Chapter 4

Clean Development Mechanism

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4.1 Introduction

This chapter examines the status and evolution of the Clean Development Mechanism (CDM) and summarises the major concerns of Asian countries regarding its implementation. Various proposals to strengthen the CDM in the current and the future climate regimes are reviewed and several options to move forward are proposed with a view to promoting more effective participation of Asian countries in GHG mitigation.

4.1.1 Origin and meaning of the CDM

The CDM market grew rapidly from February 2005 with the coming into force of the Kyoto Protocol, the approval of the decision on unilateral CDM, and the launch of the EU ETS linked with CDM/JI.

The concept of CDM arose from a proposal in mid-1997 by Brazil called the "Clean Development Fund (CDF)" – a compliance mechanism under which Annex I countries defaulting on binding emission targets would contribute to a fund to facilitate technology transfer to developing countries. During the later stages of COP3 discussions, a few Annex I countries introduced the concept of CDM as a counter-proposal to the CDF. The CDM was then endorsed as one of the flexibility mechanisms under Article 12 of the Kyoto Protocol to provide cost-effective emission reductions for Annex I countries while contributing to sustainable development in developing (Non-Annex I) countries through enabling the transfer of clean technologies and finance. The scheme permits developing countries to sell tradable Certified Emission Reductions (CERs) generated from approved CDM activities and then permits Annex I countries to use such CERs to comply with their GHG emission reduction targets under the Kyoto Protocol. If CDM is effectively implemented, it has the potential to become a strong tool to address climate change as the only mechanism of cooperation between developed and developing countries under the Kyoto Protocol. The entry into force of the Protocol in February 2005 is considered, therefore, to be a significant first step to reduce the growth of GHG emissions worldwide (UNFCCC 2005a, UNFCCC 2006c).

4.1.2 Current status

As of November 2006, the CDM Executive Board (CDM-EB) registered as many as 421 CDM projects, with an expected delivery of more than 680 million CER by 2012. If all the 1300 projects in the pipeline materialise, about 1.5 billion CERs (tCO_2eq) may be issued by 2012 (UNFCCC 2006b). The CDM market grew rapidly from February 2005 with the coming into force of the Kyoto Protocol, the approval of the decision on unilateral CDM, and the launch of the EU ETS linked with CDM/JI. Owing to the limited time available before the commencement of the first commitment period (2008-2012), many Annex I Parties, such as the EU, Japan and Canada with an estimated demand of 1.6, 0.8 and 1.3 billion tCO_2eq respectively (IETA 2005a), are expected to accelerate their efforts to acquire CER, rather than relying solely on expensive domestic options or purchasing hot air from Russia and the economies in transition. In addition, ERU from JI can only be acquired from 2008, whereas CER from CDM could be obtained from 2000 from the "prompt-start" projects. Despite rapid progress in project registration, there are serious concerns over the slow implementation of CDM projects and the mismatch between CER supply and demand.

4.1.3 International negotiations and institutional progress on CDM

The major decisions on CDM took place at COP7 in 2001 and at COP11 and COP/MOP1 in 2005 (Table 4.1). It is worth noting that CDM is continuing to evolve with several options, which gives strong hope that it could be further strengthened in the future.

There is a strong concern that several CDM projects in the region without many sustainable development benefits are getting registered, and that the application of sustainable development criteria has been lax at both national and international levels.

Table 4.1 Evolution of the CDM in the international climate regime (Relevant decision numbers are given in parentheses)

COP3 (1997)	• Parties to the UNFCCC adopted the Kyoto Protocol and flexibility mechanisms including CDM, JI, IETS (1/CP.3)
COP4 (1998)	• Schedule for Plan of Action to establish the Kyoto Protocol
COP7 (2001)	• Agreement on Marrakech Accords on rules/procedures (17/CP.7)
COP9 (2003)	• Adoption of procedures on afforestation/reforestation CDM (19/CP.9) • Establishment of the CDM Executive Board (CDM-EB) for Project registration, and Issuance of CERs, Methodology Panel for CDM Methodology approval, and accreditation of Designated Operational Entities (DOEs)
COP10 (2004)	• Recommendation for prior examination of energy efficiency and transport methodologies by CDM-EB (12/CP.10)
COP/MOP1 (2005)	• Entry into force of the Kyoto Protocol and official adoption of the Marrakech Accords, thereby making CDM a reality. • CDM-EB agreed to register "Programme of Activities" as a single CDM project if approved baseline and monitoring methodologies are used to define the appropriate boundaries, avoid double-counting, and account for leakage. However, local/regional/national policy or standards cannot be considered as the CDM. Bundling of several large-scale activities at multiple sites into one project is also permitted. (7/CMP.1) • CDM-EB was invited to review simplified modalities and procedures of small-scale CDM, and consider Carbon Capture and Storage (CCS) for CDM (7/CMP.1) • Extension of the registration deadline for CDM projects hoping to derive CERs from activities initiated between 1 January 2000 and 18 November 2005 to 31 December 2006. • Parties agreed to bridge the financing gap of the CDM-EB by pledging US$ 8.2 million. Share of CDM proceeds for administrative expenses of CDM-EB was set as $0.1 for the first 15,000 CERs issued to a project per calendar year and $0.2 for the remaining amount.

4.2 Barriers in the implementation of CDM in Asia

There was a broad consensus in IGES consultations held in 2005 that the future design of CDM should consider interests, priorities and concerns of the Asia-Pacific region more effectively than before, and that CDM should be strengthened further. The consultations revealed that slow progress in CDM implementation in the region was primarily due to the low priority given to climate change and CDM in many Asian developing countries, and poor incentives for the private sector (IGES 2005a). The barriers to CDM implementation may be grouped into seven categories, as discussed below.

4.2.1 Barriers related to sustainable development (SD) benefits

CDM is designed to achieve the twin goals of reducing GHG emissions and contributing to SD in developing countries (Chatterjee 2000). The decision as to whether a CDM project effectively contributes to SD rests with the host countries. Many Asian countries, therefore, developed SD criteria for screening using economic, social, environmental, and technological indicators. However, there is a strong concern that many projects in the region without many SD benefits are getting registered, and that the application of SD criteria has been lax at both national and international levels. It is widely felt that DNAs in some countries still lack the capacity to set apporopriate SD criteria, and that the national governments fail to recognise the opportunity to integrate the CDM into the national SD agenda and engage the private sector in the CDM (Murdiyarso 2004). Poor

coordination among ministries concerned with environmental and developmental issues has been identified as a reason, although DNAs in most countries have representatives from development-related ministries. Another reason is the limited number of CDM methodologies available especially in the energy efficiency and transportation sectors, which usually have larger SD benefits (Michaelowa 2005).

It is important to note, however, that different Asian countries have begun to adopt different methods to promote SD through CDM. While some countries (e.g. Nepal) took proactive efforts to support registration of projects (e.g. biogas) with SD benefits to a wider range of stakeholders, other countries (e.g. China) adopted policies such as the introduction of differential CER tax (65% for HFC, 30% for N_2O and 2% for renewable-based projects) in order to indirectly promote projects with large SD benefits.

The lengthy and complicated approval process by the CDM-Executive Board at the international level, and the lack of human and institutional capacity at the national level are major institutional barriers for CDM.

4.2.2 Institutional barriers

At the international level, the lengthy and complicated approval process by the CDM-EB, mainly due to lack of finance and human resources, has long been criticised by project developers as a major factor in the slow implementation of CDM (IGES 2005a). While an additional US$8.2 million was pledged and a decision for allocating a share of proceeds to administrative costs was taken at the COP/MOP1 (Decision 7/CMP.1) to strengthen the institutional capacity of CDM-EB, it is not easy to ensure such financial contribution, as the budget for COP/MOP itself is yet under-funded by US$4-4.5 million (Point Carbon 2006c).

At the national level, procedural and institutional problems of DNA in host countries are acting as a barrier. While some countries (e.g. India) have been approving projects on a fast-track basis, considerable delays in the approval are evident in several countries. A delay in DNA establishment also contributed to slow progress in some countries (e.g. Indonesia, Thailand, and the Philippines). The lack of human and institutional capacity in DNAs of host countries (e.g. Lao PDR, Mongolia, Pakistan, Thailand) to process project proposals also contributed to the delay in implementation.

Several host countries in the region still lack the knowledge and capacity to implement CDM due to lack of local experts to create Project Idea Notes (PIN) and Project Design Documents (PDD). The lack of knowledge to develop CDM projects based on previously conducted feasibility studies is another barrier.

4.2.3 Technical barriers

Baseline setting and methodology: Many participants in our consultations noted that it is not technically easy to set up baselines for various CDM projects. This is partly due to the limited number of approved methodologies in sectors where Asian countries have keen interest. For instance, only 15 energy efficiency related CDM methodologies were approved (as of 14 September 2006) out of a total 61 methodologies submitted (UNFCCC 2006b). Likewise, even though eight biofuel-related methodologies were submitted, none was approved, and as many as 13 out of 17 forestry methodologies were rejected in the first attempt (UNEP 2006). Attempts to consolidate methodologies are in progress, but consolidation may reduce the incentives to develop new methodologies (Michaelowa 2005).

Additionality: The idea that a project is additional – that it would not have occurred in the absence of the CDM – is critical to the success of the CDM. However, proving additionality has been found to be complex in several CDM projects of Asian countries. Many investors complained that additionality is too ephemeral or cumbersome to be applied at the project level (Salter 2003). Some countries (e.g. India) argued in our consultations and in international negotiations that it should not be necessary to prove additionality for certain types (e.g. renewable energy) of CDM projects (UNFCCC 2006d). However, it must be noted that non-additional CERs generated by relaxing the additionality criteria may not necessarily lead to economic gains for developing countries, even if they could acquire additional credits. Other adverse impacts might be an increase in global GHG emissions, reduction of social surplus through the trading of additional CER, and decrease in new CDM projects with higher marginal cost of reduction (Asuka and Takeuchi 2004). In our earlier consultations, SIDS (e.g. Cook Islands) emphasised that further relaxation of additionality would sacrifice the environmental integrity of CDM (IGES 2005a). Careful discussions on relaxing additionality requirements are, therefore, necessary. Some countries in the region (e.g. China) were concerned about financial additionality, especially in terms of utilising ODA for CDM.

4.2.4 Technological barriers

Careful discussions on relaxing additionality requirements are necessary.

CDM is often considered as an additional source of Foreign Direct Investment (FDI) that can facilitate the transfer of climate-friendly technologies, although FDI flows do not necessarily guarantee implementation of CDM (Niederberger and Saner 2005). Several stakeholders in our consultations reported that progress in the transfer of technology through CDM is far from satisfactory (IGES 2005a) as there were few examples of successful technology transfer (UNFCCC 2005a). One of the reasons for limited technology transfer through CDM may be that the costs of modern technologies such as photovoltaic and wind power are still more expensive than conventional technologies (World Bank 2006a, Sonntag-O'Brien and Usher 2004) and the difference in costs often exceeds the CER revenue generated through CDM. Participants from developing countries noted that the private sector in the developed countries, which invested substantial resources in technological development, might be hesitant to transfer technologies due to the fear of losing their international competitiveness. On the other hand, developed countries are concerned about technology mismatch and the lack of appropriate capacity to absorb the advanced technologies in developing countries. Further, some developing country representatives (e.g. China) considered that the long protection period of 20 years for intellectual property rights (IPRs) of technologies under the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs) is another barrier for technology deployment through CDM. Lesser (2002) noted that most climate-friendly technologies would be outdated at the end of 20 years.

4.2.5 Financial barriers

Lack of the right incentives to the private sector in some developing countries served as a barrier to investment in CDM projects.

Lack of underlying finance: Our consultations showed that several Asian countries (e.g. Indonesia) face difficulties in procuring underlying finance for CDM projects due to both country-specific and CDM-specific risks (IGES 2005a). For example, in India, where unilateral CDM projects predominate, difficulties in procuring underlying finance are especially great because of high reliance on domestic capital. Lack of the right incentives to the private sector in some developing countries served as a barrier to investment

in CDM projects. While it is assumed that the sale of CERs from a CDM project usually enhances the prospects of investment, the financial additionality criteria imposed on CDM projects appear to make them less attractive to commercial banks. Further, CDM support services fall under the category of project finance, an area which is not yet a key strategic area of business for many Asian banks.

High transaction costs: Most of the participants in our consultations (e.g. Cambodia, China, India, Indonesia, Mongolia, Sri Lanka) confirmed that high transaction costs of CDM projects from the time of PDD development to the issuance of CER have become a major barrier to effective CDM implementation in Asia. This is especially true in small-scale CDM projects, as it is estimated that projects generating below 20,000 annual CERs cannot cover their transaction costs. The problem becomes yet more serious in small unilateral CDM projects that have no Annex B participation before registration and thus have problems in mobilising finance (Michaelowa 2005). Many participants noted that the high expectations that the bundling of projects would reduce transaction costs did not come true in the Asia-Pacific region. The possibilities of bundling projects together are rather limited, especially in countries such as the Lao PDR and Cambodia. The lack of designated operational entities (DOEs) in developing countries is another barrier contributing to high transaction costs. Indeed, there are only three developing country DOEs (two from Republic of Korea and one from South Africa) among the total 16 DOEs.

The low CER price is often a strong disincentive to mobilize domestic finance for the CDM projects.

Low price of CER: Several participants in our consultations pointed out that the low CER price (ranging from US$5 to 10) is often a strong disincentive to mobilise domestic finance for the CDM projects. Very low price for lCER or tCER appears to make the sink CDM projects infeasible. The higher risk of CDM projects was considered a major reason for the large difference between the prices of CER and EUA (Lecocq and Capoor 2005). Many participants (e.g. China, India, Indonesia, Republic of Korea, and Viet Nam) noted the need for maintaining a reasonably stable price of CER and wondered why the CER price remains low despite the fact that the demand for CER, and the cost of reducing emissions in Annex I countries continues to be high.

4.2.6 Legal barriers

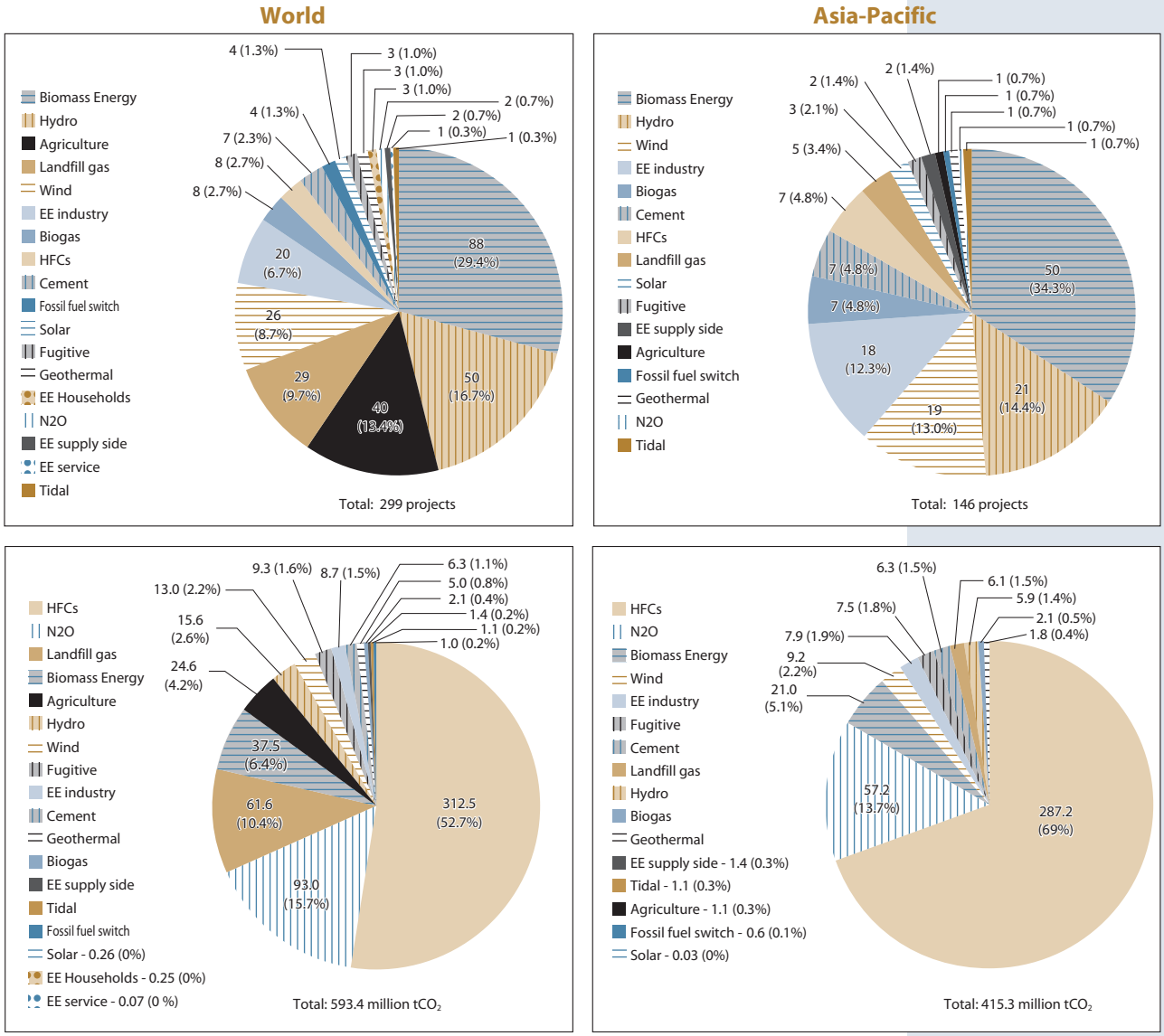
In addition to the conventional risks such as regulatory (legislative change), political (war, riots, nationalisation policy or institutional change), and economic (foreign exchange risk, currency crisis) risks, CDM projects face many legal risks because of uncertainty over the continuation of CDM beyond 2012, failure of project developers to issue CERs, incompatibility between domestic legislation and the Kyoto Protocol, non-compliance with legal requirements of the CDM, and irregular additional changes to the rules (UNEP 2004). Participants in our consultations agreed that the uncertainty of the value of CER generated after 2012 due to the lack of an agreement on the continuity of CDM beyond 2012, especially, is a serious risk to long-term projects with high capital costs (e.g. forestry). Such uncertainty is already driving many project developers in Asia to rely on short-term projects, and CER buyers to limit their purchases up to 2012. Furthermore, since the Marrakech Accords do not define CER ownership, it is unclear if CER is considered as a sovereign right or a private right (UNEP 2004). The differences in interpretation in various countries create further legal incompatibilities and uncertainties.

4.2.7 Barriers with reference to the scope of CDM

The uneven distribution among different sectors is even more highly evident in the Asia-Pacific region, as more than two-thirds of total CER in the region was from non-CO_2 projects.

Inequitable sector and geographic distribution: Participants in our consultations, especially those from Southeast Asia and various LDCs and SIDS in the region, expressed strong concern over uneven distribution of CDM projects in various sectors, particularly in terms of the total CER generated (Figure 4.1). On a world-wide basis, over 50% of total CER are expected to come from eight HFC projects, while 488 biomass projects are expected to contribute only 6.4% of total CER (as of 14 September 2006). Likewise, twenty projects aimed at energy efficiency improvements are expected to generate only 1.5% of total CER. Such uneven distribution among different sectors is even more highly evident in the Asia-Pacific region, as more than two-thirds of total CER in the region was from non-CO_2 projects. The fact that the majority of CER are expected to come from projects generating low-cost reductions of non-CO_2 gases, such as elimination of N_2O or HFC, suggests that CDM encourages project proponents to seek out the cheapest emission reductions, not the most robust development benefits (Baumert and Goldberg 2006).

Figure 4.1 Sector-wide distribution of registered CDM projects and associated CER up to 2012 in the world and the Asia-Pacific region (as of 14 Sep. 2006)

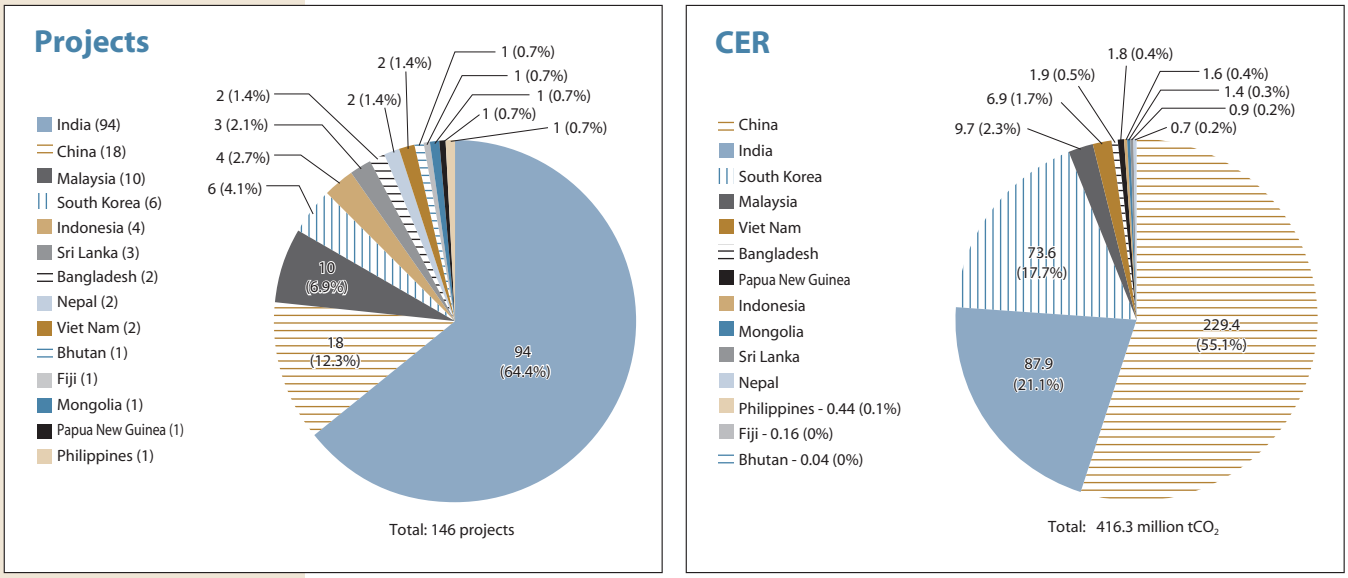


Source: UNEP 2006

Geographic inequity of CDM projects within the Asia-Pacific region was another concern expressed by many countries.

Inequitable per capita distribution of CER in the world was also evident. The highest per capita CER was in Latin America (0.54) and the lowest in the Asia-Pacific region (0.25) due to its larger population (UNEP 2006). Geographic inequity of CDM projects within the Asia-Pacific region was another concern expressed by many countries (e.g. Bhutan, Nepal, Cambodia, Mongolia, Thailand, the Philippines). As of 14 September 2006, 146 out of total 299 registered CDM projects were in the Asia-Pacific region, accounting for 49% of the number, and 70% of the total CER up to 2012. Three countries (China, India and Republic of Korea) accounted for 81% of total registered projects in the region with 94% of CER until 2012 (Figure 4.2). In contrast, only one project each from Bhutan, Cambodia, Fiji, Mongolia, Nepal, Papua New Guinea, and the Philippines was registered. There were no registered projects from countries such as Lao PDR, Maldives, Myanmar, Pakistan, Singapore and Thailand (UNEP 2006). Such inequity is not due to the lack of DNA, as most of the countries in the region have DNA. While some host countries (e.g. Bangladesh) have established mechanisms for improving geographic distribution of CDM projects within the country, no such mechanism exists at the international level.

Figure 4.2 Country-wide distribution of registered CDM projects and associated CER up to 2012 in the Asia-Pacific region (as of 14 Sep. 2006)



Source: UNEP 2006

Although CDM-EB created a few incentives (e.g. free registration of projects with <15,000 CER per year, exemption from 2% share of proceeds for adaptation, and bundling to reduce transaction costs) for small-scale projects, which are usually prevalent in LDCs and SIDS, they did not seem to help in reducing geographic inequity. The inequity in geographic distribution of CDM projects in favour of large countries was also perhaps due to recent changes in bilateral capacity building programmes, which changed their role from pure assistance to strategic CER procurement by developed countries (e.g. Japan).

A concentration in the distribution of unilateral CDM projects was also evident. Of the 71 unilateral CDM projects in the Asia-Pacific region, as many as 61 were in India (10 large [>50,000 CER per year] and the remaining small [<50,000 CER per year) CDM projects (UNFCCC 2006b). Indeed 354 out of 402 CDM projects that received host country

approval in India were unilateral (UNEP 2006) and most of them were in biomass sector. In the Republic of Korea and China, however, only a few projects based on HFC23 and methane account for production of large CER.

Absence of a sector-based approach: Several participants in our consultations (e.g. China, India, Indonesia, Viet Nam) expressed that the current project-based framework of CDM is limiting its potential for decarbonisation in developing countries. It may be associated with the lack of effective linkages between CDM and national developmental priorities in different sectors. Many have argued that the current CDM is incapable of supporting government policies or a wider range of programmes, which can have a much more significant transformative effect on the economy (e.g. Figueres 2005). Participants felt that many Asian countries would be able to participate more actively in the CDM if a wider scope of LULUCF activities were allowed.

The current project-based framework of CDM is limiting its potential for decarbonisation in developing countries.

4.3 Major proposals for strengthening CDM

Several proposals were made to overcome the above-listed barriers in CDM both on a short-term (before 2012) and a long-term basis (after 2012) (Table 4.2). Since most of the proposals were short-term solutions, the focus of recent discussions at UNFCCC shifted from the restructuring of CDM on a long-term basis to short-term solutions (Figueres 2005).

Table 4.2 List of proposals for strengthening CDM in climate regime

Name of the Proposal	Main Features	Remarks (strengths and weaknesses)
I. Proposals to address barriers related to sustainable development (SD)		
1. CDM Gold Standard (Gold Standard 2006)	• SD benefits of a project are scored on a scale ranging from -2 (poor) to + 2 (best) . • Simplified process for micro-scale projects (<5,000 tCO2e) to reduce transaction costs through relaxing the number of stakeholder consultations. • Includes ODA additionality tool to check for diversion of ODA.	• Favours projects with high SD benefits and its wider use may improve geographical equity. • Rating is questionable to quantify SD benefits accurately. • Burden of additional documentation .
2. Expanded CDM (Hiraishi 2005)	• Consideration of benefits beyond CER from CDM projects. • Multi-source financing to realise additional co-benefits (including adaptation) from CDM.	• Quantification of co-benefits in terms of equivalent CER is challenging.
3. Sustainable Development Policies and Measures (SD-PAMs) (Winkler et al. 2002)	• Mandatory provisions to incorporate GHG emission reduction plan in development plans of the developing countries. • Qualifies SD aspect of credits based on three criteria – project eligibility, additionality/baseline and contribution to SD – in addition to current requirements for CDM. • Emission reduction initiatives under SD-PAMs may be funded under the existing mechanisms, including CDM and GEF. • Countries share successful cases and approaches.	• Useful to promote SD benefits of policies. • Coordination with current national reporting systems is a strength. • Objective assessment of SD is challenging and additional screening may increase the burden.
II. Proposals to address institutional barriers		
4. Strengthening of institutional capacity for CDM-EB (Sugiyama et al. 2005, Michaelowa 2005, IETA 2005b)	• Increase funding and strengthen the institutional capacity so that CDM-EB gets professional support, hastens the approval process, and develops methodologies without a concrete project activity. • Nomination to the Board based on agreed terms of reference, resulting in a mix policy, business, regulatory and technical expertise, as well as regional perspective. • Establishment of indicators to measure the success of the CDM-EB.	• Additional burden for Annex I countries. • Vague explanation on indicators effectiveness of CDM-EB.
5. Shortening of application process (Michaelowa 2005)	• Duration from the date of request for registration to the date of registration by the CDM-EB to be reduced from eight to four weeks.	• Insensitive to uneven workload by CDM-EB due to dynamism of CDM project activity.
6. Capacity building (Michaelowa 2005)	• Focus on institutional capacity building in low-income countries should be increased.	• To what extent capacity building leads to real CDM projects is unclear, given the high investment risks in LDCs.

Table 4.2 (continued)

Name of the Proposal	Main Features	Remarks (strengths and weaknesses)
III. Proposals to address technical barriers		
7. Streamlining of additionality testing (Michaelowa 2005)	• Streamlining through (a) defining criteria for additionality in detail, (b) simple barrier tests, and (c) deleting steps 4 (common practice analysis) and 5 (proof of CER revenue overcoming barriers). • Investment tests should consider the risk faced by premium projects in developing countries. • Projects that are the first of its kind in a host country, projects with an internal rate of return below the interest rate of commercial banks, and projects with longer payback period than the usual payback period for projects in the same sector, should be considered additional.	• Contributes to simplification of CDM procedure and reduction of transaction cost.
8. Development of new methodologies	• Development of methodologies in sectors, such as transport and energy efficiency (METI 2005, IISD-CCAP-CC&D 2005), CCS (Scott 2006) should facilitate policy-based and sector-based CDM.	• Leads to an increased number of projects in sectors with large development benefits.
9. Development of multi-project baselines	• Standardisation of baselines for each sector, sub-sector or technology leads to reduction of transaction costs (Sugiyama et al. 2005, Sathaye et al. 2004, Ellis and Bosi 1999).	• Demerit of testing additionality for each project remains.
IV. Proposal to address barriers for technology development and transfer		
10. Technology transfer CDM (IGES 2005a, cited by Cosbey et al. 2005a)	• Credits in return for transfer of a technology that is used in different sectors, as part of emissions quota transactions.	• Design and necessary prerequisites for its implementation are unclear, as estimation of the amount of credits that could be gained through transfer of a single technology is challenging.
V. Proposals to address financial barriers		
11. Reducing transaction costs through various means	• Establishment of country based DOEs (IGES/UNDP 2006) for validation and verification process. • Simplified modalities and procedures for expeditious registration. • Upfront payments for the cost of PDD preparation and feasibility studies (METI Japan 2005). • Bundling of projects.	• Country based DOEs can strengthen capacity of the host countries. • Technical difficulties for bundling increase validation cost (Bhardwaj et el. 2004). • Legal constraints on CER ownership among project owners in the bundle may prevent wider use of bundling.
12. Carbon funds by World Bank, ADB and UNDP	• Prototype Carbon Fund (PCF), Bio Carbon Fund (BCF), Community Development Carbon Fund (CDCF), ADB's CDM Facility, UNDP's MDG Carbon Facility assist in providing start-up funds and mediating ERPAs.	• Funds directly contribute to poverty alleviation and SD at local levels.
13. Use of ODA for underlying finance and relaxation of financial additionality	• Change of the current rules on use of ODA to improve flexibility in interpretation of financial or investment additionality principle (Dutschke and Michaelowa 2003).	• No clear guidelines on the use of ODA for underlying finance are available. • May increase CDM activities by LDCs and SIDS, which rely on ODA.
14. Establishment of ESCO (Energy Service Company) Fund (METI Japan 2005)	• Expected to contribute to the development of energy efficiency or energy conservation projects or related methodologies.	• ESCO can develop large scale CDM projects and mobilise energy efficiency investment from developed countries. • Capacity building is necessary to develop financing expertise.
15. Debt Carbon Swap Initiative (Asuka 2002)	• Exchange of debt by ODA recipients for CERs based on the idea of Debt-for-Nature Swaps.	• Diversion of ODA for generation of CER may become a concern.
VI. Proposals to address legal barriers		
16. Unilateral declaration to ensure the value of CERs after 2012 (Michaelowa 2005)	• Even without any international agreement, major Annex B countries declare unilaterally to buy CERs after 2012. • Allows the use of post-2012 CER for complying with targets of the first commitment period under the Kyoto Protocol.	• Market demand for CERs will improve.
17. Use of Export credit insurance (Asuka and Takeuchi 2004)	• Reduce the risk of CDM investment through currently available insurance systems.	• Insurance alone may not cover all risks associated with the project.
VII. Proposals to overcome the scope-related barriers (sector and geographic reach)		
18. Sector (sub-sector/ cross-sector/ regional) CDM (Samaniego and Figueres 2002)	• Scope of CDM expanded from the current project-based activities to sector-based activities by creating sector-specific or cross-sector policies to reduce GHG emissions in line with national development priorities, and CERs are counted across the sector. • Proposal expects to drastically increase the CERs supply and reduce transaction costs. • Perverse incentive not to adopt policies and measures can be avoided. • In addition to sector CDM (e.g. modernisation of cement industry), there are sub-sector (e.g. conversion of natural gas-fueled electricity generation plants to combined cycle), cross-sector (e.g. combination of cleaner transportation and more efficient lighting in one city), and regional (e.g. departure from the BAU emission scenario in one city or other geographic region) CDM (Cosbey et al. 2005b).	• Supports emissions monitoring and reporting systems in developing countries (Cosbey et al. 2005a). • Technical problems in setting baseline, monitoring and additionality testing. • Wide-coverage of activities extend the range of stakeholders, which makes coordination difficult. (Sugiyama et al. 2005, Michaelowa 2005, Figueres 2005).

Table 4.2 (continued)

Name of the Proposal	Main Features	Remarks (strengths and weaknesses)
19. Policy-based CDM (Ghana and other DCs, 2005, Bosi and Ellis 2005)	• While sector CDM is initiated by the private sector, policy CDM is initiated by the host government (Cosbey et al. 2005b). • Emission reduction under policy CDM would be measured against a situation without such policy.	• Contributes to a drastic increase of CER, but the CER revenues flow to the government, while the cost of complying with the policy falls on the private sector (IGES/UNESCAP 2006). • Governments may delay the implementation of proactive mitigation policies if they expect approval of policy-based CDM.
20. Product CDM (Matsuo 2006)	• Allows crediting of CER for energy efficiency products, for example.	• Some proposals were submitted to CDM-EB, but no prodct CDM is registered as of October 2006.
21. CDM+ Policies (CCAP 2004)	• Rather than policy CDM, CDM+ Policies is proposed consisting of public policy CDM+, regulatory CDM+, financial CDM+, voluntary CDM+. • Expected to increase the number of participants by increasing various choices.	• Confusing array of options to governments. • Details of implementation are unclear.
22. No-lose countrywide policies and measures CDM (Michaelowa et al. 2003)	• Emission targets for developing countries whose combined per capita emissions and per capita income (weighted equally) pass an agreed graduation threshold. • Developing countries that are big emitters but do not graduate into absolute national targets could choose between an ex ante intensity target with emission trading, or use of countrywide, policies and measures CDM.	• Details of implementation are unclear.
23. Renewable energy-based CDM and nuclear energy based CDM (India)	• Ensure eligibility of all renewable energy projects for CDM without testing for additionality. • Widen the scope of CDM to include nuclear energy-based projects, as nuclear energy is primarily a climate-friendly energy source.	• Expected to contribute to sustainable development and energy security. • Environmental and security concerns restrict reaching an international agreement on nuclear energy CDM.
24. Wider definition of LULUCF (FEALAC 2006) and avoidance of deforestation (UNFCCC 2005b)	• Enhance the scope of CDM to cover a wider range of LULUCF activities. • An "optional protocol" involving a group of developed and developing countries and expansion of the CDM to permit crediting of activities to reduce deforestation.	• Arguments against allowing deforestation avoidance activities in CDM include high uncertainties of GHG-reduction estimates, the potentially large scale of credits, non-permanence, and leakage concerns (Bonnie et al. 2000, Marland et al. 2001, Schlamadinger et al. 2004).
25. High CER allocation for specific countries (IGES 2005a)	• Award double CER for LDCs and SIDS to redress the current geographical inequity.	• In view of investment risks in LDCs and SIDS, it is unclear if doubling CER would make those countries attractive CDM destinations.
26. Expeditious registration of small-scale projects and support for bundled projects (IETA 2005b)	• Ensuring expeditious registration and support for bundling may lead to a reduction in transaction costs.	• May result in better geographical reach of CDM to LDCs and other poor developing countries.
27. Unilateral CDM (Republic of Korea)/ South-south CDM (Matsuo 2004, FEALAC 2006)	• Promote unilateral CDM to ensure domestic flows of technology and finance in GHG mitigation activities.	• Unilateral CDM has contributed a lot to expansion of carbon market,. • South-south CDM is not allowed officially yet, but Republic of Korea has been implementing it in Indonesia.
28. Allowing developing countries to sell CER from unilateral CDM (Sudo and Kimura 2005)	• Developing countries should be allowed to participate in the market by selling CER generated from the unilateral CDM projects.	• May give incentive to developing countries to participate in emission reduction efforts, but some have difficulty in implementing CDM with their own domestic technology and finance, in some countries such as Indonesia.
29. Greater use of flexibility with discount CER (Yamagata 2004) and Unilateral CDM linked with CER discounting scheme (Chung 2006)	• To produce more CERs cost effectively, developed countries can use only a part of emission reductions as CER. One unit of CER accrues from a project that reduces two units of emissions in developing countries (Yamagata 2004). • The idea of unilateral CDM linked with CER discounting scheme aims to contribute to net global emission reductions through voluntary action by developing countries, maintain CER price through establishing a central bank to control total supply without imposing emission reduction target for DCs (hybrid type), and improve unequal geographical distribution and types of CDM projects, through differentiation of discounting ratio according to the level of economy (Chung 2006).	• Greater use of flexibility with discount CER ensures further emission cuts in developing countries, but it's not globally cost-effective to constrain the use of CER (Sugiyama et al. 2005). • It may be politically difficult to agree on the differentiated discounting ratio.

The decision of the Chinese government to create a sustainable development fund, based on proceeds from higher CER taxation for non-CO_2 CDM projects, to promote renewable energy sources and other environmental investments is a step in the right direction.

4.4 Perspectives of various countries

The participants in our consultations expressed a wide range of views on ways to strengthen CDM in the future climate regime. Several participants (e.g. Cambodia, China, India, Indonesia, Philippines, and Thailand) argued for simplification of the CDM approval process, especially for projects with high developmental benefits. However, a few participants (e.g. SIDS) voiced concern that excessive simplification might sacrifice the environmental integrity of the CDM (Bernow et al. 2000). Many participants (e.g. Bangladesh, India, and Viet Nam) stated that additional financial and institutional support at national and international levels is crucial for promotion of small-scale and renewable energy (e.g. Viet Nam, Bhutan) CDM projects (Yapp and Rijk 2000). A few participants (e.g. Indonesia) argued that sustainable development benefits are limited in non-CO_2 CDM projects. The decision of the Chinese government to create a sustainable development fund, based on proceeds from higher CER taxation for non-CO_2 CDM projects, to promote renewable energy sources and other environmental investments was seen as a step in the right direction. Many countries in the region did not initiate policies to introduce such differential taxation, however. Some participants (e.g. Sri Lanka) underlined the importance of integrating CDM in energy policies at national and regional levels, and the need for enhancing co-benefits from CDM projects (Hiraishi 2005). They argued that Annex I countries should consider the quality of CERs in their purchases in order to promote sustainable development in the region. Among the proposals to address barriers to sustainable development through CDM, many participants and respondents to our questionnaire (~70%) preferred SD-PAMs, which include pledges of GHG mitigation policies by developing countries.

Many participants (e.g. Cambodia, Mongolia, Indonesia, and Viet Nam) and respondents to the questionnaire (~70%) noted that the future climate regime should support institutional and human capacities to implement CDM projects in order to redress geographic inequity. Many participants (e.g. Japan, India, China, and the Philippines) argued for institutional reform of CDM-EB to hasten the CDM approval process. About 65% of respondents to the questionnaire supported the proposal of expeditious registration of small-scale CDM projects by CDM-EB. Sharing good practices in institutional and human capacity building, and CDM implementation through different platforms such as the DNA forum were considered crucial (UNFCCC 2006e). Many participants (e.g. India, Indonesia, and Republic of Korea) and most of the respondents to the questionnaire noted the need to relax additionality requirements and to develop new methodologies in sectors such as transportation and energy efficiency.

A few participants (e.g. Thailand) noted that CDM should not be seen as the main vehicle for technology transfer while others (e.g. China, India, and the Philippines) argued that the future climate regime should focus on both the transfer and deployment of climate-friendly technologies. Some participants (e.g. Japan), however, noted that developed countries are eager to transfer energy-saving technologies through expansion of related methodologies (Murphy et al. 2005) but voiced caution over the technology mismatch.

Several participants and nearly 50% of the respondents to the questionnaire noted the need for providing a clear signal on the continuity of CDM beyond 2012 and emphasised that the lack of such a signal is a barrier to raising underlying finance in many countries (e.g. Indonesia, Viet Nam). About 70% of respondents to the questionnaire supported the

proposal stating the need for establishing domestic DOEs in host countries with a view to reduce transaction costs. The views on the use of ODA for CDM were diverse. While some participants (e.g. China, India) and most of the respondents to the questionnaire (~77%) noted that diversion of ODA for CDM should not be allowed, others (e.g. Indonesia) argued for the creation of a special fund under ODA to support CDM efforts. Likewise, some participants (e.g. Mongolia) viewed the unilateral CDM as risky, while still others (e.g. India) suggested that ultimately it might be useful, especially from the point of view of technology deployment within the host country. A few participants (e.g. China) noted the need for regulating the CER price through formation of a cartel or a sellers' group.

Many participants (e.g. China, India, Indonesia, and Republic of Korea) and about 50% of respondents to the questionnaire suggested that the future climate regime should support actions to widen the scope of CDM not only in terms of geographic spread but also in terms of elevating the project-based CDM to the programme-based or sector-based CDM. However, some participants (e.g. China, India) raised concern over the need to resolve technical difficulties in baseline setting and monitoring for sector-based CDM.

Representatives from LDCs and SIDS and about 40% of respondents to the questionnaire supported the idea of doubling CERs for projects in LDCs and SIDS and for providing additional support for micro-scale CDM activities to improve geographical equity. However, other countries (e.g. China, India) were concerned about the possible market- distorting effects of such policies (Michaelowa 2003). The views of participants on expanding the scope of CDM to include, among others, LULUCF, deforestation avoidance, and nuclear energy were again diverse. Only 30 to 40% of respondents to the questionnaire supported expanding the scope of CDM in these sectors. Some participants (e.g. Thailand) cautioned that forestry-based CDM projects should consider ecological and social impacts more thoroughly than before.

4.5 Three priorities for strengthening the CDM

4.5.1 Provide an early signal to assure the continuity of CDM beyond 2012

Despite the fact that most of the CDM projects have crediting periods going beyond 2012 and can accrue CER for as many as 21 years, the current uncertainty about post-2012 climate regime generated negligible demand for post-2012 CER (UNFCCC 2006f). The need for an early signal on continuity of CDM is especially important in the Asia-Pacific region because CDM activities have just gained momentum, and many projects in the region have long gestation times with high capital costs. Giving an early signal is expected to increase the demand for CER and lead to procurement of a large number of CER at a minimal cost.

The need for an early signal on continuity of CDM is especially important in the Asia-Pacific region because CDM activities have just gained momentum, and many projects in the region have long gestation times with high capital costs.

4.5.1.1 Unilateral declaration by Annex I countries to purchase post-2012 CER

Several participants in our consultations strongly supported the proposal by Michaelowa (2005), who emphasised the need for unilateral declaration by Annex I countries to ensure the value of CER after 2012. So far, the EU in general and the Netherlands in particular have declared their support for post-2012 CER. In view of the big gap between demand and supply of CER, one approach could be for Annex I countries to declare their intention to extensively utilise post-2012 CER towards meeting their targets for the first

commitment period, perhaps through borrowing and banking. Another approach is to modify the linking directive of the EU-ETS to allow the continued use of CER beyond 2012. The extent to which CDM will play a role in EU-ETS in the immediate future remains to be seen however (Bhandari 2006). Other domestic and regional ETS (e.g. Japan, USA, and Australia) may also consider the use of post-2012 CER.

An institutional approach leading to greater clarity on the use of post-2012 CER is to extend the period of the next commitment to beyond 10 years instead of the five years of the first commitment period. Such reform is expected to enhance market stability for CERs and benefit several long-term projects (e.g. LULUCF, and energy-intensive social infrastructure projects). Many participants suggested that the discussion on post-2012 CDM should be linked with discussions on emission reduction targets of Annex I countries under Article 3.9 of the Kyoto Protocol. As there is widespread recognition that such new reduction targets must be decided by 2008 at the latest, an international agreement to decide on the use of post-2012 CERs must be made by then.

An institutional approach leading to greater clarity on the use of post-2012 CER is to extend the period of the next commitment to beyond 10 years.

4.5.1.2 Proactive support for post-2012 CERs by multilateral financial institutions

International financial institutions such as the World Bank have been instrumental in creating and catalysing the carbon market even before the Kyoto Protocol entered into force on 16 February 2005 (World Bank 2006b). For example, the establishment of various carbon funds (e.g. PCF, CDCF, BCF) by the World Bank in 2000 mobilised a wide-range of funds from the private and public sectors. Likewise, an early signal for CDM was given by AIJ projects. The efforts to create mechanisms to ensure demand for post-2012 CERs will go a long way in sending a positive signal to project developers.

4.5.2 Expand the scope of CDM through sector CDM and minimise geographic inequity

4.5.2.1 Promotion of sector-based CDM

A "sectoral" approach to the CDM was suggested four years ago (Samaniego and Figueres 2002) and several variations have been proposed since then. Bosi and Ellis (2005), for example, listed three major options: policy-based, intensity-based and cap-based sectoral CDM. Sterk and Wittneben (2005) added sectoral project clusters. The COP/MOP1 took a step forward in this direction by agreeing to register "programme of activities" as a single CDM project if approved baseline and monitoring methodologies are used to define the appropriate boundary, avoid double-counting and account for leakage. However, local/ regional/national policy or standards are not yet accepted as the CDM (Decision 7/CMP.1).

Participants in our consultations in all sub-regions emphasised the need for widening the scope of CDM, although the understanding of stakeholders on sector-based CDM varied widely. Participants noted that such an approach can enhance CER supply considerably while effectively cutting down the transaction costs and offering the least cost mitigation opportunities for Annex I countries. Through sector-based CDM, synergies with the sector-based national development plans in Asian countries can be found. In addition, the adoption of a sector-based approach could support the broader enhancement of emissions monitoring and reporting systems in developing countries (Bosi and Ellis

2005). One senior negotiator from India noted that expanding the scope of CDM would enable Annex I Parties to adopt deeper emission reduction targets at the same cost, allow equitable burden-sharing among Annex I Parties, and enable greater participation by developing countries.

A sector-based approach could benefit the Asia-Pacific region, especially in LULUCF, transportation, and household sectors. Since GHG emissions from deforestation account for 20% of the total GHG worldwide and the rate of deforestation is high in the region, adoption of a sector-based CDM may offer a chance to reduce such emissions considerably. Indeed, carbon stocks in forest biomass dropped by 33% in South and Southeast Asia during 1990-2005, more seriously than any other region in the world (FAO 2005). Papua New Guinea and Costa Rica proposed to develop an emissions trading market based on deforestation avoidance (UNFCCC 2005b). A quick decision on the applicability of CDM for deforestation avoidance would go a long way towards supporting sector-based CDM. Transportation is another sector, where sector-based CDM is more effective than the project-based CDM to bring about fundamental changes in vehicle purchases (e.g. encouraging higher fuel efficiency), fuel use (e.g. lower carbon fuels) and, most importantly, travel behaviour (i.e. slower growth in demand for motorised trips) (IISD-CCAP-CC&D 2005).

The sector CDM approach, however, has problems such as baseline setting, monitoring, and potential leakage. To overcome such problems, some Asian countries have begun to take initiatives. India, for example, in collaboration with GTZ, developed baselines for the cement sector (Point Carbon 2006b). Similar approaches should be taken in other sectors and countries depending on national circumstances and sector priorities.

4.5.2.2 Redressing geographical inequity

If CDM really aims to promote sustainable development in developing countries, all developing countries will have to participate in CDM. However, since CDM is a voluntary market-based mechanism, private sector investment activities gravitate to countries and projects where transaction costs and investment risks are low (Silayan 2005, UNFCCC 2006d). Participants in our consultations, especially from LDCs and SIDS, discussed several options to address the issue of geographical inequity. Expeditious registration of small-scale projects and support for bundled projects are crucial to improve the geographic reach of the CDM projects. Some participants (e.g. Cambodia) pointed out that the current definition of small-scale CDM does not truly reflect the circumstances in LDCs and SIDS, and has no positive impact on development of CDM projects as the current procedures do not give any premium to help realise micro-level projects in these countries. Therefore, creating another category for micro-scale CDM project activities (e.g. below 5 MW of electricity generation or equivalent) coupled with a fast-track system for registration and financial assistance can help reduce geographic inequity considerably. Relaxing additionality requirements for CDM projects, especially in renewable energy, in SIDS and LDCs for certain period of time is also recommended (UNFCCC 2006d).

Expeditious registration of small-scale projects and support for bundled projects are crucial to improve the geographic reach of the CDM projects.

The provision of international assistance through finance (e.g. low interest loans), transfer of technology, and capacity building of local financial institutions in LDCs and SIDS may go a long way. Insofar as funding is concerned, a part of the LDC Fund may be used to reduce the risk of CDM projects, and carbon funds targeting micro-scale CDM

project activities in LDCs and SIDS may be established. The policies of Annex I countries for CER acquisition, and of international financial institutions may be adjusted to give preferential treatment to LDCs and SIDS. For instance, Annex I countries may commit to allocate a share of CER purchases from LDCs and SIDS. Since some LDCs and SIDS carry high investment risks, agencies such as the Multilateral Investment Guarantee Agency (MIGA) of the World Bank group, and Nippon Export and Investment Insurance (NEXI) may consider providing insurance to cover such risks. Past experiences of carbon funds managed by the World Bank suggest that only a few countries (e.g. India, China, and the Philippines) received financial assistance (World Bank 2006a). The level of emission reduction seems to be one of the key determinants in the selection of countries and such criteria are working against the interests of LDCs, where emission reductions per project are low. In addition, capacity building programmes by international organisations, which include support to cover transaction costs in LDCs and SIDS, may help in redressing geographic inequity. Some participants (e.g. Bangladesh) suggested that a separate fund for CDM capacity building be established at the UNFCCC.

The policies of Annex I countries and international financial institutions may be adjusted to give preferential treatment to LDCs and SIDS.

A doubling of CERs for projects in LDCs and SIDS was proposed in our earlier consultations (IGES 2005a). Some participants (e.g. India) expressed concerns indicating that it would lead to market distortions. However, other experts opined that distortion of market through government intervention is necessary in this case and that Annex I countries may consider paying a higher price or setting a higher quota for CERs from LDCs and SIDS.

Non-renewable biomass issues are critical to many LDCs and SIDS, since energy consumption in those countries is led by fuel wood, charcoal and such non-fossil fuel based sources. However, the recent decision by CDM-EB not to permit the use of non-renewable biomass as a baseline technology is considered a serious setback. In seeking the way forward, it is suggested that organisations such as IETA should submit alternative baselines that would safeguard the feasibility of CDM projects based on non-renewable biomass, and that UNFCCC should recognise non-renewable biomass as a long term objective and should take the necessary steps to overcome the various barriers.

4.5.2.3 Sustainable development assessment in project implementation

In view of the high imbalance between projects with huge GHG emission reductions but few development benefits, and projects with many development benefits but fewer CERs, several participants in our consultations agreed that assessment of the contribution of CDM to sustainable development should be strengthened further. Current screening methodologies based solely on the host country's checklist do not seem to favour projects with high development benefits. Indeed, some host countries (e.g. Cambodia) modified quantitative assessment of SD into qualitative assessment to hasten the approval process. As current rules do not compel project developers to seek out projects with the most development benefits, the CDM-EB should consider shaping a more expansive accounting and incentive-based framework that would accommodate development benefits within the existing CDM. For instance, the requirement by CDM-EB that assessment of development benefits must be validated by a third party in addition to meeting the host country's criteria may compel project developers to be more receptive to the idea of promoting the co-benefits. However, efforts are necessary to avoid a long bureaucratic process. The provision of incentives to consider developmental

co-benefits is also important. In this connection, Hiraishi (2005) suggested that co-benefits from CDM projects ought to be quantified and financially supported separately for example by, ODA, CSR funding or benevolent funds, so that the total value of the projects with high development benefits could compete well with those with high CERs.

Projects with a large number of CERs should be re-designed carefully to seek development benefits through finding ways to define SD or to evaluate secondary impacts of CDM in operational terms (Kolshus et al. 2001). Self-assessment by project developers using tools, such as an additionality tool for SD, or an economic internal rate of return through qualitative indicators reflecting on a number of non-monetary quantitative indicators (Motta et al. 2002) may be helpful. In addition, UNFCCC may create a registry system for SD-PAMs to be integrated into the CDM-EB approval process to strengthen SD assessment.

4.5.3 Use ODA and multi-source funding approaches to cover underlying finance

Developmental co-benefits from CDM projects ought to be quantified and financially supported separately, so that the total value of the CDM projects with high development benefits and low CERs could compete well with those with high CERs.

4.5.3.1 Private-private partnerships in financial sector

Participants in our consultations repeatedly noted that the lack of underlying finance was a major barrier to effective implementation of CDM projects. To overcome this barrier, synergies among the private sectors of Annex I and non-Annex I countries should be strengthened through bilateral business agreements. For example, Japan Carbon Finance Ltd. (JCF) concluded business agreements with RHB Bank in Malaysia, TMB Bank Public Co., Ltd. in Thailand, and ICICI Bank Limited in India in 2006. Such business agreements enhance the prospects of obtaining upfront payments for project development and underlying finance. Besides business agreements, adequate steps should be taken to strengthen capacity and increase the CDM awareness of both public and private financial institutions in developing countries so that the underlying finance may be raised domestically (Masuda 2005).

4.5.3.2 Use of ODA for underlying finance

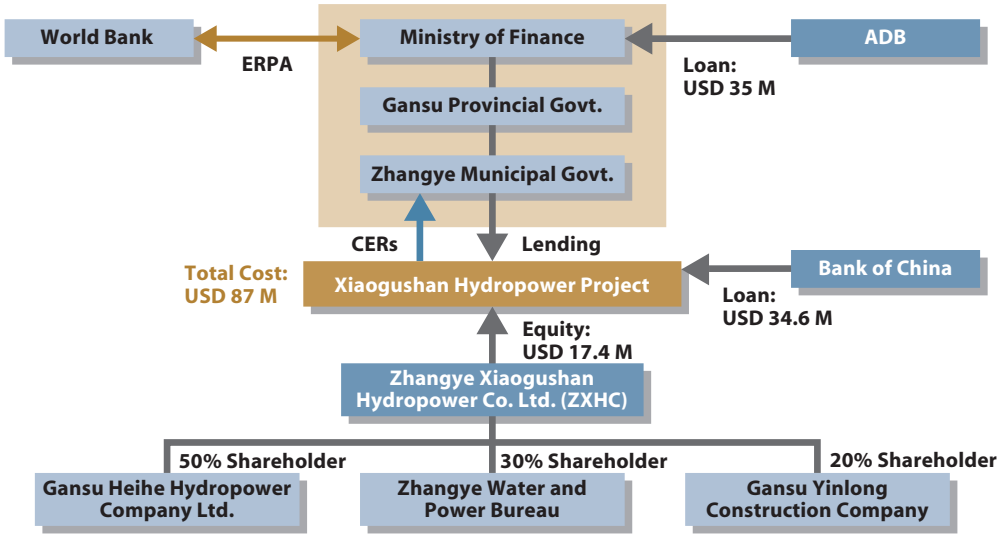
Our consultations revealed diverse views on the use of ODA for CDM (Table 4.3). While some participants (e.g. Philippines) supported the use of ODA, others (e.g. China) were against such a proposal. If ODA were to be used for underlying finance, streamlining of additionality testing (Michaelowa 2003) and relaxation of financial additionality (Dutschke and Michaelowa 2003) are crucial. Measures to prevent undue diversion of ODA (e.g. purchase of CERs, reducing allocation to other developmental activities such as education) are, however, necessary. The need for providing ODA, especially during the initial stages of CDM implementation has been highlighted (UNFCCC 2006d). This is especially true in LDCs and SIDS, which are not financially attractive to investors from the perspective of project financing. In countries with high risks, and in unilateral CDM projects, ODA coupled with export credit insurance may be used to mitigate risks.

Climate regime discussions should place a strong emphasis on a multi-source, multi-channel funding approach through existing and/or new financial mechanisms.

4.5.3.3 Effective use of multi-source funding

A mismatch between the needs for up-front investment and the annual payments for emission reduction is seen in all CDM projects (Kossoy 2004). Multi-source funding can, therefore, promote CDM projects by sharing risks among several financial institutions so that it helps project owners to receive up-front payments relatively easily (Gouvello and Coto 2003). Good coordination among funding institutions and project developers is, therefore, critical. Multilateral financial institutions and development agencies can act as catalysts to generate multi-source funding for CDM projects. For example, the Plantar project in Brazil was successful in overcoming financial barriers with the help of World Bank Prototype Carbon Fund (PCF). The Emission Reduction Purchase Agreement (ERPA) by PCF facilitated the payments for emission reduction to be placed in escrow and permitted project sponsors to get up-front finance from Rabobank Brazil and to use the ERPA proceeds to service debt. With the ERPA arrangement, Rabobank Brazil could even extend its loan tenure from two years without carbon finance to five years with carbon finance (Bishop 2004). Likewise, Xiaogushan Hydropower Plant Project in China received loans from Bank of China (39.8% of the total cost) and ADB (40.2% of the total cost) for implementation, because of the ERPA signed with the World Bank (World Bank 2004b). The equity contributions of the project owner covered the remaining 20%. Explicit guarantees from Gansu Provincial Government and Zhangye Municipal Government also facilitated the conclusion of the loan agreement (Figure 4.3).

Figure 4.3 Multi-source Funding Structure of Xiaogushan Hydropower Project in China



Climate regime discussions should place a strong emphasis on a multi-source, multi-channel funding approach through existing and/or new financial mechanisms. The synergistic benefits of such an approach will be seen in fast and effective implementation of CDM and intensive sharing of knowledge and experience.

4.6 Concluding Remarks

The ultimate measure of success for CDM will be its contribution to reducing the growth of GHG emissions and promoting sustainable development in developing countries. IGES consultations revealed a strong need to streamline and improve the current CDM to achieve these goals. Insofar as the first objective of reducing emissions is concerned, several technical, technological, and financial barriers need to be overcome. To achieve the second objective, a reorientation of thinking, both in host countries and by Annex B Parties, in terms of integrating development and climate actions is crucial. Our consultations revealed that the first priority to strengthen CDM is to ensure its continuity beyond 2012 and to expand its scope beyond the current project-based approach. Simultaneously, options for improving geographic distribution of CDM projects, and enhancing technology transfer and local SD benefits must be fully exploited. The future regime should also have adequate safeguards to reject projects that undermine social and environmental integrity. With such efforts, CDM's role as a tool for attracting clean energy investments and promoting SD in the Asia-Pacific region can be strengthened.