



# Sustainable development benefits of clean development mechanism projects A new methodology for sustainability assessment based on text analysis of the project design documents submitted for validation

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## ABSTRACT

The clean development mechanism (CDM) is part of the global carbon market developing rapidly in response to global warming. It has the twin objective to achieve sustainable development (SD) in host countries and assist Annex-1 countries in achieving their emission reduction targets in a cost-efficient manner. However, research has shown that trade-offs between the two objectives exist in favour of cost-efficient emission reductions and that left to the market forces, the CDM does not significantly contribute to sustainable development. The main argument of the paper is the need for an international standard for sustainability assessment—additional to national definitions—to counter weaknesses in the existing system of sustainability approval by designated national authorities in host countries. The article develops a new methodology, i.e. a taxonomy for sustainability assessment based on text analysis of the 744 project design documents (PDDs) submitted for validation by 3 May 2006. Through analysis of the SD benefits of all CDM projects at aggregated levels, the strengths and limitations of the taxonomy are explored. The main policy implication of the research is to propose the taxonomy as the basis of an international verification protocol for designated operational entities (DOEs) for reporting, monitoring and verifying that potential SD benefits described in the PDDs are actually realized.

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## 1. Introduction

Political differences between the North and the South over the framing of global climate change and sustainable development as an environmental or a development problem are reflected in the clean development mechanism's (CDM) double aim to achieve sustainable development (SD) in developing countries and cost-effective reduction of greenhouse gases (GHGs) in developed countries. In Marrakech 2001 at the annual Conference of the Parties (COP-7) to the Climate Convention and the Kyoto Protocol, where the main part of the 'rule book' for operating the CDM was decided upon, the responsibility for achievement of SD was delegated from the international to the national level in host countries. Rather than setting international standards for SD, which developing countries argued would impinge on their sovereignty, designated national authorities (DNAs) in developing countries are mandated to issue a letter of approval (LoA) or reject CDM projects according to each country's own national SD criteria.

Since the COP-7, issues about the CDM's contribution to SD have not directly been addressed in international policy negotiations but have rather been repackaged and addressed more indirectly in debates such as programmatic CDM<sup>1</sup> (Baron and Ellis, 2006; Bosi and Ellis, 2005; Bradley and Baumert, 2005; Figueres, 2005a, b; Sterk and Wittneben, 2005) and how to promote a more equitable distribution of CDM projects (Jung, 2006). In a recent review of the research literature on how the CDM contributes to SD, it was found that, left to market forces, the CDM does not significantly contribute to SD (Olsen, 2007). At the heart of the CDM's inability to achieve SD is the existence of trade-offs

<sup>1</sup> At COP/MOP-1 in Montreal, December 2005, a decision on programmatic CDM (par. 20) brought together three previously discussed concepts; sector, policy and private sector-based initiatives. The common idea of these concepts is to overcome weaknesses of the current project-approach limiting the scope of the CDM. Shortly described the aim is to broaden the scope of the CDM by using sector or policy standards rather than project baselines. For example a target can be set for mixing bio-fuels into petrol or promoting a certain share of energy sources coming from renewable sources. The concept of programmatic CDM is not only relevant for the current Kyoto regime 2008–12 but has also opened discussions on the principles for future post-2012 commitments including both developing and developed countries. A fast-growing body of literature has developed up to COP/MOP-1 and afterwards discussing the methodological challenges of implementing programme CDM project activities and its future potential.

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between carbon benefits valued in the carbon market and non-carbon benefits such as SD benefits that are not monetized in the carbon market (Kolshus et al., 2001; Sutter, 2003). To address the problem several researchers and policy actors have proposed an international standard for measuring and monitoring the CDM's sustainability contribution (Cosbey, 2006; Cosbey et al., 2005; Sutter and Parreño, 2007).

However, as yet no such methodology for sustainability assessment of all CDM projects at the global level exists. Furthermore, the potential merits and drawbacks of an international sustainability standard are contested. This article argues for the need of an international standard for sustainability assessment additional to national definitions. According to Article 12 of the Kyoto Protocol stating the twin objective of the CDM, the achievement of SD in developing countries is an equally important objective as reductions of GHGs. Hence, we argue that SD benefits should be 'real'—even if they are not 'measurable'—as GHG reductions are.

The article develops a new methodology for sustainability assessment of all CDM projects globally. Based on text analysis of 744 project design documents (PDDs) submitted for validation by 3 May 2006 the SD benefits of all the CDM projects are assessed. The findings describe *how* CDM projects at an aggregated level contribute to SD. As the nature of the methodology is qualitative there is *no* basis to conclude *how much* the CDM contributes to SD.

The article is structured to propose and illustrate the scope and limitations of a taxonomy for assessment of SD benefits as a way to address the problem of the CDM's poor performance with regard to achievement of SD in developing countries. First, weaknesses in the existing practices of how DNAs define and approve CDM projects' sustainability contribution are identified. A taxonomy is developed and the findings of applying the taxonomy are presented. Policy implications are discussed and finally the article concludes that the taxonomy can be used as an international standard for qualitative sustainability assessment to support verification on whether or not potential SD benefits are actually realized.

## 2. Designated national authorities—practices for approval of CDM projects

Since Marrakech in 2001 and especially since Russia's ratification allowing the entering into force of the Kyoto Protocol on 16 February 2005, the main global uncertainties have been clarified, and several countries in Asia, Africa, the Middle East and Europe have embarked on institution building to manage and approve CDM projects. However, development of host country institutions is not a new process as it has been going on since the early phase of activities implemented jointly from 1999 and onwards (Michaelowa, 2002) supported by capacity development initiatives (Michaelowa, 2004). By 11 August 2006 there were 107 DNAs globally; 88 DNAs in developing countries and 19 DNAs in developed countries (UNFCCC, 2006).

### 2.1. Global overview of DNAs

In a global overview of DNA's from different regions *Latin America* has the advantage of an early start but according to Figueres (2004) this has not resulted in strong institutional frameworks. *Asia's* DNAs are generally younger but development differs highly from one country to another. Some are leading globally (India and China) and others have just started or are in the process of institution building (Thailand, the Philippines and Indonesia). *Africa* expects and receives little CDM investment but partly due to capacity development support, a substantial number

of countries (18) have established DNAs (Wittneben, 2005). In the *Middle East and North Africa*, a few countries have established DNAs (Morocco, Egypt and Tunisia) but since the entering into force of the Protocol more countries have decided to reap the benefits of the emerging carbon market and are now beginning to establish CDM offices. *Southern-Eastern Europe and Countries in Transition* is the region furthest behind in CDM institutional development. Only a few countries in this region have designated DNA contact points and only one of them is operational with fully-fledged SD criteria and approval procedures (Findsen and Olshanskaya, 2006). Annex-I countries that have ratified the Kyoto Protocol are also required to establish DNAs in order to participate in the CDM. Before registering a CDM project, a LoA is needed from the host country. Until a LoA from the buyer country is issued, the project is unilateral. When a LoA from the buyer country is signed, the project is considered bilateral.

### 2.2. Sustainable development criteria and processes for approval of CDM projects

Analysis of the practices of DNAs with regard to their functions, institutional and legal set-up do exist overall (Michaelowa, 2003; Jung, 2006), for Africa (Winkler et al., 2005; Wittneben, 2005) and Latin America (Figueres, 2002, 2004). However, focusing on practices for sustainability assessment and approval processes and including all regions, the information is more scattered and only a few sources exist from the 'grey literature' (Pitayataratorn, 2006). The following assessment draws on data available on the internet describing the operation of selected DNAs in addition to existing studies. The assessment looks at examples of DNA practices in the two largest host countries—in terms of the number of projects in the validation pipeline—in Asia and Latin America as well as the largest DNAs in Africa, the Middle East and Europe. Table 1 provides an overview for comparison of SD criteria, other project eligibility criteria, documentation required and approval processes between regions and countries.

The most commonly used approach to the establishment of SD criteria among the seven selected host countries is the checklist approach. However, the definition of criteria differs from one country to the other. India, South Africa and Morocco each define their domestic SD criteria along three or four dimensions of SD. Brazil and Mexico also use a checklist of sustainability criteria but based on existing policies such as the qualitative threshold that CDM projects must at least meet. China on the other hand uses a different approach that discriminates between CDM projects based on project types. The reason for favouring project types in the priority area is that these are seen to support domestic environmental and energy policies. Chemical gas-based CDM projects, such as N<sub>2</sub>O, HFC and PFC reductions with few inherent SD contributions, are negatively discriminated by high taxes. Levies are pooled in a clean development fund with the aim of supporting SD in other ways.

The use of other eligibility criteria for approval of CDM projects varies significantly between countries. India, South Africa and Armenia make no other requirements for the approval of CDM projects, whereas China is protective of its right to emit GHGs and does not allow foreign investors a majority share of CER revenues. Intermediate are Brazil and Mexico with various additional requirements, e.g. for the annual monitoring of CERs produced. At international level the designated operational entities (DOEs) are required to validate and verify that GHG reductions are 'real and measurable' and the information is publicly available on the UNFCCC website. Therefore it seems superfluous to demand this information also at national level. Differences in the use of other

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