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CLEAN DEVELOPMENT MECHANISM (CDM): PROBLEMS AND PROSPECTS IN BANGLADESH

Abstract

Clean Development Mechanism (CDM) is one of the three market based emissions trading mechanisms established by the Kyoto Protocol (KP) regime. This mechanism has been designed to monetise environmental values using market mechanism to contribute to the sustainable development of the host country and to encourage cleaner technology transfer from developed countries. As of June 20, 2008, a total of 1,084 CDM projects have been registered with the CDM Registration Board. Out of these registered projects, India is the host country for 35% of the projects followed by China (14.4%) and Brazil (13.6%). Compared to these numbers, Bangladesh has so far been successful in registering only 2 projects constituting 0.18 % share of the CDM projects. Such a share is highly disproportionate considering Bangladesh's population, geographical location and economic condition. However, this should not be assumed that the local entrepreneurs are not interested in undertaking CDM projects. Thus, the paper identifies the problems that exist in undertaking/popularizing CDM projects in Bangladesh against the successes of India or other countries. The paper discusses some of the institutional, technical and capacity building issues specific to Bangladesh as well as the CDM registration process. Besides certified emission reduction (CER) attainable through the CDM process, the paper also explores the prospects of verified emission reduction (VER) in the context of Bangladesh.

1. INTRODUCTION

Kyoto Protocol (KP), adopted on December 11, 1997 and gone into effect on February 16, 2005, is part of the international initiative to

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reduce six green house gases (GHGs), namely Carbon Dioxide (CO₂), Methane (CH₄), Nitrous Oxide (N₂O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs) and Sulphur hexafluoride. KP is a legally binding Protocol that obligates the 38 industrialized countries, referred to as Annex – 1 countries, to reduce their emissions level of those six gases to an average of 5.2 percent below their 1990 levels. As of May 2008, 181 countries have ratified this Protocol. The Protocol not only put a cap on industrialized countries' GHG emissions but also devised several means of achieving the target reduction by putting a price for emissions. These means are often referred to as cooperative mechanisms, which allow the Annex-1 countries to achieve emission reductions at a lower cost in other countries than the costlier option at home. International Emissions Trading (IET), Joint Implementation (JI) and CDM are the three market-based cooperative mechanisms. IET allows the industrialized countries to transfer parts of their allowed emissions. JI enables an Annex - 1 country to claim credits for emission reductions as a result of its investment in emission reduction or emission removal project in another Annex - 1 country.

According to the proponents of KP, CDM projects are to be implemented in non-Annex countries with financial assistance and technology transfer from Annex-1 countries for the Certified Emission Reductions (CER) Credits. CDM has been designed not only as an emissions reduction tool, since it addresses the non-Annex country's sustainable development priorities, it also assists the recipient country to use it as a development tool and as a means of technology transfer. Thus, CDM is the most important and relevant flexible mechanism for the developing countries under the KP. The provision of depositing 2 percent of CER proceeding for the climate change (CC) adaptation fund is also important for the non-Annex countries, predicted to be the hardest hit from the impacts of CC. For the Annex-1 countries, probably, this is the most cost effective option in meeting the stipulated emission targets as JI and IET are to be implemented in developed countries where the project costs are usually higher.

The first CDM project has been registered at the United Nations Framework Convention on Climate Change (UNFCCC) Board on November 18, 2004¹ and it has been estimated that the global CDM market size could be between 50 MTCO (million tons of carbon dioxide

¹ Bhat, P. (2005), **Clean Development Mechanism 2005**, available from <www.iges.or.jp/en/cdm/pdf/india/activity03/pamposh1.pdf> [accessed 12/26/08].

equivalent) and 180 MTCO². As of July 21, 2008 1,128 projects have been registered with the CDM authorities. Of them, India has the largest number of registered projects, totalling 335 or 31.47% of the projects registered. This is followed by China with 244 projects constituting 21.63% and Brazil 12.68%³. Although India has the largest number of registered projects, it occupies 3rd position in terms of CER generation. In 2006, Indian projects sold 12 million tons of Carbon dioxide equivalent (CO₂e) compared to 46 million by China and 15 million by Brazil⁴. China has already taken a share of 73 percent of the total CDM fund or US\$ 5.4 billion⁵. The reason for China's prominence in terms of CERs is due to project decomposing HFC gases. It needs mentioning that HFCs are 11,700 times more potent than CO₂ as GHG⁶. It should also be mentioned that 12 out of 20 CDM projects for decomposing HFC is located in China and 95% of CERs in China are from those projects⁷.

In contrast, despite having a large population, a burgeoning economy and a sizeable landmass, Bangladesh has so far been successful in

² The Energy and Resources Institute (TERI) (2005), CDM Implementation in India: The National Strategy Study, p. 12 available from <<http://www.teriin.org/nss/fullreport.pdf>> [accessed 08/08/08].

³ United Nations Framework Convention on Climate Change (UNFCCC) (2008), Registered Project Activities by Host Parties, available from <<http://cdm.unfccc.int/Statistics/Registration/NumOfRegisteredProjByHostPartiesPieChart.html>> [Accessed 27/07/08].

⁴ Wiekert, M. (2006) **CDM Market Brief**, December 2006, available from <<http://www.kyoto-coaching-cologne.de/publikationen/CDM-Indien-Auf12-Endversion-englisch.pdf>> [accessed 8/8/08].

⁵ Ahmed, I., **South Asia braces for climate change fallout**, *The Daily Star*, July 1, 2008.

⁶ Global warming potentials (GWP) are based on the heat-absorbing ability of each gas relative to that of carbon dioxide (CO₂), as well as the decay rate of each gas (the amount removed from the atmosphere over a given number of years). The six GHGs and their GWPs are as follows:

GHG	Potential	GHG	Potential
CO ₂	1	CH ₄	21
N ₂ O	310	PFC	6,500
HFC	11,700	SF ₆	23,900

⁶ Mitsubishi UFJ Securities and Clean Energy Finance Committee, 'Recent CDM Projects and Risk Control', available from <www.resourcesaver.com/file/toolmanager/CustomO105C399F97268.pdf> [accessed 14/12/08].

⁷ Fenhann, J. (2008), **The Global CDM Pipeline and the CDM Projects in Bangladesh**, paper presented at the First Capacity Building Workshop on CDM under the CD4CDM project, Dhaka, Bangladesh, April 8-9, 2008.

registering 2 projects constituting only 0.18% of the total number of registered projects. Beside these two registered projects, there are two projects under validation. Combined together, these four projects are expected to take only 0.1% shares of CERs by 2012⁸. Such dismal performance of the country calls for a look into the reasons for its failure in attracting more CDM projects. Thus, the purpose of the paper is to:

- I. Discuss the process of CDM registration through the UNFCCC process;
- II. Analyse the reasons for feeble amount of CDM projects in Bangladesh; and
- III. Explore the options to sell carbon credits through the verified emission reduction (VER) process.

With these purposes in mind, the paper proposes to look into these issues on the basis of the available literature and personal experiences in trying to promote CDM projects in Bangladesh.

2. THE CDM PROCESS

This section draws heavily from United Nations Development Program's (UNDP) publication *The Clean Development Mechanism: A User's Guide* (2003) and Institute of Global Environmental Strategies (IGES) publication *CDM Country Guide for India* (2005).

CDM process involves the following stakeholders:

- i. *PROJECT DEVELOPER/OPERATOR*: Government bodies, municipalities, foundations, financial organizations, NGOs and private sector organisations from the developing countries can develop and operate CDM projects.
- ii. *CDM INVESTORS / CER PURCHASERS*: These are project investors or purchaser of carbon credits from the Annex – 1 country. These credits from CDM are called certified emission reduction (CER).
- iii. *HOST GOVERNMENTS AND DESIGNATED NATIONAL AUTHORITIES (DNA)*: A country that has signed and ratified KP is a party to the CDM project within the country. The Department of Environment of the Bangladesh government acts as the DNA for Bangladesh as the host country. DNA is

responsible for approving each CDM project and ensuring that it conforms to the country's sustainable development criterion.

- iv. *DESIGNATED OPERATIONAL ENTITIES (DOEs)*: DOEs are domestic or international legal entities that are accredited by the CDM Executive Board to validate CDM activities at the outset of the project, make project design documents (PDDs) publicly available, ensure public participation in the document and incorporate stakeholder comments on the PDD and verify and certify CER during project operations.
- v. *CDM EXECUTIVE BOARD AT THE UNFCCC*: The CDM Executive Board is comprised of 10 elected members from both Annex and non-Annex countries. Among other responsibilities, the Board is entrusted with approving new methodologies related to baselines, monitoring plans and project boundaries, reviewing simplified procedures and definition of small-scale projects, accrediting and suspending of DOEs, developing and maintaining a CDM project registry and reviewing project validation and verification reports and issuing verified CERs.
- vi. *OTHER STAKEHOLDERS*: Local people residing at the project site and interested parties at local, national and international levels should be allowed to review and comment on the project activities. They can also be included in monitoring the project activities.

From conceptualisation to implementation, a CDM project usually goes through the following steps:

1. *Project identification*: According to the UNFCCC rules, any CDM project has to fulfill two major conditions. They are: 1. the project activities must result in reducing or absorbing GHG emission that are measurable and verifiable known as additionality (discussed later); and 2. It must demonstrate its contribution to environmental integrity and host country's sustainable development goals. In addition to these two conditions, a CDM project should not be a nuclear power project, divert overseas development assistances from the Annex 1 countries for financing it and it should not undertake other type of sequestration activities besides afforestation or reforestation (e.g. carbon capture & storage projects) After fulfilling these conditions and ascertaining support of the host country the project needs to be categorized, its technological conditions should be assessed, and a rough estimation of the project's

emission reduction and its negative impact on the environment should be conducted.

During the project identification and screening phase some computer software available on the Internet can assist the project proponent in a rather basic way. These are ProForm⁹ developed by Lawrence Barkley Livermore Laboratory and RETScreen¹⁰ developed by the Canadian government.

Project Idea Note (PIN): If the answer to the questions asked during the Project Identification phase come out positive then the project developer should prepare and submit a PIN to the probable CER purchasers or traders to gauge the relevance and their level of interests in the project. The PIN is usually 5 pages long with the information on the type and size of the project, its location, estimated additional GHG reduction, crediting period and expected CER price (US\$/tCO₂ equivalent). However, the development of a PIN is not a mandatory requirement of the CDM.

2. *Project Design Document (PDD):* PDD is the key and mandatory document of the CDM process. This document is submitted to the DOE for validation and after that to the CDM Executive Board for registration. The standard PDD form can be downloaded from the UNFCCC website. The PDD forms include
 - a. A general description of the project activity;
 - b. A baseline methodology;
 - c. Crediting period;
 - d. Explanation of additionality;
 - e. Monitoring methodology and plan;
 - f. Calculation of GHG emission by sources;
 - g. Environmental impacts from the project activities; and
 - h. Stakeholder comments.

Stakeholder comments on the project and its impact should be documented to ensure transparency about the project. In addition, review and comment on the PDD from the local, national and international community can be invited by posting the PDD on UNFCCC and the project proponent's website.

⁹ Available from <http://poet.lbl.gov/Proform/DLProform.html> [accessed 15/04/09].

¹⁰ RETScreen International, available from <http://www.retscreen.net/ang/home.php> [accessed 15/04/09].

3. *Host country approval:* Approval of the host country in the project is a key requirement by the CDM Board to ensure that the host country retains sovereignty over all its natural resources, prioritizes its sustainable development goals and are capable of mitigating emissions. The approval from the host country should be in a written format which would serve as an evidence of host country acceptance of the project. A typical letter should mention that the host country approves the project and recognises its contribution to the national sustainable development.
4. *Validation by DOE:* The PDD and the host country approval, once received, should be submitted to the DOE for validation. The DOE, during this phase, will evaluate all the documents against the KP and the subsequent Declaration and Accords. Validation is distinct from verification in the sense that the latter occurs on the onset of the project and the former during the operation. As discussed earlier, the CDM process requires consultation on the project at the international level. This is usually done through inviting comments from all interested parties by putting up the PDD on the DOE's website. In general, the DOE is responsible for project validation and requests the UNFCCC for its registration and verifies emission reduction of a registered CDM project. However, carrying both the validation and subsequently verification of the project through the same DOE require permission from the CDM Executive Board as it might result in conflict of interests.

Depending on the reviews and the comments received, it is the responsibility of the DOE to decide whether the project can be validated. After sending the validation report to the CDM Executive Board, the DOE is also responsible for making the report public.

5. *Registration:* Registration of a project is the formal acceptance of the validated project by the UNFCCC Executive Board. The DOE is responsible for sending the request for registration. Unless a review of the project is requested, upon receiving the request, the CDM Board makes the decision on the project within a maximum of 8 weeks. The Executive Board reviews the project on validation issues and a project cannot be registered unless the review is finalised. The CDM project proponent has to pay a registration fee at the registration stage. The registration fee is US\$0.10 for each unit of CER issued for the first 15,000

tons of CO₂ (tCO₂) and US\$ 0.20 for each unit of CER issued above 15,000 (tCO₂). Registration fees can be as follows:

Table: 1

Expected average annual emission reduction (tCO ₂)	Registration fee (US\$)
10,000	Nil
15,000	1,500
30,000	4,500
100,000	18,500
1,000,000	198,500

Source: Ministry of Environment, Japan and Institute of Global Environment Strategies (IGES), *CDM in Charts Ver. 5.1*, p. 41. May 2008.

6. *Implementation and monitoring*: A project can become operational as soon as the registration is done. In effect, a project can start earning CERs since its validation. According to the procedures laid out in the validated monitoring plan of the PDD, the developer needs to start monitoring the project performance after the project implementation. The monitoring results have to be submitted to the DOE for verification and certification. CERs can be issued after verification of the monitored data.
7. *Verification*: Verification is carried out by a DOE contracted by the project proponent. It is the periodic review and ex-post determination of the monitored GHG emission resulted from the project. This process confirms the total number of CERs resulting from the project for the period specified in the PDD. The frequency of verification is related with the transfer of CERs. CERs are released more frequently when verifications are done at the same pace. DOE is responsible for making the verification report public and submitting it to the CDM Board.
8. *Certification and Issuance of CERs*: Certification is a written affirmation by a DOE that during the period specified in the PDD the project has achieved reductions in GHG as stated and verified, in compliance with all relevant criteria. It is a form of liability transfer from the project proponent to the DOE. Hence DOE is responsible for any underperformance of the project due to the quality and quantity of the CERs. Once the CDM Board approves the issuance of CERs, the CDM registry administrator forwards the CERs into the appropriate accounts. Two (2) percent of the CERs are required to go to the adaptation fund.

Baseline and additionality are two of the important concepts in the CDM process. They are discussed below.

Baseline: Establishing the baseline scenario of a project is of crucial importance in a CDM project. The baseline scenario process sets the base from which the amount of GHG and subsequently the CERs are calculated. It describes the current level of GHG emission scenario before the commissioning of the project or the technological enhancement. Emission reduction or sequestered within the project boundary during the crediting period is accounted as direct emission reduction from the project. This is calculated using the following approaches:

- a. Existing actual or historical emissions data;
- b. Emissions from economically attractive technologies; and
- c. Average emission from similar projects, whose performance is among the top 20% of their category, undertaken in similar socio-economic, environmental and technological conditions within the last 5 years.

In addition to the standardised or already approved methodologies, the project developer can suggest new methodologies to establish the baseline scenario.

Additionality: Under the CDM regime a project is additional if GHG emissions are reduced below those that have occurred in the absence of the registered CDM project activity. Proponents of the projects have to provide an explanation about how and why this project activity is additional and not the baseline scenario according to the selected baseline methodology. The tool for the demonstration and assessment of additionality, known as additionality tool, provides a general framework for demonstrating and assessing additionality. The Marrakesh Accord of 2001 define additionality as “A CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity”.

This additionality component of CDM is important as emission reduction from the project activity would be credited to the CDM investors or CER purchaser to allow the increase of emission of Annex – 1 country. Moreover, CDM projects require validation that the proposed project is an improvement from the baseline CO₂ emission meaning that it reduces emission more than the baseline scenario. Thus, baseline scenario is closely linked with additionality.

Following four steps are undertaken to assess additionalities of a project:

- i. Whether the project activity complies with the existing laws of the country;
- ii. Determine whether the project activity is economically or financially less attractive without CER;
- iii. Analyse whether the project activity faces some barriers which prevents its replication; and
- iv. Finally, identify that the project type has not diffused in the relevant sector and region.

3. REASONS FOR LESSER NUMBER OF CDM PROJECTS IN BANGLADESH

The following observations were made during the author's involvement with the International Finance Corporation – SouthAsia Enterprise Development Facility (IFC-SEDF), of the World Bank Group, the advisory services arm of the IFC during 2007-2008.

LOW EMISSION BASELINE

Energy, both through electricity generation or transportation, is largely responsible for emitting GHGs. Energy, thus, has the largest responsibility in providing solutions to mitigating climate change. So, it is no wonder that about 63 percent of projects registered at the CDM Board are related with energy usage¹¹.

Compared to India or China, Bangladesh has a lower emission baseline. That is due to several factors. Most important of them are the low consumption of energy as well as the related emission factor and the use of natural gas. According to the International Atomic Energy Commission, India's per capita CO₂ emission is 0.96 tons and China's 2.72 tons while Bangladesh's one is only 0.24 tons. Thus, India's emission rate is four (4) times greater than that of Bangladesh's¹².

One of the reasons for greater emission of CO₂ by India or China vis-à-vis Bangladesh is of the predominance of coal in India's as well as

¹¹ This include projects on energy industries (RE and non-RE resources), fugitive emission from fuel and transportation.

¹² **Energy and Environment Data Reference Book**, International Atomic Energy Agency (IAEA), available from <<http://www.iaea.org/inisnkm/nkm/aws/eedrb/data/CN-enemc.html>> [accessed 28/10/08].

China's energy mix vis-à-vis that of natural gas in the case of Bangladesh. Natural gas has been the fuel for powering more than 80% of the power generation. It needs mentioning that carbon content of natural gas is only 60 percent that of coal per unit of primary energy content¹³.

Since Bangladesh already has a low baseline scenario in terms of energy usage, the additionality factor from energy related projects (e.g. RE, conversion) does not provide lucrative benefits to Bangladesh when one compares with the situation in India. In this way, for example, a RE project's baseline would be 40 percent lower compared to that in India or China while the emission reduction factor would be the same. Thus, energy related projects although involving same amount of investment would generate less CERs. Therefore, a local entrepreneur would not find it lucrative to invest in an energy-related CDM project.

LACK OF ADEQUATE KNOWLEDGE AMONGST THE ENTREPRENEURS

Although no formal survey has been conducted to gauge the knowledge of the CDM process, general discussions with some of the potential entrepreneurs show a general lack of awareness about the CDM process¹⁴. While some of the entrepreneurs did not have any knowledge about the CDM process, some were aware of the process but did not know about the next steps to be taken. At the same time there were some entrepreneurs who had considerable knowledge about the process but had somewhat incomplete ideas about the project beneficiaries and about where the proceeds from CERs should go.

LACK OF LOCAL SERVICE PROVIDERS TO FACILITATE THE CDM PROCESS

The lack of awareness/knowledge about CDM amongst the local entrepreneurs is further hampered by the absence of CDM service providers in Bangladesh.

A large number of international and local firms have a strong presence in India to provide their services facilitating CDM projects. These services range from preparing the requisite project documents to

¹³ Kloeppel, J. E., 'Substituting natural gas for coal offers long-term climate benefits', **News Bureau** –University of Urbana Champaign, available from <<http://www.news.uiuc.edu/scitips/02/0703fuels.html>> [accessed 06/08/08].

¹⁴ Information from the informal meetings with the local entrepreneurs interested in CDM projects during January – February 2008.

preparing PDD without additional services. The presence of such large number of firms has raised competition in providing such consultancy services. Even large multinational firms like Ernst & Young or PricewaterhouseCoopers has to face stiff competition from smaller local consulting service providers. According to a July 2005 report, the charge for preparing PDDs without additional services ranged from US\$ 5,000 to US\$ 50,000 depending upon the size of the project and the reputation of the consultancy firm¹⁵.

Presence of such consultancy firms at the international or local level is almost absent in Bangladesh. Such absence is a major impediment in having a sizeable number of CDM projects in the country, particularly when there is a visible lack of knowledge about CDM process existing among the potential entrepreneurs. CDM service providers and CDM projects both could act as push and pull factors. A considerable number of CDM projects in Bangladesh could have worked as the pull factor for service providers in Bangladesh. In the same manner, presence of considerable numbers of service providers in Bangladesh could have worked as a push factor enabling Bangladesh to register more CDM projects.

STRONG CDM CLIMATE IN INDIA

According to Deutsche Investigations, India has one of the best CDM investment climates in Asia, next only to South Korea. In CDM Investment Climate Index, India scored 84.50 out of 100¹⁶. The Index finds that a favourable macroeconomic climate with a present GDP growth rate of 8%, presence of 300 million strong middle class with the propensity to consume, ample supply of well trained labour, booming service sector and a rapidly growing industrial base has been conducive in attracting CDM investment in India. The report also mentions that increasing readiness of the large enterprises to enter the CDM market is a major reason for India's success in attracting more CDM projects. Some of the large Indian state-owned organizations like Oil and Natural Gas Corporation Ltd, Steel Authority of India and Indian Oil Corporation have entered the CDM market.

The following table would best illustrate India's position in the global CDM market:

¹⁵ KFW Bankengruppe, (2006), **CDM Market brief**, available from <http://www.kyoto-coaching-cologne.de/publikationen/CDM-Indien-Aufl2-Endversion-englisch.pdf> [accessed 28/10/08].

¹⁶ Martin Wiekert, *Ibid.*

Table: 2

Global carbon market	415-1250 MtCO ₂ /year
Global market carbon price range	\$1.3 – \$6.1/tCO ₂
Global CDM volume	37.8 – 26.4 MtCO ₂ /year
India's export revenue	\$4.8 – \$106.6 million/year
Share of India in CDM	10%

Source: Kelkar, U, (2005), The CDM Process: CDM Project Developers Workshop, available from http://www.wbcsd.org/DocRoot/ZKZmI5uWD1gwkb3QVPV5/CDM_TERI.pdf [accessed 19/04/09].

Bangladesh score or standing could not be available from the report. Since attracting CDM is similar to attracting FDI, Bangladesh's failure in attracting more FDI can be one of the explanations of the country's backwardness in attracting more CDM projects.

INDIA'S ANTICIPATION OF BINDING EMISSION REDUCTION MEASURES IN FUTURE

One of the reasons for India's vigorous push to attract more CDMs, has been mentioned, as a part of its anticipation that the next phase of KP would impose binding limitations on her to offset emissions. The process of 'cleaning up the mess' through a larger number of CDM projects seem to be an effort to prepare India to face the future.

Standing at the bottom of the list in terms of per capita emissions, one does not foresee Bangladesh coming under such binding requirements for undertaking GHG mitigation measures, where adaptation measures are of prime importance for its survival. Probably, for this reason the government or the concerned agencies do not persuade CDM projects with the same zeal as India or China.

COMPLICATED, LENGTHY AND EXPENSIVE CDM PROCESS

In addition to the registration fees, the CDM project proponent has to bear additional expenses. Thus, currently the process of CDM project approval is characterized by a high degree of complexity and long lead times. In addition, the stringent monitoring and verification requirements add to the lifetime transaction costs of the CDM. A UNDP report finds that it takes 9 - 12 months, and in cases more, to develop new methodologies and getting them approved. It takes 2 – 3 years from conceptual formulation of a project to the point of registration. The delay is caused mainly due to the lengthy validation period and securing

approval from the host country, to a lesser extent¹⁷. During this period, the CDM proponent has to bear the expenses and professional fees of the consulting firm which in effect increases the CDM implementation cost.

A study shows that on average it costs about US\$100,000 to 200,000 to develop a project¹⁸. A case study on a Ghanaian LPG plant's CDM process and costs shows that to generate CERs of 2,700 ton CO₂e per year the proponents had to spend US\$ 330,000¹⁹. Cost breakdown is as follows:

Table: 3

Stage	Cost in US\$	Cost Type
Project Idea Note (PIN):	40,000	Upfront Costs
New methodology development	200,000	
Project Design Document (PDD)	35,000	
Host country approval	5,000	
Project validation	40,000	
Project registration	10,000	
Monitoring and verifications of emission reductions	8,000	Variable Cost

Such costs as well as complicated CDM project registration process make it even more difficult for least developing countries, particularly Bangladesh, to take part in the CDM process. The time and cost involved in approving new methodologies, a process Waste Concern had to go through, can be considered as a major deterrence to bring new and innovative GHG abatement projects on-board. Thus, entrepreneurs with limited funds are uninterested to go ahead with new innovative projects. So, it is no wonder that most of the projects are registered by relatively bigger and more developed countries like India, China or Brazil.

UNCERTAINTIES OVER THE FATE OF THE CDM PROCESS IN POST-2012 PERIOD

¹⁷ United Nations Development Program (2006), 'UNDP and the Clean Development Mechanism', **Climate Change Series**.

¹⁸ Mathias, A. J. (2004), CDM business opportunities for cogeneration projects, paper presented at Vietnam Cogeneration week 2004, available from <www.cogen3.net/presentations/asean/cogenweek2004vietnam/CDMbusinessopportunitiesforcogenerationprojects.pdf> [accessed 10/08/08].

¹⁹ Chadwick, B. & Bloomgarden, E., (2006), **Effective Use of Clean Development Mechanism**, available from <www.un.org/esa/sustdev/csd/csd14/lc/presentation/chadwick.pdf> [accessed 12/26/08].

Many of the entrepreneurs met during the interview mentioned about their skepticism about undertaking CDM projects as the crediting period would end in 2012 and the future of this process is uncertain. In the words of an entrepreneur, “The KP regime is coming to an end in 2012. We do not know what is going to happen to the CDM process after that time. It takes at least two years to register a CDM project. If we start now (in February 2008) then we’ll have the registration in 2010. Then the crediting period would only be for 2 years and that is not enough to make the investment”²⁰.

4. THE ALTERNATIVE PATH: VERs

VER or verified emission reduction has also been termed as voluntary emission reduction. VER is seen as an alternative to CERs as there is yet to be a national law or set of regulation in the US, who has yet not ratified the KP, to control GHG emissions. Several US states, like California, have adopted programs or policies to reduce, verify and register reductions in GHG emissions. These policies, along with ongoing programs of voluntary carbon reduction or becoming carbon neutral developed internationally, have stimulated growth in the market for VERs²¹. The Glossary of Terms of the World Bank’s Carbon Finance Unit defines verified emission reductions (VERs) as “a unit of greenhouse gas emission reductions that has been verified by an independent auditor, but that has not yet undergone the procedures and may not yet have met the requirements for verification, certification and issuance of CERs (in the case of the CDM) or ERUs (in the case of JI) under the Kyoto Protocol. Buyers of VERs assume all carbon-specific policy and regulatory risks (i.e. the risk that the VERs are not ultimately registered as CERs or ERUs). Buyers therefore tend to pay a discounted price for VERs, which takes the inherent regulatory risks into account”²². Like CER, a VER typically represents 1 ton of CO₂e reduction.

Organizations that are willing to reduce their carbon footprint or become carbon neutral buys VERs sold at the Chicago Climate Exchange (CCX) or other organizations like the World Bank or EcoSecurities. Unlike the CDM process, there are no overarching regulatory bodies like

²⁰ An anonymous entrepreneur interviewed on February 5, 2008 at Mahakhali, Dhaka.

²¹ Dayal, P. (2007), **Standardization of Verified Emission Reductions**, Issue Alert, UtiliPoint International Inc.

²² The World Bank Carbon Finance Unit (2008), **Glossary of Terms**, available from <http://carbonfinance.org/Router.cfm?Page=Glossary> [Accessed 09/08/08].

the CDM Executive Board in the issuance of VERs but verification and certification are carried out by independent auditors like TUV SUD. The auditors provide written assurances of the integrity of emission reduction credits (ERC), in the same manner as financial audits.

There are generally three types of VERs namely pre-registration CDM, 'special situations' and small scale projects²³. A CDM project developer can sell carbon credits for the emission reduction for a period from the inception of the project to its registration at the CDM Executive Board. This is known as pre-registration CDM. Projects whose technologies or methodologies for emission reduction has not been approved in the CDM regime (e.g. land use change and forestry, carbon capture and storage, biofuels) fall within the 'special situations' typology. Small scale community driven projects with insufficient resources to meet the strict requirements and the costs of specialized consultancy services opt for lower cost options through the VERs.

Compared to CERs, VERs have some merits and demerits. On the positive side, the seller of VER transaction process is faster and less complicated than CERs. On the negative side and perhaps most importantly, the price of VERs is much lower than CERs. As of August 1, 2008 CERs were selling at US\$27²⁴ while VERs were selling at the CCX for only US\$4. CERs have individual serial numbers guaranteeing that they cannot be sold twice but in case of VERs there is no internationally recognized central issuing body. Thus, in theory, VERs can be sold twice.

Entrepreneurs who find CDM process too complicated, lengthy and expensive might explore the VER process.

5. ACTUAL AND PROSPECTIVE CDM PROJECTS IN BANGLADESH

As mentioned earlier, only two CDM projects from Bangladesh have been registered at the CDM Board. Both of these projects would be managed by Waste Concern, a local non-government research

²³ TFS Green (2008), Voluntary Emission Reduction (VER) Introduction, available from < <http://www.tfsgreen.com/global-markets/voluntary-emissions-reductions/>> [accessed 10/08/08].

²⁴ Carbon Positive (2008), **CER prices fall sharply on oil**, available from <<http://www.carbonpositive.net/viewarticle.aspx?articleID=137>> [accessed 09/08/08].

organization. These projects are 'Landfill gas recovery in Dhaka' and 'Composting of organic waste in Dhaka'. The first project is designed to handle 700 tons of organic waste each day and turn it into compost. This project would reduce annual emission of 4,300 tons of methane (89,000 tons of CO₂e)²⁵. The first project became operational, after a relatively long gestation period, on November 25, 2008. The second project was registered with the CDM Board on May 18, 2006. This project is designed to reduce 89,259 tons of CO₂e/year²⁶. Despite the expectation of the project proponents to operationalise the project in the last quarter of 2006, the project is yet to be online as of December 2008.

Beside these two registered projects, some of the projects have been in the process of development for quite a long time. These include the 'Installation of 30,000 solar home systems (SHS) in rural households' with Grameen Shakti and 'Improving Kiln Efficiency of the Brick Making Industry in Bangladesh'. The first project was opened for comments on December 31, 2005 and the second one on October 27, 2007. The first project is expected to reduce 6 kilo tons of CO₂e and the second one is 59 kilo tons of CO₂e²⁷. It should be mentioned that the last project envisages bundling up of some of the brick kilns to attain the desired reductions.

Apart from these four projects, Reazuddin and Sinha identified several opportunities for CDM projects in Bangladesh²⁸. These are:

1. Methane recovery from landfills with or without electricity generation (one of the CDM projects of Waste Concern of that nature is already underway);
2. Composting of urban solid waste (one of the CDM projects of Waste Concern of that nature is already underway);
3. Biogas from waste
 - Poultry droppings,
 - Tannery waste,

²⁵ 'CDM plant opens today', *The Daily Star*, November 25, 2008.

²⁶ Waste Concern (2006), **Second CDM Project from Bangladesh Registered with the CDM Executive Board of the United Nations**, available from <http://www.wasteconcern.org/latestNews/Second%20CDM%20Project_WC.pdf> [accessed 12/17/08].

²⁷ Fenhann, J., *ibid*.

²⁸ Reazuddin, M. and Sinha, M., (2003) **Structure of DNA and proposed Sustainable Development Criterion for CDM projects in Bangladesh**, Paper presented at the COP9 in December 2003 in Milan, Italy, available from <www.sdnpsd.org/sdi/issues/climate_change/cop9/presentation/bangladesh.pps> [accessed 12/17/08].

- Effluent from food processing industries,
 - Human excreta,
 - Sewage treatment
4. Solar home systems (SHS) in the off-grid areas (BCAS in association with Grameen Shakti has undertaken such project)
 5. Compact fluorescent lamps to replace incandescent light bulbs;
 6. Fuel substitution and efficiency improvement in brick manufacturing (one such project is at validation stage); and
 7. Sugar cogeneration

Besides these project opportunities, EcoSecurities, a business organization that deals with both compliance and voluntary carbon markets, has listed several projects²⁹. These are:

1. Aero derivative turbines for peak load generation;
2. Cement manufacturing (wet to dry process);
3. Conversion of four stroke vehicles with compressed natural gas (CNG) engines (Bulk of this projection has been achieved by the Bangladesh government already without taking recourse to the CDM process);
4. Introduction of electric vehicles in urban areas; and
5. Improved biomass cooking stove.

Apart from the energy based projects, for understandable reasons, there is still a large potential for Bangladesh to bag its share of the CDM projects. However, to undertake more projects to be involved in the compliance (CER) or voluntary (VER) carbon market, the main thing that seems to be missing is the right combination of the governmental policy directives, incentive structure, reduction of bottlenecks, positive drive of the entrepreneurs, consultancy firms and the local or international financial institutions to help fund CDM projects and the bureaucratic bottlenecks in the UNFCCC and the anxiety over the future of the carbon market after 2012.

6. CONCLUDING REMARKS

The CDM process has been initiated by the UNFCCC with two-pronged developmental goals. Firstly, to save the developing Southern nations from the impact of CC by mitigate GHG emissions. Secondly, to aid the sustainable development of the developing countries by enabling

²⁹ EcoSecurities, **Bangladesh Country Paper: Appendix A**, available from <www.cdmcapacity.dial.pipex.com/bangladesh/Bangladesh_country_paper.pdf> [accessed 12/24/08].

technology transfer and FDI flow. More than eight years since the initiation of the CDM process according to the KP, most of the developing countries, particularly the LDCs, have clearly failed to reap the benefits. The CDM process, as evident from the foregone discussion, is designed to reward the polluters as evidenced in the case of China and India while the case should have been the other way round as in the case of Bangladesh.

Public sector in Bangladesh along with its development partners has the bulk of responsibilities in creating awareness/educating the prospective entrepreneurs on the benefits of CDM on Bangladesh economy, society and environment. Bulk of the responsibilities in undertaking CDM projects in Bangladesh lie on the shoulders of the private entrepreneurs. However, that is not to say that the government should not or cannot undertake CDM projects. The discussion in Section 4 shows that there is ample opportunity for the Bangladesh government to replace old and inefficient power plants with the efficient ones by using the CDM option. Although CERs might not be able to cover for the whole expenses, the longer-term savings in energy, manpower, health and other socio- economic benefits should makeup for the deficit.

The Conference of Parties (CoP-15), scheduled in Copenhagen in December 2009, is expected to determine the future format of the KP. Before embarking on the new round of talks on the shape of climate change protocol in the post-Kyoto era it necessary to take a closer look at the flaws of the Kyoto process. To attain its goals, it is imperative that the proposed climate regime should be better structured, less-bureaucratic, LDC friendly, efficient and a more effective CDM regime be designed to make the process of carbon trading worthwhile.