The industrialization challenges of the Latin American and the Caribbean region in achieving the Sustainable Development Goal 9 and an Inclusive and Sustainable Industrial Development.

Safeguarding the Environment

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Introduction

Latin America and the Caribbean (LAC) have an indelible history of inequality and social polarization that was institutionalized by colonialism and/or slavery. The latest statistics from LAC show that approximately 167 million people are poor and 71 million live in extreme poverty (UN ECLAC: 2015). The development capacity of our youthful population is oppressed by high rates of unemployment and underemployment, and youth have less social protection than adults (UN ECLAC: 2015).

It is now axiomatic that sustainable industrialization is essential for poverty eradication and the achievement of most of the sustainable development goals. Undoubtedly, industrialization presents a great opportunity to boost economic growth, improve our standard of living, empower women and create decent jobs especially for youth. However, history has shown that industrialization does not always bring equitably benefits to a country. For instance, Peru was able to graduate from being a low-income to a middle-income country through industrialization but the peoples in rural and isolated regions such as Puno, Ayacucho and Cusco still suffer from social exclusion, poverty and unemployment (UNIDO: 2013). This is why the Sustainable Development Goal 9 (SDG 9) must be achieved in unison with Inclusive and Sustainable Industrial Development (ISID).

In assessing the potential industrialization challenges in achieving SDG 9 and ISID, one must bear in mind that the region is a very diverse. Countries are at different stages of industrial development and their national circumstances give rise to different challenges and solutions. For instance, Haiti is still in a phase of rehabilitation and reconstruction of its industrial sector following the earthquake in 2010. Moreover, small island developing states in general do not have the capacity to support large scale industrialization mainly due to their size and the fact that they are dispersed islands (UN ECLAC: 2015). Contrariwise, Brazil and Chile are in a more advanced stage of industrialization and they have the capacity to support

large scale industrialization. Nonetheless, industrialization will bring a plethora of economic and social benefits to the region.

But what about the environment!

It is no secret that the traditional approach to industrialization has had significant negative impacts on our environment and ecological systems. The use of fossil fuels and traditional industrial practices are partially responsible for increased pollution, land degradation, natural resources depletion, ozone layer depletion, hazardous waste, biodiversity loss and the destabilization of the global climate (UNEP: 2012). A healthy environment is a primordial feature of sustainable industrialization and a circular economy because businesses rely on biodiversity and ecosystem services to produce their products and/or provide business services. For example, if the water is polluted the fisheries and agricultural industries as well as the ecotourism sector will be negatively affected. Further, the region needs to raise its environmental standards so that our industrial produce are competitive in the international market and are not subjected to export rejections, as had happened to Colombia, because of weak sanitary and phyto-sanitary frameworks (UNIDO: 2015).

In seeking to protect the environment whilst achieving SDG 9 and ISID, there must be a specific focus on energy and the environment. In the body of the essay, the writer will discuss:

1 How a revolutionary approach to energy production and supply, and the protection of the natural environment will buttress the achievement of SDG 9 and ISID;

2 The challenges to the achievement of SDG 9 and ISID under the energy and environmental chapeaus;

3 The way forward in terms of addressing the challenges.

4 A conclusion: The way forward.

Throughout the essay the writer will highlight a number of actions/ initiatives in LAC led by youth, civil society and international organizations.

Vision: A Revolutionary Industrial Approach to Energy and the Environment

Energy

Energy access is indispensable to industrial development and the achievement of the SDGs. Energy is the lifeblood of our economy because it drives key sectors such as construction, agricultural production, transportation, technological development, and commerce. Further, an assured supply of energy attracts domestic and foreign business investments, and it creates an enabling environment for innovation and entrepreneurship (OECD: 2007).

Industries in LAC remain heavily dependent on imported fossil fuels despite the fact that the region has an abundance of renewable energy resources. Irrefutably, fossil fuels have huge environmental costs in terms of greenhouse gas emissions (GHG), air and water pollution, wildlife and habitat loss, and of course, socio-economic implications relating to public health and damage to infrastructure. Moreover, dirty energy due to their volatile and rising prices have limited our socio-economic development and discouraged investments, especially in the rural areas where many people still do not have access to electricity (Gardner, Alleyne and Gomes: 2013). UNIDO (2009) has pointed out that industries are responsible for more than one third of global energy consumption and energy-related GHG.

To achieve SDG 9 and ISID, the region will need to shift towards a pathway of sustainable low-carbon industrial development and thereafter, ultimately achieve green industrial development. This would require efforts to scale up the availability of renewable energy and to improve energy efficiency in different sectors such as tourism, construction and small and medium-sized enterprises (SMEs). Renewable energy will provide the necessary energy supply to develop quality, reliable, sustainable and resilient infrastructure in a manner that is significantly less environmentally damaging. Further energy efficiency and system optimization will enable the region to upgrade infrastructure and transportation as well as retrofit industries to make them sustainable.

ISID will be advanced because, for instance, small-scale industries and other enterprises will have an opportunity to be integrated into the value chain markets. The World Bank (2014) has indicated that huge economic opportunities exist for SMEs in wastewater management, bioenergy and ethanol production in Latin America. For example, it is touted that bioenergy has a market value of about $40 billion in Latin America (World Bank: 2014).

SMEs can get a reasonable share across the value chain by carrying out activities in the areas of feasibility consultancy, operations, equipment maintenance and ash disposal (World Bank: 2014). Further, opportunities exist for SMEs to provide energy in rural areas that have low electrification rates and this is likely to create further economic opportunities for people in these rural areas (World Bank: 2014). Secondly, it presents an opportunity for social inclusion, innovation and entrepreneurship, especially by youth. For instance, in the recent UNDP funded Caribbean Youth Innovation Challenge one of the winners business startup was a boat prototype powered only by solar energy which transports goods for clients to and fro different islands within Saint Vincent and the Grenadines (UNDP: 2013).

Environment

In order to achieve SDG 9 and ISID, it is imperative that LAC ensures that there is good industrial management of our natural resources and cleaner industrial production processes. As it stands, our consumption and production patterns are injudicious; they have caused several environmental burdens relating to waste management, climate change, ozone depletion and land degradation. Moreover, the use and misuse of some chemicals have severely impacted human health and the environment. Astonishingly, these practices continue even though it is recognized that many resources are finite and that the wealth of industries depend on the health of the environment.

Indubitably, LAC needs to decouple economic growth from resource use and environmental degradation to realize SDG 9 and ISID (UNIDO: 2011). To do this, the region will need to increase resource-use efficiency in industrial processes and fulfill the obligations under a number of multilateral environmental agreements.

SDG 9 and environmental sustainability can be achieved simultaneous through, for example, eco-industrial development. Eco-industrial parks can increase profitability, create new market avenues and significantly reduce environmental degradation because the businesses will be in one geographical space and they will have to share resources [Cohen-Rosenthal: 2003]. For instance, the waste or by-products of one of the businesses can be stole to, or used by, another business as raw material or energy [UNIDO: 2014]. In LAC, Brazil has been leading the way where eco-industrial development is concerned and the country has developed some interesting eco-industrial park models, notably in Santa Cruz and Paracambi, Brazil [Veiga and Magrini: 2009]. UNIDO has also provided support to the establishment of an eco-industrial park in Pucallpa, Peru and is seeking to provide similar support in other countries such as Argentina, Costa Rica, Panama and Venezuela [UNIDO:

2014]. Further, eco-industrial parks are ideal for SIDS since they face many issues relating to sustainable land management.

With respect of ISID, society as a whole will benefit because industrial resource efficiency provides many economic opportunities in resource efficiency and the multilateral environmental agreements ensures several health and environmental benefits. Industrial resource efficiency presents economic opportunities in waste recycling industries, waste-energy production, research in areas green chemistry and nanotechnology. Youth and Women have already taken up some of these opportunities. For example, the Caribbean Youth Environment Network in its 'Junior Upcyclers to Green Deen Campaign' in Trinidad and Tobago trained hundreds of youth on how to recycle various materials and sell them. Moreover, in El Salvador, through the Harvesting Geothermal Energy Initiative women from rural communities use the waste-heat from a renewable energy geothermal plant owned by LaGeo Company to grow and water fruit for themselves and for commercial sale [UNFCCC: 2015]. Similarly, reducing harmful chemicals to the environment in industrial productive processes bring about socio-economic. For example, UNIDO in a project on artisanal and small-scale gold mining (ASGM) along the Puyango-Tumbes River between Ecuador and Peru was able to introduce measures to reduce the impacts of mercury on health and environment while simultaneously increasing gold production [UNIDO: 2013].

Ensuring that the environment is protected when achieving SDG 9 and ISID is by no means a simple task. There are a myriad of potential challenges to achieving SDG 9 and ISID. Some of the challenges are specific only to matters concerning energy or the environment, namely those under the heading of gender equality and multilateral environmental agreements, respectively. There are few cross-cutting challenges relating to both energy and the environment such as financing, access to technology, lack human and institutional capacity and environmental democracy. There is, however, a way forward and this would include building on the existing initiatives in LAC, some of which are led by women and youth.

Challenges in achieving SDG 9 and ISID

1. Gender Equality

It is crucial that women are included in, and given the opportunity to contribute to, matters relating to environmental sustainability. Mr. LI Yong, Director General of UNIDO, explained that "[w]hen women and men are more equal, economies grow faster, more

people are lifted out of poverty and the overall well-being of societies is enhanced" [UNIDO: 2015]. SDG 9 and ISID will only be achieved by taking action to systemically eliminate intrinsic discrimination against women in the energy industry. As it stands, an extremely small number of women hold decision-making and technical positions in science and technology and the energy sector [UNIDO: 2015]. The corollary of this is that decisions and potential solutions will have an unintentional bias towards males because women do not have a voice in the process [UNIDO: 2015]. The natural environment does not reap full benefits from this approach because new technologies that improve energy efficiency and the reduction of GHG generally may not be suitable for industries dominated by women such as the food and beverage industries. Further, women are marginalised from certain economic opportunities because new innovations are not user-friendly to women. This will perpetuate concerns relating social injustice, household air pollution and the active participation of women in social and political activities [UNIDO: 2015].

2. Multilateral Environmental Agreements

Under the Minamata Convention, the biggest challenge will be the ability to get suitable and affordable environmentally friendly alternatives to mercury to remote communities involved in ASGM. If the alternatives to mercury do reach the communities, because the livelihoods of many people are dependent on ASGM, the miners will have no choice but to resort to illegal ASGM. Further, it will be a challenge convincing countries that do not have ASGM to make the necessary national arrangements (legal, institutional and otherwise) to sign the Minamata Convention when other issues like debt, poverty and crime reduction are their priority. It is important that the other countries notably the small islands in the region sign the Convention so that we seal off the loopholes in the trade of mercury by-products of ASGM and silver mining, and in general mercury contaminated products. Finally, properly coordination amongst all relevant organisations will be necessary to avoid duplication efforts under the Basel, Stockholm and other relevant Conventions.

Similarly, under the Montreal Protocol the main challenge will be the ability to scale up the accessibility and availability of viable alternatives to ozone depleting substances to companies. A lot of success under the Montreal Protocol has been achieved in the region. For example, the largest manufacturer of fridge-freezer in Ecuador, Induglob S.A., converted its insulation foam which contained hydrochlorofluorocarbon (HCFC) to cyclopentane technology which is a non-ODS [UNIDO: 2014]. Similarly, farmers in Mexico were able to replace methyl bromide with alternatives such as plant grafting and integrated pest management in their tomatoes and strawberries farms [UNIDO: 2014].

Similarly under the Stockholm Convention, there is the concern relating to the accessibility and affordability of alternatives to Persistent Organic Pollutants (POPs). (Cite Author) puts things in context by giving the example in Honduras where in one community farmers utilises alternatives to POPs such as integrated pest management but in another country a few miles away the farmers rely on POPs due to lack of awareness of the alternatives, common social attitudes to continue with old products and sometimes due to a high degree of illiteracy that makes dissemination of information difficult. Finally, emerging policy issues such as environmentally persistent pharmaceutical pollutants will create new legal, institutional, financial and capacity building challenges for the region.

Under all of the Multilateral Environmental Agreements there are concerns relating to technology transfer, capacity building and public awareness but these concerns will be addressed below.

3. Finance

Financing will ultimately be the main lubricant for shaping a sustainable energy transition; increasing resource-use efficiency in industrial processes and; assisting LAC countries in fulfilling their obligations under a number of multilateral environmental agreements. Assistance from the Global North will be crucial as well as South-South Cooperation but we also need to address concerns relating to national financial policies and create an enabling environment for private financing and investments.

Access to finance and myopic fiscal policies can potentially be major barriers to advancing SDG 9 and ISID. For instance, financial institutions and governments have been more alacritous to providing support to the large companies to enhance their energy efficiency and introduce renewable energy technologies because the conjecture is that large companies emit more GHG (UNEP, 2004). However, given that SMEs are more numerous than large companies, collectively they will emit more GHG. As such, finance must be made available for SMEs to improve their energy efficiency and increase the use of renewable energy. This will not only assist the region in alleviating the global climate crisis but it will also advance ISID as explained above.

Moreover, harmful environmental subsides, in particular subsidies on fossil fuels, undermine innovation, investments in markets and the accessibility to loans for new and more environmentally friendly technology. These subsides were intended to make energy more affordable to the poor but there is a mountain of evidence which shows that the poor

will seldom benefit and these policies enlarge greenhouse gas emissions [UNEP:2014]. The promotion of eco-industrial parks and SMEs as well as the achievement of zero-emission transportation can be affected by the lack of funding opportunities and the prolonged harmful environmental subsides. For example, the lack of fiscal and tax incentives such as tariff reduction and general sales tax exemption for the use of energy efficient vehicles have stymie our transition to sustainable low-carbon transport. There will not be a transition to clean energy and cleaner production in industrial processes unless the relevant stakeholders get appropriate financial incentives to make the transition.

Finance is also highly relevant on matters relating to funding research, innovation, access to environmentally friendly technology, public awareness, institutional capacity building and monitoring and evaluation mechanisms.

4. Technology

Technology certainly has a critical role to play in achieving SDG 9, ISID and a circular economy. It provides a slew of opportunities to advance SDG 9, ISID and environmental sustainability concurrently. Our industries will need to rely on technologies to, amongst other things, upgrade infrastructure and retrofit industries to make them sustainable, and to develop quality, reliable, sustainable and resilient infrastructure. Moreover, information and communications technology (ICT) will enable us to develop eco-industrial parks and SMEs, and promote human development, entrepreneurship and green employment opportunities for everyone through mechanisms such as e-education and e-business. Also, technology helps to address and mitigate industrial-related environmental concerns relating to waste management, health, pollution, energy, climate change.

Technology is potentially a panacea for most development challenges but it also presents challenges to the environment and there are difficulties in acquiring the appropriate clean and environmental technology in LAC. For instance, Fettweis and Zimmermann [2008] explained that “ICT systems are . . . responsible for the same amount of CO2 emissions as global air travel”. As such, we will face the challenge of finding innovative ways to improve the energy efficiency of ICT in order to address climate change. Moreover, technology transfer has been a major bugbear to access to cleaner production technologies. Companies in the Global North have been able to rely on intellectual property policies to maintain monopolies and high prices on new cutting-edge technology. The high cost of clean technologies and renewables has ineluctably deterred industries and entrepreneurs from investing and transiting to green industrial development.

5. Human and Institutional Capacity

To achieve SDG 9, ISID and environmental sustainability the LAC countries will need the necessary technical expertise and, institutional and legal frameworks. This will be a major challenge. The regional has insufficient technical expertise in many important areas. For instance, we lack experts to draft legislation, monitor and evaluate the implementation of multilateral environmental agreements and police the use of environmentally harmful chemicals in industrial processes. Moreover, we have failed to find incentives to keep our highly skilled people from migrating to the developed countries. Without the required technical expertise, it will be difficult to create the necessary institutional and legal frameworks to fulfil international obligations and achieve SDG 9 and ISID as quickly as we would like.

Way forward

Ultimately, the concerns relating to the achievement of SDG 9 and ISID will be assuaged if Governments fulfil their obligations under both the Addis Ababa Action Agenda of the Third International Conference on Financing for Development, the Paris Agreement under the United Nations Framework Convention on Climate Change and Multilateral Environmental Agreements. Further, UN programmes in Latin America and the Caribbean such as the Centres for Renewable Energy and Energy Efficiency and the Sustainable Energy for All Hub will gradually solve issues relating capacity development, technology development and deployment, data and knowledge management, and investment and business promotion. Moreover, there should be an increase in national and regional financing mechanisms similar to the Uruguay Trust Fund for the Development of Energy Efficiency. Some of these funding opportunities should be exclusive to young people so as to support youth innovation and entrepreneurship.

With respect of gender equality, more women must be included in the energy sector. In Latin America and the Caribbean, women are getting more involved in the energy sector. For example, in Colombia there is an all-women leadership alliance initiative called Fostering Cleaner Production that is transforming the highly polluted construction industry in Valle del Cauca by teaching women about techniques and technologies to create a greener industry and ensure energy efficiency (UNFCCC, 2015). Similarly, women from the small islands in the region are taking advantage of sustainable energy services, investment and business

opportunities through the Island Women Open Network for sustainable energy and climate resilience (UNFCCC, 2015). Moreover, it is posited that women from the Global North also have to play an active role in the energy sector so as to influence the development designs and processes of new technologies that will be deployed to developing countries.

Similarly, where all modes of transport are concerned there are many actions taken at the international level that will have positive impacts at the national level. For instance, the UN Secretary General has a High-level Advisory Group on Sustainable Transport that is seeking to find solutions to, amongst other things, promote environmental protection through sustainable transport. Also at the regional level, national finance institutions such as Caixa Economica Federal in Brazil, Financiera de Desarrollo Territorial (FINDETER) in Colombia, and the National Bank of Public Infrastructure and Services (BANOBRAS) in Mexico are investing resources into the Emerging and Sustainable Cities Initiative to, amongst other things, upgrade of the public transport system to benefit urban poor neighbourhoods (UNFCCC, 2015).

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