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International Climate Law and Mining Regulation – Perspectives from Developing Countries

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Abstract

For many years, environmental concerns were not considered to be part of the regulatory frameworks of the mining industry. Omission of mining in major international environmental instruments also confirms the fact that environmental concerns were not seen as part of mining regulation until recently. This article argues that mining could be made environmentally and socioeconomically sustainable in the resource-dependent countries of the Global South if appropriate regulatory and institutional frameworks are put in place to mitigate climate change and other negative environmental impacts of mineral exploitation. Adapting to and internalising the principles of international climate law are advocated as part of the global initiatives and options for reducing emissions of greenhouse gases (GHGs) in mining operations in the developing countries. This article examines international climate law principles and practices which have formed the basis of positive changes in others countries and regions, and advocates the adoption of such principles and practices in addressing climate change challenges in mineral exploitation in the developing countries.

A. Introduction

Market-based approaches[1] for mitigating climate change impacts of mineral extraction might be unsuitable for the mineral-dependent countries of the Global South. A viable alternative for making mining both environmentally

1 Gradual erosion of the initial opposition of corporate actors and groups in energy, minerals and other businesses to climate change issues is a trade-off for market-based solutions to global warming. See Pring & Sigele (2005:260–263).

and socioeconomically sustainable is for the less developed, mining-dependent countries to identify specific principles and practices of international climate law suitable to their peculiar socioeconomic circumstances for integration into legal and policy frameworks for addressing climate change challenges in their mining sectors. Due to their nature and sophistication, market-based approaches offer little succour for developing countries that rely largely on the extractive industry[2] for survival. This informs the dominant argument of this article that social, rather than economic or market-based traded-offs are required to impact directly on mineral-dependent, Third World countries, if they must be dissuaded from pursuing mining-based economic development, like the developed countries, to minimise the increasing global threat of climate change owing to the emission of greenhouse gases.

The stakes of developing countries of the Global South,[3] which were undermined at the negotiation of earlier climate change instruments,[4] may become further complicated unless socially dynamic and more flexible alternatives offered by contemporary international climate change law and practice are deployed.[5] The duo of Gray and Gupta examined the implementation of the Kyoto Protocol in Africa and concluded that the region stands disproportionately to suffer the greatest effects of greenhouse emissions.[6] What the scholars forgot to add is that it is even more risky for the developing countries in Africa and elsewhere to hinge their apathy to international climate change governance or frameworks on their disadvantaged position at the negotiation of earlier climate change instruments. This is because the resource sectors like mining and others, on which most of these countries depend, are the most vulnerable to global warming and other negative effects of climate change.

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2 For the purpose of this article, *extractive industry* means oil & gas, mining and related sectors.

3 The term *Global South* refers to developing countries of the Southern hemisphere.

4 See Mumma (2000:190). See also Coghlan (2002:165); see generally French (2000:35).

5 Mumma (2000:190).

6 Gray & Gupta (2003:66-67). These scholars argued that African countries were severally unrepresented in the climate change regime as their voices and concerns/interests were overwhelmed by industrialised countries that command the negotiations agenda. This is due to the fact that Africa has been unable to effectively mount a common position in relation with other like-minded G77 countries, which negates its position in relation with the rest of the G77 countries.

A number of years ago, the writer argued that mining in the developing countries is not incompatible with sustainable development.[7] In another piece, the author concluded that adapting to climate change by incorporating principles of climate change law and other relevant environmental instruments is a sustainable option for developing countries, particularly in sub-Saharan Africa.[8] This article specifically articulates the need for deploying the legal and institutional frameworks of international climate change law to cover mineral exploitations in the developing countries. To justify its arguments, the provisions of the Kyoto Protocol to the United Nations Framework Convention on Climate Change [hereinafter Kyoto Protocol][9], the Framework Convention on Climate Change [hereinafter Framework Convention][10] and other international climate change instruments are employed. Its arguments amplify the socioeconomic realities of the Global South[11] in the quest for the application of international climate change law and principles in their mining sectors.[12] The question of whether mineral exploitation is compatible with environmental sustainability is answered in the affirmative. This article uses the prism of international climate change law as basis for achieving reduced GHG emissions towards a socially responsible exploitation of mineral resources in the developing countries.

B. Minerals Sector and Climate Change Impacts

The adverse impacts of emission of greenhouse gases on developing African countries are phenomenal.[13] Flaring in Nigeria's extractive industry of oil and gas contributes a measurable percentage of the world's total emission of greenhouse gases. This partly explains why the country ratified the Kyoto

7 See Oke (2008) and (2005).
8 Oke (2011).
9 Kyoto Protocol to the United Nations Framework Convention on Climate Change, 31 ILM 849 (1992).
10 See United Nations Framework Convention on Climate Change (U.N. Doc. A/AC. 237/18 (Part II) (Add. 1), Misc 6 (1993), Cm 2137; 31 I.L.M. 848.
11 The term 'Global South' refers to developing countries of the Southern hemisphere.
12 See APF (2007:4).
13 See Conway (2004:2). It has been pointed out that many tropical regions and developing countries are expected to experience lower yields, due to reduced water availability, smaller fertilization effects from carbon dioxide and interactions with non-climate factors, such as reduced capacity to adapt to climate change.

Protocol.[14] But Nigeria and other developing countries that have ratified the Protocol lack the technical skills and political will for effective implementation. Worse still, greenhouse gas emissions represent one of the few instances where African customary approaches to environmental management have not been tested.[15]

Climate change issues are modern challenges unknown in age-old traditional wisdom of environmental management. Owing to the peculiar nature of greenhouse gases, highly technical and scientific capabilities rather than indigenous, traditional knowledge or practices are required.[16] The nature of mining and relative incapacity of the developing countries to deal with its climate change impacts imply that new ways would need to be devised for engaging climate change issues in mining in the developing countries. In the opinion of George Pring and Linda Sigele –[17]

> As global efforts to fend-off climate change accelerate, the projected shift in GHG emissions from developed to developing countries presents a challenge for the mineral resources industries, especially in the area of energy resources. In recent years, the largest percentage of new development in mineral resources has occurred in the developing world, and this trend is expected to continue well into the 21st century.

The extractive industries of mining, coal, oil and gas, among others, contribute to the emission of carbon dioxide.[18] Backing off from mining owing to its climate change impact is not a realistic option for mineral-dependent countries. Mining is a source of survival for many.[19] For example, in South

14 See Moffat & Linden *(*1995); see also Global Health Watch (2008).

15 Oke (2011:60).

16 (ibid.). The impact of science and technology on the natural environment and resource exploitation and management is undeniable. One of the arguments put forward for apparent apathy to traditional knowledge in environmental and natural resource management is practical impossibility of applying traditional knowledge in the extractive industry of oil, gas, mining as well as in solving modern environmental problems like emissions of greenhouse gases, global warming, atmospheric pollution or poison from oil, gas or mining explorations. See also Richardson (1993).

17 Pring & Sigele (2005:250).

18 A shift from the use of hydrocarbons as the world's primary source of fuel would positively affect the mineral industry, while also minimising global emissions of greenhouse gases. See Pring & Sigele (2005:251).

19 Mineral producing countries in Africa like Ghana, South Africa and new entrant like Nigeria have demonstrated through their mining regimes that mining could be an engine of economic growth and development if well managed. An important aspect of the regulatory frameworks of the mineral sectors of the countries is the inclusion

Africa, which is Africa's most developed economy, and in emerging states like Ghana the need for increasing and sustaining mining investment continues to underlie their mining sectors.[20] Like in South Africa and Ghana, the Nigerian mining regime offers future options for diversifying the nation's economy from its present near absolute dependence on the oil sector, which makes the country vulnerable to global trends and social forces, particularly the quest for resource control by the oil-producing states and communities.[21] Resort to mining in Nigeria is an indispensable alternative to douse increasing tension in the oil sector.[22]

The potential of the mining industry and ability of the sector to contribute positively to socioeconomic fortunes of a country are not in doubt.[23] What seems in serious doubt is the ability of mineral-dependent countries, particularly developing countries of the Southern Hemisphere, to make mining sustainable in the short and/or long run. Beyond mining, climate change and global warming are matters of global concern. Abbasi describes global warming as a/the "perfect problem" owing to the fact that it involves a substantial and uncertain time lag between its cause and effect.[24] Its impact goes beyond national or regional barriers, as it causes severe damage to the global atmospheric system,[25] aside from its socioeconomic implications on developing countries.

C. Aspects of International Climate Law

The Kyoto Protocol deals essentially with environmental management challenges arising from emissions of greenhouse gases by countries.[26] The in-

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of statutory provisions to accelerate systematic state withdrawal in order to increase foreign investment and to achieve developmental and other objectives. See Campbell (2003:2).

20 See Oke (2009:87).

21 Oke (2008:184f.).

22 (ibid.).

23 Fundamentally, the minerals and mining laws of Nigeria, South Africa and Ghana have deployed various institutional mechanisms to achieve success in mining. While sustainability is an implied phenomenon under the Nigerian mining regime, it is both the rule and norm in South Africa. However, in Ghana, it is an unwritten persuasive normative code having both the force and effect of a law. See Oke (2008:211).

24 Abbasi (2006), cited in Watchman (2008:21).

25 Cameron (2008:26).

26 See Article 3 of the Kyoto Protocol.

strument is further to the Framework Convention which articulates principles for protecting the climate systems.[27] The provisions of the Kyoto Protocol specifically aim at curtailing environmental challenges of climate change. The protocol provides binding emission reduction targets for countries.[28] The effects of emission of greenhouse gases on developing countries appear threatening.[29] This justifies the ratification of the Kyoto Protocol by some developing countries in Africa in order to seize the benefits of the frameworks in the instrument.

The Kyoto Protocol seeks to curtail the level of emission of greenhouse gases associated with the extractive sector of mining, and energy production and consumption.[30] Its precursor, the United Nations Framework Convention on Climate Change (UNFCCC), on the other hand, merely provides an advisory regulatory framework for curtailing greenhouse emission. The Kyoto protocol was negotiated in furtherance of the objectives of the UNFCCC to stabilise the atmospheric concentration of GHGs. It provides three flexible global mechanisms, namely Emission Trading (ET), Joint Implementation (JI) and the Clean Development Mechanism (CDM).

The flexible alternatives and institutional mechanisms provided under the ET, JI and CDM provide avenues for making mining and mineral exploitation in developing countries more socioeconomically and environmentally sustainable. The only task is for countries to identify and deploy a framework best suited most suitable to the peculiar nature of their mining sector and socio-political configuration of their country. In simple terms, a CDM or JI project involves a physical activity that reduces greenhouse gas emissions, ranging from capping a landfill, greenhouse efficiency at an industrial facility, planting trees and a variety of other projects tending towards reduction

27 Article 3 Principle 1 of the United Nations Framework Convention on Climate Change states:
"In their actions to achieve the objective of the Convention and to implement its provisions, the Parties shall be guided, *inter alia*, by the following:
1. The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof…".

28 See Kyoto Protocol Articles 2–4 and Annex I.

29 See Conway (2004).

30 See Kyoto Protocol Article 3.

of greenhouse gas emissions.[31] Structuring of CDM or JI projects are evolving trends, and changing dynamically, particularly in the developed countries where the financing terms are being driven by a combination of powerful forces from multinational institutions and the financial world.[32] The CDM mechanism has the potential to reduce climate change effects of mining operations in the developing economies of the Global South.

ET, on the other hand, allows the developed countries to trade their surplus emission rights with one another to meet their emission reduction commitments. JI encourages Annex-1 countries to generate and amass emission reductions units through cross-border investments in projects that reduce emissions. Compared to ET, the CDM also enables Annex-1 countries to earn Certified Emission Reductions (CERs) by embarking on projects which contribute to sustainable development in a developing country.

The CDM provides opportunities for increased international investment in renewable energy and bio-efficiency to enable countries to contribute to reducing global levels of greenhouse gas emissions. The concept of CDM first arose in an international context in 1992 at the Rio Earth Summit, at which developed countries contended that GHG mitigation would be more politically and economically feasible in developing countries where labour and materials are cheaper, and fewer vested interests in the fossil fuel technology sector exit.[33] Regional collaborations towards emissions reduction targets are also on the increase. A case in point is the Western Climate Initiative (WCI), a regional partnership between various states of the United States and provinces of Canada for the common objective of achieving a 15% reduction of the 2005 level of six main greenhouse gases by 2020, beginning in 2012.[34]

The above-mentioned objectives of climate law notwithstanding, scholars have reacted to the gaps in the Kyoto Protocol, pointing out that developing countries, particularly African countries, which signed the instrument despite being disadvantaged at the negotiation stages of the instrument, might be imperilled when the instrument becomes fully operational.[35] For instance, Gray and Gupta examined the implementation of the Kyoto Protocol in Africa and concluded that the region stands disproportionately to suffer the

31 Carr & Rosembuj (2008:39).
32 (ibid.).
33 Coghlan (2002:169). See also Mumma (2000:190).
34 See Sorensen (2008:7).
35 See Mumma (2000:190); Coghlan (2002:165); and French (2000:35).

greatest effects of greenhouse emissions. This is because the region is expected to experience lower yields due to reduced water availability, smaller fertilisation effects from carbon dioxide and interactions with non-climate factors such as reduced capacity to adapt to climate change, among others.[36]

Emission of greenhouse gases impacts more on the developing countries owing to reliance on mineral and natural resource extraction, which activities are prone to emission of GHGs.[37] Strong commitments are therefore required to reduce carbon emissions, particularly in the mining sectors of the mineral-dependent countries of the Global South. This is essential to the success of global climate change governance. Although expectations were high, success was neither achieved by parties to the UNFCCC at the conference in Copenhagen, Denmark[38] nor at the Rio+20 Conference in Rio de Janeiro, Brazil, as further illustrated below.[39] Based on this observation, it is important that developing countries speak with a strong, unified voice in subsequent negotiations about climate change and other international environmental instruments. And their voices must be heard – in contrast to the insignificant role played by countries, particularly of the African region, at the negotiation and implementation stages of the Kyoto accord.[40]

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36 Gray & Gupta (2003:67).

37 See Conway (2004).

38 See the fifteenth session of the Conference of the Parties to the UNFCCC and the fifth session of the Conference of the Parties held at Denmark in December 2009. The Copenhagen Accord contained several key elements on which there was strong convergence of the views of governments. But there was, however, no agreement on how to do these in practical terms. Developed countries promised to fund actions to reduce greenhouse gas emissions and to adapt to the inevitable effects of climate change in developing countries. Developed parties promised US$30 billion for the period 2010-2012, and to mobilise long-term finance of a further US$100 billion a year by 2020 from a variety of sources. All these remain pipeline dreams. For the outcomes of the Copenhagen Conference see http://unfccc.int/meetings/copenhagen_dec_2009/meeting/6295.php, last accessed 14 July 2012.

39 The United Nations Conference on Sustainable Development (UNCSD), Rio+20, held between 20 and 22 June 2012, at Rio de Janeiro, Brazil, to mark the 20th anniversary of the 1992 United Nations Conference on Environment and Development (UNCED), in Rio de Janeiro, and the tenth anniversary of the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg. See the United Nations Conference on Sustainable Development, Rio+20 http://www.uncsd2012.org/rio20/rio20conference.html, last accessed 14 July 2012.

40 See Mumma (2000:190).

The Kyoto protocol might be defective to the extent pointed out above; but it cannot be denied that it assigns to all parties common but differentiated responsibilities, taking into consideration the respective contributions of countries to global environmental challenges, particularly emission of greenhouse gases and climate change.[41] It is becoming increasingly apparent that creating adaptation incentives is the best way of getting the developing countries to adapt effectively to climate change in mining and other activities that generate high levels of GHG emissions. Paramount at every stage of the negotiations is the geographical divide between the developed and developing world.[42] Long-term viability of global climate change governance, initiatives, policies and frameworks is contingent on active participation of the developing countries in embracing flexible mechanisms on climate change.[43]

The imperative of persuading and encouraging developing countries to embrace and implement flexible mechanisms on climate change is more apparent in the highly emitting mining sectors of these countries. The effect of climate change knows no bounds. Mitigating global climate impacts of mining in the developing countries requires the application of global measures through a set of preventive and adaptive actions at all levels of governance in these countries.[44] The application of these measures will enhance domestic standard-setting agendas by creating regulations and policies that charge specific agencies and institutions with responsibility for implementation.[45] According to a writer, the world is indeed faced with no alternatives in climate change; we either adapt or are imperilled.[46] This further justifies the need for the mining industry, which had erroneously been assumed to be incompatible with environmental sustainability, to strive for meeting the challenges of climate change.[47]

41 See Article 3(1) Kyoto Protocol.
42 See Coghlan (2002:166).
43 (ibid.:180).
44 See Fagbohun & Nlerum (2011:267–269).
45 (ibid.:267).
46 See Watchman (2008:9).
47 According to Llewellyn "[t]he pace of a firm's adaptation to climate change is likely to prove to be another of the forces that will influence whether, over the next several years, any given firm survives and prospers; or withers and, quite possibly, dies." See Llewellyn (2007:4).

D. Global Climate Governance and Rio+20

Beyond the menace of mining-induced climate change, global concern for controlling GHG emissions might remain a façade, as the world continues favour economic interests over climate change and related environmental concerns. The recently concluded Rio+20 Summit is anything but a success. The global players appear to be slackening rather than accelerating in their commitments to climate change governance. In the words of an observer –[48]

> As the global economic crisis has consumed more and more time and attention, focus on the global warming crisis has waned. So it wasn't surprising when President Barack Obama chose not to attend the Rio+20 …, and it also was unsurprising when there was little progress reported there. … And with the world economy on everyone's mind, global warming has taken a back seat … the summit was a bit of a disappointment, but only marginally so, because no one was really expecting anything to come out of it. That's why you don't see David Cameron (the U.K. Prime Minister) or Angela Merkel of Germany in Rio +20 either.

The lackluster outcome of the Rio+20 Earth Summit had been predicted by those who contend, in relation to climate change, that these types of mass international conferences have become an incredible distraction that actually undermine rather than support efforts to reduce greenhouse gas emissions.[49] Edis and others are of the view that such global conferences reinforce a false belief that reducing carbon emissions must be closely coordinated internationally.[50] This notion would appear justified in the sense that the recently concluded Rio+20 did not offer succour to the developing countries in terms of global consensus and readiness to mitigate the effects of mining on climate change. Similarly, in 2009, the Copenhagen Summit failed to produce a binding climate change agreement, as large target goals on carbon dioxide emission reductions were dropped, and the summit ended in failure. This reinforces the argument that local policy and action are more likely to succeed than globally binding agreements.[51] This is why this article advocates home-grown strategies for mainstreaming international climate change principles and practices towards sustainable mining in developing countries,

48 See The Takeaway (2012).
49 See Edis (2012).
50 (ibid.).
51 Awiti (2012).

and maintains that a new global consensus is unlikely, at least for now. With the hard reality of a not-too-successful Rio+20 Conference, there is a need to look elsewhere in ensuring that developing countries are able successfully to harmonise the need for socially sustainable mineral exploitation, while also making the world a better place by mitigating global climate change effects of mining and related activities. The Nigerian president, too, challenged the global leaders on the implementation of climate change principles among other social issues.[52]

E. Making Mining Compatible with Climate Change

Policy and legislation are essential for dealing with unavoidable impacts of climate change in mining and other extractive sectors.[53] For developing countries, however, a cautionary and persuasive approach is desirable. For instance, Europe, China, India and the United States have deployed technological advances to stem the rising tide of greenhouse gas emission, which opportunities are not available to developing countries.[54] Thus, developing countries can, with justification, point to the fact that the developed countries have had their advantage of unregulated GHG emissions for centuries, and to now expect these countries to limit, pause or halt their economic development based on adverse effects of mining and other extractive sectors on climate change, being a problem created by the developed countries, according to Watchman, smacks of irony at best, and hypocrisy at worst.[55]

It might be counterproductive to use the above position as basis for continued trends of environmentally perilous exploitation and development of

52 According to the Nigerian president, Goodluck Jonathan: "In effect, Rio+20 can only be successful if the thorny issue of the means of implementation is adequately addressed. We must bridge the yawning gaps underlining the fulfilment of international commitments on sustainable development, especially in areas of finance, external debt, trade and investment, capacity building and technology development. Today, we have a unique opportunity to reshape the future and redefine the relationship between human advancement and environmental sustainability, by ensuring that we join, in a collective effort, to reduce the conflict between human development and environmental conservation." See the speech of the Nigerian president at the Rio+20 Conference as reported by Adetayo (2012:4).

53 Watchman (2008:18).

54 (ibid.).

55 (ibid.).

mineral resources in the developing countries. Rather, social justice advocacies should be intensified around the contention that the cost of mitigation of climate change impacts in the developed countries be borne by the developed countries. The polluter pays principle is handy here, as it provides justification for externalising the cost of mitigation by developing countries to their developed counterparts. The polluter pays principle is a normative doctrine of environmental law.[56] Its central objective stems from the fundamental but fair proposition that those who generate pollution should bear the cost of cleaning it up.[57] This normative principle is one of the considerations for the emission trading ventures, which aimed at encouraging investment in projects to reduce greenhouse gases in developing nations.[58] The polluter pays principle first appeared in a legal text in a document prepared by the Organisation for Economic Cooperation and Development (OECD),[59] but receives widest expression as an international environmental law principle in the Rio Declarations.[60]

The polluter pays principle notwithstanding, addressing climate change at the international level through the use of law has not proved to be a viable option.[61] The first major challenge to a binding international legal framework of climate change is the impossibility of reaching a consensus on comprehensive climate law. The second hurdle relates to lack of effective implementation and enforcement authority, as well as heavy reliance on flexible mechanisms. The effectiveness of implementing international framework on climate is also hindered by the principle of territorial sovereignty and differences in the distribution of technology, as well as natural and financial resources within regions and nations, which account for varied, in-

56 See Principle 16 Rio Declaration, the UN Conference on Environment and Development 1992 (Rio) A/CONF.151/26 Vol. I), 8:31 I.L.M 874 (1992).

57 See Nash (2000:466).

58 (ibid.). See also Fialka (2000:A18).

59 OECD, Environment and Economics: Guiding Principles Concerning International Economic Aspects of Environmental Policies, May 26, 1972, annex para. 1 Doc. No C (72) 128, 1972 WL 24710 (hereinafter OECD Recommendation).

60 Principle 16, Rio Declaration, provides: "National authorities should endeavor to promote the internationalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with dues regard to the public interest and without distorting international trade and investment.".

61 Fagbohun & Nleru (2011:277).

consistent levels of mitigation and adaption to climate change by countries.[62]

The question as to whether or not mining or mineral exploitation could bring about sustainable economic development or diversification remains uncertain.[63] Academics hold divergent views as to the economic effects of mineral exploitation in the developing countries.[64] The pro-mining sustainability groups argue that mining and mineral processing have the potential to become important sources of income, and can serve as driving forces for broader economic development. They concede that while mining itself might not be sustainable in that it can be exhausted over time, it provides income that can be re-invested in more sustainable national development projects.[65] The anti-mining groups contend that the economic potentials of mining are unlikely to be realised owing to the fact that nations that depend on mining industry are among the poorest and worst performing economies in the world.[66] These groups advocate that such nations should avoid export-oriented extractive industries altogether.

Reconciling mining with the imperative of environmental sustainability and climate change would require ideological (re)orientation for the developing countries. According to Prince and Nelson, the basic discipline of the minerals industry has for many years been separated along four basic lines of geology, mining, mineral processing and metallurgy, but now a major new field has emerged: environment.[67] Omission of mining in major international environmental accords, such as Stockholm,[68] Rio[69], Agenda 21[70] and others, until the defects were remedied in the Johannesburg Plan of Im-

62 See Rogers et al. (2007); Keohane & Victor (2010). See also Fagbohun & Nleru (2011:277–279).
63 Ali (2003:7A1-10).
64 For detailed arguments on the opposing views on mining and sustainable development see Humphreys (2000). See also Davis & Tilton (2002). See also Richards (2002); Ross (1999:301), and Stevens (2003:1).
65 Eggert (2001:3). See generally MMSD (2002).
66 Ross (1999:297f.); Stevens (2003:3). These scholars commonly pointed out the effects of resources mismanagement in developing countries as a strong factor in resource curse theory.
67 See Prince & Nelson (1996), citing Eggert (2001:1).
68 UN Conference on Environment and Development 1972 (Stockholm) UN Doc. A/Conf.48/14/Rev. 1(UN pub. E.73, II.A.14).
69 Rio Declarations, supra note 60.
70 See Agenda 21, A/CONF.151/26, Volumes I, II, III (1992).

plementation [hereinafter JPOI],[71] further corroborates the duo's assertions on the hitherto lackadaisical attitude to the environmental effects of mineral exploitation, especially as it affects developing countries.[72] Private sector initiatives had been deployed by way of self-regulation or industry governance, to cushion the effects of the gap. One such is the global spread of environmental management systems (EMSs) and EMS standards such as the International Organisation for Standardisation's ISO 14000,[73] including other industry standards like environmental auditing, labelling, and others,[74] to complement the lacuna in the international regime of environmental regulation of the mineral sector. The risks of climate change effects of mining are already here. Devising suitable mitigation and adaptation mechanisms is the most crucial task to navigating the troubled waters of reconciling climate change concerns in mining, as delaying action may be dangerous to humanity.[75]

F. Redressing Regulatory Imbalance in Mining

There is need to redress imbalances in the international regime for regulating the environmental impacts of mining in the developing countries by reconciling the need for mining and mineral extraction with the imperative of environmental sustainability. There is every reason to believe that the best way of realising this is by deploying sound climate change policy and regulatory frameworks inspired largely by the international climate law principles and practices. For mining to be sustainable in the developing countries,

71 See the WSSD Plan of Implementation, available at http://www.un.org/eas/sustdev/documents/WSSD, last accessed 13 September 2011.

72 TWN (1997).

73 See Wood (2003) for detailed discussions on the Environmental Management Standards.

74 Among the 150 countries that have at least one ISO 9000 certified company, 76 countries have no 14000 certifications at all. See Islam (2001). See also Prince & Nelson (1996).

75 Stern (2007:357) warns: "The conclusion of the Review is essentially optimistic. There is still time to avoid the worst of impacts of climate change, if we act now and act internationally. Governments, businesses and individuals all need to work together to respond to the challenge. Strong, deliberate policy choices by governments are essential to motivate change. But the task is urgent. Delaying action, even by a decade or two, will take us into dangerous territory. We must not let this window of opportunity close.".

the imbalance in the global mining regime must be revisited. The mineral-dependent countries must be assisted to attain the objective of environmentally responsible mineral exploitation by deploying institutional and policy frameworks of the international climate change law, as the option of mining is a matter of economic survival in these countries.[76] Economically motivated development is not without its consequences. As some scholars argued, economic development and sustainability are antonymous.[77] Some contend that environmental sustainability is unnecessary in mining, as environmental sustainability in mineral exploitation in the developing countries may be mortgaged for development until enough wealth has been generated to repair the damage done to the environment.[78] If arguments of scholars are anything to go by, it thus means that developing countries need not bother much about environmentally sustainable mineral exploitation.[79]

Many developing countries seem to support the above-metioned views,[80] as they are wary of environmental standards that fail to take into account their peculiar economic and development needs.[81] To these countries, the argument for 'development now, environment later' seems attractive, and permeates the attitude of countries with developmental aspirations, thus making it difficult, though not impossible, for a global consensus to tackle the menace of global mining and emission of GHGs frontally. A more worrisome trend in international environmental governance is the reluctance of countries to extend the application of their environmental laws to their corporate citizens operating in the developing countries. This approach was suggested towards sustainability in mining, especially in the developing countries, where environmental regulations of impacts of mining are extremely feeble and wobbly.[82]

Extraterritorial control of multinational mining companies in the developing countries deserves global concern for various reasons. First, mineral exploitation, whether small, medium or large scale, inevitably leaves its

76 See Darimani (2009:1).
77 See for example Stewart (1993:2052f.); Brown Weiss (1993:2127); Lucas et al. (1992:72); Carvalho (2001:61).
78 (ibid.), see Brown Weiss (1993) and Stewart (1993).
79 See Daly (2004).
80 The presumption is that being coerced into meeting higher standards of the 'North' does not constitute a legitimate means of achieving sustainability in the developing world. See Vaughan (1994:597).
81 (ibid.:596).
82 See Sampson (2000:6). See also Campbell (2003).

negative impact on the environment and contributes to climate change. Second, trade liberalisation, globalisation and other global economic pressures culminated in the race-to-the-bottom syndrome[83] that led to foreign-dominated extractive industries in the developing countries. Consequently, natural resources, the environment as well as social and political structures in these countries have been put under intense external pressure by the demand on them to strive for the attainment of environmental standards set by the developed nations without taking into account their peculiar economic aspirations and developmental needs or situations.

The trend above provides justifications for relaxed environmental regulations for mining operations in order to attract foreign investment, while leaving compliance with appropriate environmental standards in mining in the hands of extraterritorial controls.[84] Notwithstanding the fact that environmental concerns in mining are global in nature, some developed countries are apathetic about subjecting their local companies operating in the mining sectors of the developing countries to extraterritorial mining governance or control, [85] though some scholars see the issue as a matter of global imperative.[86] Assisting mining-dependent countries to achieve the objective of enforceability of climate and other categories of environmental governance through extraterritorial regulation of activities of multinational mining corporations would go a long in redressing regulatory gaps in mining vis-à-vis GHG emissions in the developing countries. This will also go a long way in changing the mining investment climate in the developing countries towards making mining and mineral exploitation sustainable ventures.

83 Vaughan (1994:596).

84 See Johnston (1998:58). Johnston sees this as the harbinger of "environmental lawlessness". See also Cohen (1996:154).

85 Sampson (2000:6).
Johnston (1998).

86 For example, Campbell (2003:20) argues that given the present lack of financial and technical resources resulting in inability of developing countries to monitor and enforce (environmental) norms, it should be the responsibility of the countries of origin of the companies operating internationally to ensure respect for (environmental) norms and standards.

G. Towards Changing the Climate of Mining

Climate change presents both challenges and opportunities for the mining and metals industry.[87] The way a government addresses these challenges determines the extent to which the country benefits from mining.[88] A clear distinction must be drawn between adaptation and mitigation frameworks. An effective climate change control mechanism in mining must reflect a synergy between mitigation (being global and long-term) and adaptation (which is local and short-term) structural changes. Both mitigation and adaptation options manage different aspects of climate-change-related risk.[89] This, therefore, creates the challenge of effective blending for the developing countries in the application of mining regulation.

As part of adaptation and mitigation strategies, developing countries will be required to include provisions in their national climate change plans to measure, report on and verify their progress in tackling GHG emissions in the mining industry. The information must be fully transparent, comparable, robust and consistent in order to ensure efficient benchmarking of the level of responses to the various approaches to climate change compliance in the mining industry.[90] Information on the level of climate change governance is vital, as some developing countries depend almost exclusively on natural resources, now and for the future. Climate change mitigation and adaptation for these countries must therefore reflect their resource-based economies. Addressing climate change in mining and other resource sectors in the developing countries would require long-term solutions, including drawing up appropriate policy guidelines, institutional capacity-building and deployment of adequate resources.[91]

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87 See ICMM (2011:2).

88 For example, the mining sector is a significant contributor to economic growth in many developing and developed countries, including Australia, as it has considerable potential to help reduce poverty and accelerate human development, through increasing government and community revenues, generating employment, and providing physical and human infrastructure. Australia's approach to mining in development focuses on increasing the capacity of governments to address institutional and policy challenges. See the *Mining for Development* project of the Government of Australia, information available at http://www.ausaid.gov.au/aidissues/mining/Pages/home.aspx, last accessed 10 April 2013.

89 Harrison (2000:367). See also Fagbohun & Nleru (2011:287).

90 ICMM (2011:2).

91 Nwamarah (2012).

The desire for climate change governance in mining and other extractive sectors must originate from the developing countries. Countries must own the process by demonstrating genuine commitments. An African adage says, "Even if a horse is forced to the river, coercing it to drink from the stream may prove impossible". It is only where there is a clear demonstration of genuine desire that the much needed assistance could be forthcoming from the developed countries in climate change mitigation in mining and other extractive sectors.

In this regard, developing countries must press for changes to the financing mechanisms for mobilising public and private investments for climate change mitigation and adaptation, such as the Clean Development Mechanism. With additional resources, adapting to and mitigating climate change in mining and other resource sectors would appear feasible and realistic. It is for this reason that the demand of African leaders of the African Development Bank (AfDB) to establish an Africa Green Fund to receive and channel part of climate finance to Africa is a step in the right direction in climate change governance in the region. Based on this proposition, the AfDB is working towards the establishment of the fund.[92] The fund, when established, will help African governments commit resources to improving their respective national environmental governance in mining and the extractive industry generally, by investing in capacity-building for technology transfer. This will eventually stimulate development of green technologies that can help Africa exploit its rich mineral and other natural resources without undermining environmental sustainability in the region.[93]

H. Mining, Climate Law and Environmental Rights

Effective climate change regulation is indispensable to socioeconomic rights. It has been argued that if the purpose of government is to provide welfare and security to all citizens, governments fail to fulfil this purpose when they commit to enforcing only civil and political rights, leaving socioeconomic rights in abeyance.[94] Socioeconomic rights include environmental rights, as well as rights to natural resources and rights to self-deter-

92 (ibid.).
93 (ibid.).
94 Agbakwa (2002:178).

mination, among others.[95] Environmental rights constitute both third generation substantive and procedural rights of citizens for the purpose of ensuring equitable use of resources, as well as sustainable management of resources and the environment in the interest of the past, present and future generations.[96]

The need to enhance the regime of environmental justice through judicial activism in global environmental governance was recently stressed by participants at the Rio+20.[97] Several other participants at the summit also reflected on the need to bring law to remote communities; remove procedural impediments for access to justice by vulnerable groups; and ensure that environmental information from public and private entities is placed in the public domain and disclosed without procedural restraints.[98] Many participants underscored the need for enhancing capacity-building of judges in environmental law and climate change adjudication, in order to ensure enhanced environmental justice by courageous and proactive judges.[99] The nature of judicial activism required to instil better environmental consciousness has been displayed by some Nigerian jurists. In *Jonah Gbemre v Shell Petroleum Development Company of Nigeria Limited* (unreported), the Federal High Court per C.V. Nwokorie J., held thus:[100]

> These constitutionally guaranteed rights inevitably include the rights to a clean, poison-free, pollution-free healthy environment. Therefore, to flare gas in the course of oil exploration and production activities is a gross violation of their fundamental right to life (including healthy environment) and dignity of human person. Failure to carry out Environmental Impact Assessment concerning the

95 First generation rights are fundamentally civil and political in nature, and include right to life, right to dignity of human person, right to vote and be voted for among others. Second generation rights relate to equality, and began to be recognised after the World War II. These include right to be employed, right to health care among others. See (1984).

96 According to Amokaye (2007:112): "In the first category, it refers to the substantive rights of the citizen to a clean and healthy environment. In the second category, environmental rights encompass the procedural rights to secure the enjoyment of substantive rights and this involves right to participate in environmental decision making, access to environmental information and access to court to vindicate environmental abuses."

97 See the UNEP (2012).

98 (ibid.:4).

99 (ibid.).

100 See *Jonah Gbemre v Shell Petroleum Development Company of Nigeria Limited,* Suit No. FHC/B/CS/2005.

effects of gas flaring activities is a clear violation of Section 2(2) of the Environmental Impact Assessment Act, Cap. E12 Vol. 6, Laws of the Federation of Nigeria 2004 and has contributed to a further violation of the said fundamental rights.

The position of the Nigerian court is to discourage multinational and indigenous companies in the extractive sectors of oil, gas and minerals in the country from indulging in environmental abuse and GHG emissions that harm the people.[101] It is now legally settled that damage to natural resources and the environment can be litigated and remediated as right-based subjects in the Nigerian courts.[102] Climate change litigation is expected to grow in Nigeria and other developing countries in the coming years in response to jurisprudential dispositions to environmental claims and resource rights in mining and related sectors.

Carbon emissions in mining, like other businesses, are expected to create corporate liability[103] in Nigeria and elsewhere, based on the trends in the case law. Climate litigation will instil positive environmental dispositions in mineral exploitation and further clarify some important constitutional, public and administrative law issues.[104] Procedural issues will likewise become streamlined in the wake of increased consciousness of environmental liability of mining activities with positive judicial attitudes in Nigeria and other developing countries.[105]

South Africa represents advancement in the regulation of climate change effects of mining. This is not unconnected with the constitutional basis for sustainability in the mineral sector of the most industrialised country in

101 According to the Court of Appeal in *Shell Petroleum Development Company v Farah* (1995) 3 NWLR, at page 199-201, per Edozie JCA: "If therefore, as the parties agreed, the Respondents were paid fully only for the crops and economic trees damaged at the time of the incident, that certainly could not amount to a fair and adequate compensation as the damage the Respondents suffered went beyond a mere damage to crops and economic trees, for according to the experts called on both sides the Respondents' arable land was heavily polluted and rendered unproductive for many years. In view of the foregoing, I am of the firm view that the finding by the learned Trial Judge that the Respondents were not paid a fair and adequate compensation is sound and cannot be faulted.".

102 See Oke (2012:22).

103 See Mills & Lecomte (2006:7). See also Watchman (2008:15).

104 Watchman (2008:15).

105 Participants of some developing countries at the Rio+20 Conference advocated for increased "judicial activism" and procedural reformations for climate change litigation. See UNEP (2012).

Africa.[106] The minerals law of South Africa (the Mineral and Petroleum Development Act) also unequivocally states that "exploration of mineral resources of the country must be orderly and in an ecologically sustainable manner".[107] This provision accords with the landmark case of *The Director: Mineral Development, Gauteng and Sasol Mining (Pty) Ltd v Save the Vaal Environment and Others*.[108] In this case, Vaal, an unincorporated association sought to resist the holders of mineral rights from commencing mining operations in an environmentally sensitive area. Though the case was decided based on the old Minerals Act,[109] the basis of the decision of the court, per Oliver JA, was that by including environmental rights as fundamental and justiceable human rights under the Constitution, the director of Mineral Development was bound not only to give regard to environmental implications under the constitution but also mining law and other relevant environmental codes in making decisions on issues affecting the environment.[110] Non-climate change-related case law is also important to the way climate change litigation claims will be presented, interpreted and decided by the court.[111]

I. Mainstreaming Climate Change Principles in Mining

The regime of international climate law has made it possible for countries to articulate and express concerns about GHGs at all levels and sectors, though the regime left many issues unsettled.[112] One of the issues yet unresolved is the extent to which climate change is affecting the mining industry and how mining companies, particularly those operating in the developing

106 (ibid.).
107 See the Mineral and Petroleum Development Act of South Africa 2002 (the MPRDA), section 2 (h).
108 Case 133/98 delivered on 12 March 1999. See Kidd (1999). See also Mabiletsa & du Plessis (2001).
109 See the old Mineral Act of South Africa, Act No. 50 of 1991.
110 See Kidd (1999:152).
111 In an English case, the Court of Appeal clarified the current law of England on public nuisance and held that damages may be awarded in public nuisance where a person's life, safety or health has been adversely affected by unlawful act which need not necessarily involve interference with the enjoyment of land. See *Corby Group Litigation v Corby Borough Council* (2008) *EWCA Civ*. 463 (per Lord Justice Ward, Lord Justice Dyson and Lady Justice Smith), cited in Watchman (2008:15).
112 Watchman (2008:8).

countries with weak environmental governance, are responding to GHG reduction.[113] More crucial is the need for developed-countries-led efforts, in collaboration with the developing countries, to strengthen institutional capacity for climate change mitigation and adaptation in mining activities. International climate governance must face the reality of mineral exploitation in the sense that it would be difficult, if not impossible, to halt the quest for resource-based economic development in the Third World countries. For these countries, survival is paramount, after which comes the environment.[114] Typical of the developing countries, the Nigerian president announced to the world at the Rio+20 Conference, that his major objective is to create more job opportunities for Nigerians in order to reduce poverty.[115]

Most Western mining companies operating in the developing countries had primarily focused on climate change mitigation; but they are starting to take steps to increase climate change adaptation strategies.[116] However, there is a need to collaborate with stakeholders to implement adaptation mechanisms in an efficient and effective manner. Industrialised nations have been implementing climate initiatives that tend to ostracise the developing countries owing to the level of sophistication of such frameworks, such as a mix of market-based instruments, e.g. taxes on GHG emissions, and cap-and-trade schemes, among others.[117] This range of policy and regulatory approaches offers effective baselines for dealing with climate change issues in extractive industry, particularly in minerals and mining operations in the developed countries, but might not be as suitable for developing countries.[118] For example, the use of taxation to ensure curtailment of GHG emissions is now widely applied in European countries like Finland, Sweden, Norway, Denmark, Slovenia, Italy, Estonia Switzerland and others, where carbon tax has been introduced.[119] In North America, carbon taxes are applied in some regions in Canada like British Columbia, Quebec, and in California in the United States.[120] The European Union has also intro-

113 See Sampson (2000) and Campbell (2003) on extraterritorial regulation of multinational mining corporations.
114 See Adeyato (2012) on the speech of the Nigerian President at the Rio+20 Conference.
115 (ibid.).
116 Kauffmann & Tébar (2009:3).
117 (ibid.).
118 Aguado (2011:2).
119 (ibid.).
120 See Litman (2009:1f.).

duced the Emission Trading Scheme. The scheme is designed to cap the overall level of emissions, while allowing participants to buy and sell allowances on a need basis.[121]

In Australia, the government outlines the design of the Australian Carbon Pollution Reduction Scheme through a White Paper released in 2008, which in effect also uses the cap-and-trade mechanism to control GHG emissions in the country.[122] Like Australia, Canada also proposed an emissions trading scheme in 2007 and 2008, using a baseline-and-credit system approach. This scheme imposes a specific target for individual facilities participating in it, and covers a range of extractive sectors of oil and gas (including oil sands), upstream oil and gas, natural gas pipelines and petroleum refining, iron and steel, and smelting and refining of metals, including aluminium and power generation.[123]

Beyond carbon tax regime, reducing GHG emissions in mining in the developing countries will require (re) education to raise the level of awareness of basic understanding of the complex technical, legal, socioeconomic, environmental, conservation and other issues in the extractive sectors. Concerns about reduction of GHGs and socially responsible mineral exploitation must permeate every level and segment of the mineral industry in the developing countries, ranging from exploration, evaluation, development, exploitation or production, processing, marketing, use, depletion, and impacts, among others. Effective environmental management strategies must be formulated and integrated into governance and industry codes for mining and other extractive industries in the developing countries.[124] Mineral exploitation without adequate environmental provisions amounts to "environmental lawlessness".[125]

The quest for economic development often necessitates attracting investment in the solid minerals sector of the developing countries by relaxing provisions on environmental regulations. The need to attract mining investments tends to undermine concerns for climate change in Third World coun-

121 The first trading period ran for three years ending in 2007 while the second trading period began on 1 January and runs for five years until the end of 2012. See European Parliament and Council of the European Union (2009).

122 The Australian scheme is for implementation after the end of the current commitment period of the Kyoto Protocol and subject to the action of other major economies including China and India. See Government of Australia (2008).

123 See Bramley et al. (2009:6).

124 See Johnston (1998) and also Cohen (1996:154).

125 Johnson (ibid.:58.).

tries. A typical example is the Nigerian Minerals Act, which aims to attract investors in mining at the expense of the already weak biodiversity situation in the country. Curiously, rich mining companies are to be granted permission under the Act, "by the proper authority to take protected trees without payment of royalties and fees" while raising minerals.[126] This 'manifesto' seems not to have taken into cognisance the provisions of the UN Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa.[127] The objective of the convention is to combat desertification and mitigate the effects of drought in countries experiencing drought and/or desertification, particularly in Africa[128] by imposing appropriate obligations on parties.[129]

Desertification and drought have been major problems in Nigeria. The country's attempts at combating the problem under various polices, including those under the convention, are yet to yield expected dividends, despite the establishment of the Afforestation Council by the Federal Government of Nigeria.[130] In view of this, allowing "the taking of protected trees without payment of royalties and fees" appears most unfortunate for a country whose major agricultural problem is drought, especially in the northern parts of the county. An effective climate change adaptation strategy for the country would have been the imposition of strict limitation or reasonable conditions like planting a minimum of 10 trees for every protected tree taken.

An effective regulatory framework must reconcile the imperative of climate change with sustainable mineral exploitation in the developing countries. It must also ensure workable policies, laws, regulations and codes to minimise GHGs and instil an effective climate change regime in mining governance in developing countries. Such policies must be implemented, and laws and regulations fully enforced by these countries through well-

126 See section 33(2) of the Nigerian Minerals and Mining Act, 1999. The new 2007 version of the Act is silent on the offensive provision. See the Nigerian Minerals and Mining Act, 2007, available at http://mmsd.gov.ng/Downloads/Nigerian%20Minerals%20and%20Mining%20Act%202007.pdf, last accessed 23 July 2012.

127 See UN Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa, 33 I.L.M 1328 (1994).

128 (ibid.:Artile. 2(1)).

129 (ibid.:Article 5).

130 The Nigerian President inaugurated the Council on 18 January 2004 in the renewed bid to combat draught and desertification problems of the country. See Lohor (2004).

oriented institutions that monitor their implementation. The agencies charged with enforcement and compliance duties must be well-manned, equipped, financed and oriented to monitor environmental compliance effectively, in order to curtail climate change impacts of mining activities and operations in the developing countries.[131]

Reducing climate change effects of mining in the developing countries will also depend largely on the extent to which the international regime is able to address the externalised factors in the political economy of resources utilisation of the developing countries.[132] For the shift in paradigm towards reduction of GHGs in mining to be realistic, it would also require changes in the structure of international political economy for an equitable and stable international economic order.[133] Perhaps, as international trends sometimes dictate domestic realities especially in the extractive sector, this will most likely result in a positive change in the existing political economy of resources governance in mineral-exporting developing countries.[134]

Mutual co-existence of mining companies and the local communities should also be encouraged, like in Ghana.[135] In Ghana, where land concession granted to mining companies contains alluvial gold deposits suitable for small-scale mining, such areas are awarded to resident small-scale miners and a Purchasing Services Agreement is then entered into where mined products are sold to the company at prevailing market prices.[136] Emission reduction technologies and techniques should be deployed in small-scale mining without undermining co-habitation and mutual co-existence of mining companies and the local communities, as part of strategies for integrating international climate change law and practices in mining in the developing countries.

Effective climate change regulation in mineral-producing, developing countries would also need to ensure that mining companies establish climate change adaptation strategies by working with host communities to develop

131 Oke (2004:221).
132 See Sandbrook (1982:17).
133 See Carvalho (2001:61).
134 (ibid.). See also Oke (2008: 205-8).
135 See Hilson (2001:18–21); see also Hilson (2002:59) and Oke (2008:207).
136 Hilson (2001:19–20).

concrete climate adaptation plans.[137] As part of adaptation strategies, multinational mining companies could also procure environmentally friendly, portable cooking gas equipment for the local people in communities of operation, as alternative to, and to dissuade them from using firewood and resorting to other ozone-depleting activities. These measures may be supplemented by the donation of energy-efficient light bulbs, air-conditioners and other devices to dissuade the locals from continuous usage of objects that emit GHGs.

Effective climate change governance for developing countries would also entail initiating cross-industry collaboration on regional adaptation strategies. By exploring opportunities for regional and sub-regional collaboration, mining companies and stakeholders in the developing countries can share information as well as scientific and technical models, data, and strategies for mining activities to ensure industry best practices and implementation of large-scale adaptation strategies. This has been explored in the case of partnerships between various states of the United States and provinces of Canadian, and also in Brazil, through the Company for the Climate initiative, under which private companies meet monthly to discuss climate information and learn from each other's efforts to develop mitigation and adaptation strategies.[138] However, the model of adaptation or mitigation strategies to be introduced in developing countries for curtailing emission of GHGs in mining will vary significantly, given the diversity of geographies and complexities of mineral productions or operations of countries.

J. Conclusion

It is imperative for mining companies in developing countries to integrate climate-related risks and mitigation measures into business decisions to minimise operations and host-community risks in mining through community-friendly, climate adaption strategies. The various flexible frameworks

137 Mining operators can share scientific information for site planning to inform community preparation, advice on emergency planning practices, and advocate for climate-resilient economic growth with local authorities and development agencies. See Akpan (2005:311) and Cook Clark (2005:332f.).

138 An example of regional collaboration in climate change is the Western Climate Initiative, a regional partnership between the US States and Canadian provinces for the common objective of achieving a 15% reduction of the 2005 level of six main greenhouse gases by 2020, beginning from 2012. See Conway (2004:3).

and strategies for mitigating climate change effects of mining in the developing countries are part of the international climate change law; an emergent aspect of international environmental law which articulates, motivates and develops effective global climate governance, policies, principles, strategies, plans and laws for application in mining and other sectors, particularly in the developing countries.

This article has discussed a range of those adaptation and mitigation strategies that would add meaning and purpose to the application of international climate change law in mining regulation in the developing countries. It suggests that mining companies need to change their corporate strategies and practices to address climate-related risks in mining operations. It advocates collaboration between the host communities, agencies, governments and other stakeholders in climate change adaptation. It acknowledges that the world is moving fast in the direction a green economy,[139] and therefore tasks the global actors, particularly the developed countries, to encourage their corporate citizens operating in vulnerable mining sectors in the developing countries to become 'greener'. It stresses that attaining the goal of effective global climate change governance requires a collective resolve to transit to a low-carbon economy in minerals exploration and other sectors in both developing and developed countries.

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139 For the purposes of the Green Economy Initiative, UNEP has developed a working definition of a green economy as one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. In its simplest expression, a green economy can be thought of as one which is low carbon, resource efficient and socially inclusive. See UNEP, "What is the 'Green Economy'?" at http://www.unep.org/greeneconomy/AboutGEI/WhatisGEI/tabid/29784/Default.aspx, last accessed 13 April 2013.

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