Full Length Research Paper

A critical look at the Ghanaian one district one factory industrial policy in relation to climate change

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Received 18 January, 2019; Accepted 12 March, 2019

This paper takes a critical look at Ghana's one district one factory industrial policy in relation to climate change. This is important because climate variability and change as a result of industrialization can stand as hazard to impending advancement and expansion in Ghana. Industrial policy can contribute significantly to economic, ecological as well as communal sustainability. This paper aim to clarify the need for industrial policy because of climate change as well as to determine its effects on the one-district, one-factory industrial policy in Ghana. A far-reaching work examination was done on detailed comparative account of the role played by industrial Policies due to climate change in development and growth. This search resulted in the selection of four implications namely: international coordination, green industrial policy, energy efficiency and diversifications; and trade policies, which were missing in the 1D1F industrial policy in Ghana.

Key words: Climate change, energy; industrial policy, trade policy, sustainable development.

INTRODUCTION

Ghana is one of Africa’s fastest growing economies, which has taken noteworthy progresses in poverty decrease, but climate unpredictability as well as change stand as hazard to impending advancement and expansion. Ghana has attained a reduced middle-income status and seeks to attain a full-grown middle-income nation in the future. Although the government to set the country’s resources to judicious usage as they sustain the economic development, implements responsibilities as well as the country and its people growth, one challenge of environment-development relationship that is the growing threats of global warming, of which Ghana is not exempted. Climate change in Ghana can develop into a grave hazard to livings and there is minute or no strong indication of devoted reaction to climate change (Amuakwa-Mensah, 2014; World Bank, 2009). Instead, most government’s frontrunners choose to approve political contracts and memo rather than exercising suitable techniques of alleviating the danger of climate change. In recent times, Ghanaians boost of the governments’ quest to implement the industrial policy (IP) of one district one factory (1D1F) in its 254 districts. The specific aim of the 1D1F is:

1) To create massive employment particularly for the youth in rural and peri-urban communities, thereby improve incomes levels and standard of living, as well as reduce rural-urban migration.
To add value to the natural resources of each district and exploit the economic potential of each district based on its comparative advantage.

To ensure even and spatial spread of industries and thereby stimulate economic activity and growth in different parts of the country.

To promote exports and increase foreign exchange earnings to support the government’s development agenda.

This 1D1F industrial policy is an excellent industrialization initiative and requires a critical look in relation to climate change. Before the methods, results and discussions the fundamentals of climate change finances as it relates to industrial development and procedure is reviewed to offer a satisfactory structure of situation and pressure the formidable difficulties on the track of industrialization.

Even though industrial development leads to wealth creation and social transformation, it can also affect the environment and contributes ultimately to climate change if not done sustainably. A country’s IP is actually directs an administrative interference in the economy (Evenett, 2006). Government takes measures aimed at improving the competitiveness and capabilities of domestic firms and promoting structural transformation. A country’s industrialization often has a key role in IP and it is very important to implement IP (Rodrik, 2007).

In recent times most countries have been implementing IP (Perez and Primi, 2009). Naudé (2010a and b) argues that there exists numerous justifications for IP, comprising the dangers as well as prospects posed by climate change. This paper aim to make clear the necessity for IP owing to climate change as well as to define its inferences in Ghana pertaining to 1D1F policy. An important point of leaving is that IP is important for environmental and societal tolerability. In a world characterized by growing inequity, industrial development proposes opportunities for employment creation, revenues and the opportunity for industrially holdup nations to catch up. Altenburg (2009) describes climate change as one of the most important challenges facing IP. According to Naudé (2011) and Naudé and Alcorta (2010), achieving low-carbon industrialization is going to require selective government intervention and neutrality towards all products and processes. The necessity to make accurate decisions will be more superficial as the world’s populace rises to above 9 billion persons by 2050 (Naudé and Alcorta, 2010). A rising populace with amassed procure influence will request novel and additional merchandises as well as methods to make them that would not just have a weighty clang on the environs but would also put weighty force on the obtainability of natural resources to make them (Naudé, 2011). Furthermore, indorsing low-carbon industrial development as well as procurement of its supplementary growth remunerations will itself advance the capability of current underprivileged nations to acclimate to climate change (Szirmai, 2012).

Although the Earth’s climate(s) has continuously been fluctuating, there is currently an extensive understanding that the climate is warming and anthropological release of Greenhouse Gases (GHGs) which is an anthropogenic global warming is a causative influence. According to Tol (2010), every household, company, farm, releases some greenhouse gases. One such weighty level emanates from industrialized activities. According to IEA (2009), industry demand institutes about 30% universal ultimate energy request and is accountable for about 40% of all energy-related releases, with pulp and paper, iron and steel, chemicals and petrochemicals, cement, and aluminum making as the utmost carbon intensive. The human released element of GHGs in the air has increased significantly from the time of the earliest Industrial Revolution. It stands as threat for humanoid wellbeing as climate warming is comes with countless adverse effects on society. Climate change is foretold to have specific economic and communal influences over numerous passages; furthermore, these are predictable to be different geographically and emerging nations are projected to be the vilest affected. These influences and concerns will entail adaptation to climate change along with activities to alleviate global warming. Industrialization has always seemed to be the key to wealth creation but in reality, it has been shown that, although it leads to better conditions of living in certain respects, it affects the environment and ultimately, contributes to climate change (Mgbemene et al., 2016). Industrialization not only involves technological innovations, it also involves economic and social transformation of the human society.

Industrialization comes with opportunities as well as challenges. The challenges include pollution, changing human life styles and changing philosophies. Due to these challenges, industrialization must take into account climate change and its consequences according to Equation 1.

\[
\text{GHG emissions} = \text{population} \times \left\{ \left( \frac{\text{GDP}}{\text{Population}} \right) \times \left( \frac{\text{Energy Use/GDP}}{\text{GHG emissions/Energy Use}} \right) \right\}
\]  

(1)

According to The Kaya identity as shown in Equation 1, the first expression on the right side specifies the connection with profitable development and the second and third expressions indicates the connection with invention. Industrial development consequently donates to GHG releases through (i) encouraging general GDP development; (ii) having a vivid general influence on energy demand and usage; and (iii) using carbon-intense invention techniques.

According to Ojha (2008), global warming will be harmful to economic expansion and subscribe to higher poverty. Climate change will have such a serious impact on economic growth that 1% of global gross domestic product (GDP) will be required to mitigate its effects (World Bank, 2009). Many studies have presumed a rise
MATERIALS AND METHODS

Industrialization has become a development priority for a number of developing countries. These countries are elaborating ambitious and long-term industrial development plans that provide a clear vision and rationale for industrial development and promote skills and resources to meet the industrial development challenge. This industrial development challenge has a potential to affect the environment and ultimately contribute to climate change. There is therefore the need to clarify the need for IP due to climate change in Ghana. Most of the existing literature and data relating to industrial policy due to climate change in Ghana were scanty. The National Climate Change Policy as an assimilated reaction to weather alteration in Ghana is a great idea. Even if it offers an obviously clear passageway to deal with issues of climate change in the socio-economic situation of Ghana, it appears not to have secure grounds in terms of sustainability operation (MOTI, 2010).

To fully understand industrial policy due to climate change globally an extensive literature search was carried out on detailed comparative account of the role played by industrial policies due to climate change in development and growth in different countries, their different effectiveness, the importance of varying combinations of polices measures and the details of their implementations as shown in Table 1. The following four implications were selected because those were missing in the United Nation documents on industrial policy process in Ghana, namely the international coordination, green industrial policy, energy efficiency and diversifications, and trade policies. The aim is to clarify the need for IP because of climate change as well as to regulate its inferences for the one district one-factory industrial policy in Ghana. Four insinuations are deliberated, specifically the need for Universal management, green industrial policy, energy efficiency and diversifications, and trade policies.

RESULTS

International coordination

Dealing with climate change is an economic necessity. According to IPCC (2007), climate change impacts are very likely to increase due to increased frequencies and intensities of extreme weather events and that aggregated and discounted to the present, they are very likely to impose costs, and these costs will increase over time. However, a coordinated international response can drive down the cost of mitigation compared to each country doing this in isolation at home.

Developing countries have been predicted to experience the greatest impacts from climate change. This is because many of the developing countries are vulnerable and regrettably poor in terms of development to mitigate the challenge of climate change. For the countries most vulnerable to climate change, the most reliable defense lies in economic development itself. The advanced industrial countries that have been primarily responsible for bringing about climate change will most
likely not experience its most severe impacts. They have a responsibility to assist both poor and genuinely developing countries to find a path of development that does not exacerbate global harm. In the past IP was very much nationally oriented with little collaboration and management between countries. This increases subjects of the suitable and actual official devices to attain such management. In Africa, the case for international coordination of IPs needs to be considered and the biggest platform to ensure and monitor compliance is Africa Union AU.

Currently, from the earliest industrial revolution, many emerging nations are not key GHG emitters, even big developing markets like China, India and Brazil release comparatively slight in apiece terms though because of the proportions of their populaces as well as economies their entire releases are important (Ojha, 2008). Conversely, to the extent that the future is apprehensive, the IEA (2009) assumes that the entire probable upsurge in CO₂ releases from now to 2030 will come from emerging nations mostly India, the Middle East and China. About 75% of the projected 12 Gt upsurge in yearly releases is set to originate from China only, with the state probable to be the world’s main wholesaler of oil by 2025 (Naudé, 2011). The development in CO₂ will be determined not merely by the rising affluence and increasing request from increasing industrialized giants like India and China; but also from the necessity to meet the still as yet unmet request of about 1.5 billion people in the world who short admission to electricity and growth as well as the most of those who live in Sub-Saharan Africa (SSA) (IEA, 2009).

Developing countries will however, in many cases also be worst affected by climate change. And most of the current industrially generated stock of carbon in the atmosphere has been caused by advanced economies, where most of the technological capability, know-how, human skills and financial resources reside to mitigate climate change and adapt to its impacts (Naudé, 2011).

### Green industrial policy

Green industrial policy (GIP) is strategic government policy that attempts to accelerate the development and growth of green industries to transition towards a low-carbon economy. This policy has come about as a result of global concern for climate change and its adverse effect on countries especially in developing countries. Greening, the economy, transforming it to ensure environmental sustainability, is becoming increasingly urgent at the current rates of natural resource depletion. There is an urgent need for support for international cooperation and coordination of green industrial Policy.

Now the dilemma is, if such management is complete, it may imply that industrialized guidelines will face definite global restraints, nonetheless will have to poise universal weights for climate change alleviation contrary to nationwide weights for job making as well as structure. It was renowned that numerous emerging nations have possibly greatly to benefit from carbon-concentrated industrial development, mainly as they face job making as well as providing basic services, comprising electricity and infrastructure construction.

### Energy Efficiency and diversification

Energy competence involves expending a lesser amount of energy in construction and consumption. This includes growth of clever networks, developments in constructing energy competence, industrialized energy competence and vehicle competence (Martin, 2010). Energy competence in industrialized procedure can contribute suggestively to condensed GHG releases. Trudeau and Tam (2009) evaluated that energy savings in commerce might contribute to a decline of about 5.7 Gt in CO₂ releases by 2050. Internationally synchronized IP and collaboration in IP is essential since emerging nations can decrease their industrialized releases suggestively over the small to intermediate term over implementation of presently prevailing best available technologies (BAT).

Prins et al. (2010) for example, accounts that BAT in the steel business is internationally diffused; it will diminish CO₂ releases yearly by about 340 million tons. IPs simplifying knowledge, repetition, accepting and research on a sector-by-sector source will be needed (Trudeau and Tam, 2009). It should be noted that, although

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Table 2. Overview of global industrial policy due to climate change.

| References          | Climate change worst off region | Industrial policy application |
|---------------------|---------------------------------|------------------------------|
| Naudé (2011)        | Developing countries            | Yes                          |
| Hope (2006)         | Asia                            | Yes                          |
| Maddision (2003)    | South America                   | Yes                          |
| Meadelsön et al. (2000) | Africa                      | No                           |
| Plambeck and Hope (1996) | Asia                      | Yes                          |
| Tol (1995)          | Africa                          | No                           |
| Frankhauser (1995)  | China                           | Yes                          |
improvement in industrial energy efficiency can make an important short-term contribution, it may not necessarily lead to significantly lower energy demand or reduced GHG emissions.

Moreover, energy divergence necessitates strong IP creativities to upsurge the part of non-fossil fuels in energy demand. Energy change would mean better usage of renewable energy sources clean energy (Simmons, 2014). Such variation is appreciating great importance in numerous nations, not only founded on issues on climate change, but also on energy safety and the likely chances it might grip for industrial development and job formation.

**IP and trade policy**

In recent times, the concern about environmental impacts has gone beyond relying on existing national regulation because international markets are increasingly demanding environmentally sound products (ITTO, 2005). Most international certification schemes provide options to consumers to choose products, which have been sourced that are deemed to be managed sustainably (Brundtland, 1987). Therefore, life cycle thinking has become a key focus in environmental integrated product policy and an effective integration of this concept in Ghana is considered as a critical success factor for a more sustainable industry.

The research on the links between trade rules and climate change action has mostly been concerned with how far climate change action is constrained by current trade rules pertaining, for example, to border tax adjustment (Horn and Mavroidis, 2011), subsidies (Green, 2006), and exports of natural gas (Levis, 2012). It is argued that only radical technological progress can reconcile climate change goals with the development and energy aspirations of humanity (Mattoo and Subramanian, 2012). Generating technological progress requires deploying the full range of policy instruments (Mathew, 2015).

Considering IPs to foster a low-carbon economy will have important repercussions for trade and Foreign Direct Investments (FDI) and hence trade policies. Bilateral Trade Agreement (BTA) currently appears to be the most favored approach. This approach makes industrial and trade policies consistent. Whalley and Dong (2008) deliberated some of the problems involved in the use of BTAs to influence releases. Initially, they noted that it is development instead of trade, which is the main releases donor. In addition, releases vary more considerably between nations than merchandises, posing the issue of whether skill procedure must distinguish against merchandises, or nations and struggle with the non-discrimination articles of the World Trade Organisation (WTO). In addition, WTO based rate events will probably have minor influence on releases since most are in a minor amount of areas where production is not directly transacted, for example electricity generation and transportation. Moreover, it is problematic to describe and decide on what might be viewed as ecologically subtle goods and services to indulge disjointedly in trade. Additionally, the management of BTAs founded on the carbon-content of importations will be an expensive procedure and challenging to execute. Lastly, Whalley and Dong (2008) also indicate the hazard that when BTAs are used that management might want to involve in additional tactical trade strategies to try and counterbalance other apparent causes of modest shortcoming, which could message a novel period of receding from permitted universal trade to isolationism. In other words, BTAs might be misrepresented for protection. Therefore, in the milieu of climate change IPs must watch as touching being appropriated by planned trade rules because of misappropriation of BTA. Cautious arrangement with trade is necessary; furthermore, the drawbacks once more highlight the significance of internationally synchronized IPs.

**CONCLUSION AND RECOMMENDATIONS**

This paper aim to clarify the need for IP because of climate change and to regulate its insinuations for the one district one-factory industrial policy in Ghana. Therefore, this paper made the case that the carefully chosen industrial policies (IPs) are required to manage such development amidst the climate change issue on one district one-factory industrialized procedure in Ghana. Numerous emerging nations might profit from this green evolution, if they can organize satisfactory and suitable replies through IPs.

Four key issues international coordination, green industrial policy, energy efficiency and diversification and trade policies were discussed and the key conclusion was that in the situation of weather change the most significant precondition for dodging drawbacks is that IPs require better global organization and collaboration than what they had in the past. Dealing with climate change is an economic necessity because climate change impacts are very likely to increase and are very likely to impose costs, and these costs will increase over time if critical measures are not put in place. A coordinated international response can drive down the cost of mitigation compared to doing this in isolation in Ghana. This has been the principal issue in this research. This work recognized a few problems, comprising the circumstance that emerging and progressive economies experience diverse purposes and issues in low-carbon industrial development. For emerging nations, job formation as well as the addition of energy to their inhabitants are important; for progressive economies, it is job formation and energy safety. IPs for low-carbon industrial development requires be intending and synchronizing
CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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