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A two-track Clean Development Mechanism to improve incentives for sustainable development and offset production

Asbjørn Torvanger[i], Manish Kumar Shrivastava[ii], Nimisha Pandey[iii], and Silje H. Tørnblad[iv]

Abstract

The literature assessing the performance of the CDM shows that the mechanism is weak with regard to sustainable development and problematic with regard to offset production. One explanation for weak performance is the difficulty of combining sustainable development with offset production in many CDM projects. Many of the proposals to address these drawbacks face the challenge of political feasibility. This paper argues that a way forward is to split the CDM into a two-track mechanism, with one track for offset production and the other for offset production with emphasis on sustainable development benefits.

Keywords:

Clean Development Mechanism; Sustainable Development; Offset production; Two-track.

1. Introduction

The Kyoto Protocol, in its Article 12, specifies two objectives for the Clean Development Mechanism (CDM): (a) to assist developing countries in achieving sustainable development, and (b) to assist developed countries in meeting their emission reduction targets under the Kyoto Protocol, through offset production in a host developing country.[v] Funding of adaptation actions in developing countries particularly vulnerable to climate change impacts through proceeds from CDM projects is also provided for.[vi] Stakeholders, however, have interpreted CDM as also including a number of additional objectives related to capacity building in developing countries: increase awareness; understanding and learning of low-carbon technologies; influence business and policy thinking; stimulate low-carbon development paths; learn about climate issues, policies, and instruments; technology transfer; and more generally; enhance global climate collaboration and trust building. Thus, the CDM is perceived as a carefully balanced “package” reflecting the interests of developing and industrialized countries.

At the climate conference in Durban in autumn 2011 countries agreed to a second commitment period for the Kyoto Protocol and a plan to negotiate a new climate agreement by 2015, to enter into force by 2020 (ENB 2011). This implies that the CDM will continue as a global greenhouse gas (GHG) trading mechanism beyond the first Kyoto Protocol period 2008-2012. The performance and impacts of CDM projects have been criticized by stakeholders, so the ongoing discussion of measures to improve the CDM will continue. There is an obvious possibility of a reformed CDM being part of a new climate agreement from 2020. Considering this, an exploration of how the CDM could be improved is timely and important.

In order to enhance the CDM’s future potential a timely research question therefore is: How can incentives to improve sustainable development and offset production performance in the CDM be improved?

In the next section we discuss the difficulty of achieving the SD and OP objectives simultaneously in many CDM projects. In section 3 we review the literature on CDM performance, assessing the degree CDM projects have delivered on OP with environmental integrity and have supported SD, as well as simultaneous fulfillment of the two objectives. We then discuss, briefly, some of the proposals to reform the CDM and strengthening OP and SD with a view to their political feasibility. Subsequently, in section 5, we propose a new two-track CDM, with one track for OP and the other track for OP with emphasis on SD benefits, which can enhance the political feasibility of these proposals and addresses the conflicts between attainment of SD and OP. Finally policy recommendations and conclusions are offered.

For a broader assessment of reforming CDM, confer e.g. Gillenwater and Seres (2011), Schneider (2007), and Paulsson (2009).

2. The two CDM objectives

The dual objectives of the CDM were adopted as a compromise between the interests of developing and industrialized countries. They reflect expectations of synergies between OP production and SD impacts, e.g. in the form of technology transfer and poverty alleviation. Still, when modalities, procedures and institutional organization of the CDM were decided in Marrakesh in 2001 the outcome was biased towards the objective of cost-effective emissions reduction through OP. One explanation for this is that many developing countries saw potential earnings from selling CDM credits and many industrialized countries anticipated potential cost savings from buying CDM credits. In terms of SD, however, developing countries were concerned that uniform criteria and standards for SD in a CDM setting would infringe on their national responsibilities. As a consequence CDM ended up with no fixed definition of SD. Thus evaluations of SD will always depend on interpretations, whether by a national Designated National Authority (DNA) or other actors.

2.1 Contribution to sustainable development

A frequently used definition of SD is that of the Brundtland Commission, which states that SD "implies meeting the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development 1987). This conceptual definition is useful for understanding what all SD activities must imply, but not in terms of operationalization, implementation or measurement. The definition is thus not specific enough to allow for evaluation of activities or efforts. While it is more or less agreed that SD contains three spheres: economic, social and environmental, and that SD is secured if an activity has a positive impact in at least one of the spheres without affecting any of the remaining spheres in a negative direction, there is limited consensus when trying to specify further which aspects SD should encompass (see for example Goepel 2010; Alfsen & Moe 2005; UNFCCC 2011).

The DNA in each country is responsible for deciding what they will approve as SD contributions from CDM projects depending on national priorities. However, in the majority of countries CDM projects do not need to comply with all, or even most, of these criteria. Also, the criteria have been criticized for being far from rigorous enough to actually provide benefits, as a result of host countries wanting to attract a larger number of projects (Fuhr and Lederer 2009). In addition, there is no validation of whether the project has actually performed as intended after the initial letter of approval has been given by the DNAs. Thus, it is very difficult to assess real contributions to SD from CDM projects more generally.

2.2 Contribution to offset production

Offset production (OP) through a CDM project is based on two prerequisites, environmental additionality and economic additionality (Gillenwater and Seres 2011; Schneider 2007; Michaelowa 2005). This means that a CDM project should produce reduction in greenhouse gas (GHG) emissions compared to a reference situation (baseline), and that the project is not profitable and thus would not be realized in the absence of CDM revenues. Verifying that these prerequisites are met is very challenging since the baseline is estimated and/or based on economic development plans, prevailing technological/production practices, and regulatory requirements. Also, if the CDM project is realized, future development in the absence of the CDM project will never be known with certainty. This indicates that OP of the CDM may not be fully in compliance with article 12 of the Kyoto Protocol. Adding to this is asymmetrical information among project developers and control institutions (foremost the CDM Executive Board), and the fact that both project developers in the host country and investors from industrialized countries have incentives to exaggerate environmental additionality (i.e. reduction of GHG emissions) and economic additionality (i.e. portray high cost and low profitability of project).

Environmental additionality and net effect on GHG emissions of a CDM project can be assessed at different scales, from the actual project, to the municipality level, and to the national level. Additionality is thus linked to the issue of carbon leakage. As an example of carbon leakage, a new polluting power plant could be built somewhere else in the same municipality (or in another part of the country) instead of at the original CDM project site (Gillenwater and Seres 2011; Schneider 2007). In such a case there would be an emission reduction at the project level, but not at municipality (or national) level.

3. Review of CDM performance

What can the literature tell us about the performance of the CDM with regard to SD and OP, and challenges meeting the two primary objectives?

3.1 Studies of SD performance

Studies of SD performance inherently suffer from the many meanings the concept SD can take. Even so, a number of studies have been published in the last three to four years assessing the performance of CDM with reference to SD. Comparison across countries with a sample based assessment has been a common characteristic of many of these studies, with exception of some studies examining particular experiences in China and India. While studies have focused on either a set of SD parameters or any one element of CDM objectives, technology transfer and diffusion emerge as the most frequently used criterion of evaluation. The other parameter frequently referred to is employment creation, which symbolizes the importance of poverty alleviation through income generation for SD.

Technology transfer

The studies considering technology based parameters validate the assertion in Karakosta et al. (2009c) that for many countries SD objectives appear in the form of demand of sustainable energy technologies, which leads to an increased emphasis on technology transfer issues in CDM. Boyd et al. (2009) and Nussbaumer (2009), however, suggest that it is not wise to assume that certain project types would necessarily deliver SD.

Different definitions of technology transfer have been used by different scholars in assessing CDM's contribution to technology transfer (Pueyo 2007; Dechezleprêtre et al. 2009; Schneider et al. 2008; Seres 2007; van der Gaast et al. 2009; de Coninck et al. 2007; Haites et al. 2006; Olsen and Fenhann 2008; Murdiyarso et al. 2008; Garcia-Quijano et al. 2005; Georgiou et al. 2008; Schroeder 2009; UNFCCC 2010; Karakosta et al. 2009a and b). A general lesson is that CDM is successful only to a limited extent even with a liberal definition of technology transfer (i.e. not always insisting on technological capability enhancement and considering presence of any component of commercial transfer of technology as technology transfer).[vii] A possible explanation is that the technology transfer content of a project is dependent upon host country priorities and national conditions (economic, political, geographic, infrastructural, etc.), and that the design of the CDM has little influence.

Other aspects of sustainable development

Different studies have used other parameters to assess SD impact of the CDM. Olsen (2007) reviews 19 studies that assess SD impacts of CDM (including grey literature) and suggests that while the theoretical potential of the CDM is generally positive (following the reasoning embedded in the CDM itself), there are few empirical studies supporting SD benefits above project level. For example, Olsen & Fenhann (2008) analyze SD claims made in 744 Project Development Documents (PDD) and find that distribution of SD benefits among the economic, environmental and social dimensions is fairly even, with most benefits in the social dimension. This is also supported by Subbarao and Lloyd (2011) based on the analysis of 500 small scale renewable energy projects. However, the authors of the first study do not look at empirical evidence for whether the SD benefits listed in the PDDs have actually been achieved, whereas the authors of the second study find only marginal SD benefits when conducting empirical case studies.

Pulver et al. (2010) find that in the case of Brazilian sugar mills, necessary social and environmental requirements were already in place before projects was included in the CDM. The CDM can thus not be said to have contributed significantly to SD in these projects. The authors also find that a strengthening of CDM rules to improve environmental integrity led to lower investments in environmentally friendly technologies due to increased uncertainty. Overall, the literature in this field questions the ability of the CDM mechanism to deliver significant contributions to sustainable development (see for example Subbarao and Lloyd 2011; Bumpus and Cole 2010; Liverman 2009; Ellis et al. 2007). Haya (2009) even argues that SD contributions are in some cases negative, as the CDM mechanism can improve the profitability of projects that have negative impacts in terms of environment or social aspects.

There are also studies that provide insights into why theoretical SD contributions fail to materialize, through pointing out national level barriers to realizing SD contributions. For example, Cunha et al. (2007) find 'substantial economic, technological, corporate and institutional barriers' hindering realization of renewable energy projects' potential for SD in rural areas in Brazil. Kim (2003) studies a solar-powered rural private homes project in South Africa, and suggests that the development benefits of the CDM depend on whether such benefits are "factored into the design of the mechanism's institutional framework". One can also question the incentive for host countries to require significant SD contributions from projects, when the financial benefits lie in maximizing the number of projects (Liverman 2009; Olsen and Fenhann 2008). In addition, there is the debate of whether development can happen sustainably without developed countries making larger changes domestically. For example Haya (2009) argues that "In a world dominated by a single vision of "progress", sustainability requires changing the image of what "developed" means. Ultimately, promoting low-carbon development in the South requires demonstrating it in the North." (Haya 2009, p. 24).

3.2 Studies of OP performance

While studies have suggested that due to its design the CDM is biased in favor of cost-effective emission reductions, i.e. generating offsets in comparison to promoting SD, many studies have raised serious doubts about the credibility of offsets that the mechanism produces (Michaelowa and Purohit 2007; Schneider 2007; Wara 2006; Wara and Victor 2008; CAN 2009). The essence of the arguments is that while the offsets allow industrialized countries to continue to emit GHGs and still meet their emission reduction targets, if the emission reductions achieved through CDM are not additional in real terms (i.e. reduction from an absolute emission level instead of from an imaginary business-as-usual baseline that is prone to manipulation), the claims of industrialized countries to have met their emission reduction targets under the Kyoto Protocol are questionable. Haya (2009), for instance, provides an elaborate critique of the design of CDM and explains why it fails in ensuring the "additionality" condition of emission reductions. Based on stakeholder interviews and project analysis of 70 renewable energy projects in India, she shows that not only the investment additionality calculations are difficult and questionable; many of the projects would have been built even without the (small) financial returns from selling offsets. In many cases, such as large hydropower projects, due to existing procedures guaranteeing agreed returns to equity investors, an additionality test is rather meaningless. In her view, therefore, less reliance on offsets for meeting emission reduction targets in industrialized countries is the best option.

Also the performance of CDM projects with regard to cost effective abatement of greenhouse gas emissions is questioned. Lütken (2012) finds that CDM projects often do not improve global cost effectiveness since they are driven by other factors than the lowest marginal abatement cost, related to discrete production and technology markets, for instance in the cases of hydro power and wind power.

3.3 Relation between sustainable development and offset production

A CDM project should deliver both on OP and SD, which brings into question the mechanism's ability to do so given that these two objectives are widely different. We argue that there are significant challenges for CDM projects to perform well both on SD and OP simultaneously.

First, if more emphasis is put on delivering SD impacts in CDM projects this would likely add to project costs without generating more CERs. If SD performance should play a stronger role in many CDM projects this would impact the CDM market and contribute to an increase in the CER price and lower the traded CER volume. One example is the higher price of CERs in CDM projects that have adopted the Gold Standard for CDM projects; confer The gold standard manual for CDM project developers (2006), Sutter (2003), and Thorne and La Rovere (1999).

Second, the CDM is primarily designed for producing offsets, which is reflected in a weak framework for assessing SD impacts, for instance with respect to Measurement, Reporting and Verification (MRV) of SD impacts.

Checking the literature, we find that many studies have examined the assumption that CDM could deliver both on SD and OP, arguing that the mechanism is biased in favor of cost-effective OP generation. The vague definition of what SD means in a CDM context and the lack of a universal framework for assessing contributions to SD can very well lead to efforts mostly being spent on achieving OP. In the competition for attracting CDM projects and financing, a 'race to the bottom' can occur where the assessment of a project's contribution to SD is made less stringent in order to make the process easier for project developers wishing to invest (Olsen 2007, p. 62; Sutter & Parreño 2007; Sutter 2003). There is a general agreement that a conflict exists between OP and SD because the CDM is designed as a market mechanism where SD benefits are not linked to pricing mechanism (Brown et al. 2004; Kim 2003; Olsen 2007; Sutter 2003, Ch. 3; Sutter and Parreño 2007; Paulsson 2009). This has led scholars to suggest several ways in which an international standard could be introduced in order to have a universal framework for assessing CDM projects' contribution to SD (Olsen & Fenhann 2008; Sutter 2003; Thorne & La Rovere 1999).

Grounding their analysis in the theoretical aspects of conflict between CDM objectives, Sutter & Parreño (2007) use a framework developed by Sutter (2003), the MATA-CDM methodology,[viii] to evaluate the contribution of 16 implemented CDM projects to SD in their host country and conclude that the top-performing projects all have a high rating *either* on likelihood of producing real/additional emission reductions *or* a high contribution to SD. Thus, empirical evidence is also found for the conflicting objectives. However, when looking at the number of CERs produced, there is a clear tendency of a higher contribution to emission reductions rather than to SD. This is taken to be an empirical observation of the focus on cost-efficient emission reductions on behalf of SD. van der Gaast et al. (2009) find empirical evidence for CDM technology transfers being more focused on lowest-cost emission reductions than on SD in Chile, China, Kenya, Israel, and Thailand.[ix]

Subbarao and Lloyd (2011) have suggested that a greater participation of community in conception of small-scale renewable energy projects can help achieve both the objectives simultaneously. Since many of these projects substitute inefficient subsistence energy use, additionality of emission reductions is less questionable.

In any case, and in terms of reforming the CDM, we should keep in mind that strengthening the OP performance of CDM projects does not necessarily strengthen SD performance (and vice versa).

4. Proposals to improve CDM performance

We now turn to the issue of how the CDM's performance with regard to the two main objectives can be improved.

4.1 Improving SD performance

Some studies present general frameworks for treating SD in a CDM context (see e.g. Sutter 2003 and Cosbey et al. 2007). We organize the discussion of ideas to improve the CDM's SD performance into output-based and input-based approaches.

Output-based approaches

Assessment of SD is difficult at any other level than national/local. One option is to ask national authorities to make their measurable SD criteria explicit and let the project developers give measurable output against those criteria. As an example, it has been shown that only few CDM projects result in poverty alleviation despite the national checklists (Michaelowa & Michaelowa 2007; Schneider 2007).

Another option is to have a general list of SD criteria that all national checklists must contain. For instance, employment generation could be a direct or indirect result of a CDM project. However, parameters relating to social aspects of SD are necessarily extrinsic and difficult to measure. Therefore, arriving at universally acceptable criteria is difficult. A general checklist further faces the difficulty of being too rigid, and thus could have little relevance for some of the areas where it is applied, or being too general, which leaves it with few benefits compared to keeping the national checklists in the present system. Also, if appropriate general criteria could be identified, there is still a problem of measuring performance.

An example of a stricter set of SD criteria in use today is the Gold Standard premium market (confer description in Schlup 2005). The Gold Standard is strictly voluntary and makes up a minority of projects. Making such a premium standard compulsory would mean shifting the responsibility and prerogative of approving CDM projects in terms of SD from national authorities to independent reviewers. It would, however, most likely lead to increased costs and time delays compared to the current procedure (The gold standard manual for CDM project developers 2006; Sutter 2003; Thorne and La Rovere 1999).

Another route to an output based interpretation of SD is to emphasize capacity building in host developing countries. There are a limited number of studies examining CDM's contribution to capacity building. However, considerable indications exist that CDM have contributed to dynamism conducive for increased awareness with respect to low-carbon technologies, particularly in the renewable energy sector. The growth in the number of CDM consultants/professionals in the developing world and an expanding number of entrepreneurs conceiving potential CDM projects could be seen as an indicator of growing awareness about environmental aspects of business activity (see e.g. Naydenova and van der Gaast 2011; ADB 2009).

Input-based approaches

Direct assessment of SD with the help of any criteria has proven difficult since criteria are hard to define and even harder to measure. The alternative is to focus on input variables. Two types of such proxy performance indicators are project category and resources spent on a project. The most important benefit of such an approach is that it allows us to see projects as contributing to the promotion of SD rather than delivering it. Lecocq and Ambrosi (2007) argue that there are two ways in which CDM projects can contribute to SD: either directly through the project activity, or indirectly through using the revenues from the project on activities that contribute to SD. The benefit of using revenues from the project on activities contributing to SD is the decoupling of (money for) SD from investment projects meant to produce CERs. Hence the problem that SD is currently treated as a subordinate objective can be addressed without taking the autonomy to decide upon a meaningful interpretation of SD away from national government and thus allowing for local variation.

Muller (2007) argues that rent extraction through taxation (on profits or revenues, alternatively a fixed fee on CDM transactions) could be used to finance SD. Governments can tax CDM revenues for SD. Any funding mechanism must be aimed at activities with a clear contribution to SD, and it should allow for continued local variation in the meaning of SD.

There are also other input-based measures of SD, such as inter-and intra-generational equity. As Mueller (2011) finds in her study of biomass projects in India, most of the projects are located in richer districts and hence they add to the unequal distribution of economic development. Governments can categorize the districts according to their level of economic development and the tax rates could differ so as to incentivize more investment in poorer districts. Alternatively, a discount or multiplication factor could be introduced on the basis of location of the project.

Other important input-based parameter considered in various studies is project types, where an implicit assumption has been that a certain types of projects, for instance, renewable energy in general and small renewable energy projects in particular, promote SD in long run.

4.2 Improving OP performance

Many proposals to limit problems associated with additionality of CDM projects have been forwarded.

One category is stricter rules for acceptance of CDM projects: a) The Gold Standard, which implies stricter criteria and procedures for approving CDM projects, more involvement of stakeholders, and conservative estimates of CER production (The Gold Standard 2006); b) Introduce stricter eligibility requirements with respect to project type and technologies, such as a list of acceptable project types (positive list), and possibly also a list of project types that should not be eligible (negative list) (Gillenwater and Seres 2011; Natsource 2007; Schneider 2007; Hall et al. 2008); and c) Introduce benchmarking, where the idea is to set a reference level for emissions associated with a specific industry, based on e.g. the 20% best performers in that industry, and where CER production from a CDM project in that industry is equal to the gap between the benchmark and actual emission level which is below the benchmark (Schneider 2007). A variation on this is the suggestion to have standardized methodologies for a given type of project activities (UNFCCC 2008).

A second category is discounting CERs generated by a CDM project, that is discounting the volume of CERs produced by a CDM project to compensate for (insure against) the risk of the project not satisfying additionality (Greenpeace 2000). Discounting can be done by a fixed factor across all project types, or attempt to account for uncertainties for each project type (Natsource 2007; Gillenwater and Seres 2011; Schneider 2007), or be based on development level for a host country that reflect "common but differentiated responsibilities" (Michaelowa 2008).[x]

A third category is to limit the use of offsets. Industrialized countries that buy CDM credits and are concerned about additionality may choose to cancel an allowance for national emissions (under the Kyoto Protocol) for each CER they use for compliance. Alternatively, such countries could take on more ambitious targets to compensate for purchase of CERs (Naydenova and van der Gaast 2011).

A fourth category is aggregation of CDM projects, where the main idea is to lower transaction costs through more efficient approval and verification of a group of related CDM projects (Hultman et al. 2009). Some alternatives are: a) Sector based CDM, where the reference situation is defined at sector level and where more than one CDM activity could be included (Michaelowa 2005); b) Programmatic CDM, where projects with similarities along one or more dimensions are handled as a group to streamline approval and verification; c) Policy CDM, where adoption and implementation of policies and measures that reduce GHG emissions give rise to CER production (Schneider 2007). Since this type of CDM activity could enable crediting at municipality or national level the risk of carbon leakage is reduced. Nevertheless additionality would be an issue since policies and measures that mitigate GHG emissions could well be motivated by other policy objectives than climate policy.

Other alternatives discussed in the literature are voluntary targets by developing countries (Naydenova and van der Gaast 2011), simplifying the CDM administration process (JIN 2010), and professionalize the Executive Board of the CDM and make it more independent (De Sepibus 2009; Hepburn 2009).

5. A two-track CDM to improve incentives for SD and OP

CDM is less effective in delivering on SD and OP simultaneously since the primary priority often is to produce cost-effective OP, and since there is no common definition of SD. Together, these two reasons reflect the political challenge of putting a price on SD in the absence of which the CDM can at best deliver SD as a by-product of OP.

Many of the proposals for CDM reform, discussed above, face the challenge of political acceptability. To break the political deadlock and include SD benefits in the price mechanism we propose that the CDM should have two tracks, one with stricter MRV for OP generation (OP track) and the other with provisions for MRV for the SD performance as well (SD track). A schematic representation of the proposal is given in Figure 1. To ensure that the SD track has traction among different stakeholders, the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP) will have to decide:

(a) A certain percentage of the total purchased CERs must be from the SD track. These CERs will receive a higher price than the current average price of CERs from the OP track;

(b) Criteria for SD and MRV requirements. In order to benefit from the SD track project developers will have to agree to these requirements, and indicate this at the PDD stage.

A binding quota for the SD track will create a demand for CERs with higher SD output. This provision will likely induce a higher price for the CERs with SD benefits, dependent on the percentage constraint as compared to the supply of CERs from the SD track and the cost of increasing this supply. This could lead to higher earnings and be an incentive for project developers to voluntarily opt for MRV against a-priori decided SD criteria. Since a project will be subjected to such SD criteria only if a project owner volunteers, the question of infringing upon national sovereignty of developing countries should not arise. Most of the proposals for CDM reform discussed in previous sections can be applied to the two tracks. In fact, their political acceptability is likely to be higher under a two-track CDM due to the combined effect of a quota for the SD track, SD criteria with MRV requirements, and incentives to voluntarily opt for MRV for SD benefits. Further, it may be agreed that a certain share of purchased CERs with SD benefits should mandatorily come from least developed countries. This will not only bring about fairness and equity in the market but would also promote growth and development in such regions.

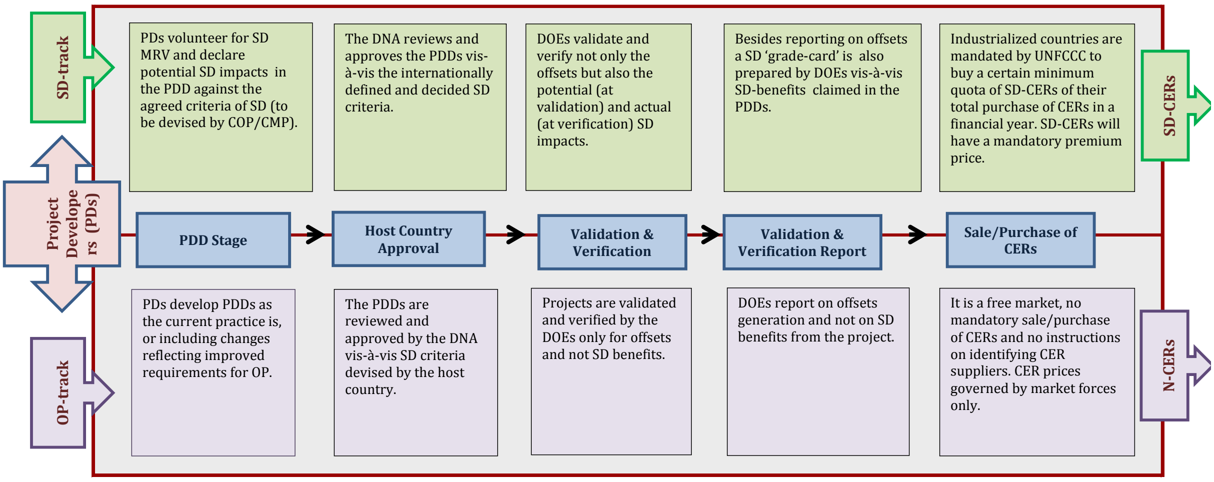
However, the primary requirement for implementing a SD track is a common, internationally devised definition of sustainable development and its criteria, and also likely sub-criteria for various project types. Possibly, the recent discussions on sustainable development declaration tool (SD tool) at the UNFCCC level[xi] and the High-Level Panel on the CDM (CDM Policy Dialogue) is the first step in this direction. The projects' performance with respect to SD benefits shall be assessed vis-à-vis the international formulation of SD and its various components. The Designated Operational Entities (DOE) (independent auditors) shall be authorized and accredited to review the projects achievements not only in terms of CERs generated but also SD co-benefits.

In the SD track an alternative incentive for industrialized country participation could be that funding for SD projects in a developing country is accepted as part of meeting a national climate commitment for the industrialized country. For example, a fixed additional amount of money per CER from the SD-track could be accounted for other climate policy commitments of an industrialized country towards developing countries.

5.1 Gradient approach for SD-track

Since SD faces a problem of quantifiable measurement, we also suggest that a 'gradient measurement approach' for SD track should be applied. A project developer must indicate in the PDD as to the expected input and/or output against the SD criteria and method to measure the performance. The SD performance should be 'graded' rather than placing an exact number as in the case of CERs. The Executive Board of the CDM should develop methodologies for arriving at these 'grades'. The range of the grades should also be indicated in the PDD with adequate justification. Accordingly, in the PDDs the project developers shall not only list the potential SD impacts but would also be required to indicate the extent or range of expected impacts for various SD criteria from the project. Once the project is under implementation and is generating CERs and SD benefits, the DOEs, as part of the validation and verification processes, shall evaluate the projects' outcomes and also assign grades to various claimed SD impacts vis-à-vis the grades assigned to them in the PDD by the project developer. These grades, linked to a price premium, could correspond to over-achievement, in-range achievement and under-achievement against the expected performance.

Figure 1. Schematic arrangement of the two-track CDM



6. Conclusions and policy implications

The present design of the CDM implies weaknesses with regard to calculation of real reductions in GHG emissions, and in particular with regard to supporting SD in host developing countries. Uncertainty related to OP and SD impacts may undermine the credibility of the CDM. Yet, the CDM has had a sizeable impact on capacity building in the areas of climate policy and green energy development in developing countries. In terms of securing measurable impact from CDM projects on SD the problem is political. This is due to the political difficulty of agreeing on a common definition and operationalization of SD, which are firmly based on rules for MRV. A strengthening of the CDM requires stricter process and assessment methods.

On this background we argue that it is difficult for one mechanism to deliver on two objectives. There are even indications of significant challenges combining good SD and good OP performance. Thus it may be more efficient to move in the direction of a two-track mechanism, were one track focuses on OP only and the other also includes SD. Some degree of decoupling SD and OP may enhance its capability to deliver on each of these objectives. Such a two-track approach would keep the offset character of the mechanism, which is the main incentive for industrialized countries to pay for a part of CDM project, and promote the SD objective. Making this solution operational could imply that only some projects types, where conditions are most favorable for producing CERs with high environmental integrity, can produce legitimate credits (CERs) in the OP track. Still there would some uncertainty associated with the environmental integrity of CERs from projects which score high on SD criteria. This could be handled through a discount factor according to level of uncertainty when accounting for the number of CERs produced in the SD track. The loss in terms of lesser amount of CERs due to discounting could be balanced by higher prices according the SD-performance grades.

Further research should focus on the wider set of climate and development objectives, and how these best could be shared among the CDM and other existing or upcoming mechanisms, as well as climate related funds. Given considerable indications that CDM projects have contributed to dynamism conducive for increased awareness with respect to low-carbon technologies in host developing countries, particularly in the renewable energy sector, and to promoting learning and competence building on climate change and mitigation, it would be interesting to explore how such capacity building effects could be strengthened under a two-track CDM. An assessment of political feasibility at international level for the various alternatives of reforming the CDM is also worth investigating.

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[i]Corresponding author. Center for International Climate and Environmental Research – Oslo (CICERO), P.O. Box 1129 Blindern, N-0318 Oslo, Norway. Email: asbjorn.torvanger@cicero.uio.no

[ii] The Energy Research Institute (TERI), India. Views expressed in paper are author's own.

[iii] The Energy Research Institute (TERI), India. Views expressed in paper are author's own.

[iv]Center for International Climate and Environmental Research – Oslo (CICERO).

[v] The exact phrasing is to "assist Parties not included in Annex I in achieving sustainable development and in contributing to the ultimate objective of the Convention, and to assist Parties included in Annex I in achieving compliance with their quantified emission limitation and reduction commitments" (UNFCCC 1998. Published on the Internet at http://unfccc.int/kyoto_protocol/items/2830.php; retrieved 4.3.2010).

[vi] Paragraph 8 states that a fee is to be put on sales of certified CDM projects activities, for the purpose of covering administrative expenses, and assisting developing countries that are particularly vulnerable to climate change to cover their adaptation costs.

[vii]There is considerable literature on technological change and transfer that insists on defining technology transfer as a process necessarily leading to technological capacity (ability to adopt, modify and develop technology) enhancement in the host country. Regarding technology transfer in a developing country context, two particularly interesting studies are Lall (1993) and (1992).

[viii]For a detailed description of this framework, see (Sutter 2003).

[ix]The article goes more into depth in the analysis of China and Kenya, as an illustration of method and factors influencing local assessment of different technologies.

[x]"Common but differentiated responsibilities" is cited from Article 3.1 (on principles) from the United Nations Framework Convention on Climate Change, which was adopted in 1992.

[xi] The UNFCCC secretariat, in collaboration with UNEP Risoe, is developing a SD tool. The voluntary tool is also undergoing an iterative process of selected peer review to ensure the sufficiency and robustness of the criteria (questions) and indicators (answers). Refer to UNFCCC (2012a) and UNFCCC (2012b).