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USING CREATIVITY FOR SUSTAINABLE DEVELOPMENT BY INCORPORATING CLEAN DEVELOPMENT MECHANISM (CDM): A STUDY FOCUSING ON CARBON CREDIT TRADING IN INDIAN CONTEXT

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ABSTRACT

Growing concern about climate change is based on various findings of the studies on climate change, most significant of them are the findings and reports of the Intergovernmental Panel for Climate Change (IPCC), a body established in 1988 by World Meteorological Organization (WMO) and United Nations Environment Programme (UNEP).Anthropogenic emissions from various human activities lead to changes in weather and it is now recognized that international cooperation is necessary to respond effectively to the challenge of climate change.

A variety of approaches are being implemented to reduce carbon emissions. These range from efforts by individuals and firms to reduce their climate footprints to initiatives at organizational, city, state, regional and global levels. For realizing this mission various governments have taken certain steps like 1992 UN Framework Convention on Climate Change (UNFCCC) and its subsequent 1997 Kyoto Protocol. Kyoto Protocol commits 38 industrialized (Annex I) countries to cut their emissions of greenhouse gases starting 2008 up to 2012 to levels that are 5.2 per cent below 1990 levels. Clean Development Mechanism is one of the mechanisms included in the protocol. This tool enables Annex I parties to reduce their GHG emission and also Carbon becomes a tradable commodity with an associated value and every tonne of carbon reduced through a CDM project activity after being certified by Designated Operational Entity(DOE) becomes a Certified Emission Unit(CER) and is tradable. In this paper we have tried to understand and analyze the current scenario of CDM and Carbon Crediting in Indian Context, identifying the root causes, finding opportunities and then proposing a framework for turning these opportunities into strength for emerging leader in Carbon Trading by creatively and effectively using Creative Problem solving skills and tools like Interpretive Structural Modeling(ISM) and Options Profile Mythology (OPM) with emphasis on developing a robust and effective model.

Keywords: *Carbon Trading, Clean Development Mechanish (CDM), Global Warming, Interpretive Structural Modelling(ISM) ,Options Profile Methodology(OPM).*

Literature Survey

The need for future action to reduce the risks of climate change has figured significantly on the international agenda, a variety of approaches are being implemented to reduce carbon emissions.

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These range from efforts by individuals and firms to reduce their climate footprints to initiatives at city, state, regional and global levels. For realizing this mission various governments have taken certain steps like 1992 UN Framework Convention on Climate Change and its 1997 Kyoto Protocol, and Europe's carbon constraint for electricity generators and industry under the European Union Emissions Trading Scheme (EU ETS)[1].

Figure 1: Participation in the Kyoto Protocol
Source: World Bank Report 2007

Figure 1 depict participation by various countries in the Kyoto Protocol, where dark green indicates countries that have signed and ratified the treaty and yellow indicates states that have signed and hope to ratify the treaty. Australia and the United States have signed but not ratified it yet.

The protocol commits 38 industrialized countries to cut their emissions of greenhouse gases starting 2008 up to 2012 to levels that are 5.2 per cent below 1990 levels [1].

National targets range from 8% reductions for the European Union and some others to 7% for the US, 6% for Japan, 0% for Russia, and permitted increases of 8% for Australia and 10% for Iceland.

Every country is assigned a specified quota for production of GHG (Green House Gas) emissions. These AAU's (Assigned Amount Units) are based on a country's emission reduction target and can be traded on the IET (International Emission Trading) market[2], along with following tradable units established by the Kyoto protocol and commonly referred to as Carbon Credits.

- emission reduction units (ERU's), created through joint implementation projects;
- certified emission reduction units (CER's), created through clean development mechanism (CDM) projects; and
- Removal units (RMU's), created through carbon-sink (land-use) projects

Carbon Trading

The necessity for carbon trading arises primarily from the inability of developed nations in the EU and Japan to meet their emission reduction goals within the stipulated time period. This opens up the opportunity for Carbon Trading since Kyoto Protocol allows developed nations to offset their emissions by funding reductions in developing countries through Joint implementations of projects or buying Carbon Credits [1].

Although developing world is catching up in terms of carbon emissions with growing population, industrialization etc but still per capita CO2 emissions in developed countries is far more than that in developing countries.

Another reason for trading of Carbon Credits between developing and developed nations becoming a huge opportunity is that cost of CO_2 emissions reduction in developed countries is much more than in developing countries.

Developed countries have to spend nearly $300-500 for every tonne reduction in CO_2 emission. Whereas developing countries like India need to spend only $10-25 for the same [8, 9]. The stage is thus set for carbon trade to flourish [7]. Trading carbon credits is hence seen as a less expensive and lucrative for both developed and developing countries.

CDM and Carbon Trading in Indian Context

Per capita Carbon emissions in India's context is small(0.5 tons) as compared USA (5.6 tons).The Clean Development Mechanism enshrined in the Kyoto Protocol gives Indian industry, the opportunity to implement greenhouse gas reduction projects taking advantage of the markets for trading emissions[3]. Such trading will also make a large variety of energy conservation and alternative energy projects more viable. A number of trading systems are active in North America and Europe [4]. Another advantage of implanting cleaner and sustainable technologies is the ability to avail funding from Prototype carbon Fund which is under the tutelage of the World Bank. The fund is formed by contributions from many developed nations [1].

Problem Structuring

A problem well understood is problem half solved, therefore a major part of our efforts was focused on understanding, analyzing and structuring the problem.

Problem as Understood

After Kyoto Protocol it became mandatory for the member countries to work consciously to reduce pollution and contribute towards a clean environment and to maintain their GHG emissions below a predetermined level. Most of the developed countries in spite of their best possible efforts are unable to do so because of massive industrialization and huge cost involved but lot of scope is there for developing countries to not only reduce GHG emissions but also to turn it into a big business opportunity therefore we need to focus on finding as to how can Indian beat competition, overcome odds and leverage from the current situation to turn it into a big opportunity.

Mess Statements

How can India leverage from the emerging carbon credit revolution (CDM) which is expected to be the biggest industry in next few years and dominate the CDM market on the supply side? And in order to achieve these goals, what steps India should take to exploit its potential in terms of growing industrialization, abundant venture capital, good track record in intellectual property, research and development taking place for making the environment cleaner?

Root Cause(s) Identification

Fish Bone method /Root cause analysis was used for identification of root causes. In this method barriers or causes of a certain problem are classified under various head or domains and then an attempt is made to segregate root causes, which can then be addressed while formulating a solution.

Root Cause Diagram in the context of our project is shown in figure 2.

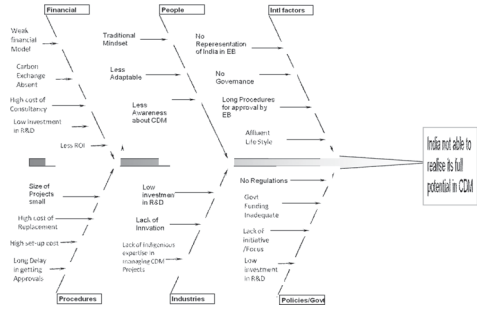

Figure 2: Root Cause Analysis

Problem Statement

India, despite having enormous potential to become the market leader in CDM / Carbon Credit trade is lagging behind china (its arch rival) by a huge margin as shown in figure 3. Therefore it is high time technocrats take cognizance of the situation, identify the root cause, find appropriate opportunities and leverage them to become the market leader.

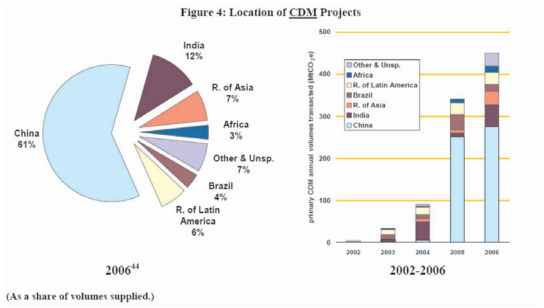

Figure 3: Location of CDM Projects
Source: World Bank Report 2007

Methodology

In this study our aim was to understand and analyze the current scenario of CDM and Carbon Crediting in Indian Context, finding opportunities and then proposing a framework for turning these opportunities into strength for emerging leader in Carbon Trading and to identify problems related to carbon credits volume disparity between India and China and to propose a solution at national and individual firm level and from there this project can be taken ahead to involve all the aspects of management and can be provided as a solution to organization keen on adopting CDM.

Using Creative Problem Solving for Finding Viable Solutions.

We used various creative problem solving tools like Scenario Building, Option Profiling, SAP-LAP, ISM (Interpretive Structural Modeling) to assess the current situation, analyze the problems and for proposed solution.

Findings and Results

In this section we discuss results obtained after using tools like ISM and Option Profiling.

Interpretive Structural Modeling

Objectives

1. To turn CDM into a good business Opportunity
2. To increase awareness among the masses
3. To cut down on the amount of emissions at our home and workplace
4. To have an appropriate and feasible financial model for Carbon Trading
5. To set up a Carbon Exchange in India as in China
6. To have flexible Carbon Trade policies
7. To look out for opportunities for public private partnership(PPP)
8. To increase the size of projects
9. To emphasize on R&D in the domain of pollution control
10. Development of indigenous technology for CDM
11. Low cost replacement technology.

ISM is used for prioritization of objectives to get a single rank order or to create a network, therefore after applying ISM the rank order obtained for various objectives is shown in figure 4

Level	Objectives
I	1
II	3,9
III	2,7,4
IV	5,6,8
V	10
VI	11

Figure 4 : Rank Order (ISM)

Option Profile Method

Thrust Areas as identified are Financial Model, Awareness, Regulations, Investment in R&D, Promotion, and Key Industries identification.

Various Options proposed to focus on Thrust Areas are:

- Setting up of an exchange for carbon trading
- Promoting linkages and understanding among exchanges around the globe.
- Identifying key emitting industries that could be given Focus
- Implementing regulations for carbon trading in India
- Attract foreign investment in India

Action Plan/Outcomes of ISM and Options Profile Method

In this section we have list down the outcomes of ISM and OPM (refer to Appendix I for details) Setting up of an Exchange

India, at present, lacks any kind of exchange where carbon credits (CERs) can be traded. If India has its own exchange, it will facilitate trading of credits earned by SMEs and other small firms. It also helps to stabilize the price of fluctuating CERs and different financial instruments can be introduced.

Identifying Key Industries

There is a possibility of a capping on India's emission after 2012. Thus India has got a short

span of 5 years to cash this opportunity of earning CERs. India should identify sectors which are major emitters of GHG and try to leverage on these sectors to earn the maximum number of CERs.

Outsourcing Model for Global Companies

It is seen as a major investment area as foreign entities can establish their own subsidiaries in India and collaborate and undertake CDM projects. Through these subsidiaries the parent company can indirectly earn CERs which otherwise it had to buy from an exchange at much higher price.

SEZ / Green Field Projects

To promote CDM projects government can make policies according to which a SEZ will be approved only if it undertakes 10 or 15 % of its total projects as CDM projects. Since SEZs are seen as a driver of growth in infrastructure, this will also help India to reduce its overall GHG emission.

Conclusion

India is on the path of Socio – Economic growth with increasing GHG emissions. India, although out of the purview of Kyoto protocol restrictions, needs to cut down its GHG emission and that at the same time utilize the opportunity to harness its growing economy by earning CERs by undertaking CDM projects.

Thus there is a need to meet the challenges India is facing and can hamper its growth plans. India has low implementation cost of CDM projects and an effective strategic planning can give India an edge over all other developing countries.

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Appendix I
Options Profile Method

Step1: Ideas

1. Set up of exchange for carbon trading
2. Impart awareness and education about carbon trading.
3. Increase investment in R&D
4. Promote technology initiatives in Clean Development Mechanism Projects
5. Reform executive board for expediting clearance of CDM projects
6. Promote linkages and understanding among exchanges around the globe.
7. Ensure correct price discovery for the buyer-seller
8. Encourage SME for adoption of CDM projects.
9. Enable Financing in CDM projects.
10. Maintain ample liquidity in Carbon Market.
11. Lower overall cost of emission reduction
12. Make emission control feasible and attractive for firms
13. Increase average size of CDM projects in India
14. Lower transactional cost
15. Promote indigenous expertise in the field of CDM consulting
16. Make India a global emissions reduction powerhouse
17. Identify key emitting industries that could be given focus
18. Implement regulations for carbon trading in India
19. Improve project approval mechanism in India
20. Provide platform for SME players to undertake joint projects under a CDM Platform

Step 2:

A

7. Set up of exchange for carbon trading
8. Ensure correct price discovery for the buyer-seller
10. Maintain ample liquidity in Carbon Market.
11. Lower overall cost of emission reduction
21. Attract foreign investment in India

B

1. Impart awareness about carbon trading.
15. Promote indigenous expertise in the field of CDM consulting
19. Improve project approval mechanism in India

C

9. Enable Financing in CDM projects.

2. Increase investment in R&D
3. Promote technology initiatives in Clean Development Mechanism Projects
12. Make emission control feasible and attractive for firms

D

4. Reform executive board for expediting clearance of CDM projects
5. Promote linkages and understanding among exchanges around the globe

E

13. Increase average size of CDM projects in India
14. Lower transactional cost
20. Provide platform for SME players to undertake joint projects under a single CDM program

F

16. Make India a global emissions reduction powerhouse
17. Identify key emitting industries that could be given focus
9. Encourage SME for adoption of CDM projects.
18. Implement regulations for carbon trading in India

Step 3: Thrust Areas

- Financial model
- Awareness
- Regulations
- Investment in R&D
- Promotion
- Key Industries identification

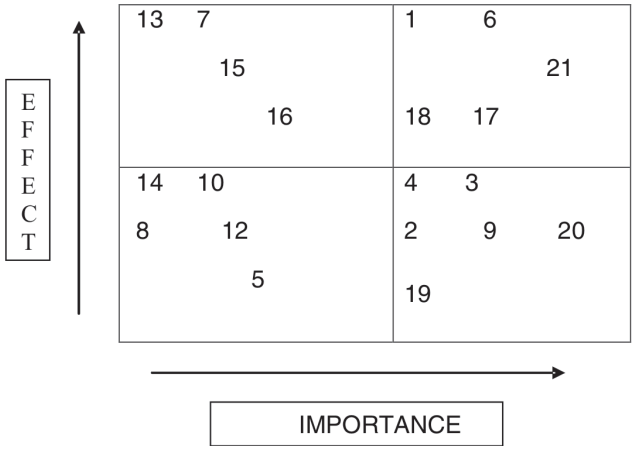
A:

Trading Exchange, B: Awareness, C: Financing, D: Global measures, E:Procedures, F: Regulations

Step 4 : Mapping

A	B	C	D	E	F
1	2	3	5	13	16
7	15	4	6	14	17
10	18	9		20	8
11	19	12			
21					

A	C	F	E	B	D
1	3	17	13	19	6
11	9	8	20	15	5
7	4	18	14	2	
10	12	16			
21					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18 17
14 10
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4 3
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EFFECT
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