

## **The Clean Development Mechanism in Africa – Potential and Limitations**

*Christof Arens, Dagmar Kiyar and Wolfgang Sterk*

Many experts and scholars have reflected on the inequitable distribution of CDM projects and have come up with both analyses of the situation as well as with suggestions for possible solutions. This paper takes stock of the existing material and tries to evaluate the suggestions and their possible effects. The underlying hypothesis is that a market-based instrument like the CDM might not be suited to achieving a balanced distribution of projects, and that additional measures may have to be considered to achieve a balanced clean development in every part of the world.

In a first step, we look at the current situation of the CDM with regard to the distribution of projects. We then make an attempt to assess Africa's CDM potential and correlate it with the numbers of inhabitants and the region's level of CO<sub>2</sub> emissions. In the next chapter, we sum up the different barriers to an equitable distribution of CDM projects. We then juxtapose the barriers and the solutions as suggested by the different authors and check their compatibility and consistency, e.g. whether every barrier matches with a solution. Finally we evaluate the options for solution and review them in the context of the hypothesis from the beginning. We conclude that the CDM as market-based instrument might not be suited for achieving a balanced distribution of projects. The CDM potential in Africa should be explored and the ongoing initiatives for capacity building need to be continued, reinforced and adjusted. However, additional measures outside the UNFCCC process should be taken up in order to support clean development in Africa.

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## 1 Introduction

Very few African CDM projects have been registered so far: as of June 2007, there were only 20 projects on the African continent, whereas in Latin America and the Caribbean there were 259 and in the Asia and the Pacific region there were 405 projects (UNFCCC 2007).

Yet there is potential for CDM projects in Africa, e.g. in the continent's natural resources and the associated processing industry as well as in alternative and decentralized energy production. There is further potential in afforestation and reforestation, though there are specific barriers for and also concerns about this project type.

Concerns about the unequal distribution of CDM projects have been voiced for several years already. At COP/MOP 1, Parties as well as the public were therefore requested to submit their views on equitable distribution of CDM projects as well as suggestions to the CDM Executive Board. A summary of this input was presented to the COP/MOP 2 in Nairobi, which took note of the results and encouraged Annex I Parties to support the African countries to improve their level of participation in the CDM (UNFCCC 2006a+b). In Nairobi, the then UN secretary general Kofi Annan launched the so-called Nairobi Framework, an initiative for the better inclusion of developing countries, especially in Sub-Saharan Africa, in the CDM.

This paper reflects on the ongoing discussion. After a brief look at the status quo and the possible potential for CDM projects in Africa, we sum up the barriers identified by the different contributors as well as the suggestions to overcome them. We then evaluate the suggestions as for their feasibility and discuss further strategies on how to deal with the issue of equitable distribution of CDM projects.

## 2 Status Quo: CDM in Africa

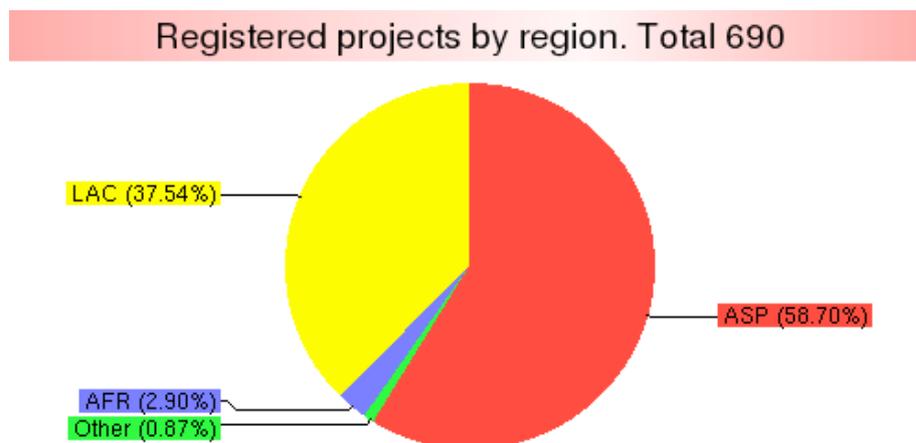
The total number of registered CDM projects worldwide is rising steadily: 690 projects have so far been registered with an expected CER volume until the end of 2012 of 940 Million (figures as of 05-06-2007). However, the geographical distribution remains uneven. Nearly 60% of all CDM projects are located in Asia and the Pacific and 38% are located in Latin America and the Caribbean. Only about 3% are located in African countries. Figure 1 and Table 1 illustrate the imbalance.

Table 1: Geographical distribution of registered CDM projects

Region	Number of projects
Africa	20
South Africa	10
Asia and the Pacific	405
Latin America and the Caribbean	259
Other	6
<b>Total</b>	<b>690</b>

Source: UNFCCC (2007)

Figure 1: Registered projects by region



<http://cdm.unfccc.int> (c) 05.06.2007 16:12

Source: UNFCCC (2007)

And the trend continues: with regard to projects in the CDM pipeline, the same tendency can be observed, see Table 2.

Table 2: Overview of projects in the pipeline, Status: 31. May 2007

Total in the CDM Pipeline	Number		kCERs	2012 kCERs		Population	2012 CER per cap.
Latin America	556	27,5%	52002	332190	16,5%	559	0,59
Asia & Pacific	1391	68,8%	262122	1554799	77,4%	3529	0,44
Europe and Central Asia	17	0,8%	1009	5986	0,3%	149	0,04
Sub-Sahara Africa	27	1,3%	11543	76984	3,8%	752	0,10
North Africa & Middle-East	31	1,5%	6920	39174	1,9%	278	0,14
<b>Total</b>	<b>2022</b>	<b>100%</b>	<b>333596</b>	<b>2009132</b>	<b>100%</b>	<b>5266</b>	<b>0,38</b>

Source: UNEP Risø (2007)

Table 2 shows that CDM projects in Africa continue to represent a low fraction of the current project pipeline.<sup>1</sup> Only 41 African projects out of 2022 projects world-wide are in the pipeline. They represent 97,065 kCERs expected cumulatively by 2012, which is only approx. 5% of the total kCER volume.

There are, however, arguments for moderation in the discussion over equitable distribution. Cosbey et al. (2006) correlated the host countries’ population and GDP with the CERs in the CDM pipeline. This approach was initiated by the idea that the countries enjoying the lion’s share of CDM investment also represent a major share of population, GDP and energy use among non-Annex I countries. The GDP-deflated distribution of CERs in the pipeline clearly shows a more equitable distribution of projects with Mongolia being the only country to achieve more than 10 percent of the GDP-deflated CERs, see Figure 2. China gets about 3 %, whereas it captured just under a third of the CERs in the unweighted pipeline.

Figure 2: GDP-Deflated Distribution of CERs in the Pipeline

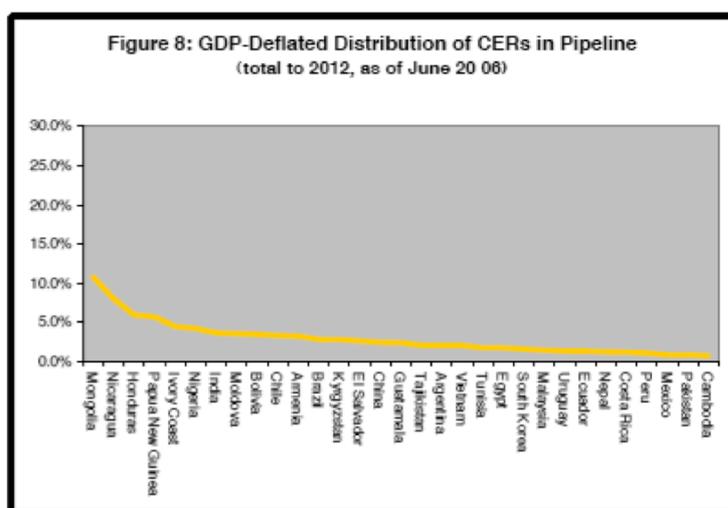


Fig. shows total CERs to 2012 of the top 31 countries, as of June 2006; Source: Cosbey et al. 2006

A similar conclusion can be drawn from the population-deflated distribution of CERs: here, only South Korea and Chile achieve more than 10 percent share of the deflated CERs, all other countries lie

<sup>1</sup> The figures include projects that are at least at the validation stage as well as those that have already been registered.

below this threshold (ibid). This insight is supplemented by Africa’s share in the global CO<sub>2</sub> emissions, see Table 3 in the following chapter. Africa accounts for only 3.57% of the total CO<sub>2</sub> emissions, which correlates directly with it’s 3% share of the globally registered CDM projects, cp. Table 1.

Looking from this angle, the distribution of CDM projects appears much less skewed. We are now going to look at the potential for CDM projects in Africa in order to assess the general framework for project opportunities on the continent.

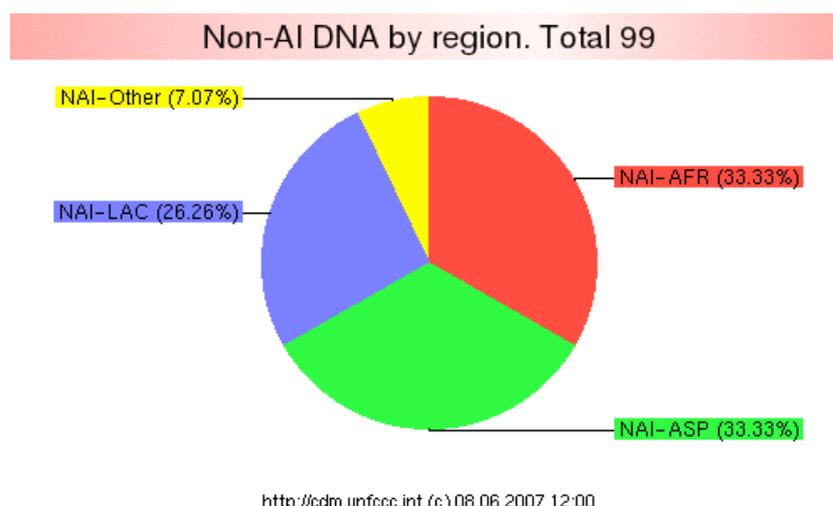
### 3 The CDM potential in Africa

As a large continent with a high political, geographical and economic diversity, it is difficult to make general assumptions about feasible CDM projects in Africa. In the following, we are going to present some data on Africa’s CDM potential; however, it has to be stated that there are no concise, detailed assessments of the region’s GHG mitigation potential.

Therefore we start the examination of CDM potential in Africa with a look at the current DNA situation. The establishment of a Designated National Authority (DNA) is a prerequisite for processing CDM projects. Thus, a look at the registered DNAs in Africa can serve as a first indicator where conducting CDM projects is at least theoretically possible.

As of 8 June 2007, 124 DNAs are in operation worldwide, 99 of which are located in the Non-Annex-I states. 33 or one-third of them operate in Africa, cp. Figure 3. There are, however, 61 African countries, 46 of which have ratified the Kyoto Protocol. Of these, 15 countries have still not established DNAs, which makes CDM project development in these countries impossible. However, the countries that are missing are mainly countries with relatively small populations and GHG emissions, CDM potential would therefore probably be limited in any case.<sup>2</sup>

Figure 3: DNA in Non Annex I Countries



Source: UNFCCC, CDM Statistics

<sup>2</sup> Cp. <http://cdm.unfccc.int/DNA/index.html>.

Another preliminary indicator for the region’s CDM potential is the amount of the continent’s GHG emissions. Table 3 gives a first overview of worldwide GHG emissions:

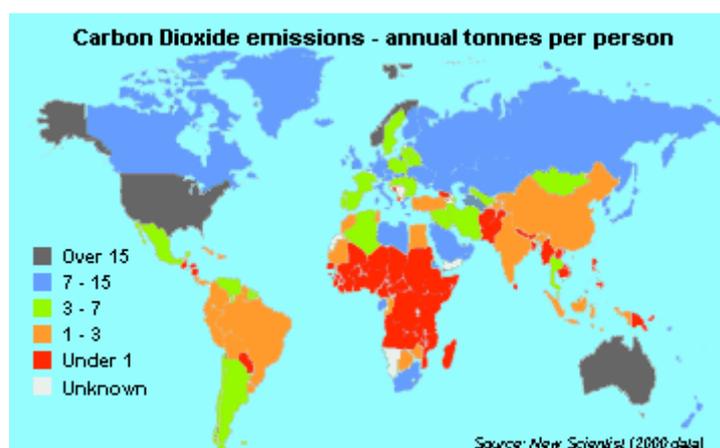
Table 3: GHG emissions in 2000

Region	GHG emissions 2000 (in Mt CO <sub>2</sub> )
Asia	7,819.4 (32.45%)
North America	6.320,0 (26.23%)
Europe	6.063.8 (25.16%)
Middle East	1,293,6 (5.37%)
Africa	859,9 (3.57%)
- South Africa	349.6 (1.45%)
- Egypt	125.9 (0,52%)
- Algeria	88.3 (0.37%)
- Nigeria	79.0 (0.33%)
South America	816.6 (3.39%)
Central America and Caribbean	507.6 (2.11%)
Oceania	367.5 (1.53%)
<b>World Total</b>	<b>24.098,4 (100 %)</b>

Source: WRI (2007)

Table 3 outlines the worldwide GHG emissions in 2000. Africa accounts for only 3.57% of the total emissions, with 40% of these emissions coming from South Africa, followed by Egypt, Algeria, and Nigeria. These figures give a first impression of Africa’s CDM potential. This observation is underlined by the breakdown of carbon dioxide emissions per person, cp. Figure 4. Clearly Africa has the lowest annual CO<sub>2</sub> emissions per person in the world.

Figure 4: Carbon Dioxide emissions – annual tonnes per person



Source: The National Energy Foundation (2007)

Low amounts of emissions translate into low amounts of potential of reducing emissions through the CDM. Moreover, most of the investing parties are only interested in projects that offer a certain minimum amount of emission reductions. As Cosby et al. (2006) explain, many investors from

Annex I countries tend to seek the “low hanging fruit”, i.e. the rapid generation of CERs in order to meet the first commitment period’s reduction targets. Furthermore, CDM projects with low amounts of emission reductions have significant difficulties to shoulder the transaction costs incurred through the CDM project cycle as these are fixed and the projects cannot profit from economies of scale (Sterk 2004).

Table 4 illustrates the African projects in the current CDM pipeline.

*Table 4: African CDM projects in the pipeline*

<b>Africa</b>	<b>Number</b>	<b>kCER2012</b>
South Africa	18	21043
Egypt	7	13803
Morocco	5	2153
Nigeria	2	25026
Tunisia	2	4125
Uganda	2	319
Equatorial Guinea	1	22632
Ivory Coast	1	5661
Tanzania	1	1112
Kenya	1	406
Senegal	1	784
<b>Total</b>	<b>41</b>	<b>97065</b>

Source: UNEP Risoe (2007)

Again, it becomes clear that the majority of projects is located in countries with higher emission levels, like South Africa and Nigeria. The North African states get such a good share not only because of their emissions levels but also due to a better general investment climate (cp. e.g. Bfai 2006) – which also holds for South Africa. This issue will be discussed in detail in section 4.1.

However, the currently very low levels of emissions in most African countries also mean that there is still substantial room for growth. Average global per capita emissions are currently about 4 t per year while in Africa they are only about 1.1 t. Africa has a population of about 851 million. If emission entitlements were to be distributed equally per capita, for Sub-Saharan Africa this would therefore yield an additional 2.9 t per capita or 2.5 Gt in total. If current global per capita emissions were to be cut by half to prevent dangerous climate change, for Sub-Saharan Africa this would still yield an additional entitlement of 0.9 t per person or 766 Mt in total (all figures from WRI 2007).

One reason for the currently low level of emission is that many Africans do not yet have access to basic energy services. Average energy use in Sub-Saharan Africa is 0.7 toe while the global average is 1.7 toe. It can be assumed that under business-as-usual conditions African energy needs would in the future be met mostly from emission-intensive sources. CDM projects could therefore aim at meeting this “suppressed demand” from low-emission sources. The CDM modalities and procedures make clear that “the baseline may include a scenario where future anthropogenic emissions by sources are projected to rise above current levels, due to the specific circumstances of the host Party.” (Decision 3/CMP.1, Annex, para 46) This approach has for example already been used in the Kuyasa low-energy housing project (PDD Kuyasa 2005).

## 4 Barriers to an equitable distribution of CDM projects

Africa is a very diverse continent and the reasons why there are so few CDM projects differ from country to country and from region to region. However, a number of reoccurring barriers marking a general trend have been identified by several experts. These include

- structural and institutional issues in CDM host countries
- CDM process issues in host countries
- issues relating to the international level

The most important of these barriers will be examined in detail in the following chapter.

### 4.1 Structural and institutional issues in CDM host countries

In general, it has to be stated that foreign investment tends to concentrate in countries that provide a conducive investment environment, i.e. **political and macroeconomic stability** and a robust institutional and administrative capacity. This trend is observed for the CDM as well. Capoor and Ambrosi (2006) point out that the African share of the global CDM Market is even lower than the share of African countries to developing nations in Foreign Direct Investment (FDI) over the past few years, which has been around 10%. For some African countries, the overall investment climate has improved recently; there are, however, still a lot of countries where armed conflicts and unstable regimes shake the basic fundamentals of political stability and which, as a result, make it difficult to invest in these countries. Niederberger and Saner (2005) have shown that the widespread assumption that CDM investment is closely related to FDI flows is too simplistic. Instead, CDM attractiveness to a large extent depends on creating an enabling framework for the CDM in terms of an effective DNA and CDM awareness and capacity in the business community. For example, Chile, Costa Rica and Mexico promoted the CDM at a very early stage and as a result had in 2005 attracted a greater share of CDM investment than the FDI giant China. India also rates relatively poorly in FDI flows but has today by far the most CDM projects. Niederberger and Saner conclude that this issue is not yet well understood and that it needs further analysis (ibid). Nevertheless, it has to be said that a number of African countries suffer from civil unrest and war, others rate very bad in the corruption indices and investment climate tables. These conditions make investment in general quite unlikely.

Another important prerequisite for foreign investment in general is a **clear, stable and enabling legal framework**. This refers to, inter alia, complexity and transparency of the existing laws. It is of equal importance that basic legislative conditions remain stable and enforced, especially when considering the long lifetime and crediting period of CDM projects. Further issues regarding enabling factors in legislation are described in section 4.2.

Key factors for foreign investment are **financing possibilities** and the **tax framework** in general. A simple and transparent tax system will obviously have a vital influence on the decisions of investors. Furthermore, import tariffs or other fiscal means can hamper the economic attractiveness of a (CDM) project to a great extent. Other prohibitive factors include the lack of access by project hosts to (low-rate) capital, gaining acceptance by national financial institutions of carbon finance and related instruments as valid 'currency' (Pembleton 2006). The CDM-related aspects of this complex will be dealt with in section 4.2.

As highlighted in the previous chapter, many African countries also face the challenge that their relatively **low level of industrialisation and energy consumption** leads to a limitation of their CDM potential.

## 4.2 CDM process issues in host countries

A key national factor is often referred to as **CDM awareness**. Often, CDM host countries, in particular Least Developed Countries (LDCs), lack information and appropriate knowledge on the CDM. This can lead to, for example, policymakers introducing laws and regulations that stifle growth in the CDM sector: Ellis & Kamel (2007) report in this context on some host countries that have introduced a minimum price for CERs rather than leaving it for the market forces to determine it. Moreover, the **CDM capacity** plays an important role for project development. Often, there is not enough CDM-specific experience and capacity for project preparation, related to both institutions and man-power. CDM capacity also refers to the existence and effectiveness of CDM institutions, see below.

A prerequisite for hosting a CDM project is the existence of the **CDM-related institutional framework**, cp. chapter 3. Apart from the pure existence of these institutions, their **effectiveness** is decisive. Ellis and Kamel (2007), for example, stress two factors for a successful “Kyoto framework”:

1. CDM-related institutions should possess adequate information on the CDM modalities and procedures.
2. Institutions should have the mandate and ability to take actions facilitating the completion of CDM transactions in a timely and transparent manner.

The main CDM-related institution is the Designated National Authority, DNA. Crucial factors for a **successful DNA** include adequate staffing, appropriate office equipment (which can be a difficult task in LDCs), clear internal guidelines and a regulatory framework through which the DNA can function (ibid). A problem relating to the second factor observed by Ellis and Kamel can be seen, for example, in Thailand: the cabinet must acknowledge decisions of the DNA, thus complicating and delaying a lot of processes, e.g. project approval (Anemüller et al. 2005).

Project validation and verification are undertaken by Designated Operational Entities. Validation and verification are often conducted by large international companies whose rates exceed the budget of local project developers. Many observers have pointed out that it would be preferable to rely on **local DOEs** that charge local rates; there is, however, quite often not enough trained staff at hand – see above – which in turn leads to a “complete dearth of DOEs” from LDCs (Cosbey et al. 2006).

As noted above, a **clear and consistent CDM policy** is crucial for successful participation in the CDM market: this requires first of all good communication both between the different actors and the various levels of government as well as within host country governments. Additionally, governments could start promotional initiatives to encourage investors and project developers to invest in particular host countries (Ellis & Kamel 2007). Legal aspects such as a clear policy on the legal status and ownership of CERs also contribute to making project conduction easier (ibid). A further issue are supportive / hampering laws and regulations; for example, private-sector independent power producers are frequently excluded from feeding electricity into the grid; this leads to the complete failure of many renewable energy projects (see, e.g., Arens 2006).

The CDM project cycle causes high **transaction costs**, especially for small-scale projects. The majority of them are incurred up-front while the carbon revenue will only flow back after the project

has been registered and the credits issued. This proved to be a major hurdle to a lot of SSC projects and for poor developing countries (see, e.g., de Gouvello & Coto 2002 and Cullis 2006).

### 4.3 Issues relating to the international level

The **lack of appropriate methodologies** suitable for projects in LDCs remains a constant challenge. An approved baseline methodology is a precondition for the CDM Executive Board's project approval. Africa has, for example, a high potential for **afforestation and reforestation** projects ("sink projects"); yet these projects face a lot of barriers, among them the complexity of the preparation of methodologies or the lack of land-use records that could prove that the respective land had no forest at the end of 1989, a prerequisite for the eligibility of a sink project (Desanker 2005). Apart from that, replacing unsustainable fuelwood with **sustainable biomass**, biogas or solar energy is a promising project activity for Africa. However, the eligibility of these projects has been under discussion for almost two years now due to methodological issues. This process is still pending as MOP 2 in Nairobi was unable to resolve the issue; the EB is to make suggestions on a new methodology to MOP 3 (Sterk et al. 2007).

One also has to note that there were **delays in developing guidance**, e.g. for the so-called "Programmes of Activities", an important project type for LDCs. This concept was adopted at COP/MOP1 in December 2005; however, it took one year to develop initial guidance for project developers. There is still no agreement on subsequent guidance, or on the required forms for submission to the validator.

Another issue is the tendency of buyer states to look for **attractive high-CER generating projects which quickly deliver credits**. Renewable energy projects or other project types that could be conducted in Africa yield relatively few emission reductions over a long time period, thus again putting the region at disadvantage.

A final issue relating to the international level is the perceived **uncertainty about the future of the CDM**, the development of carbon prices and the general climate policy framework after the end of Kyoto Protocol's first commitment period in 2012. This constellation puts certain project types at disadvantage, for example those with a long lead time, e.g. hydro electricity systems or forestry projects with low levels of credit generation in early years (Ellis and Kamel 2007). It also reinforces the tendency to focus on low-cost high-yield projects since more difficult projects would require post-2012 CERs to be viable.

**On the whole**, CDM project developers in LDCs and especially in Africa face many barriers, some of which are fundamental in nature. Some of the obstacles can be overcome by the project developers themselves, others can be dealt with on host country level, cp. next chapter. Some barriers need to be addressed at the international level, which generally takes a lot of time. Other hurdles, however, cannot be solved within the framework of the UNFCCC.

## 5 Options for action

As became clear in chapter four, there are many barriers hampering equitable distribution of CDM projects worldwide. These obstacles occur at various stages of project development and on different levels. In order to overcome the barriers, action by different actors is needed using various means.

In order to examine the proposed solutions in the context of the barriers they are addressing, we chose to juxtapose the most important barriers and suggested measures in the form of tables. Consequently, the structure of this chapter follows the one of the previous chapter.

### 5.1 Structural and institutional issues in CDM host countries

Barrier	Measure	Actor responsible
Political and macroeconomic stability	These require to be tackled in the broader context of promoting economic and social development by other relevant fora (e.g. International Financial Institutions, the Commission on Sustainable Development (CSD), international public and private investment institutions, ODA and development institutions	Host country governments, international community
Clear, stable and enabling legal framework	<ul style="list-style-type: none"> <li>▪ Ensure that laws are stable and enforced;</li> <li>▪ Make sure that legislation is enabling and unambiguous</li> </ul>	Host country governments
Financing possibilities / tax framework	<ul style="list-style-type: none"> <li>▪ Encourage/develop an enabling investment climate with stable fiscal and regulatory regimes</li> <li>▪ A more active, well-established formal private sector</li> <li>▪ Dedicated loan facilities</li> <li>▪ Reduce participation/ownership restrictions on foreigners (see also next section)</li> </ul>	Host country governments, banks, business associations, international community
Low level of industrialisation and energy consumption	<p>Choose appropriate baseline, e.g. taking into account “suppressed demand”, i.e. enable poor communities to gain access to increased energy consumption in a „clean“ way rather than through fossil fuels (Cullis 2006)</p> <p>Development of projects reducing GHG not related to energy consumption, i.e. landfill gas (to energy) projects</p>	Project developers

## 5.2 CDM process issues in host countries

Barrier	Measure	Actor responsible
CDM awareness	<ul style="list-style-type: none"> <li>▪ Awareness promotion programmes: for policy makers, private sector, regional/sub-regional/national + business institutions to invest in CDM;</li> <li>▪ Hold African regional and sub-regional carbon expos;</li> <li>▪ Fora to share experiences + best practices, like under the Nairobi Framework</li> </ul>	Host country governments, media, educational bodies, project developers, industrialised country governments
CDM capacity	<ul style="list-style-type: none"> <li>▪ Capacity building: sub-regional / regional level</li> <li>▪ Technical assistance for countries entering the CDM late to help them</li> </ul>	Host country governments, media, educational bodies, project developers, industrialised country governments
CDM-related institutional framework	<ul style="list-style-type: none"> <li>▪ Develop a structured and transparent CDM approval process</li> <li>▪ Ensure that project approval is given within an acceptable time frame</li> </ul>	Host country governments, media, educational bodies, project developers, industrialised country governments
Successful DNA	<ul style="list-style-type: none"> <li>▪ Using the DNA forum to share good practices and lessons learned;</li> <li>▪ Regional DNA forum for Africa (cp. Nairobi Framework)</li> <li>▪ Multilateral organizations could take on a service-provider role for certain countries</li> </ul>	Host country governments, international organisations, industrialised country governments
Lack of local DOEs	<ul style="list-style-type: none"> <li>▪ Establishment of developing country DOEs</li> </ul>	Host country governments, UNFCCC, industrialised country governments
Clear and consistent CDM policy	<ul style="list-style-type: none"> <li>▪ Provide adequate communication between the different actors involved</li> <li>▪ Promotional activities</li> <li>▪ Remove hampering laws or subsidies</li> </ul>	Host country governments
Approved methodologies and baseline data	<ul style="list-style-type: none"> <li>▪ Pursue CDM Programmes of Activities</li> <li>▪ Define relevant and efficient procedures with better emission inventories and baseline data</li> </ul>	Host country governments, regional or municipal governments, project developers, industrialised country governments
Transaction costs	<ul style="list-style-type: none"> <li>▪ Tax incentives (Cosbey et al. 2006)</li> <li>▪ Premium purchasing, e.g. Gold Standard</li> <li>▪ Dedicated funds</li> <li>▪ Upfront financing</li> <li>▪ Use local DOEs</li> </ul>	Host country governments, International or national carbon funds, project developers
Buyer states seek low-cost high-yield projects which quickly deliver credits	Unilateral projects, landfill gas to energy-projects, cement production projects	Host countries, project developers

### 5.3 Issues relating to the international level

Barrier	Measure	Actor responsible
Lack of appropriate methodologies	<ul style="list-style-type: none"> <li>▪ Develop simplified versions of some data-intensive methodologies</li> <li>▪ define relevant and efficient procedures with better emission inventories and baseline data</li> </ul>	Project developers, EB, UNFCCC
Delays in developing guidance	Try speeding up decision making	UNFCCC, international negotiators
Uncertainty about the future of the CDM	<ul style="list-style-type: none"> <li>▪ Clear signal that the CDM will have a future post 2012</li> <li>▪ Purchase post-2012 CERs</li> <li>▪ Clarify eligibility of post-2012 credits within EU-ETS</li> </ul>	International negotiators, buyer governments, EU,

### 5.4 Summary

The tables make clear that there has been at least one solution proposed for every perceived problem. However, when taking a closer look, some barriers are connected to the concept of a market-based mechanism, e.g. the problem that many LDCs have low levels of energy consumption and thus a limited emission reduction potential. Other hurdles cannot be tackled at UNFCCC level, like political and macroeconomic stability of a host country. In the next section, we are taking up these insights and draw a number of conclusions.

## 6 Conclusions

In this paper, we looked at the geographical distribution of CDM projects and some of the reasons why CDM investment might be inequitable in a global perspective. We saw that the general concern over equity of distribution might have to be viewed with moderation, when correlating the distribution of CERs with figures like GDP, population and GHG emissions level. For example, Africa accounts for 3.57% of total GHG emissions. This correlates with the continent's share of the registered CDM projects worldwide, which is 3%. Furthermore, international investments are in general primarily directed into newly industrialising countries, which provide political and macroeconomic stability as well as high-yield, low-cost CDM opportunities. As a consequence, areas like Sub-Saharan Africa are left behind – not only as regards their share in the CDM, but as regards FDI in general.

Nevertheless, the currently very low levels of emissions in most African countries also mean that there is still substantial room for growth. Many Africans do not yet have access to basic energy services and it can be assumed that under business-as-usual conditions these energy needs would in the future be met mostly from emission-intensive sources. CDM projects could therefore aim at meeting this “suppressed demand” from low-emission sources. The baseline of a CDM project may in fact include a scenario where future emissions are projected to rise above current levels.

We then examined further barriers that hamper investment in CDM projects in the region as well as the measures that could be taken in order to change this. It turned out that while some of the suggested solutions could be tackled at host country level, others would need to be addressed by the international climate regime, such as the lack of methodologies or guidance for particular project types. Some of the issues raised, in particular those relating to general political and macroeconomic stability, cannot to be dealt with inside the UNFCCC process.

Fostering clean development in Africa needs to be pursued along various lines. Two different basic strategies can be distinguished: making the carbon market work better for Africa and pursuing options outside the carbon market.

As for the first strategy, various measures can be taken to promote a wider use of the the CDM in Africa. The ongoing initiatives for capacity building and awareness raising need to be continued, reinforced and adjusted. These initiatives must account for the region's diversity. Host countries or blocks of host countries need to follow a pro-active, sub-regional or regional approach for developing and marketing projects. The possibilities for unilateral projects should be considered as these provide space for bottom-up initiatives without having to wait for international investors. The lack of appropriate methodologies and delays in developing guidance must be tackled – even though for some of them this will take a considerable amount of time. Last but not least, the international negotiations need to provide a clear signal that there is future for the CDM after 2012.

Nevertheless, as a market-based mechanism, the CDM can be expected to continue to focus on regions where investment conditions are best. Some have therefore suggested to develop a fourth mechanism for the Kyoto Protocol, complementing Emissions Trading and CDM/JI. This fourth mechanism would work similar to the CDM but would focus on particular agreed types of projects, such as small-scale, community-based projects. It could also focus on particular sectors, such as renewable energy or transportation (Cosbey et al. 2005). This approach would take up some existing initiatives, like the World Bank's Community Development Carbon Fund (see [carbonfinance.org/cdcf/home.cfm](http://carbonfinance.org/cdcf/home.cfm)).

Since such a mechanism would by definition focus on emission reduction potential that is not easily accessible by the market, costs would probably be higher and the demand for the credits would in consequence probably need to come mainly from the industrialised country governments. To make it viable, governments would therefore need to commit to promoting this mechanism and sourcing a certain amount of their purchases from this source. The new project type of Programmes of Activities might be an opportunity to move in this direction. For post-2012, this discussion could also tie in with the discussions about a sectoral or policy-based CDM (Sterk/Wittneben 2006).

Moreover, measures outside the climate regime could be explored. One possibility would be developing emission reduction projects which do not follow the CDM but rely on schemes for voluntary reductions of emissions; Cullis (2006) shows that this can be a way for reducing transaction costs while still ensuring the environmental integrity of such projects. The Gold Standard has recently published a set of evaluation criteria for voluntary offset projects which support this approach (The Gold Standard 2006).

Nevertheless, all these different incarnations of the carbon market cannot be expected to achieve clean development on their own. Other avenues for mobilizing financing for Africa outside the carbon markets should therefore also be explored. Considering the strong linkages between development goals and climate change objectives, there should be a way for additional ODA to support clean development, particularly in least developed countries like in Sub-Saharan Africa. Another possibility might be to structure GEF financing complementary to the CDM, i.e. to have the GEF focus on countries where the CDM does not perform.

All these approaches should be pursued. Africa belongs to the regions most severely suffering from climate change and it needs sustainable development. In what way development aid and technology transfer get there, plays a subordinate role.

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**Contact:**

**Christof Arens**

**Tel.: +49-(0)202-2492-170 (-129 Secretariat)**

**Email: [christof.arenst@wupperinst.org](mailto:christof.arenst@wupperinst.org)**

**Wuppertal Institute for Climate, Environment and Energy GmbH**

**Döppersberg 19 - 42103 Wuppertal - Germany**

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**Internet:**

**German:**

**[www.wupperinst.org/jiko](http://www.wupperinst.org/jiko)**

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