Chapter 10
Climate Justice: The Clean Development Mechanism as a Case Study

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Abstract Justice considerations are now almost inextricably linked to the climate change discourse because of the recognition that global injustice and inequity are evident in the climate change problem, from its causes to its impacts. Consequently, the climate change regime contains a range of provisions, tools and measures to promote justice in the regime. One such tool is the Clean Development Mechanism (CDM), which gives developing countries the opportunity to contribute to climate change mitigation and also provides them with sustainable development benefits. However, the CDM itself is beset with its own justice issues, specifically distributive justice issues. This chapter focuses on the distributive justice issues of the CDM. It defines what distributive justice in the CDM means, examines what it should look like, and identifies the main causes for the lack of distributive justice in the CDM.

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10.1 Introduction

The problem of climate change raises issues of equity and justice,[1] particularly with regard to its causes and impacts. This is because those that have contributed the least to climate change face most of its impacts. Climate change is historically attributable to the developed world and developed countries have benefitted the most from the activities that caused the problem.[2] However, developing countries, which have historically contributed the least to climate change,[3] are expected to be the most affected by it.

The impacts of climate change are expected to be quite severe, and the Intergovernmental Panel on Climate Change (IPCC) notes that these impacts would be greater in developing countries than in developed countries, concluding that climate change will likely exacerbate income inequalities between and within countries.[4] Developing countries also have lower capacity to adapt. This goes to another issue of justice – the ability or capacity to address the problem of climate change. Developed countries, with their greater resources and technological advancement, are generally recognised as having greater capacity to address climate change than developing countries.

The issue of historical responsibility for climate change also gives rise to another justice consideration. Developing countries argue that developed countries have had many years to develop, and that in their development process, have caused the current climate change problem; and that developing countries in turn need to increase their energy use in order to achieve development and alleviate poverty in

[1] Equity and justice are used interchangeably in this chapter, as appropriate. The ordinary dictionary meaning of equity includes definitions like "justice according to natural law or right, freedom from bias or favouritism, or something that is equitable", The Merriam-Webster Dictionary, available at: http://www.merriam-webster.com/ (last accessed on 1 March 2012); "the quality of being fair and impartial" *The Concise Oxford English Dictionary,* 11th ed. (Oxford: Oxford University Press, 2008); "fairness," and "justice," Samantha Hepburn, *Principles of Equity and Trusts*, 2nd ed. (Sydney/London: Cavendish Publishing Pty Limited, 2001), at 3; and "that which is just or right," Leslie Curzon, *Equity & Trusts*, 2nd ed. (London: Cavendish Publishing, 1996), at 1.

[2] See generally on the science and effects of climate change, Barrie Pittock, *Climate Change: Turning up the Heat* (London: Earthscan, 2005); John Houghton, *Global Warming: The Complete Briefing*, 3rd ed. (Cambridge: Cambridge University Press, 2004); and Mohan Munasinghe and Rob Swart, *Primer on Climate Change and Sustainable Development* (Cambridge: Cambridge University Press, 2005).

[3] Although this is still true, in terms of current emissions, some developing countries have overtaken or are overtaking developed countries and there is therefore a call for such developing countries to undertake appropriate mitigation actions.

[4] Samuel Fankhauser et al., "Vulnerability to climate change and reasons for concern: a synthesis", in James McCarthy et al. (eds), *Climate Change 2001: Impacts, Adaptation, and Vulnerability: Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge: Cambridge University Press, 2001), at 916.

their countries.[5] This is one of the reasons why developing countries have resisted attempts to cap their emissions. Responsible development, however, should not be taken to mean unrestricted freedom to continue to produce greenhouse gas (GHG) emissions. Any consumption that leads to GHG emissions should be done in light of the need for 'sustainable' development – defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."[6]

Finally, there is the issue of intergenerational equity. The impacts of climate change will exceed the impacts that are being seen today, and will continue to be felt far into the future – by those persons that did nothing to contribute to the problem and perhaps will not even enjoy the same benefits of industrialisation being enjoyed by the developed world today.

Due to these issues, justice considerations were key considerations in the design of the climate change regime, which contains a range of provisions and mechanisms aimed at ensuring justice.[7] One of the mechanisms adopted to help deliver justice under the regime is the Clean Development Mechanism (CDM). The CDM is, however, a flawed mechanism. One of the major problems with the CDM is that the distribution of projects under the CDM is generally regarded as inequitable.

This chapter focuses on this particular flaw. It examines what "distributive justice" in the context of the CDM means and ascertains the main reasons why the CDM has been unable to achieve this.

10.2 The CDM and Justice

First, a brief explanation of the role the CDM should play in delivering justice. The CDM is a market-based mechanism established by Article 12 of the Kyoto Protocol.[8] Under the CDM, projects or programmes of activities can generate Certified Emission Reductions (CERs) through activities implemented in developing countries that result in lower GHG emissions than would otherwise have been produced.

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[5] See United Nations Framework Convention on Climate Change, New York, 9 May 1992, in force 21 March 1994, 31 *International Legal Materials* (1992), 851, para. 22 of the Preamble, which recognises that developing countries need access to resources and that their energy consumption will grow, in order to achieve sustainable social and economic development, albeit taking account of the possibilities for achieving greater energy efficiency and for controlling GHG emissions.

[6] See "Our Common Future, Chapter 2: Towards Sustainable Development", in *Our Common Future: Report of the World Commission on Environment and Development*, UN Doc A/42/427, 4 August 1987, Annex, para. 1.

[7] On climate change and justice generally, see Friedrich Soltau, *Fairness in International Climate Change Law and Policy* (Cambridge: Cambridge University Press, 2009); and Eric A. Posner and David Weisbach, *Climate Change Justice* (Princeton: Princeton University Press, 2010).

[8] Kyoto Protocol to the United Nations Framework Convention on Climate Change, Kyoto, 11 December 1997, in force 16 February 2005, 37 *International Legal Materials* (1998), 32.

The two main objectives of the CDM are to contribute to sustainable development in developing countries and to contribute to climate change mitigation through the GHG emission reductions achieved by the projects. Generally, in relation to developing countries, the CDM aims to assist developing countries to achieve sustainable development and also to contribute to the ultimate objective of the Convention[9] through the reduction in their GHG emissions achieved by the CDM projects.[10] In relation to developed countries, the CDM provides them with flexibility and cost-effective opportunities to comply with their emission reduction commitments under the Kyoto Protocol.[11]

As already noted above, the CDM is a key mechanism for achieving justice within the climate change regime. In recognition of their limited responsibility for the climate problem and their limited capability to address it, developing countries do not have emission reduction commitments under the Kyoto Protocol.[12] However, through the CDM, they are given the opportunity to contribute to climate change mitigation. In addition, in recognition of their need for sustainable development, CDM projects are required to contribute to sustainable development in developing countries. In this way, the CDM attempts to ensure justice in the treatment of developing countries within the climate change regime.[13]

Although the CDM is one of the key justice mechanisms within the climate change regime, the CDM itself, in its operation and implementation, also has justice problems, specifically distributive justice problems. The first CDM project was registered in 2004, and there are now more than 5,600 projects in the CDM pipeline, including over 3,800 registered projects.[14] Although there are currently 128 developing countries that are eligible to participate in the CDM,[15] only 73 countries do.

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[9] The ultimate objective of the Convention is to stabilise GHG concentrations in the atmosphere at a level that would prevent dangerous human interference with the climate system. See UNFCCC, supra, note 5, Art 2.

[10] Kyoto Protocol, supra, note 8, Art. 12.2.

[11] Ibid., Art. 3.1 and Annexes A and B. Accordingly, developed countries are required to ensure that their total emissions of certain greenhouse gases (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride) do not exceed their allowed emission levels. The aim is to reduce their overall emissions of these gases by at least 5% below 1990 levels in the first commitment period of the Kyoto Protocol, which runs from 2008 to 2012.

[12] Ibid., Arts. 3 and 10.

[13] The CDM is a good example of the implementation of the principle of common but differentiated responsibilities, which is one of the justice principles of the climate change regime. On the common but differentiated responsibilities principle in the climate change regime, see UNFCCC, supra, note 5, Arts. 3.1, 3.2 and 4.1.

[14] Statistics correct as of 30 January 2012. See CDM, "CDM in Numbers", available at: http://cdm.unfccc.int/Statistics/index.html (last accessed on 1 March 2012).

[15] This refers to those countries that have fulfilled the CDM participation requirements, which are: Kyoto Protocol ratification; designation of a national authority; and confirmation of voluntary participation. See Decision 3/CMP.1, Modalities and procedures for a clean development mechanism as defined in Article 12 of the Kyoto Protocol, FCCC/KP/CMP/2005/8/Add.1, 30 March 2006, Annex, paras. 28–30.

Of this number, just two countries – China and India – account for 67% of all projects, and China, India, Brazil and Mexico together account for 76% of all CDM projects. This skewed distribution continues at the regional level, with Asia and the Pacific region hosting 82% of projects, Latin America and the Caribbean hosting 15%, and Africa hosting just over 2% of all CDM projects.[16]

In 2001, countries highlighted the need to promote equitable distribution of CDM projects.[17] At the first Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (COP/MOP) in 2005, countries again identified addressing the issue of equitable distribution of CDM projects as one of their roles.[18] At most of the subsequent COP/MOPs, Parties have addressed the need to ensure an equitable distribution of CDM projects, and have taken various actions, all aimed at achieving this goal.[19] However, the goal remains elusive, and the distribution of CDM projects, both among countries and among regions, still appears to be inequitable. Although the number of registered CDM projects has multiplied, the distribution of projects among countries has not changed much and the same four countries, namely India, China, Brazil and Mexico, have been consistently dominating the CDM market.[20] This is therefore obviously a justice problem in the CDM.

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[16] All statistics are correct as of 30 January 2012. See CDM, "Registered project activities by host party", available at: http://cdm.unfccc.int/Statistics/Registration/NumOfRegisteredProjByHostPartiesPieChart.html (last accessed on 1 March 2012).

[17] See Decision 17/CP.7, Modalities and procedures for a clean development mechanism as defined in Article 12 of the Kyoto Protocol, FCCC/CP/2001/13/Add.2, 21 January 2002, Preamble, para. 6.

[18] Decision 3/CMP.1, supra, note 15, Annex, para. 4(c).

[19] See for example Decision 7/CMP.1, Further guidance relating to the clean development mechanism, FCCC/KP/CMP/2005/8/Add.1, 30 March 2006, para. 32; and Decision 2/CMP.5, Further guidance relating to the clean development mechanism, FCCC/KP/CMP/2009/21/Add.1, 30 March 2010, paras. 47–50. For a detailed discussion of the actions that have been taken with the CDM regime to address the problem of inequitable distribution of projects, see Tomilola Akanle, "Distributive Justice in International Law: Can the CDM Achieve an Equitable Geographic Distribution of Projects?", Ph.D. thesis on file at the University of Dundee, (2011), at 189–238.

[20] As of March 2007, the distribution of projects among the top 4 CDM hosts was: India (33%), China (8%), Brazil – (16%) and Mexico – (13%). In January 2008, the distribution was as follows: India: 33%; China: 16%; Brazil: 12% and Mexico: 11%. In July 2010, it was China (40%), India (22%), Brazil (7%) and Mexico (5%). In April 2011, the distribution was: China (44%), India (21%), Brazil (6%) and Mexico (4%) (all statistics obtained by the author from the CDM website at the relevant times). In January 2012, the distribution was: China (47%), India (20%), Brazil (5%) and Mexico (4%). The significance of these statistics is not so much that it is the same four countries that are the top CDM hosts. Much more significant is that although there has been some fluctuation in their percentage shares, they still host by far the majority of all CDM projects – the distribution has not levelled out. These four countries were hosting 70% of the 516 registered CDM projects as of March 2007, 72% of the 850 projects as of January 2008, 75% of the 2,312 registered projects as of August 2010, 76% of the 2,970 registered projects as of April 2011, and 76% of the 3,815 registered projects as of January 2012. The growth in the number of CDM projects has not led to a percentage increase in the number of projects hosted by other countries or a significant increase in the number of countries participating in the CDM. Instead, the status quo has mostly been maintained.

10.3 Meaning of Justice in the CDM

Countries have been highlighting the need for distributive justice within the CDM even before the first CDM project was registered.[21] However, what distributive justice in the CDM means has never been defined. Although a lot of effort has gone into achieving what countries refer to as "equitable distribution" of CDM projects,[22] and countries have, for many years, been addressing the apparent problem of the inequitable geographic distribution of projects, the exact nature of the problem has never been defined. There is no description of what an equitable distribution should be, so efforts to achieve this goal essentially amount to efforts to achieve an uncertain goal.

While there is a broad range of literature on distributive justice in general, far less has been written on the issue of distributive justice within the CDM or equitable distribution of CDM projects. It is generally regarded as given that the distribution of projects is inequitable and the focus is usually on determining the reasons for the inequitable distribution of projects, rather than on defining "equitable distribution." So the question is 'what is the meaning of equitable distribution of CDM projects/ distributive justice under the CDM?'

There are many different approaches to distributive justice broadly speaking. Firstly, there are various theories of distributive justice, such as egalitarianism, utilitarianism and Rawls's difference principle.[23] Generally, these theories can be regarded as 'outcome-based' approaches, as they would often result in set outcomes, regardless of the specific situation under consideration. For instance, egalitarianism requires equal distribution, whatever the circumstances surrounding the distribution, such as the specific circumstances of the recipients of the benefits.[24] Utilitarianism holds that a just outcome is the one that results in the greatest overall utility and maximises the happiness of society as a whole.[25] It gives no weight to individual happiness and only considers collective happiness, and would, for

[21] In 2001, when establishing the rules to govern the CDM, countries recognised the need to promote equitable distribution of projects. See Decision 17/CP.7, supra, note 16, Preamble, para. 6.

[22] "Equitable distribution" is the specific term used within the CDM regime to refer to distributive justice.

[23] See generally on egalitarianism, Ronald Dworkin, *Sovereign Virtue: Equality in Theory and Practice* (Cambridge: Harvard University Press, 2000); and Andrew Mason (ed.), *Ideals of Equality* (Oxford: Blackwell Publishers, 1998). On utilitarianism, see Jeremy Bentham, *An Introduction to the Principles of Morals and Legislation* (Kitchener: Batoche Books, 2000) (originally published 1781); and John Stuart Mill, *Utilitarianism* (London: Electric Book Company, 2001). On the difference principle, see John Rawls, *A Theory of Justice* (Cambridge: Harvard University Press, 1971); and John Rawls, *Political Liberalism,* expanded edition (New York: Columbia University Press, 2005).

[24] See Felix E. Oppenheim, "Egalitarianism as a descriptive concept", in Louis P. Pojman and Robert Westmoreland (eds), *Equality: Selected Readings* (Oxford: Oxford University Press, 1997), at 56; and Mason, *Ideals of Equality*, supra, note 23, at 3.

[25] See James W. Harris, *Legal Philosophies*, 2nd ed. (London: Butterworths, 1997), at 41.

instance, require an individual to sacrifice their own happiness, regardless of their circumstances, if this would increase the overall collective happiness.[26]

Thus, in these theories, specific circumstances are often disregarded[27] and distributive justice would require that the same formula be applied to all cases, irrespective of relevant circumstances. This approach can be contrasted with that used in international law. The approach to distributive justice in international law appears to be what can be called a "process-based" approach. Distributive justice is usually seen as the outcome of a process that takes certain relevant issues into consideration.[28] For instance, under the law of international watercourses,[29] a just outcome is achieved when factors such as the needs and uses of States, as well as the geographic and hydrographic factors of the watercourses, are taken into consideration.[30] In the case of the delimitation of maritime borders, account must be taken of circumstances such as the existence of islands, coastal configurations and proportionality, in order to reach an equitable outcome.[31]

These factors must be specific to the issue under consideration and should not be generalised. When these factors are fully taken into consideration, the outcome of this process would be considered just or equitable and distributive justice would be achieved. There is therefore no 'one-size-fits-all' equitable outcome. It is this approach, the one used in international law generally, that this chapter also adopts for the CDM. Consequently, equitable distribution of CDM projects can be regarded as the result of a process that takes certain relevant factors into consideration, rather than as a set or pre-determined outcome.[32] Following from this conclusion, the question is what the relevant factors in relation to the CDM are.

As already noted above, the relevant factors to be considered vary depending on the specific regime in question. Under the CDM regime, it is not necessary to go far

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[26] See Howard Davies and David Holdcroft, *Jurisprudence: Texts and Commentary*, *Commentary* (London: Butterworths, 1991), at 219.

[27] For instance, both utilitarianism and egalitarianism do not require consideration of relevant circumstances.

[28] See generally, Akanle, "Distributive Justice in International Law", supra, note 19, at 131–136.

[29] One of the basic rules governing the use of, or access to, shared watercourses is the requirement for equitable and reasonable sharing of the watercourses. See *Gab ikovo-Nagymaros Project (Hungary/Slovakia)*, Judgment, 25 September 1997, *ICJ Reports* (1997), at 54. See also Convention on the Law of the Non-Navigational Uses of International Watercourses, New York, opened for signature 21 May 1997, not yet in force, 36 *International Legal Materials* (1997), 703 (Watercourses Convention).

[30] The Watercourses Convention does not expressly define "equitable and reasonable" use. Instead, it outlines some of the factors for determining whether a use is equitable and reasonable. According to Article 6, to achieve equitable and reasonable use, account should be taken of all relevant factors and circumstances, some of which are identified in the Article (6).

[31] See generally *Continental Shelf (Libyan Arab Jamahiriya/Malta)*, Judgment, 3 June 1985, *ICJ Reports* (1985), at 39–40; and David Freestone et al. (eds), *The Law of the Sea: Progress and Prospects* (Oxford: Oxford University Press, 2006), at 150–159.

[32] A set or pre-determined outcome under the CDM would be something to the effect that all countries should host the same number of projects, that countries should each host x number of projects, and such like.

to determine what should be the relevant factors to be considered. The CDM was established to achieve two objectives: to reduce greenhouse gas emissions and to contribute to developing countries' sustainable development.[33] The relevant factors that should be considered can therefore be distilled from these two objectives: countries' potential to achieve GHG emission reductions and their need for sustainable development.

Countries' potential to achieve GHG emission reductions can be referred to as their GHG emission reduction potential. This is a relevant factor because the CDM aims *inter alia* to help developing countries contribute to the ultimate objective of the UNFCCC to stabilise GHG concentrations in the atmosphere and to assist developed countries to comply with their emission reduction commitments.[34] Countries' emission reduction potential and the realisation of this potential determine how much countries can contribute to these objectives of the CDM. Uruguay, which emits about 45 million tonnes of carbon dioxide (CO_2) equivalent annually, cannot be expected to host the same number of projects as Indonesia, which emits in excess of 2 billion tonnes of CO_2 equivalent annually.[35] Consequently, a country which produces very little GHG emissions may not have much in the way of potential CDM projects and should not be expected to host more CDM projects than it has the potential for. The argument here is that to ensure that the CDM objective of GHG emission reduction is achieved, countries' emission reduction potential, determined by their GHG emission levels, must be taken into consideration.

The reference to potential is often a reference to emission reduction potential. However, another kind of potential that should also be considered is the sustainable development potential of countries. Since sustainable development is one of the objectives of the CDM, it is not sufficient to only consider the emission reduction potential and opportunities for cost-effective emission reductions in countries, as these only measure one of the objectives of the CDM – its objective to promote cost-effective emission reductions. The objective of contributing to sustainable development is equally important. Consequently, countries' need for sustainable development, or their sustainable development potential, should also be considered. Sustainable development potential can be taken to refer to how far along the development path a country is, considering its current development level. Countries that are less developed have greater sustainable development potential and greater need, and presumably, need the sustainable development benefits of the CDM more than those countries that are more developed.

In conclusion, an equitable geographic distribution of CDM projects is a distribution among countries based on their GHG emission reduction potential and their sustainable development potential. A distribution that is the result of the consideration of these two elements can then be regarded as just or equitable.

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[33] See the discussion in Sect. 10.2 above.

[34] Kyoto Protocol, supra, note 8, Art. 12.

[35] For countries' emissions data, World Resources Institute, "World Resources Institute's Climate Analysis Indicators Tool (CAIT) Version 7.0.", 2010, available at: http://cait.wri.org/ (last accessed on 27 January 2012).

10.4 How Just Is the Current Geographic Distribution of CDM Projects?

This section examines whether the current distribution of CDM projects among countries is equitable, using the meaning of equitable distribution described above. It uses the relevant factors, emission reduction potential and sustainable development potential, to calculate countries' CDM potential and provide an outline of what the distribution of CDM projects should be. It then compares the current distribution of projects to this ideal, with the aim of determining whether or not the current distribution fits this ideal.

All developing countries produce GHG emissions, and therefore, all have the potential to reduce their emissions. It is however unlikely that every country will be able to host as many projects as it has the potential to, largely due to practical issues, specifically the size of the CDM market. As of January 2012, the CDM generated over 560 million CERs annually, which is equivalent to annual reductions of 560 million tonnes of CO_2 equivalent.[36] Annual developing country GHG emissions for 2005 are estimated to be about 25 billion tonnes of CO_2 equivalent, which means that annually, only about 2.2% of developing countries' emissions are being reduced through the CDM.[37]

Countries' emissions data is available from the World Resources Institute's Climate Analysis Indicators Tool (CAIT).[38] The emissions data for 2005, which is the year with the most comprehensive record of all GHG emissions for all countries, will be used.[39]

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[36] See CDM, "CDM in Numbers", available at: http://cdm.unfccc.int/Statistics/index.html (last accessed on 31 January 2012).

[37] The estimated demand for CERs has been steadily falling. See Alexandre Kossoy and Philippe Ambrosi, *State and Trends of the Carbon Market 2010* (Washington, DC: World Bank, 2010), at 55–59. The bulk of this demand is from the European Union, which accounts for about 70% of demand. See page 55. However, supply too is expected to fall, due, among other things, to the revised EU Emissions Trading Scheme (EU ETS) Directive, which provides that CERs from new projects registered after 2012 will only be accepted into the EU ETS if the projects are in LDCs. See Council Directive 2009/29/EC amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community, OJ 2009 L 140/63, Article 11a(4), and infra, note 92. It is difficult to estimate with any kind of precision, the demand and supply of CERs in the post-2012 period, as these depend on several factors, such as the emission reduction commitments of developed countries, and rules for the use of CERs to meet these commitments. See generally, World Bank, *State and Trends of the Carbon Market 2011* (Washington, DC: World Bank, 2011), at 47–68.

[38] World Resources Institute, "World Resources Institute's Climate Analysis Indicators Tool (CAIT) Version 7.0.", 2010, available at: http://cait.wri.org/ (last accessed on 27 January 2012).

[39] CAIT contains the GHG emissions of most countries and can help with calculating a country's potential for GHG emission reductions. However, the available data has some shortcomings. The total CO_2 emissions data for all countries is available up to 2006. For non-CO_2 emissions (such as methane and nitrous oxide), this data is only available up to 2005 and is not available for all countries. In addition, for some countries, their emissions data from land use, land-use change and forestry activities is also not available. However, the CAIT database contains the most up to date and comprehensive information found.

To measure countries' sustainable development potential, this section uses the UN Development Programme's (UNDP) Human Development Index (HDI). Countries with low HDI are considered to have greater sustainable development potential due to their low human development levels. The HDI measures the average achievements in a country in three basic dimensions of human development: a long and healthy life (health), access to knowledge (education) and a decent standard of living (income).[40] The basic use of the HDI is to rank countries by level of "human development." The HDI has not been generally accepted as a measure of human development and has been criticised for, *inter alia,* not including environmental indicators in its assessment.[41] Nonetheless, it is widely used and is regarded as a more complete assessment of a country's development than, for example, gross domestic product (GDP) or gross national product (GNP), because it assesses not only economic, but also social development. The latest HDI data available is for 2011, and it is this data that is used in this section.[42] HDI data is available for all eligible developing countries with the exception of the Democratic People's Republic of Korea (North Korea).

10.4.1 CDM Potential and the Current Geographic Distribution of Projects

Using the meaning of equitable distribution described above, this section calculates countries' CDM potential and compares this potential to the current distribution of projects. A three-step process is employed to calculate countries' CDM potential.

Firstly, countries are classified according to their GHG emission reduction (ER) potential, using their 2005 emissions data. For ease of analysis, countries are divided into five categories, representing the ER potential of each category: 1 billion tonnes and over (very high); 500 million–1 billion tonnes (high); 100 million–500 million tonnes (medium); 1–100 million tonnes (low); under 1 million tonnes (very low).

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[40] See UNDP, "Frequently Asked Questions (FAQs) about the Human Development Index (HDI)", available at: http://hdr.undp.org/en/statistics/hdi/ (last accessed on 27 January 2012).

[41] See Mark McGillivray, "Measuring development? The UNDP's Human Development Index", 5 *Journal of International Development* (1993), 183–192; and Ambuj D. Sagara and Adil Najam, "The Human Development Index: A Critical Review", 25 *Ecological Economics* (1998), 249–264.

[42] See UNDP, "Human Development Index and Its Components", 2011, available at: http://hdr.undp.org/en/media/HDR_2011_EN_Table1.pdf (last accessed on 21 January 2012). Although it is possible to use the 2005 HDI data in order to be consistent with countries' GHG emissions data, the 2011 data is a more accurate measurement of countries' current development levels than the 2005 data. As the purpose of this section is not to compare countries' sustainable development potential to their GHG emission reduction potential, but to carry out a comparison among countries, this author determines that it is better in this situation to be accurate.

Each country grouping is then assigned a value, as follows: Very High ER Potential (5); High ER Potential (4); Medium ER Potential (3); Low ER Potential (2); and Very Low ER Potential (1).

Secondly, countries are classified according to their sustainable development (SD) potential, using their 2011 HDI values. This requires further explanation. In UNDP's pre-2010 classifications, countries were classified into four groups, based on values, as follows: Low HDI (0 to 0.499); Medium HDI (0.500 to 0.799); High HDI (0.800 to 0.899); and Very High HDI (0.900 to 1.000).[43] However, using this classification, almost double the number of countries fell into the medium HDI group, compared to the number in the other groups. Because so many countries fell in the medium HDI group, compared to the other groups, and to make it easier to analyse the data more precisely, this section further splits the medium HDI group into two. To achieve this, UNDP's low HDI group is renamed "very low HDI" and UNDP's medium HDI group is split into two equal groups.

Therefore, the groups and values used to classify countries are as follows: very low HDI = very high SD potential (0–0.499); low HDI = high SD potential (0.500–0.649); medium HDI = medium SD potential (0.650–0.799); high HDI = low SD potential (0.800–0.899); very high HDI = very low SD potential (0.900–1.000). As a result, this section classifies countries into five groups according to their HDI, which also enables cross comparison with the data on developing country GHG emissions, where countries are also categorised into five categories. Currently, however, no developing country falls in the "very high HDI" category.

Each country grouping is assigned a value (the same used for ER potential), as follows: Very High SD Potential (5); High SD Potential (4); Medium SD Potential (3); Low SD Potential (2); and Very Low SD Potential (1).

The third step is to calculate countries' complete CDM potentials. To do this, a simple arithmetic calculation is done using the values assigned to each country in steps 1 and 2, and adding these numbers to show overall out of ten, what each country's potential is.

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[43] Since 2010, countries are now divided into four roughly equal quartiles, as follows: low, medium, high and very high HDI. In this classification system, the cut-off point for each category does not depend on countries' HDI values. Rather, countries are simply grouped into roughly equal quartiles, and the cut-off point depends on the number of countries to be included in each quartile, regardless of the HDI values of the countries. The result of this is that two countries with the same HDI value could fall into different categories. For instance, although Tunisia, Jordan and Algeria all have the same HDI value of 0.698, Tunisia is categorised into the high HDI category and Jordan and Algeria into the medium category, essentially because with Tunisia, the number of countries to be included in the high HDI category was completed and so the next countries (starting from Jordan) were classified in the next (medium HDI) category. It is the opinion of this author that the previous classification system (of using absolute values) is a better system, as it will ensure that all countries with the same or similar values fall in the same categories. Consequently, it is this system that this section uses in classifying countries according to their sustainable development potential. See, for instance, the 2007 HDI, in UNDP, "Human Development Report 2009: Summary", 2009, available at: http://hdr.undp.org/en/media/HDR_2009_EN_Summary.pdf (last accessed on 21 January 2012), at 12.

Countries are then classified again into five groups to show what the distribution of CDM projects among countries should look like, based on their CDM potential. The categories and values used are as follows: Very High CDM Potential (9–10); High CDM Potential (7–8); Medium CDM Potential (5–6); Low CDM Potential (3–4); and Very Low CDM Potential (1–2). This is compared to the current geographic distribution of projects (as of 30 January 2012), to show whether or not this distribution is just or equitable.

All this data is presented in Table 10.1 below. It is important to note that this table is intended only as a rough representation of countries' CDM potential. It cannot, and is not intended to, be used to determine exactly how many projects countries should host compared to other countries. Instead, the purpose of this table is to provide a guide as to which countries should be performing well under the CDM, due to their ER and SD potentials taken together. The ultimate objective is to use this information to reach a conclusion about whether or not those countries that should be performing well in the CDM are the ones actually performing well and if not, to ascertain the possible reasons for this. However, the exact number of projects that a particular country can or should host will depend on the country's own ER and SD potentials.

This is particularly so because, due to countries' varying ER potential, the number of projects they can host will also vary. Therefore, countries which, according to Table 10.1, have the same CDM potential, are not necessarily expected to host the same number of projects. For example, although Guinea-Bissau and Iran have the same CDM potential value of 7, this does not mean both countries should host the same number of projects. While Guinea-Bissau has a low ER potential, Iran has a high potential and this necessarily affects the numbers of projects these countries can host. This however does not change the fact that Guinea-Bissau should be performing well under the CDM because it has a high CDM potential, considering both its ER and SD potentials. Because Guinea-Bissau has a high SD potential, it should receive priority or preferential treatment to facilitate its participation in the CDM. However, the precise meaning of "well," in terms of exact number of projects, will depend on the country's ER potential and how many projects it can actually host. And because Guinea-Bissau currently hosts no project, it is obvious that it should be doing much better than it is currently doing.

10.4.2 Analysis of the Distribution of CDM Projects

Table 10.1 above shows clearly the countries with the highest CDM potential. Forty-nine countries fall into the category of those with very high and high CDM potential, comprising countries from all regions. Within this category are those already hosting the largest number of projects, such as India, China and Brazil. On the other hand, only about 60% (29 countries) currently host projects and this hosting is extremely skewed. It ranges from China hosting 1,800 projects, to Iran hosting 7 and Mali hosting 1. The other 20 countries, such as Angola, Myanmar and Mozambique, host no projects at all.

Table 10.1 Countries' CDM potential and the current geographic distribution of projects

	Country	Emission reduction potential	Sustainable development potential	CDM potential	No of registered projects
1.	India	Very high (5)	High (4)	9 (Very high)	776
2.	Indonesia	Very high (5)	High (4)	9 (Very high)	75
3.	China	Very high (5)	Medium (3)	8 (High)	1,800
4.	Dem. Republic of the Congo	Medium (3)	Very high (5)	8 (High)	2
5.	Nigeria	Medium (3)	Very High (5)	8 (High)	5
6.	Zambia	Medium (3)	Very high (5)	8 (High)	1
7.	Angola	Medium (3)	Very High (5)	8 (High)	0
8.	Brazil	Very high (5)	Medium (3)	8 (High)	201
9.	Cameroon	Medium (3)	Very High (5)	8 (High)	2
10.	Myanmar	Medium (3)	Very high (5)	8 (High)	0
11.	Sudan	Medium (3)	Very high (5)	8 (High)	0
12.	Tanzania	Medium (3)	Very high (5)	8 (High)	1
13.	Bangladesh	Medium (3)	High (4)	7 (High)	3
14.	Benin	Low (2)	Very high (5)	7 (High)	0
15.	Burkina Faso	Low (2)	Very high (5)	7 (High)	0
16.	Burundi	Low (2)	Very high (5)	7 (High)	0
17.	Cambodia	Medium (3)	High (4)	7 (High)	5
18.	Chad	Low (2)	Very high (5)	7 (High)	0
19.	Côte d'Ivoire	Low (2)	Very high (5)	7 (High)	3
20.	Gambia	Low (2)	Very high (5)	7 (High)	0
21.	Guinea	Low (2)	Very high (5)	7 (High)	0
22.	Guinea-Bissau	Low (2)	Very high (5)	7 (High)	0
23.	Iran	High (4)	Medium (3)	7 (High)	7
24.	Liberia	Low (2)	Very high (5)	7 (High)	1
25.	Malawi	Low (2)	Very high (5)	7 (High)	0
26.	Mali	Low (2)	Very high (5)	7 (High)	1
27.	Mozambique	Low (2)	Very high (5)	7 (High)	0
28.	Niger	Low (2)	Very high (5)	7 (High)	0
29.	Pakistan	Medium (3)	High (4)	7 (High)	13
30.	Rwanda	Low (2)	Very high (5)	7 (High)	3
31.	Senegal	Low (2)	Very high (5)	7 (High)	2
32.	Sierra Leone	Low (2)	Very high (5)	7 (High)	0
33.	Togo	Low (2)	Very high (5)	7 (High)	0
34.	Djibouti	Low (2)	Very high (5)	7 (High)	0
35.	Haiti	Low (2)	Very high (5)	7 (High)	0
36.	Egypt	Medium (3)	High (4)	7 (High)	10
37.	Lesotho	Low (2)	Very high (5)	7 (High)	0
38.	Madagascar	Low (2)	Very high (5)	7 (High)	1
39.	Mauritania	Low (2)	Very high (5)	7 (High)	1
40.	Mexico	High (4)	Medium (3)	7 (High)	136
41.	Nepal	Low (2)	Very High (5)	7 (High)	4
42.	Papua New Guinea	Low (2)	Very High (5)	7 (High)	5
43.	Philippines	Medium (3)	High (4)	7 (High)	57
44.	South Africa	Medium (3)	High (4)	7 (High)	20
45.	Uganda	Low (2)	Very High (5)	7 (High)	9

(continued)

Table 10.1 (continued)

	Country	Emission reduction potential	Sustainable development potential	CDM potential	No of registered projects
46.	Uzbekistan	Medium (3)	High (4)	7 (High)	13
47.	Viet Nam	Medium (3)	High (4)	7 (High)	94
48.	Zimbabwe	Low (2)	5 (Medium)	7 (High)	0
49.	Yemen	Low (2)	Very High (5)	7 (High)	0
50.	Algeria	Medium (3)	Medium (3)	6 (Medium)	0
51.	Bhutan	Low (2)	High (4)	6 (Medium)	2
52.	Bolivia	Medium (3)	Medium (3)	6 (Medium)	4
53.	Ghana	Low (2)	High (4)	6 (Medium)	0
54.	Kenya	Low (2)	High (4)	6 (Medium)	6
55.	Lao	Low (2)	High (4)	6 (Medium)	1
56.	Swaziland	Low (2)	High (4)	6 (Medium)	0
57.	Thailand	Medium (3)	Medium (3)	6 (Medium)	64
58.	Argentina	Medium (3)	Medium (3)	6 (Medium)	25
59.	Botswana	Low (2)	High (4)	6 (Medium)	0
60.	Colombia	Medium (3)	Medium (3)	6 (Medium)	38
61.	Ecuador	Medium (3)	Medium (3)	6 (Medium)	17
62.	Equatorial Guinea	Low (2)	High (4)	6 (Medium)	0
63.	Guatemala	Low (2)	High (4)	6 (Medium)	11
64.	Guyana	Low (2)	High (4)	6 (Medium)	1
65.	Honduras	Low (2)	High (4)	6 (Medium)	21
66.	Kyrgyzstan	Low (2)	High (4)	6 (Medium)	0
67.	Moldova	Low (2)	High (4)	6 (Medium)	4
68.	Morocco	Low (2)	High (4)	6 (Medium)	8
69.	Namibia	Low (2)	High (4)	6 (Medium)	0
70.	Nicaragua	Low (2)	High (4)	6 (Medium)	6
71.	Tajikistan	Low (2)	High (4)	6 (Medium)	0
72.	Peru	Medium (3)	Medium (3)	6 (Medium)	26
73.	Republic of Korea	High (4)	Low (2)	6 (Medium)	67
74.	Saudi Arabia	Medium (3)	Medium (3)	6 (Medium)	0
75.	Syria	Low (2)	High (4)	6 (Medium)	3
76.	Solomon Islands	Low (2)	High (4)	6 (Medium)	0
77.	Comoros	Very Low (1)	Very High (5)	6 (Medium)	0
78.	Armenia	Low (2)	Medium (3)	5 (Medium)	5
79.	Azerbaijan	Low (2)	Medium (3)	5 (Medium)	1
80.	Belize	Low (2)	Medium (3)	5 (Medium)	0
81.	Bosnia & Herzegovina	Low (2)	Medium (3)	5 (Medium)	0
82.	Oman	Low (2)	Medium (3)	5 (Medium)	0
83.	Dominican Republic	Low (2)	Medium (3)	5 (Medium)	2
84.	El Salvador	Low (2)	Medium (3)	5 (Medium)	6
85.	Eritrea	Low (2)	Very high (5)	5 (Medium)	0
86.	Ethiopia	Low (2)	Very high (5)	5 (Medium)	1
87.	Fiji	Low (2)	Medium (3)	5 (Medium)	2
88.	Gabon	Low (2)	Medium (3)	5 (Medium)	0
89.	Georgia	Low (2)	Medium (3)	5 (Medium)	2
90.	Jamaica	Low (2)	Medium (3)	5 (Medium)	1

(continued)

Table 10.1 (continued)

	Country	Emission reduction potential	Sustainable development potential	CDM potential	No of registered projects
91.	Jordan	Low (2)	Medium (3)	5 (Medium)	3
92.	Mongolia	Low (2)	Medium (3)	5 (Medium)	3
93.	Paraguay	Low (2)	Medium (3)	5 (Medium)	2
94.	Sri Lanka	Low (2)	Medium (3)	5 (Medium)	7
95.	Suriname	Low (2)	Medium (3)	5 (Medium)	0
96.	Tunisia	Low (2)	Medium (3)	5 (Medium)	2
97.	Turkmenistan	Low (2)	Medium (3)	5 (Medium)	0
98.	Albania	Low (2)	Medium (3)	5 (Medium)	1
99.	Bahamas	Low (2)	Medium (3)	5 (Medium)	0
100.	Costa Rica	Low (2)	Medium (3)	5 (Medium)	8
101.	Cuba	Low (2)	Medium (3)	5 (Medium)	2
102.	Cape Verde	Very low (1)	High (4)	5 (Medium)	0
103.	Lebanon	Low (2)	Medium (3)	5 (Medium)	0
104.	Macedonia	Low (2)	Medium (3)	5 (Medium)	1
105.	Malaysia	Low (2)	Medium (3)	5 (Medium)	105
106.	Mauritius	Low (2)	Medium (3)	5 (Medium)	1
107.	Montenegro	Low (2)	Medium (3)	5 (Medium)	0
108.	Panama	Low (2)	Medium (3)	5 (Medium)	8
109.	Serbia	Low (2)	Medium (3)	5 (Medium)	0
110.	Libya	Low (2)	Medium (3)	5 (Medium)	0
111.	Trinidad and Tobago	Low (2)	Medium (3)	5 (Medium)	0
112.	United Arab Emirates	Medium (3)	Low (2)	5 (Medium)	5
113.	Uruguay	Low (2)	Medium (3)	5 (Medium)	7
114.	Barbados	Low (2)	Medium (3)	5 (Medium)	0
115.	Kuwait	Low (2)	Medium (3)	5 (Medium)	0
116.	Bahrain	Low (2)	Low (2)	4 (Low)	0
117.	Chile	Low (2)	Low (2)	4 (Low)	52
118.	Maldives	Very low (1)	Medium (3)	4 (Low)	0
119.	Samoa	Very low (1)	Medium (3)	4 (Low)	0
120.	Antigua and Barbuda	Very low (1)	Medium (3)	4 (Low)	0
121.	Cyprus[a]	Low (2)	Low (2)	4 (Low)	8
122.	Grenada	Very low (1)	Medium (3)	4 (Low)	0
123.	Israel	Low (2)	Low (2)	4 (Low)	22
124.	Malta[b]	Low (2)	Low (2)	4 (Low)	0
125.	Qatar	Low (2)	Low (2)	4 (Low)	1
126.	Saint Lucia	Very low (1)	Medium (3)	4 (Low)	0
127.	Singapore	Low (2)	Low (2)	4 (Low)	2
128.	Democratic People's Republic of Korea	Medium (3)	NA	NA	0

Source: Author

Source of project data: UNFCCC: CDM in Numbers (January 2012)

[a]Annex I to the UNFCCC has been amended to include Cyprus. This amendment will take effect from 1 January 2013 or on a later date. This means from the entry into force of this amendment, Cyprus will no longer be eligible to host new CDM projects. See Decision 10/CP.17, Amendment to Annex I to the Convention, FCCC/CP/2011/9/Add.2, 15 March 2012

[b]Annex I to the UNFCCC has been amended to include Malta, which means that the country is now no longer eligible to host new CDM projects. See Decision 3/CP.15, Amendment to Annex I to the Convention, FCCC/CP/2009/11/Add.1, 30 March 2010

This skewed distribution cannot be explained solely by countries' GHG emission levels. Although the countries that are currently performing well are among those with the highest ER potential,[44] many of the countries that also have relatively high potential are underperforming[45] particularly when compared to other countries in the same category[46] or those in a lower category.[47]

It also cannot be explained by countries' SD potential, as the current distribution of CDM projects does not match with that required by this factor. The groups of countries with the with high and very high SD potential are actually hosting the least number of projects, with most of them not hosting any project. Therefore considering both the ER and SD potentials of countries, neither of these elements explains the current distribution of CDM projects.

Table 10.1 shows also that many of the countries, such as Mexico, the Philippines, Thailand and Viet Nam, currently performing very well under the CDM are not among those with the highest CDM potential. In fact, countries like Israel, Malaysia and Chile have among the lowest CDM potential, but relatively high number of projects. This again cannot be explained by either their ER potential (low) or their SD potential (low or medium). In relation to those countries with higher CDM potential, the conclusion must be that this distribution is not equitable.

It is therefore reasonable to conclude that the current geographic distribution of CDM projects is inequitable and the reason for this inequity cannot be found solely in countries' ER or SD potential. Therefore, in order to address the problem of the inequitable geographic distribution of projects, it is necessary to ascertain the cause(s) of the problem, so that efforts can be targeted at these causes. This is what the next section sets out to do: to identify the main reasons for the inequitable geographic distribution of CDM projects.

10.5 Barriers to Distributive Justice in the CDM

Some of the barriers to participation in the CDM and equitable distribution of projects are internal to the countries involved, and include barriers that would affect any kind of investment. Examples of such internal barriers are corruption, lack of security, poor governance structures, conflict and political instability, all of which lead to high investment risks.[48] These internal barriers to investment are beyond the ability of the CDM regime to address, and so will not be discussed in this section, as modifications to the

[44] For example, China, Brazil, Indonesia, India, Mexico and the Republic of Korea are the countries with the highest GHG emissions and they are among the countries with the largest number of CDM projects.

[45] Such as Iran (seven projects), Nigeria (five projects) and Cambodia (five projects).

[46] Such as the Philippines (57 projects) or Malaysia (105 projects).

[47] Such as Chile (52 projects).

[48] See generally Matthias Busse and Carsten Hefeker, "Political Risk, Institutions and Foreign Direct Investment", 23 *European Journal of Political Economy* (2007), 397; and Chantal Dupasquier and Patrick N. Osakwe, "Foreign direct investment in Africa: Performance, challenges, and responsibilities", 17 *J. Asian Economics* (2006), 241.

CDM regime at the international level cannot address these barriers. However, many other barriers stem from the institutional makeup of the CDM itself and are issues that the international CDM regime can address, such as lack of capacity and lack of financing opportunities. These CDM barriers are the focus of this section.

Nevertheless, before moving on, it is useful to show that these internal barriers are not the key or sole reasons for the inequitable distribution of CDM projects. Statistics show that although many countries do have internal barriers to investment, this has not stopped some of them from performing well under the CDM. In addition, some of the countries that are actually doing well in terms of their internal governance structures are under-performing under the CDM. For instance, Botswana, Cape Verde, Mauritius, the United Arab Emirates, Uruguay and Qatar are performing relatively well in terms of the World Bank's governance indicators,[49] which are: voice and accountability,[50] political stability, government effectiveness, regulatory quality, rule of law and control of corruption.[51] Nevertheless, these countries are not doing well under the CDM: Botswana and Cape Verde do not host any project; Mauritius and Qatar host just one; and the United Arab Emirates hosts five. The Republic of Korea and Israel, whose good governance rankings are similar to these countries', host 67 and 22 projects, respectively. Mexico and the Philippines have much worse rankings, but they host 136 and 57 projects, respectively. China, which hosts almost half of all registered projects, ranks low compared with many other countries, such as Brazil (201), South Africa (20), Bhutan (2) and Lesotho (0), but this has not stopped it from being the single largest CDM host country and doing far better than these other countries. Even though some of these differences can be explained by the varying levels of ER potential and/or SD potential in these countries, not all of them can. For example, South Africa has greater ER and SD potentials than the Philippines,[52] and South Africa's governance ranking by the World Bank is higher than that of the Philippines, but while South Africa hosts 20 projects, the Philippines hosts nearly three times this number – 57 projects.[53]

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[49] For the World Bank good governance indicators, see World Bank, "The Worldwide Governance Indicators (WGI) project", 2011, available at: http://info.worldbank.org/governance/wgi/index.asp (last accessed on 30 January 2012).

[50] These refer to the perception of how much a country's citizens are able to participate in selecting their government, as well as freedom of expression and association, and a free media. See Daniel Kaufmann, Aart Kraay and Massimo Mastruzzi, "The worldwide governance indicators: methodology and analytical issues", September 2010, available at: http://siteresources.worldbank.org/INTMACRO/Resources/WPS5430.pdf (last accessed on 6 February 2012), at 4.

[51] These countries are performing well for most, though not necessarily all of the statistics. But in comparison to other developing countries, they *are* performing very well.

[52] In absolute values. In the classification in Table 10.1, both have the same ER and SD potential rankings (as these rankings cover a range of absolute values).

[53] All governance statistics are for 2010 (the latest available). See World Bank, "Access governance indicators", 2011, available at: http://info.worldbank.org/governance/wgi/sc_country.asp (last accessed on 6 February 2012). Even computing beyond 2010, the conclusion remains that governance is not the key barrier to equitable distribution. For example, comparing South Africa's and the Philippines' governance indicators for 2007, 2008 and 2009, South Africa has consistently ranked higher, but the Philippines is still performing better under the CDM.

These statistics suggest that while internal structures and barriers may play a part in determining the distribution of CDM projects, there are other, probably more important, considerations that investors look out for, and these internal barriers are not the overriding barrier to CDM participation. Therefore, this section briefly outlines some of the barriers to distributive justice in the CDM, including the key barriers.

10.5.1 Lack of Capacity and Local Expertise

There are two elements to hosting CDM projects which may impact on the distribution of projects: the general investment/project element; and the CDM-specific element. CDM-specific issues arise out of the need to comply with the CDM modalities and procedures when developing and implementing CDM projects.[54] General investment issues are those that would affect normal investments, not just CDM projects, and relate to the underlying project. They include the legal and regulatory framework for investment within the host developing country, and the available infrastructure, such as transportation and telecommunications facilities. Lack of capacity in these two areas, that is, lack of CDM-specific and general investment capacity, has been identified as a barrier to CDM hosting and equitable distribution of projects.[55]

The primary reason why lack of capacity, particularly project development capacity, constitutes a barrier to CDM hosting and the equitable distribution of projects is the unilateral nature of many CDM projects. In the unilateral CDM structure, developing country entities themselves develop, finance and implement projects, rather than with developed country support.[56] As a result of this, those that lack the capacity to develop and implement projects are under-performing in the CDM market.

This capacity barrier to distributive justice in the CDM primarily undermines the 'SD potential' factor for achieving equitable distribution because the countries with the lowest human development and greatest SD potential are often those with the least capacity. It also undermines the 'ER potential' factor because many of the countries that lack the capacity to effectively participate in the CDM and are

[54] The CDM modalities and procedures are provided by the Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol (COP/MOP) and the CDM Executive Board. These include the modalities and procedures for undertaking activities such as those relating to selecting the project methodologies, preparing the necessary project documentation such as the project design documents, and registering the project activities. See "Rules and References", available at: http://cdm.unfccc.int/Reference/index.html (last accessed on 27 February 2012).

[55] See Ann E. Prouty, "The Clean Development Mechanism and its Implications for Climate Justice", 34 *Columbia Journal of Environmental Law* (2009), 513, at 523; Sanja Lutzeyer, "Climate trading: the clean development mechanism and Africa", 12 *Stellenbosch Economic Working Papers* (2008), 1, at 27; and Emily Boyd et al., "The clean development mechanism: an assessment of current practice and future approaches for policy", 2007, available at: http://www.tyndall.ac.uk/sites/default/files/wp114.pdf (last accessed on 15 January 2012), at 23.

[56] See the discussion of the unilateral CDM structure as a barrier to equitable distribution, in Sect. 10.5.5 below.

therefore affected by this capacity barrier, such as least developed countries (LDCs) and sub-Saharan African countries among others, do have sufficient ER potential to participate in the CDM.[57]

10.5.2 Finance and Cost-Related Barriers

Lack of funding has been identified as a major barrier to the equitable distribution of CDM projects, or as a barrier to the hosting of projects by certain groups of countries, such as LDCs and African countries.[58] As with most projects, the funding required for CDM projects can be divided into: funding for the project transaction costs; and funding for the underlying project.

10.5.2.1 Transaction Costs

CDM project transaction costs include the cost of identifying potential CDM projects, identifying potential partners and negotiating the CDM contract, as well as the costs involved in the approval process, such as those associated with establishing baselines, proving additionality, validation, registration and verification of the project. They also include the share of proceeds and registration fees required by the Kyoto Protocol.[59]

Transaction costs are a barrier to local developers who cannot access the funds required to pay the transaction costs associated with the development of CDM projects. As these costs are incurred upfront, project developers would require some financing to cover the costs, which could be quite substantial. UNEP estimates the costs incurred during the CDM planning phase as ranging from US$18,500 to US$610,000, depending on various things such as the complexity and scale of the project.[60] The need for host country project developers to bear the bulk of these transaction costs would generally only arise in the case of unilateral projects, where

[57] Most of these countries fall in the medium ER potential category and others fall in the low potential category. For example, Angola (no project), Zambia (one project), Tanzania (one project), and Nigeria (five projects), all have medium ER potential and very high SD potential. See the classification of countries according to their emission reduction in Table 10.1 above.

[58] See UNEP and Ecosecurities, *Guidebook to Financing CDM Projects* (Roskilde: UNEP, 2007), at 3 and 7.

[59] Kyoto Protocol, supra, note 8, Art. 12.8 provides that a share of the proceeds of CDM projects should be used to cover administrative expenses, as well as to assist in meeting the cost of adaptation in developing countries. The share of proceeds to support adaptation in developing countries is 2% of CERs issued. See Decision 17/CP.7, supra, note 17, para. 15(a). The share of proceeds to cover administrative expenses, including the registration fee, is US$0.10 per CER issued for the first 15,000 tonnes of CO_2 equivalent and US$0.20 per CER issued for any amount in excess of 15,000 tonnes. See Decision 7/CMP.1, supra, note 19, para. 37.

[60] See, UNEP and Ecosecurities, *Guidebook to Financing CDM Projects*, supra, note 58, at 56.

the host country entity itself undertakes and finances all the preliminary elements of the CDM project.[61] However, even in the case of bilateral projects, the host country project developer may still have to bear some of the transactions costs, such as negotiation costs.

This barrier to equitable distribution particularly affects those countries with the lowest human development and greatest SD potential and therefore undermines the 'SD potential' factor for achieving equitable distribution.[62] It also, obviously, undermines the 'ER potential' factor, because some of these countries with the greatest SD potential that are unable to effectively participate in the CDM also have ER potential.[63] Their inability to participate effectively therefore means that their potential is not being adequately exploited under the CDM.

10.5.2.2 Implementation Costs

These refer to the actual or direct cost of producing the goods, as opposed to the transaction costs, which are the costs associated with organising production. Under the CDM, the implementation costs would include the project construction costs, such as purchasing the plant and equipment, and the project operating costs, such as the cost of maintenance and other running costs.[64]

Lack of underlying finance for the project has been identified as a major barrier to CDM participation, particularly for those smaller developing countries that do not have strong financial institutions. For example, Sieghart, commenting on the Yemeni experience, states that "some buyers offer to assist with the designing of the project. However, transaction costs are not perceived as the major financial barrier by project developers. Developers face difficulties in procuring underlying finance due to a deficiency of domestic capital and both to country-specific and CDM-specific risks."[65]

The original expectation of the CDM was that it would attract foreign investment, and that this foreign investment would provide financing for the actual CDM project, beyond the purchase of CERs generated from the projects. If this original expectation was generally the case, local project developers would only have to secure foreign developed country counterparts to invest in the projects and this investment would cover the implementation costs of the project, in exchange for the

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[61] See the discussion on unilateral CDM projects below.

[62] See, for example, Jane Ellis and Sami Kamel, "Overcoming Barriers to Clean Development Mechanism Projects", May 2007, available at; http://www.oecd.org/dataoecd/51/14/38684304.pdf (last accessed on 12 February 2012), at 32–33, where the authors state that transactions costs are a barrier faced by many project developers, especially for small-scale projects, and in poor developing countries.

[63] See note 57 above for examples of such countries.

[64] See generally for the financing requirements of CDM projects, UNEP and Ecosecurities, *Guidebook to Financing CDM Projects,* supra, note 58.

[65] Lia C. Sieghart, "Unilateral clean development mechanism – an approach for a least developed country? The case of Yemen", 12 *Environmental Science and Policy* (2009), 198, at 201.

CERs generated by the project.[66] However because of the prevalence of unilateral CDM projects and pure CER purchase-type transactions, the norm has become that local developers source local financing for the underlying projects and then secure foreign developed country counterparts to purchase the CERs generated by the projects. This is a problem for many countries that do not have well-developed financial institutions, and for those that even where these institutions exist, local financiers are reluctant to invest in CDM projects because of a lack of understanding of its operation and because of its greater risk compared to other kinds of projects. In these situations, local developers have difficulty sourcing the required financing for the underlying projects locally and depend on foreign investment, which is often not forthcoming because of the preference for simply purchasing CERs.[67]

Just like the transaction costs barrier, this implementation costs barrier undermines the 'SD potential' and 'ER potential' factors for achieving equitable distribution of CDM projects.

10.5.3 Preference for Large-Scale Projects

The size of CDM projects has been identified as a barrier to the distribution of projects. Specifically, this has been highlighted as investors' preference to invest in projects that will generate a minimum quantity of CERs. This is partly in order to ensure that considering the transaction costs of the project, the quantity of CERs generated is enough to make the project worthwhile.[68] Linked to this barrier is the relatively low level of industrial development in some countries, resulting in limited opportunities for large-scale projects. Because the CDM seeks to assist developed countries to meet their Kyoto targets in a cost-effective way, investors will consider cost-effectiveness in determining the attractiveness of any CDM project. Some investors have a minimum project size they will invest in. For example, the World Bank requires the volume of emission reductions to be generated from a project to be large enough to make a project viable, and states that for example, a small-scale project should generate at least 50,000 tonnes of CO_2 equivalent annually.[69]

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[66] Here, the developing country would for example benefit from the use of renewable energy, capacity building, technology transfer and other sustainable development benefits arising from the project.

[67] See Gregor Pfeifer and Geoff Stiles, "Carbon finance in Africa – a policy paper for the Africa Partnership Forum", 2008, available at: http://www.africapartnershipforum.org/dataoecd/40/15/41646964.pdf (last accessed on 16 February 2012), at 17; Axel Michaelowa, "Unilateral CDM – can developing countries finance generation of greenhouse gas emission credits on their own?", 7 *International Environmental Agreements: Politics, Law and Economics* (2007), 17, at 17; and Sieghart, "Unilateral clean development mechanism", supra, note 67, at 202.

[68] See the discussion of transaction costs in Sect. 10.5.2.1 above.

[69] See World Bank, "Minimum Project Requirements", available at: http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/ENVIRONMENT/EXTCARBONFINANCE/0,,contentMDK:21844766~menuPK:5220728~pagePK:64168445~piPK:64168309~theSitePK:4125853,00.html (last accessed on 16 February 2012).

However, although this has been identified as a barrier by some authors,[70] the number of small-scale projects that have been registered and that are in the pipeline belies this claim. As of 30 January 2012, of the 3,815 registered CDM projects, 1,627 (43%) were small-scale and 2,188 (57%) were large-scale projects.[71] This means that even if investors do prefer large-scale projects in order to minimise cost and maximise cost-effectiveness, small-scale projects are still being developed and registered at almost the same rate as large-scale projects. A likely explanation for this is that most small-scale projects are unilateral, the host countries themselves are almost solely responsible for the projects, which involve no foreign investment, and therefore what foreign investors want does not directly affect the rate of developing and implementing such projects.

The barrier presented by many investors' preference for large-scale projects mainly undermines the ER potential factor for achieving equitable distribution. This is because when countries with limited opportunities for large-scale projects are ignored or overlooked, their ER potential (even though this potential can only be tapped primarily through small-scale projects) is basically lost and is not exploited under the CDM. In addition, it also undermines the SD potential factor because many of the countries with the lowest human development and greatest SD potential have limited opportunities for large-scale projects and are thereby affected by this barrier.

10.5.4 The Market-Based Nature of the CDM

As highlighted above, the CDM is a market-based mechanism. Developed or developing country entities can invest in these projects[72] and the resulting CERs can either be traded or used directly by the developed country participant (to comply with its emission reduction commitment).

Although the CDM was created as a mechanism that would both generate cost-effective emission reductions and contribute to sustainable development,[73] the

[70] See Alan Silayan, "Equitable distribution of CDM projects among developing countries", 255 *Hamburg Institute of International Economics Report* (2005), 1, at 23–24; Prouty, "The Clean Development Mechanism and its Implications for Climate Justice", supra, note 57, at 523; and Ben Pearson, "Market failure: Why the Clean Development Mechanism Won't Promote Clean Development", 15 *Journal of Cleaner Production* (2007), 247, at 250.

[71] See CDM, "Registered project activities by scale", available at: http://cdm.unfccc.int/Statistics/Registration/RegisteredProjByScalePieChart.html (last accessed on 30 January 2012).

[72] If investment comes from developing country entities, the projects are referred to as unilateral, and if from developed country entities, they are either bilateral or multilateral, depending on the number of developed country entities involved in the project.

[73] Kyoto Protocol, supra, note 8, Art. 12. See also Prouty, "The Clean Development Mechanism and its Implications for Climate Justice", supra, note 55, at 522.

very nature of the CDM as a market-based instrument is preventing it from achieving these objectives equitably among developing countries. The nature of the CDM means that apart from the necessary environmental constraints,[74] normal market considerations, such as risk and cost, largely dictate the location of projects. Investors are generally more interested in lower cost and risk projects, with the cost of a CDM project and the profit to be derived from it being the major considerations.[75] Added to the problem is the fact that the sustainable development element of the CDM, unlike its GHG emission reduction element, has no monetary value, and is therefore not factored into the cost or profit of the CDM.[76] There is no market incentive to promote sustainable development and no particular benefit to investors from investing in projects with high sustainable development benefits.[77] Because of this, for investors, who are considering cost and profit, the GHG reduction element is usually the paramount consideration. It is partly because the market-based nature of CDM projects that the size of projects, which partly determine the profit to be achieved from projects, and cost-related issues also constitute barriers to equitable distribution.

The consequence is that those developing countries that are rapidly industrialising, with the attending industries, high emission levels, institutions and possibly project experience or existing foreign direct investment, are better placed to host CDM projects, and investors will therefore gravitate towards these countries. This is compounded by the CDM no longer being used purely as a compliance tool by developed country entities, but also as a profit-generating mechanism. This means that although many public and private entities invest in the CDM in order to use the CERs generated to meet their emission reduction commitments or to comply with environmental regulations in their jurisdictions, many invest in the CDM in order to

[74] Such as rules to ensure that projects result in real, measurable, and long-term benefits related to the mitigation of climate change, and that reductions in emissions are additional to any that would occur in the absence of the certified project activity. See Kyoto Protocol, supra, note 8, Art. 12.

[75] See Sieghart, "Unilateral clean development mechanism", supra, note 65, at 199; and Harrie Oppenoorth et al., "The Bali guide on CDM: towards a sustainable CDM", November 2007, available at: http://www.snm.nl/pdf/klimaattopbali_brochure_bali_guide_def_webversie_copy.pdf (last accessed on 12 January 2012), at 20.

[76] According to the CDM rules, the host developing countries are responsible for determining that projects will contribute to their sustainable development. The host country is required to confirm that the CDM project activity assists it in achieving sustainable development. See Decision 3/CMP.1, supra, note 15, para 40(a) of the Annex. Also the host entity usually provides in the project design document, an explanation of the sustainable development contributions of the project. Beyond this, there is no regulation or rule concerning what this means or should constitute. The regulatory tools that have been developed (such as tools for assessing the additionality of the project) are mainly focused on calculating the emission reductions achieved by the project, and not measuring the sustainable development benefits it provides.

[77] See Christoph Sutter and Juan Carlos Parreño, "Does the current clean development mechanism (CDM) deliver its sustainable development claim? An analysis of officially registered CDM projects", 84 *Climatic Change* (2007), 75, at 89.

trade the CERs generated and make profit from such trade.[78] Because of this, these entities would not only go for projects that cost the least, they will in particular go for projects that can generate the greatest profit, and most likely follow the normal foreign direct investment trends.

Although these issues are doubtless relevant and should be considered, the important point is that market-based indicators are only suitable for one element of the CDM – the GHG emission reduction element. The sustainable development element of the CDM must also be considered if the CDM is to actually achieve its dual objectives but these indicators do not compute this element. It is not suggested that the CDM should no longer operate as a market, or have market characteristics. However, it is essential that to ensure achievement of both objectives of the CDM, while investors consider market factors in selecting host countries and projects, they also consider sustainable development factors, such as countries' needs and sustainable development potential. A combination of the two, rather than just the cost-effectiveness factor, should guide investors' choices.

The barrier to equitable distribution presented by the market-based nature of the CDM mainly undermines the "SD potential" factor for achieving equitable distribution. This is because by not considering countries' SD potential, investors are not adequately considering the specific circumstances of those countries with low development levels. If countries' SD potential was actually considered by investors, then, it follows that those countries with the highest SD potentials (because of their low development levels) would be preferred over those countries with less SD development potential, or at least that they would have the opportunity to participate more effectively in the CDM. In addition, because these countries with the greatest SD potential also have ER potential, this barrier also undermines the "ER potential" factor for achieving equitable distribution.

10.5.5 The Unilateral CDM Structure

The above discussions show that many of the barriers to equitable distribution, such as lack of capacity, lack of financing and other cost-related barriers, constitute barriers to equitable distribution of projects primarily because of the unilateral nature of many CDM projects. Hence, one of the major barriers to equitable distribution of

[78] For example, as of November 2010, Ecosecurities was the largest CDM investor/CER purchaser, with a share of about 12% of all registered CDM projects. See the CDM Pipeline, 1 November 2010. Ecosecurities is however not a compliance buyer, but a CER trader, and is in the business of "sourcing, developing and trading emission reduction credits." See Ecosecurities, "Who we are", 2010, available at: http://www.ecosecurities.com/Home/EcoSecurities__the_carbon_market/Who_we_are/default.aspx (last accessed on 1 March 2012). See the CDM Pipeline (available at: www.cdmpipeline.org (last accessed on 1 March 2012)) for an analysis of all CDM projects and the official CDM website (available at: http://www.cdm.unfccc.int (last accessed on 1 March 2012)) for CDM statistics.

CDM projects is the predominance of unilateral CDM projects in the CDM market. In the unilateral CDM structure, the CDM project is developed and implemented by local project developers with financing obtained usually from local investors/financial institutions, and the resulting CERs are then sold to developed countries, developed country private entities or market traders. The key element here is that the purchaser of CERs does not invest in the underlying project – the only finance provided is for the purchase of the CERs.

These commodity-style purchase transactions are possibly the most common form of CDM projects.[79] The CDM is rapidly moving away from the envisaged foreign investment and involvement-based mechanism to one which mainly involves local developers and financiers. This dominance of unilateral CDM projects constitutes a barrier to equitable distribution because unilateral projects require the hosts to have sufficient financial and technical capacity to undertake such projects. Developing countries that lack such capacity are unable to implement unilateral CDM projects and are consequently sidelined in the CDM market. This ability to unilaterally host projects is not in itself inequitable. On the contrary, it is very beneficial particularly to those developing countries that have the capacity to unilaterally develop and implement projects, and that can also raise the necessary financing. For instance, the host countries would be able to focus on projects that align with their sustainable development objectives, rather than those projects that are more financially-attractive to a developed country sponsor.

The disadvantage arises specifically because both unilateral and bilateral CDM projects compete in the same market and for the same developed country entities. There is a finite demand for CDM projects/CERs. If there is preference for unilateral projects over bilateral projects, then the demand for bilateral projects ultimately will be reduced. And because unilateral projects currently dominate the market, the share of bilateral projects is inevitably reduced.

Many countries, especially LDCs and other poor developing countries, rely on foreign investment and capacity building to be able to develop and host projects. These countries lack the financial and technical capability to exploit their CDM potential and will thus be unable to enjoy the sustainable development benefits (such as direct investment, capacity building and technology transfer) the CDM is meant to contribute to. And yet, they are likely to be those most in need of these benefits because of their low human development.[80] Consequently, this barrier created by the unilateral CDM structure mainly undermines the "SD potential" factor for achieving equitable distribution. However, as already highlighted several times, because those countries with the greatest SD potential also have ER potential, this barrier also undermines the "ER potential" factor.

[79] Because project proponents are not required to disclose their source and style of funding, it is not possible to determine precisely how the market is divided among the various structures available. It is possible that although in some PDDs, it is not stated that the foreign entity is investing directly in the project, or that a contract has been signed for the purchase of CERs, that this is actually the case.

[80] See the classification of countries according to their SD potential/human development levels in Table 10.1 above.

10.6 Analysis of Barriers

Regarding whether the CDM regime can support an equitable distribution of projects, the answer is that two of the main elements of the CDM regime constitute the main barriers to equitable distribution of projects. These two elements in fact lead to those countries with the greatest SD potential being unable to effectively participate in the CDM. These elements are the market-based nature of the CDM and the prevalence of unilateral CDM projects in the CDM market. Because of the prevalence of unilateral CDM projects and the availability of CERs for purchase, developed country entities have less of an incentive to directly invest in CDM projects, with the attendant risks and financial commitments required. However, even where developed country entities invest directly in projects, they prefer to transact with larger, rapidly-industrialising developing countries, mainly because of their greater potential and financial and technical capacity, to the detriment of the smaller, less-industrialised developing countries, who are often those with the lowest human development and greatest SD potential.[81] This means that even bilateral projects will often by-pass smaller developing countries because of the market-based nature of the CDM.

Various actions have been undertaken within the CDM regime to address the inequitable distribution of CDM projects, such as: the Nairobi Framework, which aims to increase the African region's participation in the CDM, primarily through capacity building[82]; initiatives to reduce the transaction costs of projects, for LDCs or countries generally, such as fee exemptions for LDCs,[83] and the provision of loans to countries hosting fewer than 10 CDM projects[84]; and a registration fee exemption and simplified modalities for small-scale projects.[85] However, there are currently no initiatives which address the two main barriers of the market-based nature of the CDM and the prevalence of unilateral CDM projects. This is unfortunate, because as noted above, these two barriers are the main reasons why the current distribution of CDM projects is inequitable. It is probably because of this that these initiatives have not been particularly successful in ensuring a more equitable distribution of projects.[86]

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[81] As noted above, internal barriers such as lack of good governance cannot completely explain the distribution of CDM projects.

[82] See CDM, "Regional Distribution – Nairobi Framework", available at: http://cdm.unfccc.int/Nairobi_Framework/index.html (last accessed on 28 March 2012).

[83] See Decision 17/CP.7, supra, note 17, para. 15(b) and Decision 2/CMP.3, Further Guidance Relating to the Clean Development Mechanism, FCCC/KP/CMP/2007/9/Add.1, 14 March 2008, para. 31.

[84] See Decision 2/CMP.5, supra, note 19, paras. 49–50; and Decision 3/CMP.6, Further Guidance Relating to the Clean Development Mechanism, FCCC/KP/CMP/2010/12/Add.2, 15 March 2011, para. 64 and Annex III.

[85] See Report of the 37th Meeting of the CDM Executive Board, Annex 20, para. 4; and Decision 4/CMP.1, Guidance Relating to the Clean Development Mechanism, FCCC/KP/CMP/2005/8/Add.1, 30 March 2006, Annex II. For a more detailed discussion of these and other initiatives, see Akanle, "Distributive Justice in International Law", supra, note 19, at pages 189–238.

[86] See note 20 above for a history of the distribution of projects, which highlights that the same four countries have consistently been hosting the majority of projects.

As it currently operates therefore, the CDM regime, with its market-based nature, primacy of market forces and the prevalence of unilateral CDM projects, does not and will probably be unable to support an equitable distribution of CDM projects.

10.7 Recommendations

There are various ways of addressing these barriers to equitable distribution. For instance, to address the capacity barrier, the most obvious solution is capacity building. To have the greatest impact, this should, ideally, be targeted specifically at those countries with the lowest human development and greatest SD potential. The capacity building should also respond to specific capacity needs, such as those identified through a comprehensive study of countries' capacity.

To help overcome the barrier created by the market-based nature of the CDM, investors can be required to take countries' SD potential into consideration when selecting countries to invest in. This should go beyond considering the SD potential of projects, as this could just lead to more sustainable projects in the same countries already dominating the market.[87] Instead, in keeping with the factors to be considered for achieving distributive justice under the CDM, countries' SD potential should be considered and preference given to those countries with the greatest potential. When investing in countries, investors should consider why that particular country is the most appropriate, given its human development level and SD potential.

Considering that there is no real benefit to investors of taking sustainable development potential into consideration, especially when this may necessitate investing in countries that can only produce less profitable projects, there is a risk that a requirement of this sort may drive investors away from the CDM market because it will diminish their opportunities to generate profits relative to costs. However, having a market that has a different focus may result in a different outcome. In other words, the CDM market needs the right focus. It needs to focus, not on maximising profit and minimising risk and cost, but on ensuring achievement of its environmental objectives of reducing GHG emissions and promoting sustainable development, which should be done equitably among developing countries. Although making profit and reducing risk and cost could be part of the focus of the market, it should not be, as it is now, the primary focus.

One way of addressing this issue is by promoting the practice of socially-responsible investing within the CDM – investing in a way that incorporates social, environmental or ethical criteria with financial objectives.[88] For socially-responsible investors,

[87] There is nothing wrong with this. The issue is that those countries that are underperforming should also have the chance to fulfil their CDM potential.

[88] See Peter Waring and Tony Edwards, "Socially responsible investment: explaining its uneven development and human resource management consequences", 16 *Corporate Governance: An International Review* (2008), 135, at 135.

making a return on their investments, though an important aim, is not the overriding concern.[89] The situation with CDM investors should be similar – the overriding concern of CDM investors should not be making profit, but achieving the objectives of the CDM, which are to achieve GHG emission reductions and promote sustainable development, rather than to generate profit for investors.

An excellent example of this is the initiative by the European Commission in relation to LDCs. The Commission has decided that in Phase III of the European Union (EU) Emissions Trading Scheme (ETS), which will run from 2013 to 2020, the only new CDM projects which will be automatically eligible for inclusion in the Scheme are CDM projects implemented in LDCs.[90] Specifically, CERs generated from new CDM projects registered in LDCs from 2013 onwards will be automatically accepted into the EU ETS, whereas CERs from new projects in non-LDCs will only be accepted if there is an agreement for this purpose between the Commission and the relevant country.[91]

This is a good example of the kind of preferential treatment that should be given to countries with the lowest human development and highest SD potential, as it would help ensure that they fulfil their CDM potential. It is also important to ensure that the CDM market does not falter because of this kind of provision. While there is an obvious need to increase the participation of LDCs in the CDM market, it is also important to ensure that other countries, which are not LDCs, also have the opportunity to host projects. The key thing is that the ER and SD potentials of all countries should be considered and they should be given the opportunity to host projects, according to these potentials. In addition, it is not sufficient to limit automatic eligibility to LDCs – what is needed is for developed countries to actively source and finance projects in the developing countries that are currently underperforming in the CDM, which have both the ER and SD potentials to perform better.

To address the problem of the prevalence of unilateral projects/financial assistance, the most obvious solution is to require that a specific percentage of all registered projects must be bilateral in the real sense and, where the projects are multilateral,[92] they should be funded by the multilateral investor, rather than by the host country entity itself. This can be done, for instance, by having a requirement that x% of registered projects should be bilaterally-funded, or that x% of CERs used by developed countries to fulfil their emission reduction objectives should be obtained from bilaterally-funded projects. These options however may not directly improve the participation of those countries with the greatest need, as developed countries, in complying with the options, may simply increase their investments in the countries already performing well under the CDM. That is why these options should be used

[89] Ibid.

[90] Such CERs will be accepted into the EU ETS until 2020 or until these countries have entered into an agreement with the EU for this purpose, whichever is earlier. See Council Directive 2009/29/EC amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community, OJ 2009 L 140/63, Art. 11a(4).

[91] Ibid., Art. 11a(5).

[92] That is, where they involve several developed country entities whether acting directly or through a fund, such as the various World Bank carbon funds.

in conjunction with that proposed as a solution to the market-based nature of the CDM – requiring investors to consider countries' SD potential, to encourage them to increase their investments in those countries with the lowest human development.

10.8 Conclusion

It is ironic that those countries that are most in need of CDM projects, because of their low development levels, are actually the ones benefitting the least from the CDM. It is also ironic that they are benefitting the least precisely for the reason they are most in need – because of their low development levels. They lack the technical and financial capacity to implement CDM projects, and as most CDM projects are undertaken by developing countries themselves, this has formed an effective barrier to prevent the poorest countries from participating in the CDM.

Although there appears to be a possible solution to the problem of the prevalence of unilateral projects in the CDM market, the barrier created by the market-based nature of the CDM does not appear to be as easy to overcome. If the concept of socially-responsible investing is introduced into the CDM market, with an emphasis on effectively considering the sustainable development objective of the CDM and ensuring that more countries are able to participate in the CDM, this could reduce the focus of the market on financial incentives and refocus the market more effectively on the CDM's environmental objectives of promoting sustainable development (and GHG emission reductions) equitably among developing countries. However, there is possibly no legal solution to effectively ensure consideration of this, although investors or groups can voluntarily adopt the socially-responsible investing approach to ensure that those countries that are underrepresented in the CDM, particularly those with the greatest need, are helped to increase their level of CDM participation.

So far, this chapter has focused on the current structure and operation of the CDM, and the barriers preventing an equitable distribution of projects. As highlighted above, the Kyoto Protocol first commitment period comes to an end in 2012,[93] and countries were meant to finalize considerations for the second commitment period in 2009.[94] They were however unable to meet this deadline, spurring concern about

[93] Supra, note 11.

[94] The GHG emission reduction commitments contained in the Kyoto Protocol (in Annex B) must be achieved by the end of the first commitment period which runs from 2008 to 2012 (Protocol, Art. 3.1). The Protocol does not contain the commitments for subsequent periods, but provides in Art. 3.9 that consideration of these commitments shall be initiated by 2005. During the 11th Conference of the Parties (COP 11) in December 2005, the *Ad Hoc* Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol (AWG-KP) was established. Its aim is to determine what commitments developed countries will take on post-2012, and how they will meet those commitments. See Decision 1/CMP.1, Consideration of Commitments for Subsequent Periods for Parties Included in Annex I to the Convention under Article 3, paragraph 9, of the Kyoto Protocol, FCCC/KP/CMP/2005/8/Add.1, 30 March 2006, paras. 2–3. Countries decided to conclude this work and forward their conclusions to COP/MOP 5 in December 2009. See Report of the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol on its Resumed Fourth Session, FCCC/KP/AWG/2007/5, 5 February 2008, para. 22(c).

the future of the Kyoto Protocol and its instruments, including the CDM. However, at COP/MOP 7 in December 2011, countries established the second commitment period, which will start on 1 January 2013 and end in 2017 or 2020.[95] The CDM (and the other Kyoto Protocol instruments) will continue to operate during this period.[96]

In addition, some organisations have made efforts to ensure that the CDM market would continue to operate, even if countries had been unable to reach agreement regarding the Protocol's second commitment period before the end of the first. For instance, the European Commission will continue to accept CERs from CDM projects implemented in the LDCs into the EU ETS.[97] Also, the World Bank's Umbrella Carbon Facility has put up new funding of €68 million (US$89 million) for CERs generated after 2012.[98] It is therefore probably accurate to say that the CDM has a future, and the issues raised in this chapter are equally relevant to the operation of the CDM during the Kyoto Protocol second commitment period.[99]

Countries have also "defined" a new market mechanism, operating under the guidance and authority of the Conference of the Parties, which developed countries can use to meet part of their mitigation targets or commitments. They have also undertaken to "maintain and build upon" the existing Kyoto Protocol flexibility mechanisms, which includes the CDM.[100] This means that the new market mechanism

[95] See Decision 1/CMP.7, Outcome of the Work of the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol at its Sixteenth Session, FCCC/KP/CMP/2011/10/Add.1, 15 March 2012, paras. 1–2.

[96] See Decision 3/CMP.7, Emissions Trading and the Project-Based Mechanisms, FCCC/KP/CMP/2011/10/Add.1, 15 March 2012, para. 1. See also CDM, "Frequently Asked Questions", available at: http://cdm.unfccc.int/faq/index.html (last accessed on 26 March 2012).

[97] It will also accept CERs from CDM projects implemented in non-LDC countries with which it enters into an agreement for this purpose. See supra, note 90.

[98] See World Bank, "World Bank ups funding for post-2012 credits", 13 January 2011, available at: http://wbcarbonfinance.org/docs/World_Bank_ups_funding_for_post-2012_credits.pdf (last accessed on 28 March 2012); and World Bank, "Umbrella Carbon Facility T2", available at: http://wbcarbonfinance.org/Router.cfm?Page=UCFT2&ItemID=53224&FID=53224 (last accessed on 28 March 2012).

[99] Although the CDM market will continue to operate, it is still uncertain just how much demand there will be for CERs. See the discussion at supra, note 37.

[100] See Decision 2/CP.17, Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention, FCCC/CP/2011/9/Add.1, 15 March 2012, para. 83 and Preamble to Part E, para. 4. This new mechanism may be created under the Convention. It is however more likely to be created under the new international agreement which countries are currently negotiating, which is intended to come into effect and be implemented from 2020. See Decision 1/CP.17, Establishment of an Ad Hoc Working Group on the Durban Platform for Enhanced Action, FCCC/CP/2011/9/Add.1, 15 March 2012, para. 4.

Countries have requested the *Ad Hoc* Working Group on Long-term Cooperative Action under the Convention to conduct a work programme to elaborate modalities and procedures for the new mechanism, with a view to recommending a decision to COP 18. Parties and admitted observer organisations have been invited to submit their views on possible modalities and procedures, including their positive and negative experiences with existing approaches and mechanisms, as well as lessons learned. See Decision 2/CP.17, para. 85. This would provide a good opportunity for countries to ensure that the lessons from the operation of the CDM are taken into account when designing the new mechanism.

will likely be modelled on the CDM. It is very important that the new mechanism not repeat the mistakes of the CDM in order not to face the same criticisms faced by the CDM.[101] Instead, when designing this new mechanism, countries should learn from the CDM and ensure that the new mechanism is a better, improved mechanism. For instance, in order to give the new mechanism a better chance of achieving distributive justice, some of the recommendations in this chapter could be implemented, such as limiting the percentage of unilateral projects that can be registered.[102]

Nevertheless, there does not appear to be very much that can be done to address the problems created by the current design of the CDM as a market-based instrument. And the new mechanism "defined" by parties is also intended to be a market-based mechanism. There is no real incentive that can be given to investors to make it really worth their while to take sustainable development into consideration and there is the risk that requiring them to do so may drive investors away from the market. Addressing the problem of unilateral CDM projects should go some way in correcting the skewed distribution of projects. There is however the very real possibility that if investors cannot purchase enough CERs and need to invest directly in projects, they will simply do this in the countries where it makes the best market sense. So the problem may not be solved at all. The question that this chapter cannot shy away from therefore is whether the CDM can achieve distributive justice and whether there is any point in continuing efforts to achieve this. Should the CDM continue to attempt to achieve sustainable development and GHG emission reductions equitably among countries? Or should it be streamlined to be simply a market mechanism to achieve cost-effective emission reductions, with no significance attached to where the reductions are achieved?

In reality, CERs are issued for emission reductions achieved in countries, and not for sustainable development contributions. This is how it has to be in order to maintain the environmental integrity of the CDM, considering that these CERs are then used to offset the emission reduction objectives of developed countries. The final conclusion is that the CDM regime, given its market-based nature, may not be able to achieve a truly equitable distribution of projects, and that there is no legal solution to this problem. The only option would be to accept that the CDM cannot continue to operate as a simple market mechanism and to introduce regulations that are not

[101] For some of these criticisms, see Charlotte Streck, "Expectations and Reality of the Clean Development Mechanism: A Climate Finance Instrument between Accusation and Aspirations", in Richard Stewart, Benedict Kingsbury and Bryce Rudy (eds), *Climate Finance: Regulatory and Funding Strategies for Climate Change and Global Development* (New York: New York University Press, 2009), 67, at 67–75; and Pearson, "Market Failure: Why the Clean Development Mechanism Won't Promote Clean Development", supra, note 70, at 249.

[102] As noted above, there are several criticisms of the CDM, and there is a lot of literature on how the CDM should be reformed in the post-2012 period. The suggestions contained in such literature could also be useful in the design of a new market mechanism. See for instance, Emily Boyd et al., "Reforming the CDM for Sustainable Development: Lessons Learned and Policy Futures", 12 *Environmental Science and Policy* (2009), 820.

really suitable for a typical market mechanism,[103] but which would help the CDM to achieve its dual objectives. On the other hand, countries could simply accept that there will be no truly equitable distribution of projects and turn their attention elsewhere in efforts to contribute to sustainable development in developing countries.

[103] Such as requiring investors to invest directly in certain countries, or requiring them to take countries' sustainable development potential into consideration. See the recommendations in Sect. 10.7.