

Tackling Climate Change in the Global South: An Analysis of the Global Methane Initiative Multilateral Partnership

Llewellyn Leonard
University of Johannesburg, Auckland Park, South Africa
lleonard@uj.ac.za

Abstract: Developing countries are suffering most under climate change and global warming. The tragedy is that countries in the global South have contributed limitedly to climate change with the problem caused mainly by the fiscal activity of the northern developed countries. How effective have policy interventions been in tackling the climate crisis and how has civil society responded to tackling risks. By examining the case of the Global Methane Initiative (a multilateral partnership launched in 2010 by the United States Environmental Protection Agency along with thirty-six other countries to generate a voluntary, non-binding agenda for global collaboration to decrease anthropogenic methane releases), along with empirical analysis from projects in developing countries and through correspondence with the Global Methane Initiative Administrative Support Group in 2011, this paper seeks to explore whether the Global Methane Initiative presents a threat or opportunity, including what key strategies may be effective to either block or assist in advancing the process more decisively. How effective has the Global Methane Initiative been in addressing climate change? In addition to providing analyses of the key findings, this paper provides recommendations that may be explored by civil society groups for a common campaign to combat any deficiencies of the Global Methane Initiative.

Keywords: *Global Methane Initiative, Global Methane Fund, climate change, global warming, civil society*

1. Introduction

Global warming is the average growth in the Earth's temperature, which results in climatic changes. Due to increased temperatures on Earth, this potentially gives rise to changes in rainfall patterns, sea level rise, and widespread impacts on flora, fauna, and humans (United States Environmental Protection Agency, 2011). Unfortunately, developing countries especially within Africa will suffer most under climate change and global warming. In addition to developed industrialised nations such as the United States continuing to spew greenhouse gases into the atmosphere, the penetration of multinational corporations from these developed nations into Africa due to rapid economic globalisation have also set up operations and extracted the continents fossil fuels and wealth while simultaneously emitting further greenhouse gases (Guimei, 2003). The tragedy is that Africa has played a limited role in global warming with the problem caused mainly by fiscal activity of northern developed countries (British Broadcasting Corporation, 2006). Of all the greenhouse gases - methane is one of the most potent and dangerous contributing to climate change (Provencher, 2007). The characteristics of heat retention by this gas in the air are higher than carbon dioxide. This thus led the Kyoto Protocol¹ to establish an equivalence between them by a factor of 21 in mass (one ton of methane corresponds to twenty-one tons of carbon dioxide) as regards greenhouse effect generation. Besides improving air quality globally, studies show that dropping world-wide methane releases by 20% could evade 300,000 ozone-related deaths internationally in 2030 (Global Methane Initiative factsheet). Due to methane contribution to climate change, the Conference of the Parties (COP) of the United Nations Framework Convention on Climate Change (UNFCCC) held in Copenhagen in December 2009, a Methane Blue Ribbon Panel of leading climate scientists, clean energy finance specialists and global governance experts proposed a global methane fund (GMF). The GMF ideology came about as a result of methane emission

¹ The Kyoto Protocol is a global agreement connected to the United Nations Framework Convention on Climate Change. The Kyoto Protocol sets binding targets for thirty-seven developed countries and the European community to commit to reducing greenhouse gas emissions.

mitigation projects under the Clean Development Mechanism (CDM)² and Joint Implementation Mechanism (JI)³ under the Kyoto Protocol (Point Carbon, 2010). It was ten months later (i.e. 1 October 2010) that the United States Environmental Protection Agency (EPA) along with thirty-six other countries, the European Commission, the Asian Development Bank and the Inter-American Development Bank launched a new Global Methane Initiative (GMI). The GMI complements and supports Partners' efforts as implemented under the UNFCCC (Personal communication, GMI Administrative Support Group – received on 7 July 2011).

The GMI is a mutual collaboration, to produce a voluntary, non-binding agenda for global collaboration to reduce human-induced methane releases and advance the retrieval and use of methane through technology development. The initiative is partnership among industrialised countries, developing countries, and countries with economies in transition in coordination with relevant governmental and non-governmental organizations and the private sector. The key elements of the GMI include an *expanded scope* such as methane reduction and evasion from existing and new sectors (i.e. municipal waste water); *Methane action plans* to ensure that partner countries cultivate plans to coordinate methane reduction at home and overseas. Industrialised nations would offer coordinated support to emerging countries; and *new financial resource commitments* from industrialised country partners to accelerate global methane abatement (GMI factsheet). However, how effective has such interventions been in tackling climate change? Are such interventions appropriate or are they capitalistic endeavours that favour the business as usual approach? In light of the above, this paper has several objectives. It explores what the proposed GMI is all about and how it functions. It explores what the GMI actually entails for climate change emission reductions, including environmental and social justice, and its overall effectiveness. The paper will also examine if the GMI process presents a threat or opportunity for climate change and civil society, including what the key strategies would be that may be effective in either blocking or assisting in advancing the process more decisively. This paper examines the GMI target sectors for methane reduction (i.e. agriculture, coal bed methane, landfills, and oil and gas systems) looking at examples of project implementation globally. It finally examines the GMI finance and explores methane project efficiency for emission reduction generally, before drawing conclusions and making recommendations.

2. GMI Target Sectors

Methane projects fall under fugitive emissions (i.e. pipelines, oil installations and mining) and waste (i.e. landfills and municipal waste, composting, wastewater, manure and animal waste). Fugitive emissions normally include projects repairing pipeline leaks, utilisation of gas that would otherwise have been flared, and methane capture/utilisation in coal and metal mines (Point Carbon, 2010). However, the GMI will target five sectors for methane project implementation (i.e. agriculture, coal mines, landfills, oil and gas systems, and newly added sector - wastewater). The amount of methane captured from each will depend on legislative developments, economics, technology, and outreach (Brackmort, 2010). According to the EPA, these sectors in total account for about 60 percent of global anthropogenic methane emissions. Each of these sectors (except wastewater) is examined below.

Agriculture: The main sources of methane releases from agriculture are livestock enteric fermentation, livestock waste management, rice cultivation, and agricultural waste burning. According to the EPA livestock waste management offers the most practical prospects for methane recovery and use. The main focus in the agricultural sector is on animal manures and agriculture wastes to energy projects with project types varying. According to the EPA, three categories of animals make up to 80 percent of overall releases. These include swine accounting for 40 percent; non-dairy cattle accounting for 20 percent and dairy cattle accounting for 20 percent. The EPA states that livestock waste management will produce substantial co-benefits, including home-grown sources of renewable energy, air and water quality improvements, and decrease in odours (GMI – Agricultural Methane, 2011). In China, methane releases from livestock manure account for 10.4 percent of

² The purpose of the CDM is to assist developing country parties achieve sustainable development and to assist developed country parties in attaining compliance with part of their quantified emission limitation and reduction commitments but without emission reductions in their own countries.

³ The JI, defined in Article 6 of the Kyoto Protocol, allows a developed country to earn emission reduction units from an emission-reduction project in a developing country, the latter benefitting from foreign investment and technology transfer.

the nation's overall anthropogenic induced greenhouse gas emissions. According to Boyle (2010) Huishan Dairy Farm in northeast China fitted gas-powered generators to capture methane from fermenting cow manure. Waste is produced from 60,000 of Huishan's 250,000 cows to generate 5.66 megawatts of power. Energy produced at the dairy operation will form part of China's national grid. The plant could also produce 619,770 tons of fertilizer and decrease carbon releases by 180,000 tons per annum (Boyle, 2010).

Anaerobic digestion produces biogas and comprises of methane and carbon dioxide. It is extensively used as a source of renewable energy. A project in Tu Duong village Vietnam has a system for collecting pig waste that converts manure into biogas, which villagers use for cooking and lighting. However, according to the EPA the project has produced hundreds of biodigester demonstrations in countries such as Thailand, Vietnam and China (although it is reported that the main barriers to implementation include, lack of understanding, procedural know-how, and cultural restrictions - it remains unclear what the concerns of the people are) (IEWY News, 2010). For the agricultural sector, it seems that biogas production systems can reduce methane emissions effectively and should be implemented. Thus civil society in the environmental sector should encourage agricultural biogas developments for two main reasons. One, the burning of biogas can be employed to produce renewable fuel instead of using fossil fuels such as coal and oil, also helping farms and communities to generate their own electricity. However, any biogas developments must take place in consultation with communities who will ultimately be in-charge and own the process. The potential of biogas for methane reduction is valuable if properly implemented. However, is the carbon credit mechanism the appropriate way to get biogas projects implemented as opposed to regulation? Firstly, the expense of building, building and sustaining biogas digesters often surpassed the benefits accumulating to operators, especially for small scale operators. Bigger operations will possibly yield a higher turnover from higher carbon rates since it is usually more cost effective to construct and operate bigger digesters. At roughly \$13 per ton of carbon, smaller operations would not profit from installing digesters. However, if carbon offset prices increase, more small-scale operations would find it profitable to adopt a digester. With the uncertainty of the market, it is unlikely that small scale operators would implement biogas unless a price guarantee is offered that makes it profitable.

Coal mine Methane: Of the total global methane emissions resulting from anthropogenic activities, coal mine methane (CMM) accounts for 6 percent. In 2005, worldwide CMM emissions were estimated to be nearly 400 million metric tons of carbon dioxide equivalent (MMTCO₂E), or about 30 billion cubic meters (BCM). The world's coal mines are expected by 2020 to produce yearly releases of 450 MMTCO₂E (40 BCM) (GMI – Coal Mine Methane, 2011). Coal bed methane (CBM) differs from CMM, in that CBM is methane found in coal seams. It is made through the development of coalification, which is the conversion of plant material into coal. CBM is also recognized as virgin coal seam methane or coal seam gas. CMM is methane released from the coal and adjacent rock strata as a result of mining activities. In underground mines, it can generate a volatile danger to coal miners, and so it is removed by ventilation systems (United States Environmental Protection Agency, 2013). According to the United States Environmental Protection Agency's Coal bed Methane Outreach Program (CMOP), there are estimated to be over 200 CBM projects in operation around the world. Previously, only emission declines from operational underground coal mines were allowed. Methane caught before surface mine procedures and subsequently destroyed can now be calculated as emission reductions (US EPA, 2010). However, if projects such as gas flaring are allowed, this will assist in continuing the severe social and environmental problems such as in oil producing regions like the Niger Delta. For example, Iyayi (2010) notes that the environmental costs of oil and gas flaring in Nigeria which include acid rain, destruction of agriculture, threats to animal and fish life, loss of species and numerous human health problems. Social costs documented include incidents of violence and non-violent conflicts between gas companies and communities and between communities and government. Thus a post-petroleum global economy would not only tackle methane reduction, but also alleviate the social and environmental crisis.

Although there are environmental benefits of methane extraction in mining such as substituting clean-burning methane for dirtier fuels, however, disposal of the huge capacities of water that are created from methane removal wells, in a way that is ecologically tolerable and yet fiscally viable, is a worry. It is likely that coal fragments may get into local drinking water wells. Underground eruptions in mines are also a concern since it can result in worker deaths. Methane is an extremely volatile gas confined within coal layers. Some

causes of underground explosions include mechanical errors from inappropriately used or failing mining apparatus (such as protection lamps or electrical apparatus) or the use of inappropriate explosives underground can activate methane and initiate successive coal dust blasts. A study conducted by the US EPA lists numerous examples of water quality effects and additional problems encountered after methane mining extraction followed (US EPA, 2002). It is uncertain if the GMI will fully assess the environmental impact of proposed CMM projects. For example, one of the largest CMM projects which became operational in 2008 was an initiative to recovery methane trapped in an underground Chinese coal seam during mining, and which would normally be released into the air to decrease the danger of explosions. However, it is unclear how the water extracted was disposed of after methane extraction. This is questionable, considering China's history of environmental and human rights abuse, including lack of environmental enforcement. Even though it may be worthwhile to capture methane that would otherwise have been released into the atmosphere, it is not feasible to capture methane and simultaneously cause no additional environmental and social impacts (e.g. the water use that is specifically needed for methane capture is also complicated by the disposal of the huge capacities of water that are made from the extraction wells).

Landfills: Landfill gas (LFG), made up of roughly 50 percent methane is a result of decaying organic material. According to the EPA, LFG can be used to yield electricity with engines, turbines, or other apparatuses, and can be refined and inserted into a natural gas pipeline. The focus is on retrieval and utilization of methane to energy. An example of a landfill methane project is that in Mumbai, India, at the Gorai Landfill site, which became operational in 2009. According to the US EPA Office of Atmospheric Programs, the project is producing \$5.2 million in carbon credits. However, extraction of methane from landfill sites does pose problems in most instances. Some methane projects, such as landfills, are considered unpredictable in terms of delivered capacity (Point Carbon, 2010). In addition, there are other concerns regarding projects that would extend the life of the landfill beyond the permit date for methane extraction, or cause government to reissue permits against social, health and environmental concerns - as has occurred at Durban's Bisasar landfill site in South Africa. Methane extraction at Bisasar does not benefit informal residents who live around the landfill and who have no electricity, rather methane used to produce electricity is used by those who can afford it. For methane to be produced on a landfill also requires waste to be produced, which goes against a system of elimination, reduce, reuse and recycling of waste in society. This ultimately generates more GHG emissions.

Possible difficulties with methane yield forecasts at the Bisasar dump include concerns with upkeep and monitoring, which threaten the movement of carbon credits. A local government Monitoring Plan Report (2006) for Bisasar highlighted, the methane calculation scheme is complicated in that engines and flares burn landfill gas with diverse competences. It is also uncertain with which share the gas from project wells is flared or utilized. A report by the Academy of Science of South Africa (2011) appointed by local government showed, *'Bisasar Road landfill produces a high flow of landfill gas, in excess of 7000m³ per hour...that is neither extracted nor utilised...Approximately 2500m³ of landfill gas per hour...is captured on a continuous basis...'* This suggests that 60 per cent (i.e. 108,000m³ per day) of landfill gas is fleeing from Bisasar unburnt. This is in addition to the a portion of the methane collected that is emitted into the air, demonstrating that if the landfill is kept open and waste continued to be dumped for methane production, this will actually increase overall greenhouse gas releases into the atmosphere.

Oil and gas systems: The second largest anthropogenic methane source worldwide is that of the production, processing, transmission, and distribution of oil and natural gas. This is said to release around 88 billion cubic meters (BCM) or approximately 1,200 million metric tons of carbon dioxide equivalent (MMTCO₂E) of methane to the air yearly. Methane releases from oil and natural gas structures are chiefly the consequence of operations and system disturbances. The focus is on stopping escapes of natural gas. According to the GMI, these releases can be cost-effectively reduced by improving machineries, and by refining processes, through GMI finance. An example of a project is that of the Ukrainian natural gas transmission system. This transmission system is the second largest in Europe, running for 35,000 kilometres and comprising 171 compressor stations. Cherkasytransgas, which is one of six Ukrainian gas system companies, gained a grant for \$50,000 from the United States Agency for International Development EcoLinks. The aim was to detect and rebuild methane leaks at compressor stations. The grant permitted for acquisition of methane release

detection apparatus, teaching on leak measurement discovery plan development and leak restoration execution, and measurement of leak restoration accomplishment. Cherkasytransgas conducted measurement studies after gaining emissions detection equipment, and established that 103 million cubic feet of methane (3 million cubic meters) per annum was escaping from just two compressor stations. Through methane release identification, restoration, and measurement, Cherkasytransgas has reduced more than 68 million cubic feet (2 million cubic meters) of methane releases per annum. The Cherkasytransgas Company is continuing this successful project to the remainder of its 23 compressor stations (GMI – Oil and gas systems, 2011). However, the question is shouldn't industry be doing the maintenance and upgrading equipment as part of normal operational procedures? Although in developing countries with poor regulation and enforcement these are unlikely to occur. The GMI seems to be another opportunity for the worst polluters to bypass regulation and reduce emissions within their own industries. Upgrading of equipment would not occur in the worst polluting countries such as in the US.

3. GMI Finance: A link with the GMF to fill the financial void

The GMI builds on the Methane to Market (M2M) Partnership, an international partnership launched in 2004 with 14 partner countries, to reduce emissions of methane. In addition to the GMI's own financial assistance, the initiative will also receive financial backing from the GMF for methane reduction projects. The GMF is a fund created by governments and private donors. It initially capitalized at \$300 million to focus on methane abatement through a combination of price floors, prepayment of carbon credits and other unspecified tools. GMF investments in methane abatement in 2009 was said to total \$1 billion. Although there is a lack of transparency by the GMI Administrative Support Group (ASG) on how its own contributions will be deployed and function, its link to the GMF will engage it as an indirect player in the carbon market. However, according to the GMI ASG, the GMI and GMF are separate and unrelated efforts (personal communication received on 7 July 2011). The GMI ASG notes that the GMI does not *actively* participate in and therefore, does not "reinforce" the carbon market. However, what the GMI ASG do not outright deny is that they *do* participate in the carbon market, even if not actively, although indirectly supported via the GMF. As the Methane Blue Ribbon Panel in a 2009 report on the GMF noted, the GMI does not provide the necessary financial support needed when identified projects are ready to move forward, thus the GMF will assist the GMI with its rich registry of GMI projects needing finance (Methane Blue Ribbon Panel, 2009). Contrary to the GMI ASG, the report also noted that the GMF would work closely with the GMI (i.e. M2M) partnership, relying on GMI expertise to identify projects such as landfills and biogas, and enlist private and public sector partners.

According to the Methane Blue Ribbon Panel, links with the newly chartered GMI would thus also be important for the GMF's success (Methane Blue Ribbon Panel, 2009). In addition, the Methane Blue Ribbon Panel appointed consultants Point Carbon in 2010 to examine the level of funding required by the GMF. Point Carbon categorised and included methane projects as also similarly highlighted by the GMI for target sectors methane reductions (i.e. agriculture, coal bed methane, landfills, and oil and gas systems). It is therefore unclear why the GMI ASG would suggest that the GMF and GMI are unrelated efforts. This could also be so as to conceal the rationale behind the GMF and its link to the GMI that would guarantee that thousands of methane schemes are lined up or ready for growth, but are difficult to fund owing to doubt over forthcoming climate policy and the global credit crisis (as also highlighted by Point Carbon). This may also be to ensure that CDM projects are pushed through the market system via methane. According to the GMI ASG (personal e-mail correspondence sent on the 7 July 2011), the GMI is not a fund, nor does it deploy funds via loans and price guarantees – although as noted this will be conducted indirectly via the GMF.

The above evidence suggests a lack of transparency from the GMI ASG and US EPA on the functioning of the GMI, with links between the GMI and the GMF. The lack of transparency may be due to not only conceal the profits that are to be generated by finance capital, but also to push carbon projects through the market by way of the methane equivalence ideology as highlighted above. According to a report from Republicans on the House Energy and Commerce Committee in the United States, the US EPA grant making process lacks transparency. The Committee has called for the EPA to provide more data about the grants, including original applications for explicit grants, a list of all grants to China for CMM and information concerning investigations of overseas beneficiaries (Fox News, 2011). As economist Jeffery Sachs notes with regard to carbon trading, it is:

"hard to implement, it's hard to monitor, it's non-transparent, it's highly political, highly manipulative, which is why the banks love it, the banks all want to trade, this is an investment banking dream." (Australian Broadcasting Corporation, 2008)

4. Conclusion and Recommendations

Of the targeted sectors proposed by the GMI for methane emission reductions, biogas production within the agricultural sector can reduce methane emissions effectively and should be implemented. However, the carbon market may not be the appropriate way to get biogas projects off the ground since there would be unfair advantages for large scale farm operators over smaller farms. However many conceivable policy methods to mitigating methane releases from manure management are available in contrast to the ambiguity of the carbon market. One approach is to control releases on individual processes. This would provide producers with a motivation to embrace technologies, such as digesters, to conform to the standards. Policies for digester adoption might be stimulated by civil society with cost grants or other motivations, such as cost shares, incentive payments, tax credits, or indemnities. Many incentive programs are intended to encourage renewable energy, in addition to reducing GHG emissions. However, the GMI is inadequate in that it focuses on immediate anthropogenic sources for methane capture, without tackling the indirect consequences of these anthropogenic emissions.

Considering the GMI potential for methane project underperformance especially for landfills, it would make sense to reject methane extraction from landfills. However, in all possibility it would seem highly likely that despite potential problems with methane projects, projects will still be allowed to go through the registration process. This is due to the GMI/GMF argument of 'additionality' that emission reductions would not otherwise occur if the project does not go ahead, but also more importantly to raise the capability to get projects through the CDM registration process and gain the required CER capacity. This ideology would certainly be viewed from a business/market perspective, and the continued voluntary agreements as under the Kyoto Protocol would ensure that governments and the worst industrial polluters continue business-as-usual without adequate regulation and actually tackling human-induced GHGs emissions (e.g. securing concrete binding agreements to really tackle climate change). Considering the unreliability of landfills and increased waste generation ideology, it would make sense to move towards Resource Recovery Facilities which seek to reform the way resources and materials move through society compelling a 'whole system' method. However, it seems that any projects that do not make returns on investment and which works against the carbon market ideology would not be considered by the GMI and hence GMF.

In certain projects like replacing leaking pipelines, shouldn't industry be doing this anyway, instead of turning this into a commodity to be sold and bought? Nevertheless, the GMI/GMF have a high potential for environmental and health impacts from specific sectors such as that of CMM. There are many examples of water quality effects and other problems encountered after methane mining extraction. Even though there may be benefits to capturing methane for CMM that would otherwise have been released into the atmosphere the social and environmental consequences of this sector render CMM challenging. Rather a move away from fossil fuels would help address these problems, including regulation of individual industries and taxation on emissions should be pursued. Civil society and governments should reject outright the extraction of methane from coal mines, due to the environmental and health implications of water disposal.

Since methane and greenhouse gases are generally not considered pollutants in some countries such as South Africa, it is therefore not regulated. Civil society must push for methane and other potent GHG emissions to be considered as pollutants of industrial processes requiring regulation. Future regulatory approaches can include taxes on methane and other specific GHG emissions in the oil and gas sectors or on the specific GHG emission "content" of commodities. Taxation is simpler to implement than trading methane reductions over the market. Until renewable energy emerges and fossil fuels extraction halted, taxation would involve government's getting information on the amount of fossil fuels a company uses and precisely estimating its level of emissions. A fixed payment for every ton of projected emissions would apply. There would ensure limited outcomes for failure, with trading schemes on the other hand involving a lot of speculation. Moreover, it may be more feasible for a company in a difficult environmental position to merely remunerate another company to decrease GHG releases, rather than exercise expenditure and resources to do itself.

The GMI enforced by loans and via the GMF, will require developing countries where projects occur to pay back funds with interests. The GMI may thus further tie up such countries into foreign debt, in addition to the historical debt still paid by some countries as in Africa (a new form of colonialism). It is suggested that by civil society entertaining deficiencies of the GMI/GMF, with its obvious problems highlighted above, will actually tie into the market failures and actually aid in destruction of the environment. An important strategy to consider by civil society and which is being pushed by international civil society is to 'leaving the oil in the soil' and the 'coal in the hole', since its exploitation causing social fracturing and political instability in resources countries and further under-develops these countries and the world's climate. To achieve that rational outcome will require a far stronger international push to limit international natural resources exploitation power. Encouragement for such action can be found in some countries. In 2007 the president of Ecuador announced that the country discourage exploration and removal of its oil fields and that the world community should produce a payment trust to leave the oil permanently in the ground and fund Ecuador's sustainable development (Colonos, 2007). Nevertheless, considering the uncertainties associated with the GMI and associated concerns within targeted sectors, an alliance with groups fighting against coal and gas, including in the agriculture sectors may be beneficial to target the GMI, especially its links to the GMF and carbon market.

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