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From Rhetoric to Reality: Promoting Sustainable Development through the CDM

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Abstract

The Clean development mechanism is one of the market based flexibility mechanisms designed under the Kyoto Protocol with the dual objectives to assist developed countries in achieving their greenhouse gas emissions reduction targets cost-efficiently by investing in projects promoting sustainable development in developing countries. However, it has failed to deliver its sustainable development promise mainly due to defects in its legal design in particular and the structural flaws in the overall Kyoto Protocol legal design. The purpose of this study is thus to demonstrate the failure of this mission, to examine the causal factors for the failure with a view to outline solutions for the post-Kyoto period. A wide range of secondary as well as primary sources are consulted to substantiate the study, taking Africa in general and Ethiopia in particular as a context.

1. Introduction

The raise of global warming due to anthropogenic greenhouse gas (GHG) emissions and its concomitant adverse effect on climate change has become a global concern. The opening words of the preamble of the United Nations Framework Convention on Climate Change (UNFCCC) have recognized this phenomenon as a common concern of humankind. In order to tackle this concern, the UNFCCC set as its ultimate objectives to stabilize greenhouse gas (GHG) concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system and to enable economic development to proceed in a sustainable manner.[1] GHG emission and sustainable economic development are thus the two leading objectives of the UNFCCC. To achieve these objectives, the UNFCCC and its subsidiary legislation – the Kyoto Protocol (the Protocol) committed member states to mitigate climate change by limiting their respective anthropogenic GHG emissions, protecting and enhancing GHG sinks and reservoirs as well as by promoting sustainable development in accordance with their common but differentiated responsibilities and respective capabilities. In addition to their common duty to promote sustainable development, industrial countries (Annex I Parties) commit themselves under the UNFCCC to stabilize their GHG emissions at 1990 levels by the year 2000.[2] However, these commitments were voluntary and did little to establish firm emission reduction targets on Annex I Parties.[3] The Protocol filled this gap by committing Annex I Parties to mandatory reductions of GHG emissions by at least 5 percent in aggregate from the 1990 levels in the commitment period running from 2008 - 2012.[4]

On the other hand, developing countries (non-Annex I Parties) are required under both the UNFCCC and the Protocol to promote sustainable development without assuming any legally binding emission reduction targets.[5] Ethiopia, which belongs to the category of developing countries, is a signatory of these international agreements. As stipulated under the constitution of the Federal Democratic Republic of Ethiopia (FDRE Constitution), all international agreements ratified by Ethiopia are considered as an integral part of the law of the land.[6] Moreover, the FDRE Constitution has included the Ethiopian peoples' "right to improved living standards and to sustainable development" within the category of fundamental rights and freedoms.[7] In the provision dealing with "Environmental Objectives" the FDRE Constitution obligates the government, inter alia, to ensure that all Ethiopians live in a clean and healthy environment and to protect the environment.[8] Hence, the improvement of the living standards of the people within the framework of sustainable development has a firm constitutional basis in Ethiopia.

Similarly, both the UNFCCC and the Protocol linked developing countries' contribution towards climate change mitigation to their common obligation to promote sustainable development. Developing countries are not required to stabilize GHG emissions at a certain level. Rather, the UNFCCC acknowledges the incremental effect of achieving sustainable social and economic development on the energy consumptions of developing countries.[9] Sustainable development is viewed under the UNFCCC as a valuable end in its own right and as a crucially important instrument to the global success in combating climate change.[10]

According to Hodas, the UNFCCC can be "better understood as a sustainable development treaty than as merely an environmental treaty."[11] The objectives and principles of the UNFCCC set in Articles 2, 3 and 4(7) link Annex I Parties' compliance with their emission-reduction commitments to promoting sustainable economic development in and transfer of technology to developing countries.[12] The "twin objectives" of the CDM – reducing GHG emissions and promoting sustainable development are in accord with the objectives and principles set under the UNFCCC.

The UNFCCC further recognizes cost-effectiveness as a guiding principle stating that: "policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible cost."[13] In line with this principle, both the UNFCCC and the Protocol have not obligated developed countries to meet all their GHG emissions reduction targets through domestic actions. The underlying economic rationale is that requiring countries to meet their commitments domestically would make per unit GHG emission reduction more costly and would ultimately reduce the overall GHG emissions achievable.[14] As Mitchell notes, the environmental benefits of reducing or sequestering a ton of carbon dioxide are independent of where this occurs, but the corresponding costs of this reduction or sequestration vary significantly across countries.[15] With this rationale, the Protocol designed three market-based flexibility mechanisms[16] known as Joint Implementation (JI), CDM and Emission Trading (ET) with their corresponding emission units known as Emission Reduction Unit (ERU), Certified Emission Reduction (CER) and Assigned Amount Unit (AAU) respectively.[17] Through these different flexibility mechanisms, the Protocol has introduced the concept of carbon trade in the international market, which provides entitlement over GHG emissions reduction.

These flexibility mechanisms are designed to provide alternatives for developed countries to meet their emission reduction targets cost-efficiently.[18] The choice whether they should opt for one or more of these flexibility mechanisms or adopt domestic measures to meet their respective emissions reduction targets depends on the per unit cost of emission reductions of such choices.[19] Whichever option they opt for, developed countries are required to meet their emission reduction targets during the commitment period. The Protocol defined compliance in terms of the results states must achieve efficiently rather than the traditional 'command and control' approach, which defined compliance in terms of actions they must take.[20] Accordingly, the Protocol does not prescribe how emission reductions should be met, apart from proposing the three flexibility mechanisms as supplement to domestic action.[21]

The CDM, which is the focus of this study, is a project based engagement between Annex I and non-Annex I Parties that intends to enable the former to earn CERs resulting from projects promoting sustainable development in the territory of the latter.[22] It is the only flexibility mechanism that involves developing countries as a project partner. It was innovated by the Protocol with the "twin objectives" to assist developed countries in achieving compliance with their quantified GHG emission limitation and reduction targets, and to assist developing countries in achieving sustainable development.[23] These objectives are inseparable and equally important for the CDM.[24] These are the cumulative measures that

determine the successes and failures of the CDM.[25] Hence, sustainable development was not an "optional side benefit" to achieving emission reduction goals of the Protocol nor was it an empty promise made to appease developing countries.[26]

In practice, however, the contribution of CDM projects to sustainable development has become doubtful. The aim of this article is thus to examine the current state of the CDM from the perspectives of sustainable development taking Africa in general and Ethiopia as a particular focus of the analyses. The structure of the discussion proceeds as follow: section two provides a literature review on the concept of sustainable development. The third section evaluates the status of the CDM from the perspective of sustainable development with focus on Ethiopia. The fourth section proceeds to examine the major causal factors resulting in the CDM's failure in promoting sustainable development. The final section ends up with concluding remarks.

2. The Concept of Sustainable Development

Sustainable development is one of the most widely accepted concepts in recent development discourse. It has become a "foundational reference" of almost all academic works in the field of the environment and natural resources.[27] Since its formal adoption in the in 1992 Rio Declaration, the concept of sustainable development has become a central issue of the activities on the international, regional and national levels.[28] However, despite its wide acceptance in national and international policies as well as academic literature, no single precise definition has been given to it.[29] According to Elliott, more than 70 definitions of sustainable development were found in circulation by the early 1990s.[30] The diversity in the meaning of sustainable development is attributed to the existence of different beliefs about the natural world held in different societies, cultures and historical settings and at the individual level.[31] Different disciplines have influenced and contributed to the sustainability debate, 'each making different assumptions about the relation between environment and the human subject.'[32]

The absence of a precise definition induced some writers to characterize sustainable development as "political fudge"[33], "fashionable 'buzz word' ... in a vacuum",[34] and 'a "mantra" ... "principle for all seasons".[35] However, as Baker propounds the search for a unitary and precise meaning of sustainable development is the result of a mistaken view of the nature and function of political concepts such as sustainable development.[36] The precise definition of sustainable development remains an ideal, elusive (and perhaps unreachable) goal.[37] Sustainable development "is not about society reaching an end state, nor is it about establishing static structures or about identifying fixed qualities of social, economic or political life."[38] It is an incremental process.[39] With this in mind, Baker prefers talking about "promoting" sustainable development to "achieving" it because the former acknowledges sustainable development as an on-going process whose characteristics change over time, across space and location and within different social, political, cultural and historical contexts.[40] Acknowledging the existence of many mutually incompatible versions of sustainable development model,[41] Baker holds that the proliferation in the meanings and

applications of the term sustainable development does not undermine its usefulness; rather it reflects the complexity of issues that are invoked when development and environment are juxtaposed.[42]

The widely accepted definition of sustainable development is the one provided under the Brundtland Report, which defines the concept of sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs".[43] This definition encompasses two key concepts: the concept of 'needs', in particular the essential needs of the world's poor, to which priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs.[44] Even Brundtland envisions the possibility of variations in the interpretation of sustainable development with the proviso that such interpretation "must share certain general features and must flow from a consensus on the basic concept of sustainable development and on a broad strategic framework for achieving it."[45]

Some writers like Baker credited the Brundtland Report for addressing the links between the social, economic and ecological dimensions of development by creating a strong functional relationship between social justice and sustainable development and by acknowledging poverty as a major cause of environmental deterioration and the reduction in poverty as a precondition for environmentally sound development.[46] On the contrary, some writers like Richardson criticized the attempt made under the Brundtland Report to create links between environmental, economic and social dimensions of sustainable development.[47] For Richardson, the "anthropocentric and biocentric approaches" to development are "unbridgeable".[48] Hence, Richardson advocates either for the critical redefinition of sustainable development along purely ecological lines or else for the total abandonment of the term.[49]

However, the argument for redefining sustainable development along purely ecological lines does not seem defensible. Sustainable development involves a multiple of issues that cannot be encapsulated under a single discipline.[50] It is "a holistic and balanced ... framework" of development which "needs to integrate and reconcile the economic, social and environmental aspects."[51] It involves the triangular analysis of developmental issues from the economic, social and environmental perspectives.[52] The concept of sustainable development cannot be reduced to ecological sustainability.[53]

As Hopwood *et al.* noted, the first important use of the term sustainable development was started in 1980 in the World Conservation Strategy.[54] Its initial focus of was ecological, which subordinated economic growth to conserving living resources.[55] However, as Baker further notes, the focus of the new model of sustainable development is shifted from ecology to society, and its aim is to include environmental considerations in the steering of societal change, especially through changes to the way in which the economy functions.[56] Moreover, the new model of sustainable development challenges the conventional form of development, which simply equates development with modernization of the globe along Western lines.[57]

Taking quantitative economic growth measures such as GNP and GNP per capita growth as the only measure of development, the conventional model of economic development fails to recognize the relationship between economic, social and ecological systems.[58] The new model of sustainable development is a model of societal change that, in addition to the conventional (traditional) developmental objectives, has the objective of maintaining ecological sustainability.[59]

Most definitions of sustainable development encompass three interdependent pillars: environmental, economic and social.[60] Sustainable development is about steering societal change at the interface between these three dimensions or pillars.[61] It requires opportunities for improving economic, social and environmental systems.[62] It seeks "economic development that is ecologically sound, equitable as to both present and future generations, and promotes social welfare." [63] The objective of sustainable development is to achieve positive balance across all these three components.[64] These components or interdependent pillars of sustainable development are the litmus papers or indicators used to assess the sustainability of programs of activities like the CDM.

Economic development indicators include, inter alia, contribution to economic growth, balance of payments and foreign exchange benefits.[65] Whereas social development indicators encompass quantitative aspects such as impacts on local employment, extent and appropriateness of technology transfer, impacts on health status, impacts on awareness of environmental issues, impacts on resource distribution (e.g., income distribution); and qualitative aspects such as impacts on social structures, the extent of public participation and contribution to community empowerment, and effects on local cultures.[66] Environmental indicators, on the other hand, focus on the protection of the integrity and resilience of the ecological systems,[67] including genetic diversity and biological productivity.[68]

The issue how to strike a balance between the three components of sustainable development is a dynamic one. For developing countries, the improvement of the socio-economic status of the poor through poverty eradication, employment creation and a more equitable distribution of resources is one of the key development priorities.[69] As Munasinghe propounds, in situations where the majority of the world population lives under conditions of absolute poverty, a climate change strategy that unduly constrains growth prospects in those areas would be unsustainable.[70] Besides, social equity is considered as defining element of sustainability as highly skewed or unfair distributions of income and social benefits are less likely to be acceptable or lasting in the long run.[71] Environmental protection shall constitute an integral part of the sustainable development matrix and cannot be considered in isolation from it.[72] This symbiotic concept of sustainable development is adopted in the Brundtland Report. It rejects the definition of sustainable development along purely ecological lines by stating that "development involves a progressive transformation of economy and society."[73] It recognizes the satisfaction of human needs and aspirations as the major objective of development.[74] It further acknowledges both intergenerational and intra-generational equity as key elements of sustainable development.[75]

The UNFCCC and its subsidiary legislations have followed similar approach. Among others, the UNFCCC requires the Parties to "protect the climate system for the benefit of present and future generations of humankind" on the basis of equity and common but differentiated responsibilities.[76] The UNFCCC recognizes the promotion of sustainable development as the rights and duties of the Parities.[77] It urges the member countries, inter alia, to "[t]ake climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies, and actions, and employ appropriate methods" determined nationally.[78] The right to promote sustainable development as determined by the host Party itself is explicitly reiterated under the Protocol regarding JI and CDM.[79] The Bonn Agreements and the Marrakesh Accords further solidify the host Party's prerogative to confirm whether a given JI or a CDM project assists it in achieving sustainable development.[80] Each country has the prerogative to set its own agenda towards sustainable development.[81]

Hence, the UNFCCC and its subsidiary legislation have deliberately left the tasks of defining sustainable development to each of the Parties in line with their respective national policy priorities. This strengthens the view that sustainable development focuses on a contextual reconciliation and balancing of social, economic, and environmental law rather than the uniform application of formal and technical rules.[82] As mentioned earlier, the practical interpretation of the appropriate balance between the economic, social, and environmental equation may vary from country to country and from case to case.[83] Of course, as the Brundtland Report clearly indicated, sustainable development "must share certain general features and must flow from a consensus on the basic concept …and on a broad strategic framework for achieving it."[84]

Ethiopia's approach towards the concept of sustainable development is in line with the new model of sustainable development that attempts to integrate economic, social and environmental factors in the analyses. As mentioned earlier, the FDRE Constitution has explicitly recognized the peoples' "right to improved living standards and to sustainable development" as fundamental rights and freedoms.[85] Accordingly, in the recently adopted Growth and Transformation Plan (GTP)[86] and Green Economy Strategy[87], the Ethiopian government declared its intention to transform the country into a middle-income status by 2025 along a green economic trajectory. The Ethiopian Environmental Policy stated natural resources as the foundation of the country's economy.[88] The fate of the economy and the wellbeing of the Ethiopian people are closely linked to agriculture and the use of natural resources.[89] Similarly, in his forward to the GTP, the Ethiopian Minister of Finance and Economic Development put poverty eradication as the main development agenda of the Ethiopian government.[90] Rejecting accusations of land grab by foreign companies, the late Prime Minister of Ethiopia, Meles Zenawi, responded to the media: "We have 3 million hectares of unutilized land. We want to use all 3 million. We do not want to admire the virgin beauty of our land while we starve".[91] Hence, in the face of chronic poverty, the pressing need for optimizing natural resources utilization within the framework of sustainability has become a critical issue for Ethiopia. In this regard, can the CDM help Ethiopia to pursue sustainable development? To answer this question, it is important to examine the CDM

market structure from the perspective of sustainable development in the context of developing countries.

3. Assessing CDM from the Perspectives of Sustainable Development

As mentioned under the first section, the CDM was designed with the mutual aim to assist Annex I Parties in meeting their GHG emissions reduction and limitation targets cost efficiently and to assist non-Annex I Parties' transition to a more sustainable and less carbon intensive development path through the transfer of funds and/or low emission technologies.[92] The explicit inclusion of GHG emissions reduction and sustainable development as the mutual objectives of the CDM shows the Protocol's cautious stance against the assumption that all efforts undertaken to reduce GHG emissions are also important to promote sustainable development and vice versa.[93] In other words, sustainable development involves something beyond GHG emission reductions.

Hence, as stated earlier, the successes and failures of the CDM must be assessed in terms of the degree it tries to achieve simultaneously its twin objectives of reducing GHG emissions and promoting sustainable development.[94] The focus of this section is, therefore, to evaluate the status of the CDM from the perspectives of sustainable development. In fact, it is important to note that in the absence of a precise definition of sustainable development, the assessment of the CDM from the perspective of sustainable development is admittedly a difficult task.[95] Nevertheless, contrary to Dawson and Spannagle's view such difficulty cannot reduce the assessment into a mere value judgment.[96] The subjectivity of the assessment can be minimized by using widely accepted economic, social and environmental indicators of sustainable development as discussed in the preceding section.[97]

In literature there are two widely used benchmarks for assessing the contribution of the CDM to sustainable development: the types/quality of the CDM projects and the distribution of such projects among regions and countries.[98] The former benchmark involves the qualitative assessment of CDM registered projects in terms of their contribution to economic, social and environmental sustainability regardless of their geographical distribution and the latter involves the assessment of CDM projects in terms of distributional equity. The former investigates whether CDM registered projects deliver sustainable development in non-Annex I Parties and the latter further inquires whether such projects are fairly distributed across regions and countries.

It is important to begin the assessment with the type/quality of the projects. According to UNFCCC Statistics, there are 2510 CDM registered projects expected to generate on average 393,910,800 CERs per annum and greater than 1,850,000,000 certified emission reductions (CERs) until 2012.[99] From the 15 CDM eligible sector categories, while energy industries and waste handling and disposal both account above 80 percent of the total registered CDM projects activities, A/R account barely 0.57 percent.[100] As Dawson and Spannagle indicate, "over two-thirds of projects utilize either **renewable energy** (mainly biomass, hydropower, and **wind power**) or **energy efficiency** technologies, which are usually considered as the

types of technologies that contribute to sustainable development."[101] Whereas around one-thirds of the CDM projects mainly consist of end-of-pipe gas capture and destruction/transformation technologies known also as synthetic gases.[102] As Dawson and Spannagle further note, **"synthetic gases**, primarily HFC-23 destruction projects count for more than one-third of projected CERs to 2012."[103]

From the data presented above, it is possible to question the contribution of CDM registered projects to sustainable development. The so-called "end-of-pipe" projects represent around one-thirds of CDM registered projects. These projects have very little contribution to sustainable development "in terms of technology transfer, capital investment, employment, or community development" even though they are known to be cost efficient in terms of reducing emissions of gases with very high GHG effect.[104] The sustainable development benefits of these projects are very low since they are "end-of-pipe" solutions for a small number of companies.[105] In fact, in terms of GHG emissions reduction, these projects are highly cost-efficient.[106] They "have the potential to produce up to 1.3 billion CERs by 2012, at an average cost of €1/CER".[107] As Kneteman and Green put, "one HFC-23 capture project can deliver as many CERs as nearly 200 biomass energy projects."[108] This is what makes HFC-23 "more attractive to most CDM investors despite its much lower contribution to local sustainable development."[109]

Turning to the assessment of CDM projects from the perspective of distributional equity, studies indicate that out of the five major UN developing country regions, only two regions (Asia-Pacific and Latin America and the Caribbean) dominate the CDM pipeline and account for approximately 95 percent of projects and of expected CERs generated until to 2012.[110] Both regions account well above 97 percent of the total CDM registered projects whiles Africa accounts only for 1.91 percent.[111] The distribution is further skewed in favour of a handful of carbon-rich developing countries.[112] China, India, Brazil and Mexico host above 75 percent of overall CDM registered projects.[113] Africa has a marginal share in the CDM market, which accounts for 1.91 percent of the total CDM registered projects.[114] Excluding South Africa, sub-Sahara Africa accounts only for 0.5 percent of total CDM projects.[115] Ethiopia has one CDM registered project only, which is a large scale A/R project that is expected to generate 880,296 CERs during the 60 years lifetime and 30 years fixed crediting period of the project, with an average 29,343 CERs per annum (which approximates to 0.0000745 of the world total annual CERs).[116]

From the data presented above, one may safely conclude that the CDM has little contribution in assisting the sustainable development of the vast majority of non-Annex I Parties.[117] The concentration of above 97 percent of the overall CDM registered projects in two regions and more than 75 percent of such projects in four carbon-rich developing countries are strong evidences supporting this conclusion.[118] CDM has neglected the majority of developing countries that are in desperate need of financial and technological supports to engage in sustainable development.[119] This contradicts social equity, which is one of the key elements of sustainable development.[120] Kneteman and Green propound that sustainable development does not only mean making development more sustainable in countries that are rapidly

industrializing. It should rather help start less developed countries on a sustainable path to greater prosperity.[121] Poverty eradication, employment creation and a more equitable distribution of resources and the improvement of the socio-economic status of the poorer portion of the population are considered to be important priorities of sustainable development.[122] The CDM could not provide these opportunities to the majority of developing countries.

In sum, the domination of CDM registered projects and projects that are on pipeline by "end-of-pipe" industrial (synthetic) gases, which have little contribution to sustainable development coupled with the overconcentration of CDM projects in a handful of carbon-rich developing countries has overshadowed CDM's contribution to sustainable development. To use Kneteman and Green's words, "the CDM displays twin failures: most of its projects contribute little to sustainable development and they are inequitably distributed across the developing world."[123]

4. Why Does the CDM Fail to Promote Sustainable Development?

Having demonstrated the CDM's failure in delivering its sustainable development promise, it is necessary to further examine the causes of such failure. In doing so, it is important to admit that the failure can be attributed to a multiple of factors and that the object of this inquiry is neither to exhaust all causal factors nor to develop a single theory of causation. The aim of this inquiry is to uncover the structural causes attributed to the CDM in particular and the Protocol legal framework in general.

In fact, different explanations are provided for the CDM's failure to promote sustainable development.[124] With regard to Africa's underrepresentation under the CDM, Olawuyi mentioned "the absence of sound legal frameworks governing CDM investments, inadequate institutional capacity, and the high rate of insecurity in African countries" as "the main reasons why they have remained unattractive locations for CDM investments."[125] Out of similar premise, the Nairobi Framework was initiated at a UN Climate Change conference in December 2006, in order to improve the equitable distribution of CDM projects, particularly in Sub-Saharan Africa, by building and enhancing their institutional capacity in developing and monitoring CDM projects.[126] Moreover, various international agencies such as the World Wildlife Fund, the World Bank and the UN have initiated programs to encourage more sustainable development benefits from projects and dispersal to under-invested countries.[127]

Despite these various efforts, according to Dawson and Spannagle, the overall CDM portfolio remains dominated by a small number of countries and a significant number of projects appear to have few discernible sustainable development benefits.[128] Here an important question can be raised: why these various initiatives fail to correct the underrepresentation of the majority of developing countries, especially Sub-Saharan Africa, under the CDM? The answer is clear; these initiatives do not address the crux of the problems related to the CDM structural problems in particular and the Protocol in general. The 'solutions' devised under

those initiatives do not address the structural causes of the CDM's failures.[129] The CDM's failure is attributed to its design defects and the overall structural flaws of the Protocol.

To begin with the CDM's design defects, as Kneteman and Green point out, the CDM is fundamentally a market mechanism and its failings are natural repercussions of its current structure.[130] There is "inherent tension" between the CDM's competing aims to assist industrial countries in achieving their GHG emissions reduction targets cost-effectively on the one hand and to assist developing countries in promoting sustainable development.[131] The tension between cost-effective emission reduction and sustainable development coupled with the lack of operational definition of sustainable development under the CDM let Annex I Parties focus on highly cost-effective emission offsetting projects, which in turn overshadows the CDM's contribution to sustainable development.[132] In other words, the CDM legal design creates incentives for investment in highly cost-efficient emission reductions, not necessarily sustainability, and these are generally end-of-pipe industrial projects.[133] This inherent design defect led investments to gravitate towards carbon rich developing countries.[134] Hence, this defect can be cited as the leading factor for the proliferation of "end-of-pipe" projects, which resulted in the concentration of CDM projects in few carbon-rich countries.[135] In fact, such problem was projected early before the CDM came into operation. Some authorities anticipated that most CDM activities would occur in a relatively small number of developing countries in the absence of directions to the contrary.[136]

As a solution to the above mentioned problem, Kneteman and Green advocate for the adoption of a harmonized standard definition of sustainable development, which is to be part of the CDM project approval, monitoring and verification processes by the CDM EB.[137] According to them "a highly competitive supply side for CDM projects combined with the devolution of approval powers to national DNAs encourages a 'race to the bottom' where developing countries will adopt low sustainable development standards in order to attract CDM investment."[138] However, the search for a harmonized definition of sustainable development is highly controversial.[139] As discussed earlier, sustainable development is a dynamic concept which accommodates alternative development paths and various interpretations in different contexts.[140] Instead of searching for all encompassing definition of sustainable development, a less controversial and pragmatic option is to exclude those project activities having little contribution to sustainable development such as synthetic gases from the list of CDM eligible projects. As van Asselt and Gupta rightly note, "a project that does not contribute to sustainable development does not pursue one of the goals of the CDM, and should therefore not be eligible to receive CERs."[141] Considering their contribution to low cost GHG abatement, synthetic gases can be covered by other funding mechanisms other than the CDM.[142]

The second important factor for the CDM's failure to promote sustainable development in developing countries is the undue restrictions imposed on CDM eligible land use, land use change and forestry (LULUCF) activities. The Protocol is silent as to the type of CDM eligible LULUCF activities.[143] But the subsequent Bonn Agreements and the Marrakech Accords restricted such activities to Afforestation and Reforestation (A/R).[144] Whereas

LULUCF activities under JI, which involves only industrial countries as project partners, encompass afforestation, reforestation and deforestation (ARD) as per Article 3(3) of the Protocol, and forest management, cropland management, grazing land management and vegetation as per both the Bonn Agreements and the Marrakech Accords.[145] Annex I Parties are allowed to use Emission Reduction Units (ERUs) generated from these eligible project activities against their emission reduction targets under the Protocol so long as these activities are human induced and have taken place since 1990.[146] The Protocol allows Annex I Parties to acquire or transfer ERUs resulting from JI projects reducing anthropogenic emissions by sources or enhancing anthropogenic removals by sinks of GHG in any sector of the economy.[147]

In addition to the restriction of CDM eligible LULUCF activities to A/R only, both the Bonn Agreements and the Marrakech Accords impose quantitative limit on Annex I Parties not to account more than five times one percent of their 1990 base year emissions to meet their emissions reduction targets from CERs generated by A/R projects under the CDM.[148] There is no similar quantitative restriction imposed on the use of ERUs generated from eligible LULUCF project activities under JI. Moreover, unlike the other flexibility mechanisms designed under the Protocol, CDM projects are subject to two percent adaptation levy.[149]

These discriminatory treatments of the CDM vis-à-vis JI create artificial comparative advantage in favour of the latter. The restriction of CDM eligible LULUCF project activities to A/R only and the further quantitative restriction placed on the use of CERs generated from A/R by Annex I Parties to offset their emissions create undue barriers on the participation of the majority of developing countries in CDM projects, because the comparative advantage of most developing countries under the CDM resides in potential LULUCF projects.[150] As Kneteman and Green rightly put, "the exclusion of other potential LULUCF projects has deprived many developing countries of their comparative advantage under the CDM to reduce emissions from deforestation and agriculture."[151] This argument is true for Africa in general and Ethiopia in particular.

Given Africa's negligible level of GHG emissions, which is estimated at about 3% of world total emissions in 1998,[152] its comparative advantage in CDM projects depends not on industrial gas emissions reduction but on utilizing its rich GHG mitigation potential by carbon sinks. From the global total, according to Bryan *et al.*, Africa's estimated annual potential for GHG mitigation accounts 17 percent for agriculture, 14 percent for forestry and 29 percent for avoided-deforestation.[153] In sum, Africa's annual GHG mitigation potential in agriculture and forest related emissions account about 60 percent of the world mitigation potential. In Ethiopia, too, agriculture and the forestry sectors respectively account for 50 percent and 37 percent of the country's total GHG emissionsins, while the energy sector accounts only 3 percent of the country's total GHG emissions.[154] Deforestation resulting from agricultural land and fuel-wood consumption, which is estimated at the rate from 150,000 to 200,000 ha/yr,[155] is responsible for 50 percent and 46 percent of the overall forest-related GHG emissions in Ethiopia respectively. As projected in the the Ethiopian "Green Economy Strategy", if Ethiopia is to pursue a conventional economic development path to achieve its

ambition of reaching middle-income status by 2025, its GHG emissions will grow more than double from 150 Mt CO2e today to 400 Mt CO2e in 2030.[156]

The above data show that the current underrepresentation of Africa in general and of Ethiopia in particular under the CDM projects does not reflect their potential for GHG emissions abatement/mitigation. The data further demonstrate the long term advantage of including avoided deforestation and agriculture under CDM eligible projects in meeting the dual objectives of the CDM: reducing global GHG emissions and promoting sustainable development in developing countries. This argument can be further collaborated by the additional data. Tropical deforestation and forest degradation are cited to be responsible for above 20 percent of global anthropogenic GHG emissions and as the most significant emission source of many developing countries.[157] Agriculture is also the mainstay of the economy and the main source of GHG emissions in developing countries. In Africa, for example, agriculture is the primary source of income for 65 percent of people, represents 30 - 40 percent of GDP, accounts for almost 60 percent of the continent's export income.[158]

In Ethiopia, agriculture accounts for about 45 percent of GDP, 80 percent of total employment and 80 percent of export earnings.[159] Both agriculture and forestry account for more than 85 percent of Ethiopia's overall GHG emissions.[160] Thus, the broad inclusion of more LULUCF activities as CDM eligible activities, as in the case of JI, may assist African in general and Ethiopia in particular in pursuing sustainable social and economic development and in mitigating global GHG emissions.

The third important factor for the CDM's failure is related to the complexity of CDM project cycle. Here, the term project cycle is used to refer to a series of hurdles or steps that CDM projects must complete in order to get issued with CERs credits.[161] In this regard, the CDM project approval and administration processes involve overly bureaucratic hustles.[162] The Protocol and the subsequent Conferences of the Parties (COPs) set discriminatory procedural requirements regarding JI and CDM. Both the Bonn Agreements and the Marrakech accords affirm explicitly that it is the prerogative of the host Party to confirm whether a JI or a CDM project activity assists it in achieving sustainable development.[163] Despite this commonality, the latter is subject to more elaborate and stringent procedural hurdles in contrast to the former. The host Party (Annex I Party) can self-certify JI projects without waiting for approval by external body.[164] Besides, self-verification of additionality[165] of JI projects by participating Annex I Parties is permissible.[166] The Supervisory Committee on JI Projects (SCJIP) has no mandate to approve or reject JI projects.[167] Its mandated is, inter alia, to supervise the verification of ERUs generated by JI project activities.[168]

On the contrary, there is no provision for self-validation of CDM projects.[169] CDM projects are mandatorily required to obtain prior approval from an external body known as the CDM Executive Body (EB), which is mandated to require detailed information and impose substantive and procedural hurdles.[170] If the implementation of a CDM project occurs prior to seeking approval from the CDM EB, the project may be considered non-additional.[171] Furthermore, CDM projects are required to complete a number of steps such as the

preparation of Project Design Document (PDD) by the proponent, validation and approval by host country DNA, approval and registration by the CDM EB, implementation and monitoring by the project proponent, verification by different Designated Operational Entity (DOE) than the one that undertook the initial project validation, issuance of CERs by the CDM EB for a specified period.[172] Bettelheim and D'Origny provide a succinct summary of the matters required of CDM projects but not of JI projects as follow:

> a CDM registry; a publicly available database; public comment procedure; periodic reviews of methodologies; validation and registration requirements, which include comments by local stakeholders and UNFCCC accredited non-governmental organizations; environmental impact analysis; use of executive-board-approved methodology; written approval of voluntary participation from each Party involved; baselines that take into account national and/or sectoral policies and circumstances; limited crediting periods; adjustments for and periodic recalculation of leakage; a monitoring plan that requires collecting and archiving of all relevant data and all potential sources of emissions and project boundaries; and an extensive project design document.[173]

The requirements quoted above show not only the extent of the discriminatory treatments of the CDM vis-à-vis JI but also the complexities of the constraints imposed on CDM project approval and administration. Even the so-called "simplified modalities and procedures" adopted "for small-scale" CDM project activities provide more elaborate and stringent procedural requirements than the requirements set for JI projects in general.[174] The concern with the complexities of the CDM procedures is that such overly procedural requirements may reduce the attractiveness of CDM projects to investors by increasing both costs of compliance and project administration.[175] The longer the timeline required for CDM project registration and approval of CERs, the greater will be the cost of administration. In this regard, it is important to mention the Humbo Assisted Regeneration project (HARP) A/R project in Ethiopia as a good example, which took above three years from the initiation of the PDD preparation in March 2006 to registration by the CDM EB in December 2009.[176]

In sum, the causal factors for the CDM's failure to deliver its sustainable development promise can be attributed mainly to: (1) the lack of clarity on the concept of sustainable development in the context of CDM, which in turn resulted in the overflow of CDM investment to cost effective "end-of-pipe" industrial gas projects that have nothing to do with promoting sustainable socio-economic development (2) the exclusion of many LULUCF activities other than A/R from CDM eligible projects coupled with the further quantitative restriction placed on the use of CERs generated from A/R projects by Annex I Parties to offset their emission reduction targets, and (3) the overly complex procedural requirements placed on CDM project administration.[177] In addition to these, the Protocol's commitment period (2005-2012) is found too short to encourage investment on CDM projects that require longer timelines to generate CERs.[178] Given the overly bureaucratic hustles involving CDM project cycle, it can take a couple of decades to plan, receive approval, and implement A/R projects and to generate CERs credits from such projects.[179] The shortness of the first commitment period coupled with the uncertainty about the future continuity of the CDM after the end of the first commitment period (2012) has rendered investments on A/R projects less attractive. This can also be considered as one of the reasons for the marginal representation

of A/R projects under the CDM in particular and the underrepresentation of the overwhelming majority of developing countries in CDM projects in general.[180]

At this juncture, it is fair to reflect on the arguments advanced in support of the imposition of more stringent substantive and procedural restrictions on CDM eligible LULUCF activities in particular and in the approval and administration of CDM projects in general. Leakage[181] and non-permanence are widely cited as the main justifications for the exclusion of many LULUCF activities from CDM eligible projects.[182] Other arguments include: "more LULUCF projects would infringe indigenous rights or flood the CDM market with cheap credits."[183] It is important to briefly examine the validity of these arguments in turn. Leakage and non-permanence are basically concerns about the additionality of LULUCF projects.[184] The Protocol requires CERs generated from CDM projects to be additional to what any that would occur in the absence of the project activity.[185] Besides, such emission reductions must be real, measurable and have long-term benefits related to climate change mitigation.[186] The number of CERs that a project generates is calculated as the baseline emissions (emissions that would have occurred in the absence of the project) minus the project emissions.[187] This calculation is required to reflect the effects of leakage and non-permanence.

In fact, leakage and non-permanence are common problems to all LULUCF projects under both the CDM and JI. The difference may be that since JI involves only Annex I Parties with emission caps as project partners, the effects of leakage and non-permanence can be reflected in the national emission inventories of the host party; hence, the host Party has the interest and the capacity to monitor and verify leakage and non-permanence. But under the CDM, as the host non-Annex I Party has no emission caps, it may lack the interest[188] and/or the capacity to monitor and verify leakage and non-permanence.[189] As a result, the effects of leakage and non-permanence might not be reflected in the calculation of CERs. This in effect "undermines the legitimacy of the carbon market and erodes efforts to combat climate change."[190] Hence, one of the arguments advanced for the restriction of CDM eligible LULUCF activities to A/R is the limited capacity of the host Parties to calculate base year emissions and to monitor and verify emission reductions resulting from LULUCF project activities.[191] For similar reasons, more strict procedures have been placed even on the rest of CDM eligible projects in order to ensure that emission reductions are "additional" and correctly quantified.[192]

However, the challenge of baseline calculation and leakage are common problems of all emission-reduction projects in non-Annex I Parties and, thus, provide no rationale for the exclusion of LULUCF activities from the CDM.[193] It is also argued that the concern related to leakage can be addressed by using country/national baselines for LULUCF as opposed to the current project-based approach.[194] Measuring national baseline for LULUCF activities reduces the risk of leakage of carbon emission reduction benefits within a country.[195] Regarding the problem of non-permanence, too, alternative solutions are suggested.[196] These include, inter alia, establishing A/R projects with legally enforceable forest protection, requiring that a percentage of additional forest be held in a buffer reserve and have host countries assume liability for the reversal of GHG removals from fire, disease or logging.[197]

Obviously, many non-Annex I Parties lack the requisite financial and technical capacity to monitor and verify LULUCF projects properly. This is also the driving force behind the inception of the CDM that aims at engaging non-Annex I Parties in promoting sustainable development through the provision of funds and transfer of technology from developed countries. This idea is enshrined under the UNFCCC, which among others, makes the extent of the obligation of non-Annex I Parties to develop national GHG emissions inventories conditional upon the availability of financial and technical assistances to be provided by industrial countries.[198] Industrial countries are thus expected to properly implement these commitments and other initiatives[199] to build the capacity of non-Annex I Parties in calculating their national GHG emissions inventors, including emissions baseline for LULUCF, instead of using the lack of capacity to calculate baseline in disguise to exclude LULUCF activities from CDM eligibility.

The other argument that more LULUCF projects would infringe indigenous rights merits proper consideration although unconvincing to warrant the exclusion of LULUCF activities from the CDM. Some speculate the possible danger of land grabbing and other environmental problems associated with the expansion of CDM eligible projects to other LULUCF activities.[200] In fact, these concerns merit cautious assessment. Unless properly regulated LULUCF projects may have their own counterproductive socio-economic and ecological effects. However, such concerns can be addressed by placing stringent environmental impact assessment requirements to be undertaken preceding the approval of LULUCF projects. Moreover, the impact of LULUCF projects on the rights of indigenous people can be addressed by engaging indigenous people in planning, implementation and benefit sharing from the sale of CERs.[201] Hence, the concern about indigenous rights cannot warrant the exclusion of LULUCF activities from the CDM.

On the other hand, the argument that more LULUCF projects would flood the CDM market with cheap credits seems untenable. Firstly, the very argument that LULUCF projects offer cheap credit compared to other CDM eligible projects is unfounded. In practice, the so-called "end-of-pipe" industrial gases have dominated the CDM market because of their very low cost GHG abatement opportunities.[202] Secondly, even if such argument is taken for granted, it cannot justify the exclusion of LULUCF activities from the CDM as such exclusion contravenes the principle of cost-effectiveness enshrined under the UNFCCC.[203]

Other writers still argue that the exclusion of many LULUCF activities from CDM eligible projects as well as the imposition of quantitative ceiling placed on the use of CERs generated from A/R by Annex I Parties to offset their emissions, and the placement of stringent procedural hurdles on it was motivated by the need to induce Annex I Parties "make significant emission reductions at home".[204] Had that been the real motive, it could have been achieved by setting a stringent quantitative cap on Annex I Parties' use of the CDM in general[205] rather than by merely excluding LULUCF activities from CDM eligibility and subjecting CDM projects to more costly procedural requirements.

Hence, not only are unconvincing the arguments advanced in support of the exclusion of many LULUCF activities from the CDM in particular and the impositions of more stringent procedural hurdles on CDM projects in general, but also they are contrary to the principles set under the UNFCCC. As Bettelheim and D'Origny rightly note, these discriminatory treatment of the CDM are "inconsistent" with the UNFCCC "core principles", including its emphasis on the primacy of economic development in non-Annex I Parties, on equity and poverty eradication, on the clear concern to protect and enhance all carbon sinks and reservoirs wherever located and on achieving climate stabilization at the lowest possible cost.[206]

5. Conclusions

The CDM is an international market-based flexibility mechanism designed by the Kyoto Protocol to assist non-Annex I Parties in promoting sustainable development and to help Annex I Parties in achieving their GHG emissions reduction targets cost-efficiently. The explicit inclusion of these twin objectives under the CDM shows the CDM's cautious approach to the general conjecture that all efforts undertaken to reduce GHG emissions are also important to promote sustainable development.[207] Sustainable development involves something more than just reducing GHG emissions.[208] By the same token, the promotion of sustainable development in non-Annex I Parties does not necessarily imply GHG emissions reduction.[209] For the CDM, however, both GHG emissions reduction and promotion of sustainable development are inseparable objectives. The CDM is expected, therefore, to meet both objectives simultaneously.[210]

However, as the findings of this article demonstrate, the CDM has very little contribution in assisting sustainable development. This conclusion is supported by two strong reasons. Firstly, the so-called "end-of-pipe" projects represent about one-thirds of the CDM registered projects.[211] These projects are known for their little contribution toward the promotion of sustainable economic and social development in the host country.[212] Secondly, more than three-fourths of the overall CDM registered projects are concentrated in four carbon-rich developing countries.[213] As a result, the CDM does not engage the overwhelming majority of developing countries in sustainable development. The failure o the CDM can be attributed to a multiple of factors. The inadequacy of the developing countries legal and intuitional framework to attract CDM investment may be an important element of the problem. However, the main responsibility should be attributed to the structural flaws of the CDM legal design in particular and the Protocol in general.

First, the CDM market structure was designed in a way to encourage investment in few carbon-rich countries with highly cost-efficient GHG abatement opportunities regardless of their contribution to sustainable development.[214] This is the main cause for the domination of the CDM by "end-of-pipe" projects and the concentration of CDM projects in few carbon-rich non-Annex I Parties. Secondly, the CDM is constrained by undue substantive and procedural requirements. Unlike in the case of JI, many LULUCF activities that provide comparative advantage to several non-Annex I Parties are excluded from CDM eligible

project list.[215] In addition, the Protocol and the subsequent COPs have imposed more elaborate and stringent procedural requirements on CDM project administrations that render CDM projects less attractive by raising the costs of administration of such projects. In other words, the Protocol and the subsequent COPs have created artificial comparative advantage in favour of JI projects in the areas of carbon sinks through the broad inclusion of eligible LULUCF activities and the imposition of less stringent procedural requirements. These asymmetrical treatments of the CDM vis-à-vis JI undermine the comparative advantage of non-Annex I Parties in A/R projects and aggravate their underrepresentation in CDM projects by redirecting investment to the latter.

Thirdly, the shortness of the Protocol's first commitment period coupled with the uncertainty of its future continuity after the end of 2012 has discouraging effect on CDM eligible projects such as A/R that require much longer timelines to generate CERs. This must also have a significant contribution towards the marginal representation of many non-Annex I Parties under the CDM and the insignificant representation of A/R projects under the same.

Now the CDM's first commitment period (2008-2012) has almost gone without engaging the majority of non-Annex I Parties in sustainable development. There is no clear future whether the Protocol in its current form or with basic reforms on its flexibility mechanisms will continue after the end of 2012. Negotiations about the fate of the Protocol legal regime have been put on the agenda of the different COPs and ended up with deadlocks. However, considering the CDM's potential advantage to engage developing countries in sustainable development through financing clean development initiatives and facilitating transfer of clean technology on the one hand and its advantage in providing cost-efficient GHG abatement opportunities to industrial countries on the other, the continuation of a reformed CDM after 2012 is strongly advisable. However, the extension of the time horizon must be accompanied by some basic structural reforms to rectify the defects in the current legal design of the CDM and the Protocol in general.

Firstly, a reformed CDM has to critically resolve the inherent tension between its twin objectives. Achieving sustainable development in non-Annex I Parties is one of the leading purposes of the CDM. The UNFCCC recognizes "economic and social development and poverty eradication" as the "first and overriding priorities of the developing country Parties."[216] In this regard, the CDM has to be reconfigured in a manner to meet these requirements in addition to achieving cost effective GHG emission reduction. To ensure the CDM's genuine contribution to sustainable development, some writers advocate for the adoption of a harmonized standard definition of sustainable development, which is to be built into the CDM project approval, monitoring and verification processes.[217] However, the search for a harmonized definition of sustainable development cannot draw consensus. Sustainable development is a dynamic concept which accommodates alternative development paths and different interpretations in various contexts.[218] Hence, the proposal for the adoption of a harmonized standard definition of sustainable development under the CDM is highly controversial.[219] A less controversial and pragmatic approach is to exclude those activities having little contribution to sustainable development such as synthetic gases from CDM

project eligibility.[220] Thus, it is more plausible to exclude activities having little contribution to sustainable economic, social and environmental development from CDM eligibility.[221]

Secondly, a reformed CDM has to broaden the scope of eligible LULUCF project activities. The broadening of CDM eligible LULUCF activities will have manifold economic, social and ecological benefits to developing countries, especially African countries. For African countries, agriculture is the mainstay of the economy and the main source of GHG emissions. Hence, the broadening of CDM eligible LULUCF activities will open the opportunity for many developing countries like Ethiopia to undertake projects improving the social and economic well-being of the poor and mitigating GHG emissions.

Thirdly, it is crucially important to address the structural flaws manifest in the Protocol's existing market structure. Among other things, the Protocol needs critical reform in a manner to ensure level-playing field among the different flexibility mechanisms. In this regard, the discriminatory substantive as well as procedural constraints placed on the CDM vis-à-vis the other market based flexibility mechanisms need to be corrected. Last but not least, the duration of the post-2012 commitment period should be elongated so that project activities that require much longer timelines like A/R project activities will be able to generate CERs to their full extent.

In general, the post-2012 CDM should focus on assisting developing countries in promoting environmentally resilient economic and social development programmes. The developing countries ambitious plan for rapid economic development may have incremental effect on their energy consumptions and GHG emissions. Such increment may continue at an alarming rate if developing countries are to pursue a conventional economic development path. This is what the Ethiopia Green Economic Strategy projected in the context of Ethiopia. Hence, shifting the focus of the post-2012 reformed CDM to assist sustainable development in developing countries will have a long term benefits in mitigating GHG emissions and in promoting sustainable socio-economic development in such countries. It is important to bring the CDM into the developing countries reality so that it can achieve its claim for sustainable development beyond rhetoric.

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[86] See Federal Democratic Republic of Ethiopia, Growth and Transformation Plan (GTP) 2010/11–2014/15 – Volume I: Main Text. Available from World Wide Web: http://www.imf.org/external/pubs/ft/scr/2011/cr11304.pdf. (Accessed: 05/10/2012).
[87] See Federal Democratic Republic of Ethiopia, Ethiopia's Climate-Resilient Green Economy: Green economy strategy. Available from World Wide Web: http://www.epa.gov.et/Download/Climate/Ethiopia%27s%20Climate-Resilient%20Green%20economy%20strategy.pdf (Accessed: 03/10/2012)
[88] Federal Democratic Republic of Ethiopia, Ethiopia, Environmental Policy, 1977, Addis Ababa, at 1.
[89] See Ethiopia's vision for a climate resilient green economy. Available from World Wide Web:http://www.epa.gov.et/Download/Climate/Ethiopai%27s%20Vision%20for%20a%20Climate%20Resilient%20Green%20Economy (Accessed: 03/10/2012)

[90] See Sufian Ahmed, in supra note 86, in GTP, supra note 86, at vii.
[91] http://mobile.bloomberg.com/news/2011-05-25/india-investment-in-ethiopia-may-double-to-10-billion-by-2015-meles-says (Accessed: 05/102012)
[92] Kneteman and Green, supra note 5, at 230, citing Gupta, J. (1998) "Leadership in the Climate Regime: Inspiring the Commitment of Developing Countries in the Post-Kyoto Phase", 7(2) Review of European Community and International Environmental Law, 180 -187; See also Dawson and Spannagle, supra note 2.
[93] See Loibl, supra note 28, at 108.
[94] See Dawson and Spannagle, supra note 25, at 87.
[95] See Spalding-Fecher and Simmonds, supra note 43, at 129.
[96] Dawson and Spannagle, supra note 25, at 87.
[97] See Spalding-Fecher and Simmonds, supra note 43, at 44 & 45; Munasinghe, supra note 28; Elliott, supra note 30.
[98] Dawson and Spannagle, supra note 25, at 84; Labatt and White, supra note 3, at 154.
[99] UNFCCC CDM Statistics, Available from World Wide Web: http://cdm.unfccc.int/Statistics/index.html (Accessed: 17/11/2010)
[100]See Distribution of Registered Project Activities by Scope, Available from World Wide Web: http://cdm.unfccc.int/Statistics/Registration/RegisteredProjByScopePieChart.html (Accessed: 17/11/2010)
[101] See Dawson and Spannagle, supra note 25, at 84.
[102] See Ibid, at 84-85.
[103] Ibid, at 84.
[104] Kneteman and Green, supra note 5, at 231.
[105] Dawson and Spannagle, supra note 25, at 85.
[106] Kneteman and Green, supra note 5, at 231.
[107] Ibid, quoting Michaelowa, A., Buen, J., Eik, A. and Lokshall, E. (2007) "The market potential of large-scale non-CO2 CDM projects" in W. Douma, L. Massai and M. Montini (eds.), The Kyoto Protocol and Beyond: Legal and Policy Challenges of Climate Change, Cambridge, Cambridge University Press, at 68
[108] Kneteman and Green, supra note 5, at 231.
[109] Ibid.
[110] See Dawson and Spannagle, supra note 25, at 85.
[111] CDM Statistics, supra note 99.
[112] Dawson and Spannagle, supra note 25, at 85.
[113]UNFCCC, CDM Registered Project Activities by Host Party, Available from World Wide Web: http://cdm.unfccc.int/Statistics/Registration/NumOfRegisteredProjByHostPartiesPieChart.html, (Accessed: 17/11/2010)
[114] See UNFCCC, Registered Projects by Region, Available from World Wide Web: http://cdm.unfccc.int/Statistics/Registration/RegisteredProjByScopePieChart.html (Accessed: 17/11/2010)
[115] Kneteman and Green, supra note 5, at 232.
[116]See Humbo Ethiopia Assisted Natural Regeneration Project (HARP), http://cdm.unfccc.int/Projects/DB/JACO1245724331.7/view (Accessed: 01/12/2010); Biryahwaho, B., Misiko, M., Tefera, H. and Tofu, A. (June 2012) Institutional innovations in African smallholder carbon projects, Case Study: Humbo Ethiopia Assisted Natural Regeneration Project. Available from World Wide Web: http://cgspace.cgiar.org/bitstream/handle/10568/21220/AfricanAgCarbonCaseStudy Humbo.pdf?sequence=6 (Accessed: 03/10/2012).see also CDM Statistics, supra note 99.

[117] See Dawson and Spannagle, supra note 25, at 87.
[118] CDM Registered Project Activities by Host Party, supra note 113.
[119] Kneteman and Green, supra note 5, at 232.
[120] See Munasinghe, supra note 28; see also Spalding-Fecher and Simmonds, supra note 43.
[121] See Kneteman and Green, supra note 5.
[122] See Spalding-Fecher and Simmonds, supra note 43.
[123] Kneteman and Green, supra note 5, at 226.
[124] The following reasons are provided for Africa's underrepresentation under the CDM include: factors related specifically to how the CDM is structured and to complex and stringent procedures to safeguard the integrity of emissions reduction credits, but also reasons attributable to the African context itself, such as the small size (and therefore small volume) in relative global terms of emissions reductions that could be generated by projects in Africa, perceptions of investment risk, lack of institutional capacity, lack of financing and information, etc. See Carbon Finance in Africa (2009), Special Session on Climate Change hosted by UN Economic Commission for Africa, Addis Ababa, Ethiopia, 3 September 2009, at 3. Available from World Wide Web: http://www.oecd.org/dataoecd/29/56/43551050.pdf (Accessed: 23/12/2010)
[125] Olawuyi, D. S. (2009) "Achieving sustainable development in Africa through the clean development mechanism: legal and institutional issues considered", 17(2) African Journal of International and Comparative Law, 270 at 273, Available from World Wide Web: https://login.westlaw.co.uk/maf/wluk/app/document?&src=rl&srguid=ia744cc640000012ccad9e1e05cd8433a&docguid=I2867E7801DD211DFA14D8DDC0C67D509&hitguid=I2867E7801DD211DFA14D8DDC0C67D509&spos=1&epos=1&td=1&crumb-action=append&context=19 (Accessed: 23/04/2010)
[126] See Kneteman and Green, supra note 5, at 234, citing UNFCCC, The Nairobi Framework - Catalyzing the CDM in Africa: <http://cdm.unfccc.int/Nairobi_Framework/index.html>
[127] See Ibid, at 233; Dawson and Spannagle, supra note 25, at 87.
[128] Dawson and Spannagle, supra note 25, at 88.
[129] Kneteman and Green, supra note 5.
[130] Ibid.
[131] See van Asselt, H. and Gupta, J. (2009) "Stretching Too Far? Developing Countries and the Role of Flexibility Mechanisms Beyond Kyoto", 28 Stan. Envtl. L. J., 311 at 344, Available from World Wide Web: http://heinonline.org/HOL/Print?collection=journals&handle=hein.journals/staev28&id=317&print=section&section=11&ext=.pdf (Accessed: 20 /06/2010).
[132] Ibid, at 338.
[133] Kneteman and Green, supra note 5.
[134] Ibid.
[135] See Ibid, generally; see also Spalding-Fecher and Simmonds, supra note 43.
[136] See Rowlands, I. H. (2001) "The Kyoto Protocol's 'Clean Development Mechanism': A Sustainability Assessment", 22(5) Third World Quarterly, 795 at 805. Taylor & Francis, Ltd. Available from Stable URL: http://www.jstor.org/stable/3993675 (Accessed: 23/04/2010 05:00)
[137] Kneteman and Green, supra note 5, at 237.
[138] Ibid, at 236, citing Olsen, K.H. and Fenhann, J. (2008) "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", 36(8) Energy Policy, 2819, at 2776.

[139] During negotiations of the Kyoto Protocol and the Marrakech Accords, developing countries were concerned about their sovereignty and largely unwilling to accept imposition of externally determined sustainable development priorities: see Kneteman and Green, supra note 5, at 235; see also Segger and Khalfan, supra note 82.

[140] See Kneteman and Green, supra note 5, at 235; Baker, supra note 27, at 8; Brundtland Report, supra note 43, para. 2.

[141] van Asselt and Gupta, supra note 131, at 367.

[142] Ibid.

[143] See Bettelheim and D'Origny, supra note 12, at 1832.

[144] See Decision 5/CP.6, supra note 80, Annex VII, Para. 7; Draft decision -/CMP.1, Annex D, Article 13, in Report of the Conference of the Parties on Its Seventh Session, held at Marrakesh From 29 October to 10 November 2001, FCCC/CP/2001/13/Add.1, 21 January 2002, Available from World Wide Web: http://Unfccc.Int/Resource/Docs/Cop7/13a02.Pdf (Accessed: 29/10/2010)

[145] See Depledge, supra note 2, at 73; see also Decision 5/CP.6, supra note 80, Annex VII, para. 4; Draft decision -/CMP.1, supra note 144, Annex C, Article 6.

[146] Draft decision -/CMP.1, supra note 144, Annex C, Article 6; Decision 5/CP.6, supra note 80, Annex VII, Para. 4; see also Depledge, supra note 2, at 73.

[147] Kyoto Protocol, supra note 4, Article 6(1).

[148] Decision 5/CP.6, supra note 80, Annex VII, Para. 8; Draft decision -/CMP.1, supra note 144, Annex D, Article 14.

[149] van Asselt and Gupta, supra note 131, at 372.

[150] Kneteman and Green, supra note 5, at 240.

[151]Ibid.

[152] Spalding-Fecher and Simmonds, supra note 43, at 125.

[153] Bryan, E., Akpalu, W., Yesuf, M. and Ringler, C. (2008) "Global Carbon Markets: Are There Opportunities for Sub-Saharan Africa?" International Food Policy Research Institute, Discussion Paper, at 1. Available from World Wide Web: http://www.ifpri.org/sites/default/files/publications/ifpridp00832.pdf (Accessed: 08/10/2010).

[154] Ibid, at 13.

[155] Environmental Policy, supra note 88; Benti, D. G. (2006) Humbo Community-Managed Natural Regeneration Project, Final Report, Addis Ababa, at 2. Available from World Wide: http://cdm.unfccc.int/UserManagement/FileStorage/014EN53BOI8HPCXSWQUYF7KGVZLR69 (Accessed: 12/05/ 2010); Bishaw, B. (2001) "Deforestation and Land degradation in the Ethiopian Highlands: A Strategy for Physical Recovery", 8(1) Northeast African Studies (ISSN 0740-9133) (New Series), 7 at 8, Available from World Wide Web: http://etff.org/Articles/Deforestation_and_Land_Degradation.pdf (Accessed: 08/12/2010)

[156] Green Economy Strategy, supra note 87, at 11.

[157] See Kneteman and Green, supra note 5, at 240, citing Stern, N. (2006) Review: The Economics of Climate Change, at 216; see also Bonnie, R., Schwartzman, S., Oppenheimer, M. and Bloomfield, J. (2000) "Counting the Cost of Deforestation", 288(5472), Science, New Series, 1763 at 1764, American Association for the Advancement of Science, Available from Stable URL: http://www.jstor.org/stable/3075422 (Accessed: 23/04/2010 05:13)

[158] Ending hunger in Africa: Prospects for the Small Farmer, 2004, at 2. Available from World Wide Web: http://www.ifpri.org/sites/default/files/pubs/pubs/ib/ib16.pdf (Accessed: 20/11/2010); see also and Green, supra note 5, at 245.

[159] Central Statistical Agency: Compilation of Economic Statistics in Ethiopia (July 2007) Addis Ababa, at 4. Available from World Wide Web: http://unstats.un.org/unsd/economic_stat/intl%20coop%20and%20workshops%20(bes)_files/Pretoria-Agenda_files/notes/Ethiopia.pdf, (Accessed: 01/12/2010)

[160] Green Economy Strategy, supra note 87, at 12.

[161] See Dawson and Spannagle, supra note 25, at 81.

[162] See Ibid, at 81-83.

[163] See Decision 5/CP.6, supra note 80, Articles 2(1) & 3(1) respectively; Decision 16/CP.7, para. 3 and Decision 17/CP.7, para. 4, in Report of the Conference of the Parties on Its Seventh Session, held at Marrakesh from 29 October to 10 November 2001, FCCC/CP/2001/13/Add.2, 21 January 2002, Available from World Wide Web: http://unfccc.int/resource/docs/cop7/13a02.pdf (Accessed: 05/11/2010)

[164] See Bettelheim and D'Origny, supra note 12, at 1827.

[165] Additionality, in the context of JI, refers to the number of ERUs 'additional to what any that would occur in the absence of the project activity': See Kyoto Protocol, supra note 4, Articles 12(5)(c), 6(1)(b); For the various meanings of additionality, see also Ellis, J. (2004) "Project-based mechanisms: Baselines, additionality and monitoring", in Schrijver, N. & Weiss, F. (eds) International Law and Sustainable Development Principles and Practice, Developments in International Law, vol. 51, Martinus Nijhoff Publishers: Leiden / Boston, at 236.

[166] Bettelheim and D'Origny, supra note 12, at 1840, citing Draft Decision-/CMP.1 (Article 6) Annex D(22).

[167] See Ibid, at 1827.

[168] Decision 5/CP.6, supra note 80, Article 2(3); Draft Decision-/CMP.1, supra note 144, Article 6; Bettelheim and D'Origny, supra note 12 at 1838.

[169] Bettelheim, supra note 12, at 1840.

[170] Ibid, at 1827

[171] See Dawson and Spannagle, supra note 25, at 80.

[172] See Decision 3/CMP.1, Modalities and procedures for a clean development mechanism as defined in Article 12 of the Kyoto Protocol, in Report of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol on its first session, held at Montreal from 28 November to 10 December 2005, Annex A-J. Available from World Wide Web: http://unfccc.int/resource/docs/2005/cmp1/eng/08a01.pdf (Accessed: 29/10/201); Kyoto Protocol, supra note 4, Articles 6, 17, 12(3) and Article 3(10) (11) (12); see also Dawson and Spannagle, supra note 25, at 81-83.

[173] Bettelheim and D'Origny, supra note 12, at 1841, citing COP-7, Draft Decision-/CMP.1 (Article 12) Annex G and Appendix B.

[174] See Decision 4/CMP.1, Guidance relating to the clean development mechanism, in Report of the Conference of the Parties, supra note 172, Annex II.

[175] Bettelheim and D'Origny, supra note 12, at 1842.

[176] http://cdm.unfccc.int/filestorage/W57JTARN2IZCOHG09DYVMS1XF8Q4LK/PDD.pdf?t=TUV8MTI5MTI5MDY5Mi4yOQ==|04AZmUNms_ROjze2XhOMcphjM0s= (Accessed: 02/12/2010)

[177] See Kneteman and Green, supra note 5, at 240.

[178] See Labatt and White, supra note 3, at 163; Dawson and Spannagle, supra note 25, at 49

[179] See Labatt and White, supra note 3, at 163.

[180] See Dawson and Spannagle, supra note 25, at 49.

[181] Leakage occurs when activities that reduce GHG emissions in one project boundary lead to increased emissions outside the project boundary: See Kneteman and Green, supra note 5,

at 246; Bonnie *et al*., supra note 20, at 1867; Decision 5/CMP.1, supra note 172, Annex A, Article 1(e).

[182]Non-permanence is a form of inter-temporal leakage, where present emission reductions can be later reversed: see Kneteman and Green, supra note 5, at 246.

[183] Ibid.

[184] Ibid, at 248.

[185] For the various meanings of additionality, see Ellis, supra note 165; See also Kyoto Protocol, supra note 4, Article 12(5)(c).

[186] Ibid, Article 12(5)(b).

[187] Dawson and Spannagle, supra note 25, at 80.

[188] See Ibid, at 79.

[189] See Depledge, supra note 2, at 73.

[190] Kneteman and Green, supra note 5, at 246.

[191] See Ibid, at 248.

[192] Dawson and Spannagle, supra note 25, at 79; see also Bonnie et al., supra note 20, at 1867.

[193] Bonnie et al., supra note 20, at 1860.

[194] Kneteman and Green, supra note 5, at 246; see also Mitchell, supra note 14, at 69.

[195] Kneteman and Green, supra note 5, at 246-247.

[196] Ibid, at 247-248.

[197] Ibid.

[198] See UNFCCC, supra note 1, Articles 4(1)(a), 4(7), 4 (3)-(5).

[199] See Kneteman and Green, supra note 5, at 248.

[200] See The CDM and Africa: Marketing a New Land Grab, Briefing by the African Biodiversity Network, Biofuelwatch, Carbon Trade Watch, the Gaia Foundation and the Timberwatch Coalition. February 2011. Available From World Wide Web: http://www.africanbiodiversity.org/system/files/PDFs/CDM%20Report_Feb2011_lowres.pdf (Accessed: 12/10/2012)

[201] Ibid, at 249.

[202] See Dawson and Spannagle, supra note 25, at 84.

[203] See Bettelheim and D'Origny, supra note 12; See also UNFCCC, supra note 1, Article 3(3).

[204] See Labatt and White, supra note 3, at 154.

[205]See van Asselt and Gupta, supra note 131, at 362.

[206] See Bettelheim and D'Origny, supra note 12, at 1832.

[207] See Loibl, supra note 28, at 108.

[208] See van Asselt, and Gupta, supra note 131, at 348.

[209] See UNFCCC, supra note 1.

[210] See Dawson and Spannagle, supra note 25.

[211]See Ibid, at 84.

[212] See Kneteman and Green, supra note 5, at 231.

[213] See CDM Registered Project Activities by Host Party, supra note 113.

[214] See Kneteman and Green, supra note 5.

[215] Ibid.

[216] UNFCCC, supra note 1, Article 4(7).

[217] Kneteman and Green, supra note 5, at 237.

[218] Ibid, at 235; Baker, supra note 27, at 8; Brundtland Report, supra note 43, para. 2, at 54.

[219] See Kneteman and Green, supra note 5; see also Segger and Khalfan, supra note 82.

[220] van Asselt, and Gupta, supra note 131, at 367.

[221] See Spalding-Fecher and Simmonds, supra note 28, at 44 & 45; Munasinghe, supra note 20; Elliott, supra note 30.