

## **REFORMING THE CLEAN DEVELOPMENT MECHANISM (CDM) TO TACKLE THE ENVIRONMENTAL POLICY GAP IN THE NIGERIA OIL AND GAS INDUSTRY**

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### **ABSTRACT**

The Clean Development Mechanism (CDM) is a catalyst for sustainable development and a vehicle for economic development, but has largely been undergoing reforms through “learning by doing pattern”. The market instruments of the CDM provide the developing countries the opportunity to earn additional revenue in the form of Certified Emissions Reductions (CERs) to improve the viability of the projects. Thus, this article argues that the CDM concept and policy influence in the Nigerian oil and gas industry as a panacea to the failure of the national environmental regulations is marginal because it failed to account for sustainable development perspectives. Gas flaring in Nigeria is estimated at about 43 million tons of CO<sub>2</sub> annually, and there appear a huge gap, and to a large extent, contradictions in the sustainable development concept of a climate protection instrument of the CDM and the pace of gas flaring in the Niger Delta region. Thus, this paper focuses on longstanding and deeply rooted debates on the environment, sustainable development and reforms to translate the substantial flared associated gas in the Niger Delta rural communities to offer attractive opportunities for supporting Nigerian’s development priorities through the CDM.

**Keywords:** Clean Development Mechanism; Certified Emissions Reductions; Environmental Degradation; Least Developed Countries; Multinational Oil Companies; Sustainable Development.

## **INTRODUCTION**

The CDM is considered to be the most far reaching global environmental investment, climate protection instrument and credit scheme of its kind, which aims to contribute to sustainable development and environmental protection (Gupta 2012). It is a project based “flexible mechanisms” established to achieve cost effective solutions to mitigate environmental degradation. CDM provides a standardized environmental protection and development instrument through CERs credits with potentials to earn additional revenue to improve the viability of the projects. It allows the industrialized nations with an obligation to protect the environment, and to achieve their reduction targets by supporting appropriate projects to reduce environmental degradation in developing countries, amongst other things (Alexeew et al 2010). Environmental protection has considerable socioeconomic benefit, because the consequence of non protection, such as the situation in the oil rich Niger Delta region of Nigeria has far reaching implications on the immediate communities.

More succinctly, Michaelowa, A., Krey M. and Butzengeiger S. (2004) noted that CDM allows countries with emission targets to buy emission credits from projects in countries without targets. The CDM as a flexible instrument allows industrialized countries (Annex I) to establish projects that contribute to climate protection, such as zero gas flaring in Nigeria (non-Annex I) and earned CERs from the investment activities to achieve their sustainable development goals. The goals of CDM are to promote sustainable development in developing countries through the climate protection instrument, and to bring about a range of direct and indirect economic and social effects in the project country (Olsen & Fenhann 2008).

Similarly, IPIECA (2008) maintained that the cost of environmental protection varies considerably from region to region, as a result of differences in, for example, energy sources, energy efficiency and waste management. From the international relations perspective, Olsen and Fenhann (2008) argued that CDM is viewed as a north-south bargain that is critical to the success of the international climate regime because it has provided a way for climate protection in the south and to include the developing countries in the carbon markets, while avoiding binding emissions reductions that were politically unacceptable to most developing countries.

## **CDM ELIGIBILITY CRITERIA**

Some of the eligibility criteria to be fulfilled for a project to be considered for registration under the CDM project are:

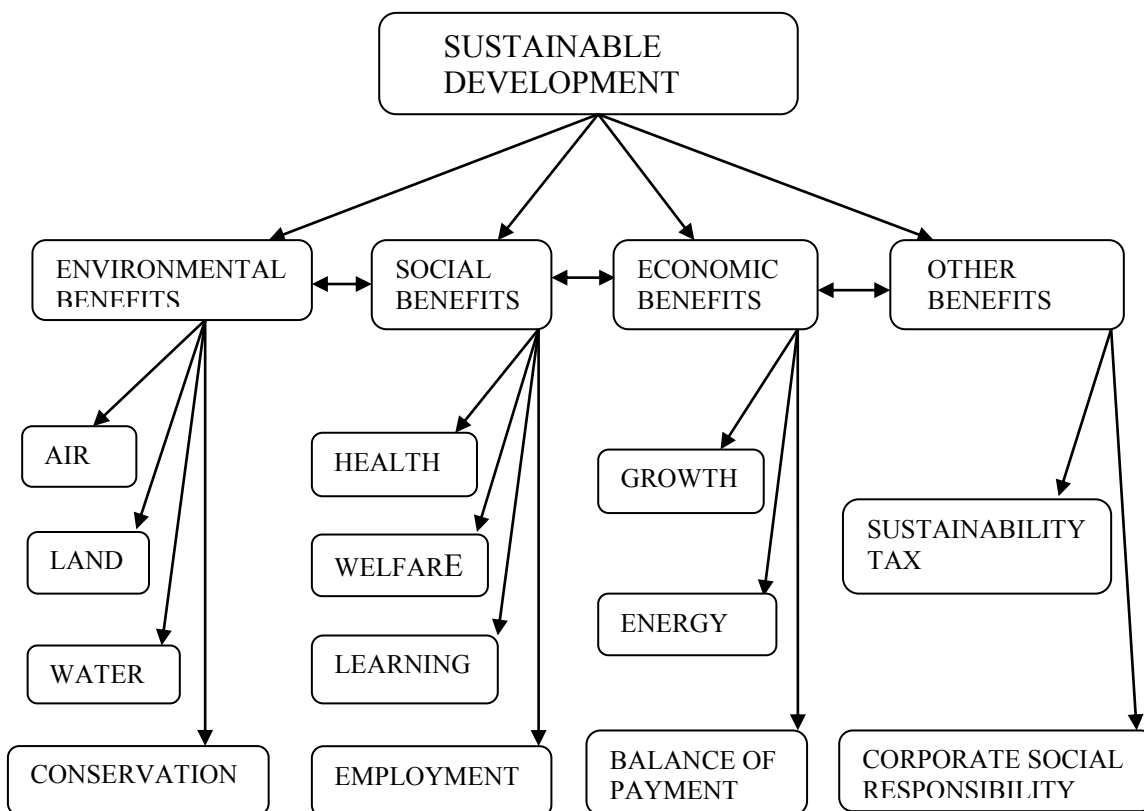
- The project must contribute to the sustainable development of host country according to national development priorities. It is the responsibility of the host country to set sustainable development criteria because international sustainable development standard would impinge on the sovereignty of developing countries.
- The project results are monitored and verified to be real and measurable as it is done for GHG reduction, and of long term benefits.
- The project must incorporate the concept of additionality element to climate change. In other words, the project must demonstrate that it would not have been feasible without the incentive from CERs, and is in addition to those that would occur under a ‘business as usual’ scenario. This is the most critical and challenging eligibility criteria.

The burden of proof is on the host country (not the community where the project is located) to evaluate whether the project leads to sustainable development. Such factors as economic benefits, efficient energy development and utilization, improvement in the environment, transfer of modern technology, employment opportunities and emission reduction is relevant in the Nigeria context.

**KEY ECONOMIC BENEFITS FROM CDM**

There are key economic benefits of CDM which include growth in green energy in developing countries, climate protection projects, and adequate guidance to developing countries on how to mitigate environmental degradation (see figure 1 below). Furthermore, CDM also promotes investment in green technology (low carbon economy), developed carbon trading market, create awareness on climate change and provide funds and modern innovative technologies necessary for projects with capacity to combat environmental degradation. According to Gupta (2012), more than 3,209 CDM registered projects have been established worldwide since 2005 when the first project was registered. It has jointly saved over 2 billion tons of CO<sub>2</sub> emissions, and the global carbon finance market through the sale of CERs from CDM has increased from US\$2634 million in 2005 to US\$32. 79 billion in 2008. CDM focuses on transfer of modern, innovative technologies, employment generation, inflow of foreign direct investment, and sustainable development (climate, environmental and development policy). The figure below represents a cognitive chart which further illustrates the perspectives in the understanding of sustainable development and social and economic benefit model of the CDM to the host country (Figueres and Streck 2009).

Figure 1: Model of CDM Contribution to Sustainable Development



Source: Olsen & Fenhann (2008)

## **SWOT ANALYSIS OF CDM PROJECT IN NIGERIA**

When evaluating the contributions of CDM to the Nigeria economy, it is very important to take into accounts, its strengths, weaknesses, opportunities and threats (common SWOT analysis). The main strengths of CDM to the Nigerian economy are the huge opportunities offered by the international efforts to mitigate environmental degradation as a result of the near total failure of the national environmental protection in the battle to eliminate routine gas flaring for environmental protection. Sonnabend and Schroder (2012) succinctly argued that the CDM promotes innovative technologies (transfer of modern technologies), develop infrastructure, and trigger investment to kick-started flare reduction projects. It also contributes to improvement of social wealth (job creation, local community involvement), sustainable development (climate, environmental and development policy) and other multiplier effects through climate-friendly projects. This is congruent to the views expressed by Shishlov and Ballassen (2012) that the contribution of the CDM to sustainable development are mixed and largely depend on the project type and national circumstances. In Nigeria, CDM bridges the huge gap created by the Associated Gas Flaring Re-Injection Act 1979, The Associated Gas Re-Injection (Continued Flaring of Gas) Regulation 1984 and its amendment Decree No. 7 of 1985. These regulations allow oil companies to continue to flare gas with little or no recourse to the environment of their immediate communities. Specifically, the 1984 amended decree of the Associated Gas Re-Injection particularly empowers the Minister of Petroleum Resources to give permission to oil company to engage in the production of oil and gas and to continue to flare gas in a particular field(s), if he is satisfied that after January 1, 1984 the utilization or re-injection of gas is not appropriate or feasible.

Notwithstanding the accruing benefits of CDM to the Nigerian economy, there appear some weaknesses which arise from verification of the real effectiveness of the mechanism. The length of the administrative procedure for certification, which stems from lack of capacity at the United Nations Framework Convention on Climate Change (UNFCCC) level and the lack of Designated Operational Entities (DOE) is a major criticism of the CDM (Shishlov and Bellassen 2012). Even though CDM makes a notable contribution to sustainable development in the host countries (UNFCCC 2011a), however, there is no standardized and internationally binding system for measuring sustainable development and the goal of the CDM in its current form has not been fully realized (Olsen and Fenhann 2008; Boyd et al 2009). The responsibility for the achievement of sustainable development was abdicated from the international to the national level in host countries, because definitions of sustainable development differ according to national development priorities (Olsen 2012). In Nigeria, a CDM contribution to sustainable development is merely rhetoric based on project design documents and evaluation of project during execution. For example, employment generation from the CDM projects for the teeming unemployed youths of host oil and gas producing communities in the Niger Delta is largely negligible. Thus, it remains to be seen whether any connection really exists given that the oil and gas industry is primarily driven by technology and highly capital intensive, using highly skilled manpower which the local people do not possess (Orubu 2006, Obi 2010). Also, weaknesses also arise from the low harmonization of the project because of the complex procedure to negotiate and receive CDM approval, which make CDM project implementation time consuming (Alexeew et al 2010).

Despite the magnitude of environmental challenge resulting from gas flaring in Nigeria, merely 12 CDM projects have so far been registered to date, out of which 4 are in the oil and gas industry. Nigeria benefited marginally from the expected average annual CERs from CDM, which bring to question the efficacy and the desire of CDM to improve air quality and tackle the problem of environmental degradation in Nigeria.

The opportunity generated by CDM in Nigeria is that it stimulates the transfer of modern and innovative technologies in the oil and gas industry that is highly capital intensive to improve sustainable development. CDM contributes to improvement in social wealth (job creation, local community involvement), sustainable development (climate, environmental and development policy) and other multiplier effects through climate-friendly projects. It also promotes innovative technologies (transfer of modern technologies), develop infrastructure, and trigger investment to kick-start flare reduction projects. On routine gas flaring in the Niger Delta, CDM stimulates growth in natural gas gathering and utilization as evidenced in the 4 associated gas utilization projects in the Nigerian oil and gas industry. The benefits arising from this emerging market to address the problem of gas flaring are quite noteworthy to national, regional and the global environment. It attracts additional inflow of foreign direct investments to the projects and contribute to real economic development in terms of innovation and technology transfer. CDM has serious potential for energy mix, emission reduction, job creation and inflows of capital investment which has generated fierce competition amongst host countries.

On power generation, CDM has contributed to the epileptic power supply in Nigeria, all the 4 CDM projects use previously flared gas for electricity generation to the national grid. For example, the Okpai project is designed to utilize a large fraction of flared associated gas produced in the Kwale oil and gas fields, delivered via pipeline to the Okpai combined cycle gas turbine power plant for the generation of 450 megawatts of electricity to the national grid (UNFCCC 2005). These projects are already making notable contribution and stimulate growth in electricity generation and environmental preservation. CDM is a trailblazer, instrument for international cooperation on GHG and intervening vehicle to power generation efforts that has been in short supply in Nigeria for the past four decades. According to Sambo (2008), Nigeria has barely 6,000 Mega Watt (MW) of power generation capacity for its well over 150 million population, of which only 3,000 MW was put to effective use in 2010. Thus, the CDM is boosting power generation and promoting foreign direct investments in the domestic economy of Nigeria.

Notwithstanding the fundamental benefits of CDM, there appear some serious threats. There is an uneven regional and global distribution of projects as more than three quarters of current CDM projects around the world are based in just four countries: China, India, Brazil and Mexico (Boyd et al 2009; Gupta 2012). Similarly, Hong et al (2011: 1695) argued that as at 2011 “China has attracted the lion’s share of CDM investment with 45% of the world projects and account for 63% of the global annual CERs”. More importantly, while CDM is a success story in China and India, it is not the case with Nigeria with just twelve projects which poses the question about the future prospect of CDM in the LDCs, particularly in Africa where it is marginally low. This is congruent to the view expressed by Gupta (2012) that the number of registered projects in LDCs is almost negligible in comparison with the rest of the world. The table below shows the top CDM 10 countries having the highest numbers of registered projects across the world.

Table 1: Top 10 CDM Registered Projects Countries in the World

Country	No. of Registered CDM Projects	Estimated Emission Reductions (C0 <sub>2</sub> e/year)	Average Project Size (C0 <sub>2</sub> e/year)
China	1,858	367,754,013	197,930
India	805	67,474,383	83,819
Brazil	205	24,175,021	117,927
Mexico	140	12,520,350	89,431
Malaysia	110	6,293,316	57,212
Vietnam	90	5,410,200	60,114
Indonesia	80	8,308,580	103,857
Thailand	67	3,541,395	52,857
Republic of Korea	63	18,187,041	288,683
Philippines	57	2,238,466	39,271
<b>All other countries</b>	<b>474</b>	<b>67,520.167</b>	<b>142,448</b>

Source: UNFCCC (2012)

It should be noted that the assessment on the table above is based on 3,949 registered projects or undergoing registration as at June 2012.

### CDM AND GAS FLARING IN NIGERIA

Nigeria is a gas province with a proven reserves estimated in the region of 187 trillion cubic feet and ranked the 7<sup>th</sup> largest natural gas reserves in the world, the largest in Africa, which represent more than 5% of the world's total. However, the bulk of the gas produced in Nigeria is flared. According to the NNPC Statistical Bulletin (2005), average daily gas production in 2004 was estimated at about 5.7mmscf/d (million meter standard cubic feet per day) with 20% used as Liquefied Natural Gas (LNG), 2% for Natural Gas Liquid (NGL), 16% for re-injection/lift, 15% sold, 4% used in operations, and a whopping 43% flared. Similarly, the United States Centre for Energy Economics (2007) has argued that Nigeria accounts for 12.5% of the global flared gas per ton of crude oil produced, which represent second largest flaring by any country in the world behind Russia Federation.

Global Gas Flaring Reduction (2013) identified underdeveloped domestic market, lack of effective regulation, lack of local infrastructure, remoteness of location, technical limitations and uncertainty as fundamental causes of gas flaring in Nigeria. To promote gas utilization and reduce its impact on the environment, CDM aims to curtail economic wastage from natural resource underutilization and plays a pivotal role in curbing oil and gas induced environmental degradation in the Niger Delta region. Using the Nigeria scenario depicted in table 2 below, CDM focuses primarily on environmentally friendly projects to promote sustainable development with the overall benefit of the immediate oil and gas producing communities.

Table 2: Summary of Registered CDM Projects in Nigeria

Name of CDM Project Activity	Type of Project	UN Registered Date	Annual Emission Reduction (tCO <sub>2</sub> /year)
Efficient Fuel Wood Stoves for Nigeria	Energy Efficiency	12/10/2009	31,309
Municipal Solid Waste Composting Project	Methane Recovery & Utilization	15/12/2010	281,781
Recovery & Marketing of Gas at Asuokpa/Umutu Marginal Field	Waste Gas/Heat Utilization	16/10/2010	256,793
Recovery of Associated Gas Project at Kwale Oil Gas Processing Plant	Waste Gas/Heat Utilization	09/11/2006	1,496,934
Pan Ocean Gas Utilization Project at Ovade-Ogharafe	Waste Gas/Heat Utilization	10/02/2009	2,626,735
Improved Cooking Stoves for Nigeria Programme of Activities (PAO)	Energy Efficiency	10/11/2011	8,912
Distribution of Fuel-Efficient Improved Cooking Stoves in Nigeria (PAO)	Energy Efficiency	06/06/2012	46,717
Landfill Gas (LFG) Project in Nigeria	Methane Recovery & Utilization	12/07/2012	129,932
Multi Country Small Scale CDM Program for Cooking at Household Level	Renewable Energy	30/11/2012	51,385
African Improved Cooking Stoves (PAO)	Energy Efficiency	06/12/2012	15,477
Lafarge WAPCO Partial Substitution of Alternative Fuels in Cement Facilities Project in Nigeria	Cement	18/12/2012	166,557
Afam VI Power Plant Operated by Shell	Waste Gas/Heat utilization	20/02/2013	500,000

Source: UNFCCC (2014)

The CDM does not have the capacity to tackle the problem of gas flaring in Nigeria under the existing scenarios. Despite its intuitive theoretical appeal and potential economic prospects and environmental benefit, it appears somewhat difficult to fathom the real impact of CDM projects in the Nigeria context. For example, combined emission reduction from the 4 CDM projects in the oil and gas industry in Nigeria based on the project design document (table 3 below) for a country that flared most gas in the world behind Russia Federation is a paltry 4,880,462 tons of CO<sub>2</sub> per annum. Furthermore, the table above shows that CDM presence is very insignificant compared to estimated 43 million tons of CO<sub>2</sub> emission from

routine gas flaring alone annually. Consequently, Lutken (2011) argued that based on simple numerical analysis, Africa and the Least Developed Countries (LDCs) have been lagging far behind in CDM projects.

*Table 3: Summary of Registered CDM Projects in Nigeria*

<b>Type of Project</b>	<b>No. of Projects</b>	<b>Annual Emission Reduction (tCO<sub>2</sub>/year)</b>
Energy Efficiency	4	102,415
Methane Recovery & Utilization	2	411,713
Waste Gas/Heat Utilization	4	4,880,462
Renewable Energy	1	51,385
Cement	1	166,500
<b>TOTAL</b>	<b>12</b>	<b>5,612,532</b>

*Source: UNFCCC (2014)*

Against this backdrop, Figueres and Streck (2009) theorized that the CDM project is a deliberate measure and a false market solution to environmental protection that permits polluters to earn carbon credits and at the same time, to continue to flare gas. Ostensibly, these kinds of arrangement encourage the MNOCs to be rewarded bountifully for halting action which in the first instance is illegal. In the simplest of terms, it is political gimmicks that further encouraged the MNOCs not to invest in green technologies such as gas re-injection that can possibly eliminate routine gas flaring. It is the priority of the MNOCs in Nigeria to continue to extract oil and gas with the least possible cost with a maximum profit, and at the same time to earn CERs from CDM which amount to double standards. The carbon credits initiative is a technical strategy and ground design to avoid tackling the problem of gas flaring head-on which allowed the MNOCs to snatch huge sums of money for green technology while keeping with the primordial style of oil and gas exploration. Thus, Bassey (2008) argued that to rely on the CDM initiative as a major solution to solve the flaring in Nigerian justifies the desire to do nothing to tackle the problem because it takes longer times to negotiate CDM project registration. That is why only 4 projects have so far been established in the oil and gas sector since inception despite Nigeria being a renowned gas flaring country. The ultimate victims are the oil and gas producing communities and the ecosystem. Therefore, the CDM is not the only way to tackle routine gas flaring, but appears to be a way to fund the non ending of gas flaring in Nigeria, a manifestation that gas flaring will continue unabated. Olsen (2012) has similarly noted that CDM blueprint submissions for Nigerian projects point a picture of challenging economics in an uncertain policy environment and tensed security conditions.

The main objective of CDM is to stimulate growth in green energy and promote sustainable development. However, Figueres and Streck (2009, p.229) noted that “the sustainable development goal of the CDM point to the fact that the CDM has been more effective in reducing mitigation costs for industrialized countries than in contributing to sustainability in developing countries”. This is consistent with the views expressed by Bassey (2008) that there is a strong political will to allocate very scarce financial and human resources to enforce further dispossession of the poor developing countries by the MNOCs from abroad in the name of CDM. For example, the Kwale-Okpai and Asuokpu/Umutu gas recovery and utilization CDM projects, whose very existence is decried by environmental



degradation owing to its inability to completely eliminate routine gas flaring, amount to rewarding unethical corporate MNOCs failure in environmental protection. In the first place, effort should be devoted to halt the destruction of the ecosystem and the livelihoods of rural peasant communities. There are contradictions between effort on the global front through CDM and the action being taken to reduce environmental degradation in the Niger Delta region.

One of the limitations of CDM is the difficulties in defining sustainable development. According to Liverman and Boyd (2008) only host country of CDM project can set sustainable development criteria, which may sometimes conflict with the host communities where the project is located. Sustainable development encompasses environmental, social and economic aspect of sustainability. In the oil rich Niger Delta region, there is a sharp divergent of opinions amongst the stakeholders, particularly between host communities of CDM projects in the Niger Delta and the government. While government regarded CDM projects in the Nigerian oil and gas industry as sustainable, the host communities think otherwise, which has often resulted in conflict (Obi 2010). In some CDM project locations, there are very limited benefits in terms of employment opportunities and technology transfer of the local people because the petroleum industry uses highly skilled manpower in disfavour of the unskilled manpower of the local communities. This is congruent with the views canvassed by Alexeew et al (2010) that CDM contributions to local sustainable development particularly in the LDCs have been very limited.

Similarly, the CDM project concept in Kwale and Ovade-Ogharafe for the recovery of associated gas for electricity generation presents a huge question mark. All the potential benefits in terms of socioeconomic impact and poverty alleviation to the host communities appear to be rhetoric. Only a relatively few neighbouring communities where the CDM projects are located have access to electricity supplies on a partial basis. Most disappointing is the fact that more than 80% of villages/clans in the project locations are not even connected to electricity line. Like the oil and gas resources, the projected electricity generated from the CDM projects benefiting primarily the wealthier urban communities within Nigerian main urban cities and not the rural communities where the CDM project is located. Sustainable development encompasses environmental sustainability and socioeconomic aspect of development which is rarely available to the rural peasant communities of the Niger Delta. The concept of sustainable development enshrined in CDM objectives has been completely sacrificed at the altar of mediocrity. Therefore, it is difficult for these communities to evaluate the criteria for measuring sustainable development, particularly where there is no economic benefit accruing to them of CDM project located in their domain.

Why should CERs be granted to the oil companies in respect of project activities that have no immediate socioeconomic benefit to the host communities and do not meet their sustainable development? Ultimately, it encourages corporate abuse and brings the CDM process into disrepute. Thus, Bassey (2008) argued that the acceptance of an associated gas flaring in Nigeria as a CDM project cannot be justified given that flaring of gas in Nigeria is outlawed. This gives the notion that MNOCs are being rewarded for activities which in the first place is illegal.

Furthermore, there are uneven global distribution of projects across countries and regions. Many questions have been raised about the inequitable distribution of projects across the developing world. CDM projects are lip services of Western countries to climate change and green economy concept because Nigeria has gained little from technology transfer to kick start development activities and eradication of gas flaring. From inception only 12 projects have been

established in Nigeria. According to Boyd et al (2009) Africa and Middle East have 43 projects equivalent of 3%, compared to Asia and Pacific with 923 projects representing 67% and Latin America 394, equivalent of 29%. Furthermore, they argued that China, India, Brazil and Mexico respectively, have benefited mostly from CDM projects.

*Table 4: Regional Distribution of Registered Global CDM Projects as at December 31, 2010*

S/No	Region	No. Of Projects	% Total
1	Africa	39	1.44
2	East Asia and the Pacific	1,479	54.73
3	Europe and Central Asia	20	0.74
4	Latin America and the Caribbean	496	18.34
5	Middle East and North Africa	49	1.81
6	South Asia	620	22.94
	<b>TOTAL</b>	<b>2,703</b>	<b>100</b>

*Source: Gupta (2012)*

Using the analysis on the table above, East Asia and the Pacific Region, which include countries such as China, Indonesia, Malaysia, Philippines, Republic of Korea and Thailand accounts for 54.73 of total registered CDM projects, while South Asia Region with a share of 22.94%. Similarly, India alone accounts for 598 of the total 620 projects in South Asia Region (Gupta 2012).

Nevertheless, some of the CDM projects in Nigeria are laughable and does not go far enough. For example, one of the CDM project – Efficient Fuel Wood Stoves (SAVE 80) for Nigeria involved the importation of 12,500 fuel efficient stoves from a Germany manufacturing company (UNFCCC 2012), which is expected to save estimated meagre 31,309 tons of CO<sub>2</sub> annually. This is utterly disappointing that cooking stoves are to be imported from Germany in the name of CDM project when they can easily be manufactured locally in Nigeria. There is a huge question mark how this CDM project concept meets the sustainable development, employment opportunities and technology transfer of Nigerians when they are imported into Nigeria from Germany. This situation speaks volumes about the prospects, efficacy and the rationale of carbon trading in Nigeria. In addition, the financial investments in small scale CDM projects are often insufficient to cover the overall high CDM transaction costs (Boyd 2009).

## **CONCLUSION AND RECOMMENDATION**

CDM has proved to be a huge success for climate protection in many parts of the world, particularly in China, India, Brazil, Mexico and Malaysia as they possess the key factors that drive and influence the CDM attractiveness globally. Unfortunately, that is not the case in Nigeria and the LDCs which indicated a need for major reforms of the CDM. Fundamentally, there appears to be a huge question mark about the efficacy or otherwise of the CDM as an instrument of environmental sustainability to curtail the excessive gas flaring and its attendant environmental consequences in the Niger Delta region of Nigeria. CDM project concept in the Nigerian oil and gas industry ought to be an intervening vehicle and a solution to the problem of environmental degradation, but it appears to be scratching the problem of environmental protection on the surface. Beyond the lack of sufficient project in the oil and gas industry, the CDM

project proponent appears to be involved in superficial projects which do not justify the need for any intervention. Rather than squandered so much financial resources on the importation of kerosene wood stove from Germany for households, the CDM should be strengthened to translate the huge natural gas being flared in the Niger Delta region into social and economic benefits for average Nigerians. Reforming the CDM for economic and environmental sustainability require the project proponent to convert the abundant flared associated natural gas to provide liquefied petroleum gas (LPG) and other domestic uses that are rarely available in the majority of homes in Nigeria. Ironically, the gas that is sending shock waves and hiccup to families' budget in Europe, America and Asia, particularly during the winter season is being flared in Nigeria at the expense of the environment.

There is the need for a more purposeful approach by reducing the length of the administrative procedure for certification of the CDM to ensure that Nigeria and indeed the LDCs participation is enhanced. The level of gas flaring in Nigeria does not only affect the national and regional environmental, but also the global environment.

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