



Clean Development Mechanism (CDM) : A Mechanism To Earn Carbon Credit In India

¹Maru Priyanka,²Dr. Rajiben S. Vagh

¹Research Scholar,²Assistant Professor

¹Saurashtra University, Rajkot, India

²Kavi Shree Daad Government Arts and Commerce College, Paddhari, Rajkot, India

Abstract : In recent years, The impact of global warming and green house gases are increasing on its extreme level in the globe. The concept of Kyoto protocol was adopted in 1997 to tackle the problem of global warming. But, due to complexity in rules and regulations of protocol, it came into force in 2005. Under the Kyoto protocol, the theory of carbon credit trading was generated. A carbon credit is a certificate which allows a company to sell its excess carbon emission above its permit. All the countries who have signed and ratified the protocol are divided into two categories called Annex I parties and Non Annex I country. Annex I countries are legally bounded by Kyoto protocol for emissions reduction of Kyoto protocol. The developed countries are the buyers of carbon credit while developing countries and least developed countries are sellers of carbon credits. The paper mainly focuses on Clean Development Mechanism (CDM) among three mechanisms (International Emission Trading, Clean Development Mechanism and Joint Implementation) established for countries by Kyoto protocol. The Carbon credit earned with the help of clean development mechanism are called Certified Emissions Trading. The objective of the paper is to discuss the status of CDM in India. The paper also discusses about the contribution of India in registration of CDM projects. Moreover, the sectoral scope of CDM projects are discussed. From the available data, it is clear that the highest projects are registered under the scope of energy industries. The details of CERs issued to India by UNFCCC are also given in the paper.

Key Words : Kyoto Protocol, Clean Development Mechanism (CDM), Carbon Credit, Certified Emission Reductions (CERs)

Introduction :

In Current scenario, Climate change has become a cause of global panic as its adverse impact on human and environment has broken the records of history. Mainly, due to industrialization, the release of green house gases (GHGs) in the environment is increased extremely. After analyzing the dangerous impact of global warming, Many scientists has suggested to take required action related to problem of global warming and climate change immediately. As a result, under the United National Framework Convention on Climate Change (UNFCCC), to deal with the issue of global warming, a protocol which is called Kyoto Protocol came into force in 2005.

The Kyoto Protocol binds only developed or industrialized countries to reduce green house gas emissions as the protocol recognizes that they are mainly responsible for global warming. The protocol has given concept of trading of greenhouse gases mainly Carbon Dioxide (CO₂) to reduce the global warming. The convention differentiated countries into three groups : Annex I parties (37 countries) which consists industrialized countries which are members of the OCED (Organization for Economic Co-operation and Development) and countries with economies in transition - the EIT parties, Annex II parties includes only the OECD members of Annex I not the EIT Parties and the third is Non - Annex I countries which are mostly developing countries.

Carbon Credit :

A Carbon credit is a general term for a tradable certificate or permit which allows a country to emit a certain amount of carbon dioxide or any other green house gases which can be traded, sold and retired if the full allowance is not used. One carbon credit is equal to 1 tonne of carbon dioxide (CO₂). The Kyoto protocol has established three flexible market mechanism for countries to meet their emission limitation targets or earn carbon credit.

International Emission Trading : Under this mechanism, the countries that have excess emission units (permitted but not used by them) can sell these units to the countries that are over their limits. The allowed emissions to annex I countries are divided into Assigned Amount Units (AAUs).

The Clean Development Mechanism: It allows countries with emission limiting commitments to implement emission reduction project in Non - Annex I countries or developing countries to earn tradable Certified Emission Reduction units (CERs).

The Joint Implementation mechanism : Under the joint implementation mechanism, a developed country can implement projects that decrease carbon emission in another developed country. The carbon credits earned in this way are called Emission Reduction Units or ERUs.

The carbon credit trading cover emissions of the greenhouse gases which includes Carbon dioxide (CO₂), Nitrous oxide (N₂O), Methane (CH₄), Perfluorocarbons (PFCs), Hydro fluorocarbons (HFCs), Sulphur hexafluoride (SF₆) and Nitrogen trifluoride (NF₃) which was added in Doha amendment.

Objectives of the Study :

- To understand the concept of the Clean development mechanism
- To know the process of registration of a CDM project under UNFCCC
- To know the current status of CDM projects in India.

Review of Literature :

(Seema Unnikrishnan, 2010) The research paper analyzes the CDM projects involving energy recovery from MSW which is Municipal Solid Waste. The researcher reviewed the solid waste management problems and CDM opportunities in India. The paper highlights that among one hundred and nineteen worldwide CDM projects, India has registered 16 Projects based on MSW. The Researcher has also discussed about RDF (Refuse derived fuel) and composting methods used to greenhouse gas emission reductions. The Researcher concluded that the India does not have proper sanitary landfills where methane (CH₄) can be captured.

(Aggarwal, October 2012) has presented a research paper which focuses on 4 selected forestry CDM projects of India. The paper analyses social, ecological and economic issues affecting these projects. The primary data has collected from group discussions and stakeholders' interviews. The researcher has concluded that due to delayed, low benefits and high opportunity cost of land and labour, three out of four CDM projects are economically unsustainable for local people.

(Castro, 2008) has presented a paper which analyses the performance of CDM projects. The researcher analysed CERs issuance rate which indicates ratio between actual CERs issued and estimated CERs in the request for registration. They have also analysed the time from the submission of the project to validation. The analysis was done mainly focusing on India, Brazil and China. The report highlighted that India has been issued more CERs than expected, China is below the average while Brazil has less than expected. It is also found out that India and Brazil has most rejected projects of cement blending projects which were rejected due to problems with additionality.

(Muthyanolla, 2022) has analysed the worldwide distribution of registered projects under CDM. He has also highlighted top 10 countries in registered projects under CDM, number of large scale and small scale projects. The researcher has also analyzed the project activities undertaken in CDM. Moreover, The researcher has highlighted India's share in the total CERs issued and state-wise CERs of India. The paper concludes that India need to adopt new strategies to deal with carbon emission market.

(Liu, 2008) has conducted a study which provides a comparative analysis of CDM in China and India. It mainly focuses on each country's DNA (Designated National Authority). The researcher has considered each country's DNA's structure, Policies and CDM project market for the analysis. The article also highlights that the number of small scale projects are almost double than the number in China. The researcher concluded that DNA of both countries are able to play an important role in forecasting sustainable development but, China has achieved more in terms of transfer of technologies comparing to India.

Type of the study :

The research is based on descriptive study because the researcher has used the secondary data.

Data Collection :

The data collection is purely based on secondary nature which are collected from different websites and journals.

Tools and Techniques :

Tools like percentage analysis and charts are used to analyse the data.

The Clean Development Mechanism :

Under the Clean Development Mechanism, the developing countries can help developed countries to reach their commitment of emission reductions. Developing countries or Non- Annex I countries can participate by establishing emission reduction projects in Kyoto protocol. With the help of these projects, developing countries earn carbon credits and sell it to developed countries which exceed its GHGs emission limit. Thus, the developing countries can promote the sustainable development. As the CDM is the flexible mechanism to earn carbon credit and the number of developing countries is large, the CDM projects are registered more. To earn carbon credit from these project, an entity has to set up and register a CDM project under the CDM Executive Board of the UNFCCC. An organisation has to follow a specific following procedure to register a project under CDM.

The CDM Project Cycle :

Project Activity Design : The Project participants have to submit information of their proposed CDM project activity with a Project Design Document (CDM - PDD).

Notification of CDM prior consideration : Announcement of possible CDM status is made for a project which comes during the submission of the form "Prior consideration of the CDM". The time period for that is of 6 months of the starting date of the project. It is a binding requirement for all those projects started before PDD has been published for community or a revised or new methodology has been proposed. The "Prior Consideration of the CDM Form" has to be submitted to UNFCCC secretariat and the host country's DNA (Designated National Authority).

Proposal of a New Baseline or Monitoring Methodology : If a Designated Operational Entity (DOE) wants to submit a new baseline methodology, he shall submit it to CDM Executive Board. He should submit it prior to validation and submission for registration of the project activity for review along with the draft PDD, identification of project participants and a description of the project.

Use of an Approved Methodology : The project participant can use approved methodology if he is not willing to propose a new methodology. The list of Approved methodology has made publicly available by UNFCCC along with any relevant guidance. Only after decision related to methodology, the DOE can proceed for validation.

Validation of the CDM project activity : Validation is the process of independent assessment of a CDM project activity by designated operational entity (DOE) on the basis of PDD as per the CDM rules and requirements. For the validation, the Project Design Document has to be published for public comment for 1 month on the UNFCCC CDM website. Moreover, if required by DOE, corrective actions needs to be taken by project participant. Validation of the PDD and processing of host country approval can take place at the same time.

Registration of the CDM project activity : Registration means the formal acceptance of a validated project by the Executive Board under the CDM. Moreover, it is a precondition for the verification, certification and issuance of CERs of that project activity. The DOE requests for registration and submit project details to CDM Executive Board along with PDD, validation report and written approval of the host country. the UNFCCC can ask for clarifications or changes prior to approving or rejecting the project.

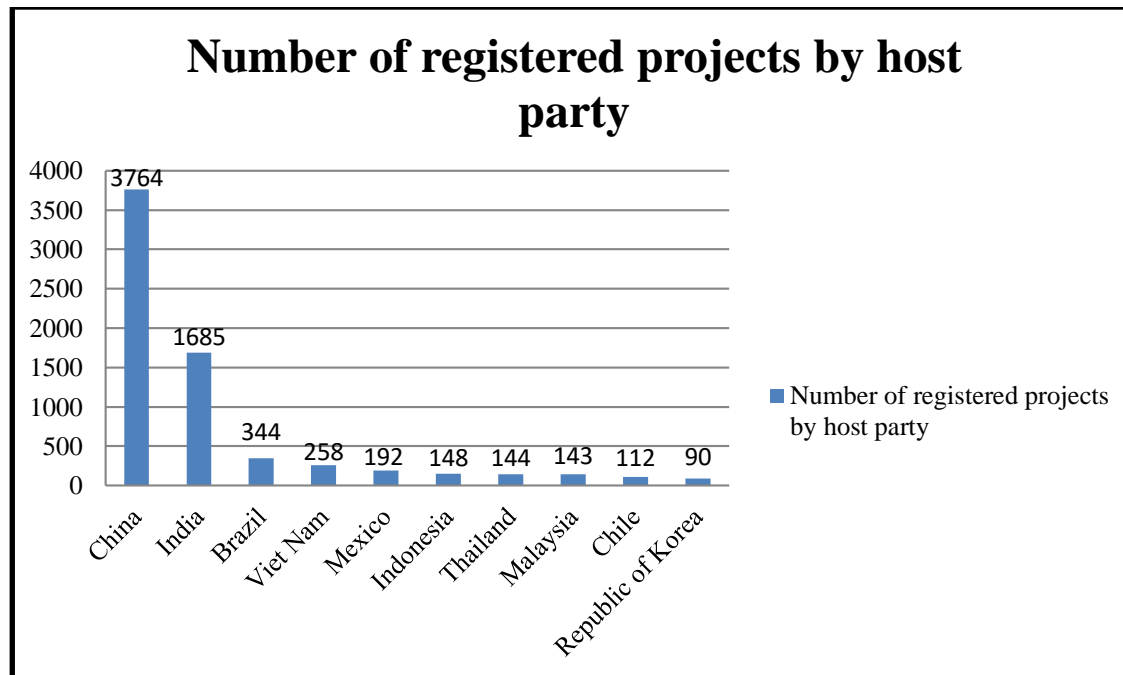
Certification and Verification of the CDM project activity : A DOE verifies that the emission reductions took place according to the approved methodology, monitoring plan and in the amount claimed. Verification is the independent review given by DOE that monitored reductions occurred during the verification period is as per approved monitoring plan. Certification is a written assurance or document given by DOE that a project activity achieved the emission reductions as verified during the specific period.

Issuance of CERs : The DOE sends request for issuance of CERs to the CDM Executive Board. After complete check of a project, the issuance request is published on the website. It is also presented to CDM Executive Board. The issuance request will go under review if a party involved in the project or at least three member of the CDM Executive Board ask for review within 28 days of

publication of it. Otherwise, the UNFCCC secretariat will instruct to issue a quantity of CERs claimed to the CDM registry administrator.

The Status of Clean Development Mechanism :

Total 7844 projects were registered under CDM of UNFCCC as on 31st October 2022. Out of which 83.7% projects were registered by Asia & Pacific, 12.9% projects are registered by Latin America & Caribbean, 2.8% are of Africa and 0.6% projects are registered by Economies in transition. From this data, it can be concluded clearly that most of projects are being registered by Asia & Pacific.



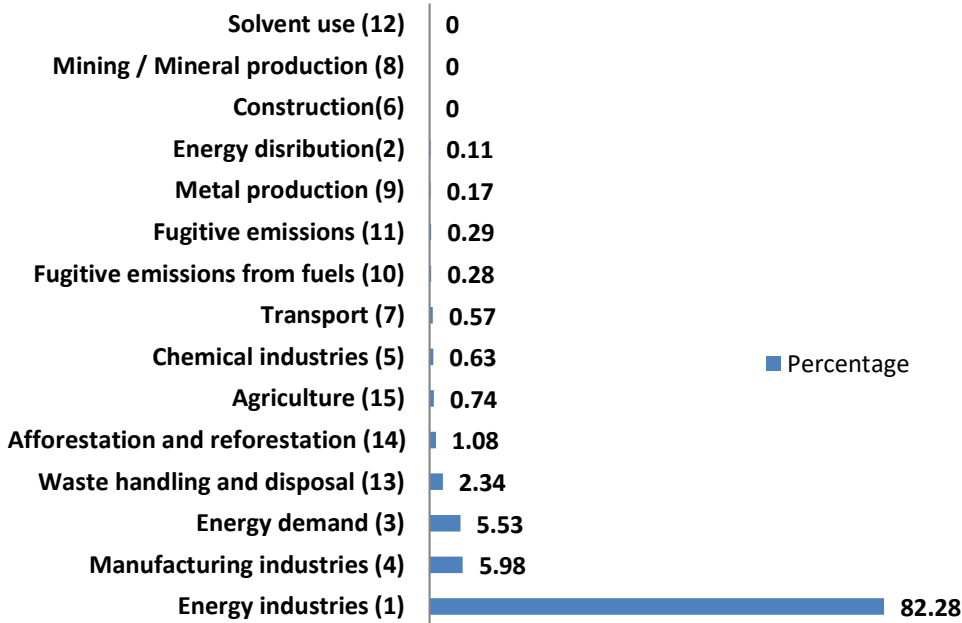
(Source : UNFCCC)

The above chart shows the number of registered projects by host party under the CDM. Only two countries, India and China contribute around 70 % of all registered project. China stood at first rank by registering 3764 projects under the Kyoto protocol and India at second with 1685 registered projects. After China and India, Brazil, Vietnam, Mexico, Indonesia, Thailand, Malaysia, Chile and Republic of Korea comes under the list of top 10 host countries out of 99 countries that are parties of the Kyoto Protocol. Out of 99 countries, 59 countries have less than 10 projects registered under CDM of UNFCCC.

The CDM and India :

As the Clean Development Mechanism allows emission reduction project to developing countries for the purpose of earning certified Emission Reductions (CERs), Many developing countries are trying to earn carbon credit and sell it to developed country. India is on second position (1686 - registered projects) after China (3764 - registered projects) in the registration of CDM projects under the Kyoto Protocol of UNFCCC as on November, 2022. In India, The most of the companies earn carbon credit through the CDM projects under the Kyoto Protocol. India's first CDM project was registered by Gujarat Fluoro-Chemicals Limited (GFL) in vadodara, Gujarat. GFL has become the first Indian company and third in the world who has an emission reduction CDM project which is certified by the CDM Executive Board.

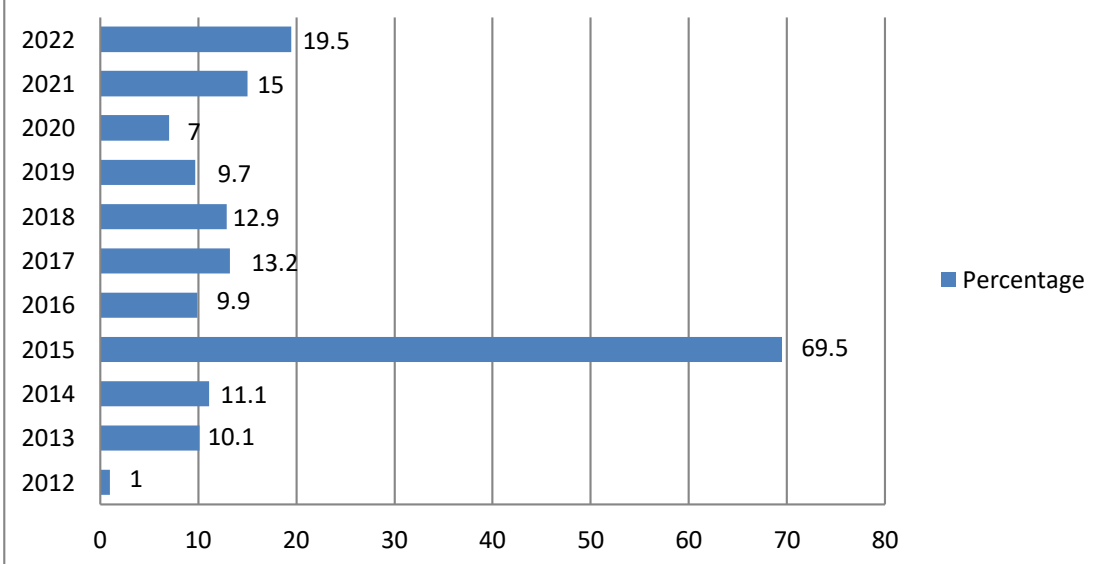
Distribution of registered projects of India by scope



(Source : UNFCCC)

The above chart shows the distribution of registered projects of India by different scopes of UNFCCC. The UNFCCC has defined 15 different sectoral scopes under which a CDM project can be registered. However, a single project activity can be linked with more than one sectoral scope. It is clear that the energy industries contribute the highest 82.28 percentage (1444 - number of projects) in CDM projects out of total 1755 registered projects of India. 105 projects were registered under manufacturing industries, 97 under energy demand, 41 under waste handling and disposal, 19 under afforestation and reforestation, 13 under agriculture, 11 under chemical industries, 10 under transportation, 5 under fugitive emissions from fuels and from production and consumption of halocarbons and sulphur hexafluoride, 3 under metal production and 2 projects were registered under energy distribution. While, Not a single project is registered under the sector scope of construction, mining or mineral production and solvent use.

India's share in the total CERs issued



(Source : Envistats 2022)

India had performed very well immediately in the beginning of the implementation of the Kyoto Protocol as it had been issued 46.5 percent CERs of total CERs. After that, the performance of India was continuously declining. From 2013 to 2015 it managed to get

more CERs. As a result, in 2015, India had been issued highest CERs about 70 percent of total issued CERs. After that, the trend of issued CERs to India was very fluctuating. Again, in 2022, India stood at 19.5 percent in the total CERs issued.

Conclusion :

After the commencement of Kyoto protocol, CDM was highly successful and beneficial as a flexible market mechanism for reducing green house gases. As a developing country, India is getting notable benefits from this mechanism. After China, India stood at second position in getting benefits through CDM from registering projects to earning CERs from those projects. Indian industries has got advantage of another source of income known as carbon credit due to the Clean Development Mechanism of the Kyoto protocol. The paper explains the status of CDM and the sectoral scope of registered projects in India. Moreover, it also discusses about CERs issued to India due to these projects. The long CDM project cycle and the complexity in rules and regulations are the major barrier for the usage of this opportunity. Therefore, it is required to make some more effective policy to reduce these barriers.

Bibliography :

Retrieved November 23, 2022, from <https://unfccc.int>.

Retrieved November 23, 2022, from <https://www.investopedia.com>.

Aggarwal, A. (October 2012). How sustainable are forestry clean development mechanism projects?—A review of the selected projects from India. *Mitig Adapt Strateg Glob Change* .

Bank, A. D. (January 2013). *The Clean Development Mechanism A Field Guide for Transport Projects*. ADB South Asia Operational Knowledge Working Paper Series.

Castro, A. M. (2008). *Empirical analysis of performance of CDM projects*. Climate Strategies - University of Zurich.

Liu, S. a. (2008). The Clean development mechanism in China and India : A Comparative institutional analysis. *Wiley InterScience* .

Muthyanolla, S. K. (2022, April 29). Retrieved December 2, 2022, from <https://factly.in>.

Seema Unnikrishnan, A. S. (2010). Energy recovery in solid waste management through CDM in India and other countries. *Resources, Conservation and Recycling* .