

# CLEAN DEVELOPMENT MECHANISM IN INDIA

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## **ABSTRACT**

*Clean Development Mechanism (CDM) aims at a cost-efficient cutback of GHG emissions with technology and capital transfer from industry to developing countries. It is the most effectual project based mechanism which is recommended by the Kyoto Protocol in the year 2005. with reference to 87% of the entirety registered projects is associated to Asia and Pacific section and 78% of the whole registered projects is related to renewable energy sector. After China, India position is second in establishment of registered CDM projects. India has several positive factors for establishing of CDM projects. With ratifying the Kyoto Protocol regulation India is establish the Designated National Authority, which is called National CDM Authority to coordinate clean development mechanism. India's largely CDM projects are renewable in nature, which contribute significantly in the success of CDM projects. I have collecting the secondary data for research purpose. The intention of taking this paper for analysis is to evaluate the clean development mechanism in India. Primarily this paper discusses the concept of clean development mechanism and its implementation. The conclusion derived from the analysis that well-standard institutional framework with constructive policies, which provide success but lack of coordination between govt. and firms.*

**Key Words: CDM, CERs, GHGs, Kyoto Protocol.**

## **1. INTRODUCTION:**

### **Change in climate:**

The environmental menace which earth faces nowadays is global warming. The environmental trouble which has been receiving severe political notice globally is the change in the climate. The United Nations Framework Convention on Climate Change (UNFCCC) defines 'climate change' is "a change of climate which is accredited directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate changeability observed over comparable periods." The major components of environmental change include a rise in normal general temperature, dissolving glaciers, changes in rainfall, and an increase in sea temperature. The activities expected to address the environmental change issue include improvement of GHG outflows and also working of flexible limits in creating nations to adjust the

adverse effects of environmental change on various section of the society and economy development and also on the different type of innovation and fund of the country. Environmental change is caused by the increase in GHGs in the atmosphere. GHGs which are in indict of a hazardous atmospheric digression are both short and continuous, with their living arrangement time in the air variable from a couple of hours, weeks, months, years to a few hundred years. As per the Intergovernmental Panel on Climate Change (IPCC), the worldwide environmental centralizations of CO<sub>2</sub>, CH<sub>4</sub>, and nitrous oxide (N<sub>2</sub>O) have extended remarkably because of human movements since 1850 and now extreme exceed preindustrial levels. The globally increases in CO<sub>2</sub> absorption are mainly due to fossil fuel use and changes in land use, whereas methane and nitrous oxide are mainly due to agriculture. According to the Fourth Assessment Report of the IPCC (IPCC AR4 2007), CO<sub>2</sub> increased I the environment due to the pre-industrial value of 287 parts per million (ppm) to 393 ppm in 2005, and the average global temperature rose by 0.84°C. Climate change means additional pressure on ecological and socio-economic systems that are already facing terrific pressure due to fast economic development. So that addressing climate change is a most important challenge in terms of policies and resources needed to address it at domestic and international levels.

For fighting with global warming and climate change in 1989 the World Metrological Organisation (WMO) set up a panel which is called the Intergovernmental Penal on Climate Change (IPCC) and the United Nation Environment Programme (UNEP). The IPCC gave its first report in 1990 in which it concluded that the rising accretion of GHGs in the atmosphere would boost the greenhouse effect, which creates additional warming in the earth's surface by the next couple of years if proper measures were not taken to limit emissions. Based on this report the UN General Assembly launched a negotiation to make an international treaty on global climate protection in December 1990, which later became the United Nation Framework Convention on Climate Change (UNFCCC). The discussions started in February 1991, lasted for 15 months and the convention was adopted in May 1992.

To fight with Global warming the United Nations Framework Convention on Climate Change (UNFCCC) in 1997 agreed upon the Kyoto Protocol which came into force in 2005. This protocol recommended three flexible mechanisms to reduce the level of emission from the atmosphere and Clean Development Mechanism (CDM) is one of the mechanisms. CDM is defined in article 12 of the Kyoto protocol, 2005 and it enables in Annex I countries to earn Certified Emission Reduction or CER from project activities in the developing countries in replace of providing funds and technologies to launch the projects. The party where the CDM project is implemented is called the Host country. CDM aims at a cost-effective reduction of GHG emissions with technology and capital transfer from developed to developing countries. In the absence of the certified project activity, emission reduction shall be additional.

The CDM allows Govt. or private entities in developed countries to implement emission reduction projects in developing countries and receive credit in the form of CER (1ton of co<sub>2</sub>e) which they may use to meet their national emission reduction target. The CERs received from the host country increase the emission reduction cap of the Annex-I parties. The CERs issued by the CDM Authority of that country during the first commitment period (2008-2012) now it is extended from 2012-2022 can only be used by the Annex-I parties. The CDM provides an opportunity for the developed countries to reduce emission anywhere in the developing world and

to use these reductions towards meeting their GHG reduction targets. The Investment of developed countries in CDM projects in developing countries helps in achieving the economic, social, environmental, and sustainable developments. It also helps in cleaning the air, improved land use, employment generation, poverty alleviation, and such other sustainable environment within the country.

## 2. LITERATURE REVIEW:

- According to **“Clean Development Mechanism and carbon credits – A Primer” a report issued by ICAI**, is that it is a supplementary business income since CERs are earned from technology employed in the process of undertaking a business project and such income would be treated as a Profits & Gains of Business or Profession (PGBP) or Income from Other Sources and taxed at the normal rate of tax like any other sources of income. ICAI focus on another point is that the sale of CERs, which means it is the transfer of capital asset comes under capital gains tax. This sight taking on the basis that carbon credit is an intangible asset and it has the commercial right granted under the Kyoto Protocol.
- **Karena Holm (2007)** on her research was to recognize the potential impacts of CDM in the sustainable progress of the host country. So that she surveyed 200 pieces of literature about the CDM and its impact and last she concluded that CDM did not considerably contribute to the sustainable development of the developing or host country.
- **“New Challenges in Carbon Accounting” by Deloitte China Research and Insight Center** identified that carbon credits have both the characteristics of intangible asset and inventory. intangible assets mean, they do not have physical substance and they do have a finite life. But they are surrendered to the regulatory body at the end of a compliance cycle. They also have the characteristics of inventory. GAAP and IFRS define inventory as assets that are either (a) readily available for sale in ordinary business, (b) easily used in the process of production or are consumed in the course of the production.
- **Sutter and Parreno (2007):** The main objective of their study was to examine whether the CDM projects fulfilled the target laid down by the Kyoto Protocol in the reduction of greenhouse gases and sustainable development of the host country. For this, they analysed 16 existing registered CDM projects and they found that about 72% of the projects fulfilled the first objective and only 1% of the projects fulfilled the second objective. They finally concluded that none of the UNFCCC registered CDM projects fulfilled both the objectives as lay down by the Kyoto Protocol.
- **Dr Hanumantha Rao and Dr P Venkata Rao in their research paper “Carbon Credits Accounting reflexion in the Balance Sheet – An Accountant’s Perspective”** argue that India has to know what a valid credit is and there has to be a method for authorization by an independent body or council. Certification is mandatory while a carbon credit is not a deliverable good. The value of this intangible asset is relevant as of trust that buyers place in the market system. The achievement and survival of the system are predicated on the credit-worthiness of carbon emission. India can hence advocate for three additional categories of responses by professional accountants: inclusion of carbon gas emission markets in the capital budgeting activity, reporting environmental impacts on financial reports, and supporting for an effective regulatory approach for each sector of the economy.

- **Toman (2000):** In his research explain that in CDM projects, developed countries could fund GHG related projects in developing countries where costs were much lower. In turn, the developed countries would receive “certified emission reductions” or CERs that could be used to offset their emission reduction obligations.
- **National Strategic Study (2005):** The objectives of the study were to analyse the opportunities that would create from the CDM projects in India and to identify the position of India to such opportunities. They concluded that there were two issues: India was expected to capture between 20 and 30 per cent of the CDM market, bringing in up to \$300 million in revenue. Several favourable enabling factors had contributed to India’s pre-eminent position in the CDM market such as a good technical base and a pro-active National CDM Authority, which included secretaries from the ministries such as finance, non-conventional energy sources and power relating to CDM those were important in the context of incentive-based policy.
- **S. Sirohi (2007):** The main objective of his study was to consider as CDM projects had any remarkable impacts on poverty improvement of the rural people. He found that all the projects were operation on business motive and none of these projects was running in the direction of poverty alleviation, which is the main part of the sustainable development of the country. He also concluded that even the most potential renewable energy CDM project of India could not fulfil this objective but it was imminently important in the development of energy resources in India.
- **Promode Kant (2010):** The objectives of his study were to identify the problems related to the CDM projects situated worldwide and its possible solution. He found that the main problem of the CDM projects was a regional imbalance of establishment of CDM projects. It was observed from the existing 2500 registered CDM projects that about 83% of the projects were situated in seven countries and again out of 83% of the CDM projects, out of total project three fourth was located in India and China. He found that the reasons behind the regional imbalance were the poor and corrupted governance in many developing countries which increased the risk of foreign investment in CDM projects in the host country.
- **FICCI (2012):** The objectives of their study were to recognize the feasible effect of CDM in India and to recognize the existing trouble of the CDM projects in India. They complete that CDM projects helped in successful GHG emission decrease of the host country, improved energy protection in the host country, technology transfer into the host country, and approximately all the CDM projects helped in the sustainable growth of the host country.

### 3. METHODOLOGY:

#### Data sources:

For this paper I have used only secondary data, which is collected from various journals, websites, news paper etc. This data is related to execution of Kyoto Protocol from [cdmpipeline.org](http://cdmpipeline.org) and [cdmindia.gov.in](http://cdmindia.gov.in).

### 4. OBJECTIVES:

- ❖ To recognise the governance of the clean development mechanism in India.
- ❖ To evaluate the issuance of the clean development mechanism projects in India.

## 5. DATA ANALYSIS AND INTERPRITATION

### 5.1. GOVERNANCE OF CDM IN INDIA:

India signed the Kyoto protocol to the UNFCCC on 10 June 1992 and ratified it on 1 November 1993. According to the UNFCCC, India is not the binding countries for GHG mitigation commitments with their little involvement in greenhouse contribution and its lower financial and technical capacities. The ministry of environment set a nodal agency for environmental change issues in India and adopt the Kyoto Protocol (KP) three flexible mechanisms that enable the India to meet its emission control and diminution commitments. These are as such:

- ✓ Joint Implementation (JI)
- ✓ Clean Development Mechanism (CDM)
- ✓ International Emission Trading (IET)

### 5.2. JOINT IMPLEMENTATION (JI):

The structure known as "joint implementation", considered in Article 6 of the Kyoto Protocol, permits a nation to release or delegate responsibility under the Kyoto Protocol (Annex B Party) to acquire discharge diminishment units from an escape reduction or release evacuation venture in another Annex B Party, every one ton of CO<sub>2</sub>, which can be checked towards meet the Kyoto target. Joint Implementation means an adaptable and cost-effective method for releasing GHGs emission to fulfil Kyoto commitment. While the host countries will get benefits from technology transfer and foreign investments.

### 5.3. CLEAN DEVELOPMENT MECHANISM (CDM):

Clean Development Mechanism (CDM) allows a developed country, with an emanation restriction and GHGs reduction obligation under the Kyoto Protocol, to employ an emission diminution project in developing countries. The CDM permits release diminishment extends in creating nations to attain ensured outflow decrease (CER) attributes, every equivalent to one ton of CO<sub>2</sub>. These CERs can be exchanged and sold, and also utilized by developed nations to meet their discharge GHGs focuses under the Kyoto Protocol. These types of Certified Emission Reductions (CERs) certificates are uniform release offset instrument in the world. Credits, means one ton carbon dioxide reduced, which can be counted in the direction of achieving Kyoto targets.

This arrangement empowers practical expansion and discharge emission, while giving developed nations some flexibility to meet their emanation reduction restraint targets. CDM project stimulates the emanation lessening and sustainable development and also giving developed nations some flexibility as to how they meet their emission restraint targets.

### 5.4. INTERNATIONAL EMISSION TRADING (IET):

International Emission Trading is a grant based mechanism and in this trading, industrialized nations agree for reducing or limiting the Green House Gases (GHGs) emission. These established targets expressed as the levels of allowed emissions are known as assigned amounts. The total allowed emissions are divided into Assigned Amount Units (AAUs). International Emission Trading (IET) permit the nations that have emission units to additional that means emissions allowed but not used, to sell this surplus capacity to those nations that are in excess of their targets. So in this type of trading developing or developed countries can trade the AAUs within

the Annex I countries in the international carbon credit market to cover their deficit in allowances. Countries with excess credits can sell them to countries with capped emission commitments under the Kyoto Protocol.

### **5.5. Structure and Authorities Involved in the CDM Project Cycle in India:**

Since the initiation of a CDM project activity till the delivery of Certified Emission Reductions (CER), a CDM project is a combination of various steps and there are some authorities which play a significant role in the whole cycle of a CDM project. Generally speaking, the CDM project has the following steps and bodies:

#### **5.5.1 Step-1-Project Recognition:**

A CDM project starting with the selection of an idea which helps in reducing the GHG emissions from the environment. The very primary steps involved in the Project Proponent or Project Participant (PP) to scan the level of emission reduction resultant from the project and to find out the improvement priorities according to the host country.

#### **5.5.2. Step-2-Approval of the Government:**

Once the project is satisfied under CDM, such project promoter prepares a Project Idea Note (PIN) and submits it to the Designated National Authority (DNA) for approval.

#### **5.5.3. Step-3- Development of the project:**

The planned project must go through a project design phase. The Project Participant develops a Project Design Document (PDD), in this phase within a prescribed format, including a depiction of the project, projected baseline methodology, method for computation of emissions through source and monitoring plan. The related Parties also submit a new baseline and monitoring methodology or the previously approved project, which has been used by the Executive Board (EB).

#### **5.5.4. Step-4-Evaluation of the project:**

After the development of the project by PP, the next step is confirmation of the project through submitted the PDD to a Designated Operational Entity (DOE). The DOE is an EB recognized independent verifying agency. Validation means the independent evaluation of the project by the DOE as per CDM framework and procedures and decisions of MOP and EB. It examines whether the planned project activity fulfils all the needs of the CDM and submit this validation report to the EB.

#### **5.5.5. Step-5-Registration of the Project:**

Once the PDD is evaluated, such PDD is forwarded to the EB with an appeal for a registration. Registration is the proper acceptance of the EB to convert the validated project as a CDM project activity. The registration is deemed to be finalized within eight weeks after the date of the receipt of the report from EB, the request for review is made by at least three members from the EB.

#### **5.5.6. Step-6-Monitoring, Verification and Certification of the project:**

After the registration is completed, the PP is liable for monitoring that the actual GHG emissions reduced by the project or not. Verification is re-evaluated and ex-post determination of the designated operational entity for the monitored reductions in anthropogenesis emissions through sources of greenhouse gases which have

occurred due to the registered CDM project activity throughout the verification period. The PP may request a DOE for periodical verification of the actual GHG emission and certify such reduction in GHG emission. Thus Certification is the written declaration by the DOE that within the specified period the project activity has reached the emission reduction target and it is verified.

#### **5.5.7. Step-7-Publication of CERs:**

The certification report by the DOE contains a request for issuance of Certified Emission Reductions to the EB, which is equal to the verified amount of reductions of anthropogenesis emissions through sources of GHGs. The project documentation to be registered and approved for implementation, only after satisfy the independent verifier i.e. the DOE and the EB. The host country should also give written confirmation that the CDM project assists the nation to attain sustainable development as per its environmental priorities.

#### **5.5.8 Step-8- Additionality Issue of CDM Project:**

Article 12(5)(c) of the Kyoto Protocol provides that CERs shall be issued only after it is based on reductions that are additional to any that would occur in the absence of the project. According to UNFCCC additionality refers to an effort that is supplemental to the Business-as-Usual (BaU) circumstances in at least two areas: (a).the additionality of monetary assistance by the developed countries to diminish climate change in developing countries, and (b).the additionality of GHG emissions generated through such mitigation activities. So it is the duty of each PP has to display the additionality of the project in the PDD. Each project must explain clearly the baseline setting through which the additionality is to be measured. The baseline setting means the GHG emissions that occurred in the business-as-usual (BaU) or in the absence of that project. The project promoter has to scan what would have happened if the project had not implemented. So the baseline setting can direct the hypothetical assumptions, which help to increase the amount of CERs.

#### **5.5.9. Step-9-Formation of National CDM Authority**

The Government of India established the National Clean Development Mechanism Authority (NCDMA) by executive order to implement its power under the Environment (Protection) Act of 1986. The NCDMA consist of the members from Ministries of Environment, Non-Conventional Energy, Power, Industry, Financial and External Affairs along with a representative of the Planning Commission. the NCDMA was vested with the power to invite officials and experts from government bodies, financial institutions, consultancy organisations, non-governmental organisations, civil society, the legal profession, industry and commerce for technical and professional inputs for recruiting its member.

The NCDMA accept the projects for evaluation and approval according to the guidelines and general rules laid down in the modalities about CDM and also the guidelines issued by the CDM Executive Board and Conference of Parties(COP) which also known as Meeting of Parties(MOP) to the United Nations Framework Convention on Climate Change (UNFCC).

The process of CDM projects evaluation includes estimation the probability of successful implementation of the projects and evaluation the extent to which it can meet the sustainable development needs. On the other hand, the NCDMA also recommend some additional requirements which ensure that the project proposals must meet the national sustainable development priorities and abide by the legal framework to make sure that the projects are compatible with all the stakeholders have been properly consulted.

### 5.6. Evaluate the issuance of CDM projects in India:

India holds the second position in the world to hosts clean development projects. As on November 2015, the total project registered in India was around 3000 with India's Designated National Authority for the Clean Development Mechanism. China hosts more projects than India. India deals in CDM with a 'laissez-faire' framework whereas the Indian government neither effectively advances nor properly executes the CDM venture in various states. India's liberal approaches to the CDM for sustainable development are still unclear. A statistical analysis by Bayer et al. 2012 on CDM project implementation in India between 2003 and 2011 reveals that in India, CDM projects are more concentrated in the industrial state, such as Gujarat and Maharashtra. In India, the CDM projects are executed by the central government, state/local government and private. The details approved projects up to 2020 are in the following table.

**Table: 1- Sector wise approved Project executed by Central Government up to 2020**

Source: [http://www.cdmindia.gov.in/approved\\_projects.php](http://www.cdmindia.gov.in/approved_projects.php)

Sl. No.	Sector	No. of Projects	No. of CER annually	No. of CER Up to 2020
1	Agriculture	1	42,749	85,498
2	Energy Demand	5	5,62,310	14,39,343
3	Energy Industries(renewable and non-renewable sources)	69	52,43,057	203,40,106
4	Energy Distribution	1	19,599	78,396
5	Metal Production	1	61,226	7,34,712
6	Manufacturing Industries	2	90,962	8,38,788
7	Waste handling and Disposal	2	3,95,499	7,65,316
<b>Total</b>		<b>81</b>	<b>6,420,402</b>	<b>24,282,159</b>

**Interpretation:**

The above table show the sector wise approved projects executed by govt, of India. This table reveal that the energy industry has more approved CDM projects with 69 projects followed by 2 projects in manufacturing industry and waste handling and disposal industry which is 85%, 0.024% and 0.024% of total project. The no of issue of CERs is also more in energy industry with 20,340,106 no CERs up to 2020 which is 83% of total CERs issue. The second industries, which hold more CERs is energy demand followed by third position is manufacturing industry, which is 5.9% and 3.45% respectively. In annually issue of CERs energy industry hold first position with 5,243,057 no, following by waste handling and disposal industry with 395,499 no, of CERs.

**Table no-2-State wise approve project up to 2020 in India**

SI No	State	No. of Approved Projects	No. of CERs Issue Annually	No of CERs Issue up to 2020
1	Andra Pradesh	10	5,03,652	30,47,892
2	Gujarat	19	8,93,470	34,96,161
3	Karnataka	9	10,37,035	43,01,632
4	Madhya Pradesh	21	10,51,936	53,90,242
5	Maharashtra	10	3,61,233	25,61,629
6	Rajasthan	15	6,34,189	24,78,484
7	Tamil Nadu	8	18,28,372	70,81,703
<b>Total</b>		<b>92</b>	<b>6,309,887</b>	<b>28,357,743</b>

Source: [http://www.cdmindia.gov.in/approved\\_projects.php](http://www.cdmindia.gov.in/approved_projects.php)

**Interpretation:**

The above table explain that Madhya Pradesh is the state where highest CDM projects are registered 21 followed by Gujarat and Rajasthan with 19 and 15, which is 22.82%, 20.65% and 16.3% respectively of total project. But no of issue of CERS is more in Tamil Nadu is 18, 28,372 followed by Madhya Pradesh and Karnataka which is 10, 51,939 and 10, 37,035 respectively, which is approximately 30% of whole project following by 17% in Madhya Pradesh and 16% in Karnataka respectively. Likewise no. of CERs issue up to 2020 is highest in Tamil Nadu and Madhya Pradesh, which is 70, 81,703 and 53, 90,242 respectively.

Sl.No.	Sector	No. of Projects Approved	No. of CERs Issued Annually	No. of CERs Issued Up to 2020
1	Afforestation and Reforestation	12	202,890	230,509
2	Chemical Industries	10	460,287	380,765
3	Energy Industries(Renewable/Non-renewable)	960	75,532,760	22,540,430

4	Energy Distribution	8	1,187,560	132,507
5	Energy Demand	67	3,438,652	1,356,809
6	Manufacturing Industries	49	2,420,378	879,654
7	Metal Production	6	976,533	1,567,768
8	Transport	9	1,023,788	356,749
9	Waste handling and Disposal	25	1,875,643	972,689
Total		1,146	87,118,491	28,417,898

**Table: 3-Approved CDM Project is being executed under PP mode**

Source: [http://www.cdmindia.gov.in/approved\\_projects.php](http://www.cdmindia.gov.in/approved_projects.php)

### Interpretation:

The above table show that approved CDM project which is running under PP mode. It reveals that more CDM projects are approved in renewable and non-renewable energy sector, which are 960 followed by 67 CDM projects under energy demand and 49 projects under manufacturing industries. Percent wise energy industries acquire almost 84% of total project, which is quite high. Annually issue CERS is also more in energy industry with 75,532,760 following by energy demand and manufacturing industries with 3,438,652 and 2,420,378. In percentage 87% in energy industry, approximately 4% in energy demand and 3% in manufacturing industries respectively.

### 6. FINDING, SUGGESTION, CONCLUSION:

As a host country India has world's largest clean development projects. From the analysis, it was found that approximately 30,000,000 projects had been registered with India's Designated National Authority up to 2020 under the Clean Development Mechanism. India was one of the first countries to react quickly towards the Kyoto Protocol's flexibility mechanism and constituted NCDMA to fulfil with the Kyoto Protocol procedures for CDM. India's renewable energy sector has been developing since the early 1975s and provided a positive ground for CDM to develop further. It was a good thing in wrap under the institutional framework and policy regime for the renewable sector, CDM projects received considerable priority.

Only China has hosts more projects than India. It also found that India's approach towards the CDM for sustainable development remains unclear. The statistical analysis reveals that implementation of CDM project in India was more concentrated on states like Gujarat and Maharashtra which are more developed and industrialised, rather less industrialised states generally execute fewer CDM projects. It's suggested that govt. must give importance to others under develop the state as well as other sector or industries such as metal production, chemical, transport etc. the environmental pressure on earth is global warming. Climate alteration is a global environmental problem which has been receiving intense political concentration both at domestic and international levels. The efforts essential to address not only the climate change problem but also mitigation of GHG emissions and construction the adaptive capacities of other developing countries to manage with the adverse effect of climate change on various sectors of the society and economy enabled and supported by technology and finance.

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