TECHNOLOGY TRANSFER UNDER THE CLEAN DEVELOPMENT MECHANISM: WHAT DOES IT MEAN FOR DEVELOPING COUNTRIES

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Abstract:
Under the Kyoto Protocol, the Clean Development Mechanism (CDM) allows developed countries to invest in abatement opportunities in developing countries and receive credit for the resulting emissions reductions. Thus CDM has the potential to become a tool for technology transfer. Its spirit is to support sustainable development and encourage the transfer of appropriate technologies. The paper analyses the opportunities and potential effect CDM can have on countries, such as Bangladesh, and discusses what policies and strategies should be put in place to facilitate technology transfer.

Keywords: Kyoto Protocol, appropriate technology, sustainable development

1.0 INTRODUCTION

Climate change is perceived as a giant threat not only for human beings on the globe but also for the natural, physical and biological environment. The United Nations Framework Convention on Climate Change (FCCC) is one of a series of agreements through which countries around the world are banding together to respond to this challenge. The convention encourages technological collaboration between countries, the development of new technologies and sharing of existing environmentally friendly or cleaner technologies. It is also designed to allow countries to weaken or strengthen the treaty in response to new scientific developments by adopting amendments or protocols. The Kyoto Protocol of December 1997 under which most industrialised countries (or Annex B countries) agreed to reduce greenhouse gases (GHG) by an average of 5.2% between 2008-2012 compared with 1990 levels, was such a response to the growing scientific evidence.

Article 12 of the Kyoto Protocol created the Clean Development Mechanism (CDM) under which developed countries are allowed to invest in abatement opportunities in developing countries and receive credit for the resulting emissions reductions, which they can use against their 2008-2012 targets. From a business point of view, such emission reduction projects are attractive economically for the developed countries as they will be less costly in a developing country environment compared to putting them in place in the home country. By doing so, Annex B countries would be in a position to reach the goal of cutting GHG at a lower cost and at the same time contribute to the economic development of the less industrialised world. The CDM is often perceived as a way for the developing countries to "help" Annex B countries to meet their targets but we argue that this is the wrong approach to the problems of climate change as well as social justice and equity. From a developing countries' perspective, it is important that CDM assists in achieving sustainable development; that it contributes to poverty eradication, economic and social improvement and preserving of the natural environment. A major component in this relates to the nature of the technology transfer, which is likely to occur under the CDM.

The rest of the paper analyses the provisions under the CDM, including its objectives, existing institutional structures, opportunities and barriers. It then focuses on the specifics of technology transfer and discusses the case of Bangladesh as a potential country of implementation of GHG emission reduction projects under the Kyoto Protocol.

2.0 THE CLEAN DEVELOPMENT MECHANISM

The idea for the CDM came as a result from the proposal by Brazil to create a "clean development fund" imposing financial penalties to industrialised countries for high levels of GHG emissions and re-channelling the funds towards projects addressing climate change in less developed countries. Although the future of the Kyoto Protocol looks quite uncertain at the moment, the CDM has the potential to become a powerful tool on the global arena. On the other hand, any future new global, regional or bilateral agreements are also likely to build on the potential such a mechanism offers. For example, the 2001 Bonn meeting of the UNFCCC (United Nations Framework Convention on Climate Change) Parties agreed to increase the available funding for climate change, targeting particularly activities related to CDM. It is therefore very important to fully understand what the CDM provisions are and how they can be beneficial for the less developed countries.

2.1 CDM and its objectives

The main objective of the CDM is twofold: reduction of GHG and encouragement of sustainable development. Under this mechanism non-Annex B countries can benefit from project activities resulting in certified emissions reductions (CER) and the Annex B countries may use the CER accruing from such project activities to contribute to compliance with part of their quantified emission limitation and reduction commitments. The implementation of CDM, however, is not a straightforward process. An established executive body is expected to supervise the activities under the CDM through which private and public funds may be channelled to finance projects in developing countries. It will also assist in finding and arranging funding for existing or new certified project activities in these countries. Because of the focus on GHG reduction, the majority of the projects will involve implementation of new technologies. This will be even so in the context of the less industrialised countries, which tend to lack the technological knowledge and basis to deal with climate change. They will be faced with a multitude of requirements arising from the advanced nature of the new technologies and these include infrastructure, workforce qualification and training, financial services, supply of materials and many others. A share of the proceeds from the certified project activities is expected to be used to cover administrative expenses of the Annex B countries as well as to assist developing countries, which are particularly vulnerable to the adverse effects of climate change, to meet the costs of adoption of new technology.

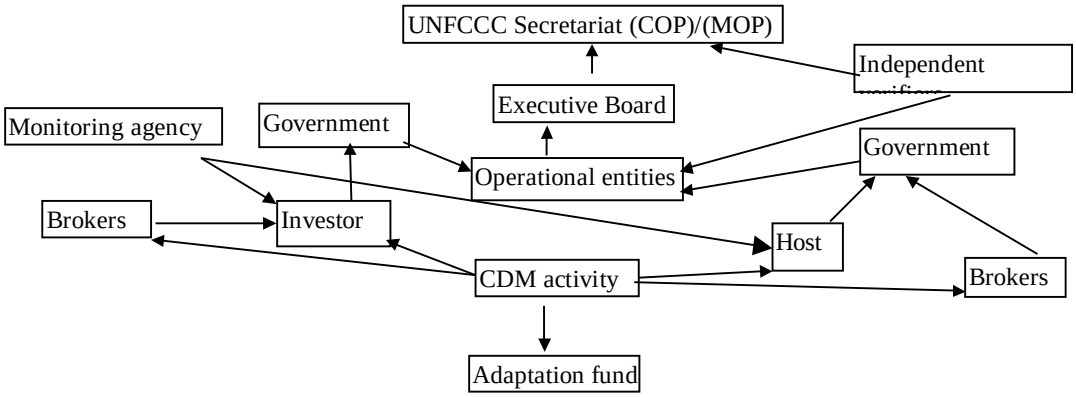
At present, developing countries are not committed to host CDM projects and their participation is entirely on a voluntary basis. Any established or expected scientific cooperation with the developed countries may facilitate such a process. However, what this means at the end of the day is that governments in the developing countries will have to balance the requirements of such activities with the national political, economic, social, cultural and environmental priorities. It will also be the case that some technology transferred via such projects will be more welcomed than other because of better match with the needs of local communities or the plans of national governments.

2.2 Institutional structure of CDM

The institutional structure of the CDM (see Figure 1) is quite complex and consists of a number of bodies. Firstly, the conference of the parties (COP), which was established under the United Nations Framework Convention on Climate Change (UNFCCC), also the highest authority for the CDM. The COP is serving as the Meeting of the Parties (MOP) for the CDM in the FCCC Secretariat. An Executive Board has been created to look after the CDM project activities under the supervision of COP/MOP. Their functions target the establishment of operational entities under the CDM. This can only happen with participation from both the developed countries, represented by their governments, investors in the projects and brokers, and developing countries represented by government, hosts of the projects and brokers and facilitated through the adaptation fund. For the certification of the projects to occur, there is a need for a monitoring agency to ascertain the nature of the investments and independent verifiers to certify the fulfilment of the goals of the project.

Although it appears to be quite complicated, the purpose of this institutional structure is to facilitate establishment of projects, and to monitor their implementation and performance. The majority of these projects are likely to be technology transfers.

Figure 1: Institutional Structure of the CDM



Adopted from http://www.teriin.org/climate/cdmissues.htm.

2.3 CDM opportunities

The main advantage of the CDM is that it covers only a certain type of technologies, namely environmentally friendly or cleaner production. As these technologies are also relatively new to the developed world, the implementation of GHG reduction projects in the less industrialised countries can give them the opportunity for a technological leapfrogging. By hosting such developments these countries may be in a position to bypass the inefficient choices made by the industrialised world and even become showcases for sustainable practices.

The CDM is a flexible mechanism, which although market driven provides room for negotiation. Private participants from developed countries will be looking for export in new possible niches (Michaelowa, 1995; Selrod et al., 1995) and the host countries can be conveniently suitably located and/or present potential markets themselves. Investors will be aiming at maximising their commercial benefits and share of reduction in the carbon rent. However, the host countries can be in a position to negotiate to type of projects and

technologies acceptable to them while aiming at maximising local economic benefits (Hourcade, 1999).

It is expected that the CDM projects will stimulate local economic activities and will also in the long run generate credit (Woerdman, 2000) from certified emission reduction, which will benefit the poor countries. In comparison with the official development assistance practices, the design of CDM carries a potential for the transfer only of technologies that will be appropriate and best suited for the local environment (Aslam, 2001).

There are still no set guidelines for the functioning of the CDM. Nevertheless, it is already clear that together with the numerous opportunities the mechanism will also pose a number of challenges.

2.4 CDM threats and barriers

The various concerns raised in relation to CDM refer to choice of location as well as nature of the projects. For example, countries (or regions within a country) offering the best technical, regulatory, finance and administrative opportunities together with political stability, are the most likely to become attractive to investors. Other countries (or regions) may completely miss out. Also, poor countries will be competing with each other in offering the cheapest possible projects. There is concern that CDM projects may distract the investment policies of governments in the developing countries from areas of major importance, such as health, education and poverty eradication as they are not covered under the clean development mechanism.

At present, there is no restriction as to what technologies can be funded under the CDM, the only assumption being that they have to be more progressive than the currently used. If for example, fossil fuel based energy projects are allowed, this will create dependence within the developing world on declining and unsustainable resources. The CDM can also be used to dump old and obsolete technologies to poor countries, as has already been the practice with foreign direct investment.

If the use of “sinks” (or forest planting projects) is allowed under CDM, they can become a very cheap option (Mallon et al., 2001) with very little benefit on the ground for the developing countries. This will also inhibit the transfer of more expensive renewable energy and energy efficient technologies.

3.0 TECHNOLOGY TRANSFER AND CDM

Technology transfer is an important aspect of UNFCCC and all parties are encouraged “to promote, and cooperate in the development, application, diffusion, including transfer of technologies, practices, and processes that control, reduce, or prevent anthropogenic emissions of green house gases” (UN, 1992). Countries should also “take all practical steps to promote, facilitate and finance, as appropriate, the transfer of, or access to environmentally sound technologies and know-how to other parties, particularly developing country parties…” (UN, 1992). The intergovernmental panel on climate change (IPCC) under UNFCCC states in its special reports “Methodological and Technological Issues in Technology Transfer” (IPCC, 2000) that the mechanisms under the Kyoto Protocol might have potential effect on the transfer of environmentally sound technology, if they are implemented. The IPCC however did not engage in any assessment of the matter due to the preliminary stage of development of the rules of the mechanisms under the Kyoto Protocol.

3.1 Ongoing technology transfer issues

Although clearly encouraged by the international community, technology transfer is a very complex process, which requires commitment, long-term interaction and learning of all parties involved. On the surface, technology transfer is the flow of equipment, machineries, technological methods and know-how from one country to another. Under CDM, there is no obligation for the developed countries to treat technology as anything different but commodity. In the reverse, they are encouraged to find the least costly business solutions to achieve their GHG emissions cuts. There is high probability that as soon as the project is operational the investors will disinvest themselves from any further responsibility for its broader implications and future.

According to Rosenberg (1982), technology transfer is not just the transfer of commodities but is also the transfer of knowledge and a socio-economic process. Kranzberg (1986) stress the learning process, which occurs with the flow of commodities. Chen (1996) emphasises that no technology transfer is fulfilled if the transferees are not in a position to fully understand the technology, to adapt it to their local socio-economic environment (including the usage of raw materials and workforce), utilise it and further improve it. Foreign direct investment and official development assistance are abundant with examples of inadequate projects, which have not contributed to the local learning or have affected the local environment in a bad way.

For cleaner technologies to be transferred, it is important that a collaborative model is put in place that is driven by local needs, adapted to the developing country environment and sustained through facilitated long-term private sector participation and commitment. It should not be terminated once the GHG credit benefits have been achieved and this requires careful elaboration of the guidelines for the CDM.

3.2 Technology transfer opportunities and barriers

Technology transfer is traditionally perceived as an agreement between two countries, which is in some ways beneficial to both of them. The area of transfer of environmentally sound technologies offers the unique opportunity for the process to be beneficial for the entire global population (TERI, n.d.).

There have already been examples when governments of East Asian countries, such as South Korea, Taiwan and Singapore have managed the transfer of technologies to achieve long-term capacity building in these countries (Lall, 1996). The national development plan of Thailand has in the past included significant budget allocations for adequate technology transfer (FCCC, 1998), including promotion of renewable energy (IVAM, 1999). This has allowed these countries to achieve a significant level of economic development and bridge the technological gap.

The CDM potentially offers similar opportunities. There have been strong views expressed that it should benefit predominantly projects which otherwise would not have happened (Greiner and Michaelowa, 2003), and this applies to the much poorer regions of the world. These countries, however, will also be faced with a myriad of difficulties, such as information gap, lack of in-country capacity, inadequate policies and appropriateness of the transferred technology (TERI, n.d.). Also, these will be in addition to juggling national with global climate change priorities. The assistance mechanism under CDM and related institutional structures have the potential to become only an economic tool leaving developing countries to handle social and environmental problems. The only way CDM can

be fully beneficial is if it provides the tools of achieving all three aspects of sustainability (namely, social, economic and environmental) simultaneously.

4.0 BANGLADESH

Bangladesh is a country, which can potentially aspire to host CDM projects and benefit from them. It is also a country for which poverty eradication is a paramount problem. All other policy initiatives must contribute to the immediate goal of feeding and improving the lives of the impoverished population.

4.1 Bangladesh government and the Kyoto protocol

The Government of Bangladesh has taken a very positive attitude to CDM (GoB, 2000). It believes that given proper functioning, CDM can greatly contribute to capital and technology transfer, capacity building, job creation and reduction of GHG emissions. Investments in CDM are likely to come from the private sector of industrial countries and forge partnerships, establish networks and collaboration with counterparts in the country. However, there are concerns that a number of basic technologies such as household stoves, which are extremely needed by Bangladesh people, will be difficult to include in CDM. This will exclude large masses of rural energy users who will not qualify for emission reductions (Edwards et al., 2004). The government is also cautious about a “fair and just system” of distribution of CDM funds and assistance to countries, which are particularly vulnerable to cope with the problems of global change.

The main concern of the Government of Bangladesh is for CDM to be oriented “towards improving the quality of life of the very poor from the environmental standpoint” (TERI, 2001) and for the funding for CDM project activities to be additional to official development assistance.

4.2 Opportunities for Bangladesh

Being one of the poorest nations in the world, Bangladesh is also one of the least per capita carbon emitter. The country’s overall environmental situation, however, is under threat and Bangladesh is one of the most vulnerable countries recognised by all international institutions. Consequently, Bangladesh should be in a position to make use of the opportunities under the CDM. The Asia Least-cost Greenhouse Gas Abatement Strategy (ALGAS) project identified several mitigation CDM projects, such as brick manufacturing and aero derivative turbine, as most suitable for Bangladesh (ADB, 1999). None of them has been taken yet but Bangladesh still has the great opportunity for selling CDM projects to the developed world. The condition for this to happen, however, is for the CDM projects to be linked with the country’s national priorities and particularly to poverty eradication. The CDM project will have to go beyond the immediate GHG reduction benefits as perceived by the more industrialised countries and contribute to the sustainable development of Bangladesh. Some recommendations for this to happen are listed below:

- Integrate sustainable development for poverty eradication with climate change mitigation process;
- Develop information and collaboration networks to widening knowledge in technical experts, academic institutions, private organisations and NGOs from developed and developing countries;
- Create capabilities for selecting the appropriate technology for Bangladesh, including recognition of traditional knowledge and skills;

- Build capabilities of the government and private sector, non-governmental organisations, regulatory agencies, financial institutions and users of the environmentally sound technologies;
- Create compensatory mechanisms for unsuccessful projects;
- Maintain adequate monitoring, verification, auditing and certification of project activities in the short and long run;
- Develop criteria for success, including sustainable development indicators;
- Establish CDM demonstration projects in Bangladesh;
- Establishment a technical assistance group, which can be used by Bangladesh.

5. CONCLUSION

The CDM has the potential to become a useful tool in coping with climate change and benefit the entire global population. However, the majority of developing countries will have to balance national necessities, such as poverty eradication, with encouraging CDM projects. The only way CDM can contribute for sustainable development of these parts of the world (including Bangladesh) is if the mechanism embraces simultaneously social, economic and environmental responsibility and avoids becoming yet another tool to make the economically rich more richer.

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