smaller, these
registered projects are expected to generate only 0.25% of all carbon credits by 2012.

- Only one project of LDC i.e. a micro hydro project in Bhutan has issued 747 CERs representing 0.00012% of all CERs issued to date.

- There are 38 projects under validation in LDCs out of total 2712 in pipeline. These 38 LDC projects added to the already registered 15 projects would represent just over 1% of the total CDM. These 53 projects are expected to generate less than 1% of all CERs by 2012 if all are registered and performs as planned.

- When looking at Africa as a whole, 8 projects have issued CERs totaling 5.6 million i.e. about 1.5% of the total CERs issued to date. However these CERs have issued from the projects located in Egypt, Morocco and South Africa.

From the above statistics it is clear that LDCs with relatively low levels of emissions at present have largely been by-passed by the CDM experience till date. The potential role of Carbon Finance in LDCs must be considered in the context to specific situations and needs of these countries. There is need to simplify the procedures for project approval and issuance for LDCs, keeping into consideration the practical realities. Methodologies and requirement to demonstrate the project’s additionality also needs to be simplified at least for the smaller projects.
xi) The forestry and agriculture sectors represent a large CDM opportunity in many LDCs but most land use activities including agriculture are not eligible in the CDM. In addition, forestry is limited to aorestation and reforestation for CDM purpose. CDM forestry projects are further panelized with “temporary” credits not recognized in some markets, thereby depressing the demand and price for these credits. The area needs to be relooked afresh with open mind for removing CDM specific barriers to enhance the outreach of the CDM to LDCs.

xii) Clarity on the post 2012 international climate change regime i.e. (i) whether to continue the existing Kyoto mechanisms or going for new mechanisms and market instruments, (ii) whether go in for new emission reduction targets, and (iii) whether emission reduction binding to be extended to other countries also, is urgently needed. In the absence of such clarity the Carbon Finance market is losing momentum. Perhaps more serious is the real dangerous of not being able to sustain and of even losing the capacity developed over the past decade in so many countries, as well as sustaining emission reductions over the long term. All out efforts are required to be made to put in place the post 2012 international climate change regime with clear description of market instruments.

xiii) Number of actions can help maximize the transformational impact of the Carbon Finance and mobilize both climate and development finance. The following actions can ultimately make carbon finance better fit into public and private sector investment decision making:
1 Scale Up: expand the demand side of the market by implementing more stringent emission reduction targets, and build a credible supply at scale by adopting a programmatic approach and moving toward large scale sectoral and policy-based mechanisms.

2 Provide long term predictability: enable lengthier contracts and provide long term pricing signals.

3 Developed Comprehensive Insurance/Guarantee Products: underwrite political risks inherent in international negotiations. The combined efforts of multilateral development banks, international financial institutions and insurers/re-insurers might be required to create a sustainable business environment, to enable the deployment of existing commercially unattractive low-carbon technologies and the development of new ones.

4 Use Financial Engineering to Front Load Future Demand: accelerate the transition to low carbon investments by issuance of bonds, long term debt instruments and monetization of future receivables.

dxiv) Coherent set of strategies have been designed by various Multilateral Development Banks (MDBs) to tackle the climate change agenda. It is important that the lessons of experience gained by various MDBs are promptly shared. It is suggested that the MDBs may consider establishing of thematic group across the bank and such groups may be organized by topic e.g. renewable, energy efficiency and adaptation etc. These groups need to include all staff working on these issues across the
MDBs. Such groups can be extremely useful in transfer of knowledge in a most cost effective manner. With the expansion in the climate change activities of MDBs, it is increasingly important that each knows what the others are doing at the operational level, both to leverage from each other's efforts and to help identify key gaps.

7.2 Carbon Finance Business of World Bank

7.2.1 Findings

The Carbon Finance Funds deployed by the World Bank was $135 million in the year 2000 which has grown to $2388 million in the year 2010. The analysis of the funds deployed by World Bank for Carbon Finance Business over the year 2000 to 2010 shows that the growth was significant during the year 2004 and 2006. The funds deployed increased by 104% during the year 2005 in comparison to that of year 2004 and 152% during the year 2006. During the initial years growth was nominal because of considerable delay in enforcement of the Kyoto Protocol to the UNFCCC adopted in 1997. The significant growth has been observed during the year 2005 and 2006 immediately after enforcement of Kyoto Protocol on February 16, 2005 when most of the world's countries eventually agreed to it. The growth again is slow during 2009 and can be said to be stagnated or almost flat during the year 2010 because of market turmoil and recession worldwide during year 2008 and 2009 and also because of the fact that end of the first commitment period of Kyoto Protocol i.e. 2008-12 is drawing nearer.

The Carbon Finance Unit of World Bank is a grassroots leader both in the conceptualization and in the operationalization of Carbon Finance. The first Carbon Finance Fund was set up during year 2000 by the
Carbon Finance Unit much before the Kyoto Protocol had entered into force in 2005. Initially, the funds deployed by World Bank for Carbon Finance represented a relatively large proportion of the total carbon market. Even though the number of carbon funds and the resources of the World Bank have multiplied but it represents a very small share of the today’s total carbon market which has grown many fold during the last 3-4 years.

The World Bank has signed 128 Emission Reduction Purchase Agreements (ERPAs) contracting 208 Million Emission Reductions (ERs) with aggregate value of US$ 1.70 billion based on total value of Emission Reductions at the stage of signing of ERPAs. Another 47 projects are in the pipeline for signing of ERPAs. The World Bank, through its Carbon Funds, has one of the largest portfolios in terms of the number of projects.

**Geographic Distribution**

In terms of number of projects, the World Bank portfolio has achieved a better geographical distribution than the Global CDM experience. Lead by Carbon Finance operations in China, the East Asia and Pacific Region has accumulated a total value of Emission Reductions of over US$ 1.33 billion i.e. 78% of all fully operational projects. “Europe and Central Asia”, and “Latin America and the Caribbean” account for 6% each, totaling to 12% of the portfolio. “Africa”, “South Asia” and the “Middle East and North Africa” region account for 2%, 5% and 3% respectively totaling to remaining 10%.

Africa has a very strong interest in Carbon Finance as a tool of sustainable development in key sectors such as forestry, agriculture, energy, and waste management. But challenges for Carbon Finance
across the region remain significant because of the unpredictable investment climate present in many African countries and lack of capacity in some African Public Sector Institutions and thus resulting into only 2% of the portfolio with 17 ERPs signed in Africa region.

With dedicated efforts, the Carbon Finance Unit of World Bank through its Bio-Carbon Fund and the Community Development Carbon Fund has played an important role in the sustainable development of Least Developed Countries (LDCs) through Carbon Finance. The total World Bank Portfolio includes about one fourth of its project in Africa in terms of number of ERPAs signed. A total number of 33 out of 49 LDCs are located in Africa.

Relative to 2009, the level of carbon market activity declined in South Asia, somewhat in 2010 with only two new ERPAs signed and two more under negotiation. Delays in validation and registration of CDM projects, due to the limited availability of Designated Operational Entities in the region, continued to plague the CDM portfolio. Despite these setbacks, the South Asia Carbon Finance Portfolio remains strong; it has 21 carbon mitigation operations in four countries (Bangladesh, India, Nepal, and Pakistan), and three new projects were added to the regional pipeline in 2010 (Bangladesh Brick Kiln, Bangladesh National Solar, and India National Ganga River Basin Authority Project). The ERPAs that have been signed or are on track to be signed before 2012 amount to 10.7 million tCO2e. This region accounts for 5% of the total portfolio of World Bank.

East Asia and Pacific region driven largely by the region’s ability to adopt new technologies rapidly and secure project financing under CDM, has the largest portfolio of 78%. Since the inception of the Carbon
Finance Unit of World Bank this region has continuously contributed a number of CDM projects. Many of these projects are in China, Indonesia, Malaysia, Philippines, Thailand, and Vietnam.

Europe and Central Asia accounts for 6% of the portfolio with CDM Projects of World Bank implemented across 11 countries.

In the Middle East and North Africa, the World Bank currently holds a portfolio of 12 carbon finance projects in Egypt, Tunisia, Jordan and Yemen which contributes to 3% portfolio.

Currently, the World Bank has 34 carbon finance projects in 14 countries across the region of Latin America and the Caribbean. This region accounts for 6% of the total portfolio.

**Technology Distribution**

The study indicates that World Bank Carbon Finance Portfolio is diversified and vide ranging spanning 57 countries and 23 different technology types. HFC – 23 projects account for the largest share of Carbon Funds with 61% of the portfolio. However, the Carbon Finance Unit continues to focus on projects in sectors such as renewable energy including non conventional energy generations such as solar, wind, geothermal, bio mass etc., and energy efficiency with 20% portfolio in these technological sectors. (Based on total value of Emission Reductions at the stage of signing of ERPAs)

The study reveals that from the very beginning the World Bank Carbon Finance Unit was involved in the development of methodologies for registration of CDM projects. To date, the Bank has contributed to the development of 53 different methodologies across more than ten technological sectors. This represents that World Bank has contributed
for more than 40% of the total approved 120 CDM methodologies. This contribution can be treated as significant and remarkable in development of global carbon finance market.

CF-Assist is the World Bank’s flagship capacity building program for carbon finance operated through the World Bank Institute (WBI). Through structured and customized initiatives, CF-Assist supports client countries and cities in their efforts to strengthen their institutional capacity. The World Bank’s CF-Assist has supported more than 60 countries during the first five years of the program (2005-2010), and has given exposure to carbon finance capacity building programs to more than 5,000 stakeholders around the world.

7.2.2 Conclusions

World Bank has helped the global community to have a much better idea of not only what works and does not work, but also what could be done to let market mechanisms reach their full potential to achieve climate change mitigation at the scale required to address effectively the global challenge faced by our planet.

As a participant committed to making the carbon markets work, the World Bank has played various facilitating roles of bringing together the diverse stakeholders to overcome hurdles. While the global community is working out various options to put in place post 2012 International Climate Change Regime outlining the next phase of the mechanisms, the World Bank proposes to continue the bridge building work whenever desirable by, for example:-

- Facilitating technical round table discussion on various topics, bringing together the rule makers i.e. UNFCCC, those responsible for applying the rules i.e. DOEs, project
entities and other stakeholders with a view to share experience and learn from one another.

- Providing a Forum for host countries through its Host County Committee (HCC) to advise the World Bank on its Carbon Finance activities, and

- Facilitating sellers and regulators of developing countries in forums such as Carbon Expo to bring them in direct contact with the market.

One of the major concerns of the CDM registered projects worldwide is the uncertainty regarding sale of CERs beyond December 31, 2012 the end of the present protocol period. The World Bank is the one to come forward for survival of CDM market by launching Tranche -2 of its Umbrella Carbon Facility during February 2011 with allocated funds of US$ 147 million to by CERs generated between 2013 to 2018 from its supported projects irrespective of fact that there is any buyer or not.

7.2.3 Suggestions

i) Out of total 128 number ERPAs signed worldwide up to 31st December, 2010, only seven projects belongs to India as host country which constitutes to around 5% only, of the total projects. The fact that the World Bank need to concentrate on its carbon finance business throughout the world with an extra emphasis on poorer countries of the world, is well recognized. The carbon finance assistance is needed for the least developed countries like Democratic Republic of Congo which proposes to utilize the carbon payments to be received from its first project for which ERPA has been signed in 2011, for ensuring education for hundreds of children and providing basic health
care services. However, it is suggested that World Bank should expand its Carbon Finance Business in India also and take up at least more risky and difficult projects from India. The projects related to hydro power generation which are mostly located in difficult areas of India like state of Arunachal Pradesh, Jammu and Kashmir and Himachal Pradesh etc., which suffers from large scale geological uncertainties because of fragile mountains and are associated with long construction period and high investment, needs to be encourages by World Bank being clean and green projects replacing thermal power by burning of coal.

ii) Presently, policy makers all over the world are working on advancing the policy framework and the regulatory structures to mitigate greenhouse gases at a greater scale. The World Bank should make a constructive contribution in this respect by providing insights of the experience and learning that has been gained over the last 10 years. This will lead to building upon a regulatory framework addressing weaknesses of the existing policies and abandoning what is not working.

iii) A critical and significant component of the World Bank carbon finance activities consist of providing capacity building and technical assistance to its client countries. Over the years, the World Bank has carried out several capacity building programs aimed at supporting host countries efforts to develop an enabling environment for project based carbon transactions. Several countries in Asia and Latin America have been benefited by capacity building efforts of the World Bank. However, there are countries and regions which have yet not been benefitted much. It is suggested that World Bank needs to
develop a comprehensive capacity building program covering all the regions of the world. The capacity building programs so designed can be delivered through regional hubs/organizations involving local governments so as to extend the reach of capacity development to the entire world.

iv) It is also suggested that an all out effort be made by a World Bank for inclusion of increase role for forests in developing countries in reducing carbon emission from deforestation and forest degradation. In addition World Bank shall facilitate the development of market mechanisms specifically designed to supports the needs of the poorest developing countries.

7.3 Carbon Finance Market in Indian Context

7.3.1 Findings

The study of the CDM Market in context to India has resulted into following specific findings:

i) As on December 31, 2010, a total of 598 projects from India have been registered as CDM projects with expected annual emission reductions of 46,653,538 CERs by the CDM Executive Board which accounts for about 22% of the total of 2703 projects registered worldwide. A total of 82,334,548 CERs have been issued from the CDM registered projects of India up to December 31, 2010.

ii) The portfolio is dominated by unilateral projects, i.e. the investors are Indian parties, employ locally available technologies, and use domestic financial resources.

iii) Industrialized countries have not participated significantly in
project financing and the project risks are mostly taken up by the host industries.

iv) World Bank has also not participated significantly in CDM project development in India. Out of total 128 ERPAs signed by World Bank by end of calendar year 2010, only 7 ERPAs are for the projects located in India. In terms of contracted CERs, World Bank has contracted only 4,297,720 CERs from India through signed ERPAs out of total portfolio of 208 billion Emission Reductions which is not even 1% of the total portfolio.

v) Insurance Companies in general have shown little interest in CDM, which is not in the positive prospective since they can catalyze carbon trading by providing risk and financial analysis skills.

vi) There is no support of any kind from Govt. of India to the projects being developed as CDM projects as well as to the CDM registered projects. In the absence of any central agency all the CDM projects needs to make their own arrangements for sale of issued CERs.

vii) Projects in India are even facing lot of hardships in getting host country approval from Designated National Authority (DNA). Against the time frame of two months provided for host country approval, large numbers of projects have been cleared by DNA in around 6 months.

viii) There is much subjectivity in the multilateral CDM process, and divergent interpretations are given by different Designated Operating Entities (DOEs) accredited by the CDM Executive Board.

ix) High transactions costs involved in CDM process prevent the small scale sector industries of India from participation in CDM.
x) There is no national or international agency providing complete information on CDM transactions which led to lack of reliable information in the carbon market.

Despite of above, there is encouraging response from Indian entrepreneurs to the CDM across different sectors with second largest share of around 22% of the total registered CDM projects worldwide.

7.3.2 Conclusions

India is the world’s fourth largest economy and fifth largest Greenhouse Gas (GHG) emitter accounting for about 5% of global emissions. India’s emissions are on increasing trend and are projected to grow another 70% by 2020. However, despite being the fourth largest economy, India’s per capita emission is only 1.4 tons of CO₂ which is less than one third of World’s average and only about 7% of USA. India is convinced that the principle of equity that must underlie the global approach must allow each inhabitant of the earth an equal entitlement to the global atmospheric resource and in this connection, India is determined to keep its per capita emission level below that of developed countries for all times to come.

India has a well-developed policy, legislative, regulatory, and programmatic regime for promotion of energy efficiency, renewable energy, nuclear power, fuel switching, energy pricing reform, and addressing GHG emissions in the energy sector. As a consequence of these measures, over the past 5 years, even with the growth in the economy, the emission intensity (GHGs per unit of GDP) has declined significantly. India’s GHG intensity is currently 20% lower than the world average (and 15% and 40% lower than the United States and China’s respectively).

India as a large democracy, with the major challenge of achieving
economic and social development, is committed to engage in negotiations and other actions at the international level that would lead to efficient and equitable solutions at the global level. At present India is active participant in the Clean Development Mechanism (CDM) established by the Kyoto Protocol.

However, India needs to setup an institutional framework dedicated to assist the development of CDM projects as well as in trading of CERs generated from CDM registered projects. As an immediate action, the concern of the CDM projects regarding uncertainty about trading of CERs beyond December 31, 2012, the end of Kyoto Protocol period, needs to be taken care by Government of India, in line with initiatives taken by the World Bank to guarantee the CDM’s survival, by way of announcing a financial package to ensure the financial viability of the CDM projects. The World Bank has explicitly told the projects it supports that funding will be available to purchase credits well into the post-2012 period, despite the fact that there may be no buyers then, so as to maintain the financial viability of the assisted projects. The World Bank during March, 2011 has announced new funds allocated for post-2012 carbon credit purchases, which are made available to member countries and assisted projects.

The value of the Carbon Finance Market in India was US$ 0.34 million in the year 2005 which has grown to US$ 336 million in the year 2008. The analysis of the value of Indian Carbon Finance business over the year 2000 to 2010 shows that the growth was significant during the year 2006 and 2007. The growth during the year 2008 was only 17% which declined in the year 2009 and 2010 because of market turmoil and recession worldwide during year 2008 and 2009 and also because of the fact that end of the first commitment period of Kyoto Protocol i.e. 2008-12 is
drawing nearer.

The comparison of the graphical presentation of the growth of CDM market in India with global carbon finance market shows that the growth pattern in the carbon market at Global level were similar with that at Indian level for all the years except year 2008, when global market declined at a rate of 12% in comparison to year 2007 whereas the Indian market increased by 17%. However, the Analysis of the Variances (ANNOVA) concludes that the growth of Indian Carbon Finance Market during the period 2005 to 2010 is not in line with the growth of Global Carbon Finance market from project based transactions.

7.3.3 Suggestions

The following suggestions are made for overall development of CDM market in India as well as to address the concerns of CDM registered projects:

i) It is the necessity of the day to establish a strong institutional framework to help Indian entrepreneurs and industrialists in development of CDM projects including consultancy services from development of Project Design Document (PDD) to registration by CDM Executive Board as well as to assist the registered CDM projects in trading of generated CERs.

ii) Government may provide financial incentive to the potential projects to be registered as CDM projects by way of bearing total cost or a part thereof involved in registration which mainly include fees for preparation of PDD, cost of engaging DOE for validation process and fee to be deposited with UNFCCC for registration. The expenditure incurred by the Government may be recovered from the sale of CERs generated. In case of rejection for registration by
CDM Executive Board, the cost needs to be borne by the government, thus providing risk coverage to the project developer.

iii) The process for the Host Country Approval by the DNA needs to be simplified. The frequency of DNA meetings may be increased so as to cut down the time taken in host country approval. Presently DNA consists of high officials mainly of Ministry of Environment & Forests, GOI, who otherwise are very busy in various other important assignments of the Ministry. It would be more appropriate to revisit the constitution of the DNA so as to make it dedicated to host country approvals mainly. In no case, the time taken for host country approval is more than two months.

iv) Establishment of a financial institution dedicated to provide financial assistance to CDM projects, is the need of the hour. A public sector financial institution in line with Power Finance Corporation established to look after the financial needs of power sector projects needs to be considered.

v) The insurance companies may be encouraged to provide for risks associated with development of CDM projects and trading of generated CERs. If necessary, change in the legislation be made for this type of coverage by the insurance companies.

vi) The emerging low carbon global economy presents challenges and opportunities for businesses of all kinds. It demands alternative business tools, fresh ways of thinking, and a new generation of managers. There is a great need to introduce a new MBA course in Strategic Carbon Management in the leading Business Schools of India, which focuses on business management in general and carbon management in particular as the two go hand in hand
Norwich Business School of University of East Anglia, UK has launched the world’s first MBA in Strategic Carbon Management in the year 2007. India being one of the biggest beneficiaries of carbon revenue through sale of CERs, a similar action is required here also.

vii) Municipal waste is an area which can contribute to CDM revenue of India in a big way, more particularly through the Municipal Corporations. As of now most of Municipal Corporations do not treat the wastes, but dump the solid wastes in the earmarked sites. Organic content in these wastes is estimated at 40%. The dumping of wastes not only generates odour but also landfill gas. Landfill gas contains approximately 50% methane and this gas creates greenhouse effect. It is inflammable and hence also poses fire hazard. Methane can be captured and flared, which would mitigate the GHG emission or could be used to generate energy. Municipal Corporations could perhaps think in terms of manufacturing compost or use the methane for power generation depending on its volume. It would be a good idea for the Municipal Corporations to join hands with private sector to share the cost of such arrangements. Equity participation by the Central and State Governments and soft loan by bilateral and multilateral agencies would go a long way in enabling the State to turn the waste into gold.

viii) At present the CDM projects get themselves registered and once they commence operation, the CERs are verified, certified and issued, where after they are sold in the international market and the revenue realized. At best, the CDM revenue goes to repay the loan. Instead, if the CDM revenues can be considered as a source of
finance, it could help the promoters to bring down the loan component and also save the interest, which could go a long way in improving the overall viability of the project. This would involve estimating the eligible CERs on ceteris paribus condition and selling them in advance (as forwards) to a Qualified Institutional Buyer (QIB), who would pay upfront the benefit. QIB could, in turn, sell it forward or await the realization and sell thereafter to realize a better price.

However, one problem that is likely to occur is the uncertainty. QIB has to take a risk of advancing the money based merely on paper registration. Though CDM benefits securitization faces same amount of uncertainty as any securitization of receivable faces, the risk is slightly higher in the case of CDM projects because the projects may not be registered as Greenfield projects. This would call for minimizing, if not altogether eliminating the risk. The only option to achieve this is to go in for insurance. General Insurance Corporation (GIC) of India needs to introduce specific insurance schemes to take care of CDM related risks, in line with Swiss Re and Munich Re who have already formulated insurance schemes to provide insurance cover.

ix) The projects originate in financial institutions, in the sense that but for their financial assistance project activity could not have become a reality. While appraising the project itself, if the financial institutions could educate the project proponents about the CDM benefits and take care of ‘Additionality’ requirement. Financial institutions could take up a sort of appraisal to ascertain the eligibility of the project and the project proponent would get more confidence and would be willing to take the risk of investing in
CDM activity, if he gets an opinion from the financial institution.
Likewise, while estimating the preliminary and pre-operative expenses, the financial institutions could make a provision for CDM consultancy, validation and registration fees so that the project proponents is well informed about the expenditure he had to incur to get the additional cash flow. Thus, the financial institutions can play major role in development of carbon finance market in the country.

The carbon market proponents worldwide are fast at work insuring that the Kyoto Protocol’s emission offsetting system survive longer than the treaty itself as well as in adoption of a new package of decisions that set all governments more firmly on the path towards a low – emission future that support enhance action on climate change. In this context, the following suggestions are made, to be considered by Government of India:

i) Our approach need to be open and must also be compatible with our role as a responsible and enlightened member of the international community, ready to make our contribution to the solution of a global challenge, which impacts on humanity as a whole.

ii) At present, one third of India’s total energy consumption is from Oil of which 70% is imported. It has been estimated that this number could become as high as 90% by 2025. Increase dependence on foreign and dirty sources of energy is not a long term sustainable option, economically as well as environmentally. Building the economy on a climate friendly way i.e. generation of energy through hydro and other renewable resources will not only
provide for energy security but also offer climate benefits.

iii) It has been argued by some that India should concentrate on economic growth and development rather than dealing with climate change by investing resources in curtailing greenhouse gas emission. It is suggested that India does not need to make choice between the two, in fact the two can go hand in hand. The development can be ensured in a sustainable and low carbon way.

In nutshell it can be concluded that the Kyoto Protocol’s CDM has developed overtime into a massive success, much bigger than expected at the time it was conceived. Over 2700 projects have been registered and an equivalent number or more are still in the pipeline. The CDM is successful in enabling the initial flow of capital into abatement projects around the world, and in creating a new mechanism that has led to actual generation of emission reduction credits. In addition to its contribution in meeting greenhouse gases commitments cost effectively, the CDM has generated other noteworthy benefits like raising the climate change awareness worldwide which led to building capacity in developing countries to use carbon finance to support greenhouse gases reductions. The challenge facing the CDM is now related to scaling up the system, post-2012 uncertainty and regulatory continuity. Multitude of delays in registration and in issuance of CERs needs to be addressed.

The role of the World Bank has been to catalyze a global carbon market that reduces the cost of achieving GHG reductions, supports sustainable development, and benefits the poorer communities of the developing world. Starting with the PCF, which became operational in April 2000 with an initial capitalization of $135 million, the World
Bank carbon finance activities helped catalyze a then nascent carbon market and pave the way for the increased participation of public and private buyers. The carbon market has since become more dynamic, with CDM primary transactions totaling US$ 98 billion from 2003 to 2010. Today, the World Bank has US$ 2.5 billion in capitalized funds (grouping fund participants from 16 governments and 66 firms). Its portfolio is wide-ranging, spanning 57 developing countries and economies in transition and 23 different technologies in projects as diverse as energy-efficient lighting in Senegal, brick-making in Bangladesh, solid waste management in Mexico, wind power in China, and reforestation of the River Nile Basin. The World Bank experience is therefore relevant to a broad set of stakeholders.

At the same time, the World Bank portfolio includes a significantly greater share of projects hosted in Africa i.e. more than 13% than the global CDM experience of 1.44%, in terms of number of projects thus extending the reach of carbon finance to the poorest developing countries. Moreover, the World Bank has made a significant contribution to the development of methodologies (i.e., about 40% of approved CDM methodologies) that define project eligibility, the calculation of the emission baseline, and the monitoring requirements for different types of project activities. Through this work the World Bank has helped open up new areas of carbon finance activities for the market, as once a methodology is approved, it can be used by any other similar project meeting the relevant criteria. With above achievements it can be concluded that the World Bank has continuously sought to expand the opportunities from carbon finance and extend its reach to more sectors and more regions and thus has
played an important role in development of global carbon finance market.

India is the world’s fourth largest economy and fifth largest Greenhouse Gas (GHG) emitter accounting for about 5% of global emissions. India’s emissions are on increasing trend and are projected to grow another 70% by 2020. However, despite being the fourth largest economy, India’s per capita emission is only 1.4 tons of CO2 which is less than one third of World’s average and only about 7% of USA.

India has a well-developed policy, legislative, regulatory, and programmatic regime for promotion of energy efficiency, renewable energy, nuclear power, fuel switching, energy pricing reform, and addressing GHG emissions in the energy sector. However, India needs to setup an institutional framework dedicated to assist the development of CDM projects as well as in trading of CERs generated from CDM registered projects.

The performance of the Indian Carbon Finance Market which has contributed more than 16% of the total CERs generated worldwide up to December 31, 2010, can be considered to be remarkable keeping in the considerations the constraints it faced in terms of poor institutional set up in place in India for assistance in CDM registration and trading of CERs as well as lack of government support.