

# Industrialization and Environmental Pollution in Africa: An Empirical Review

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## Abstract

Industrialization, the process of transformational change of the human society from an agrarian society into an industrial one, has positive contribution in social, economic and political life of the society and impose strain on the natural environment. The aim of the paper was to review literatures on industrialization and environmental pollution from developing countries (Africa) perspective. In developing countries, focusing only on industrialization without considering waste emission may impose constraint on the environment. These nations need to regularly monitor the effect that growing industrialization is creating on the environment.

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## 1. Introduction

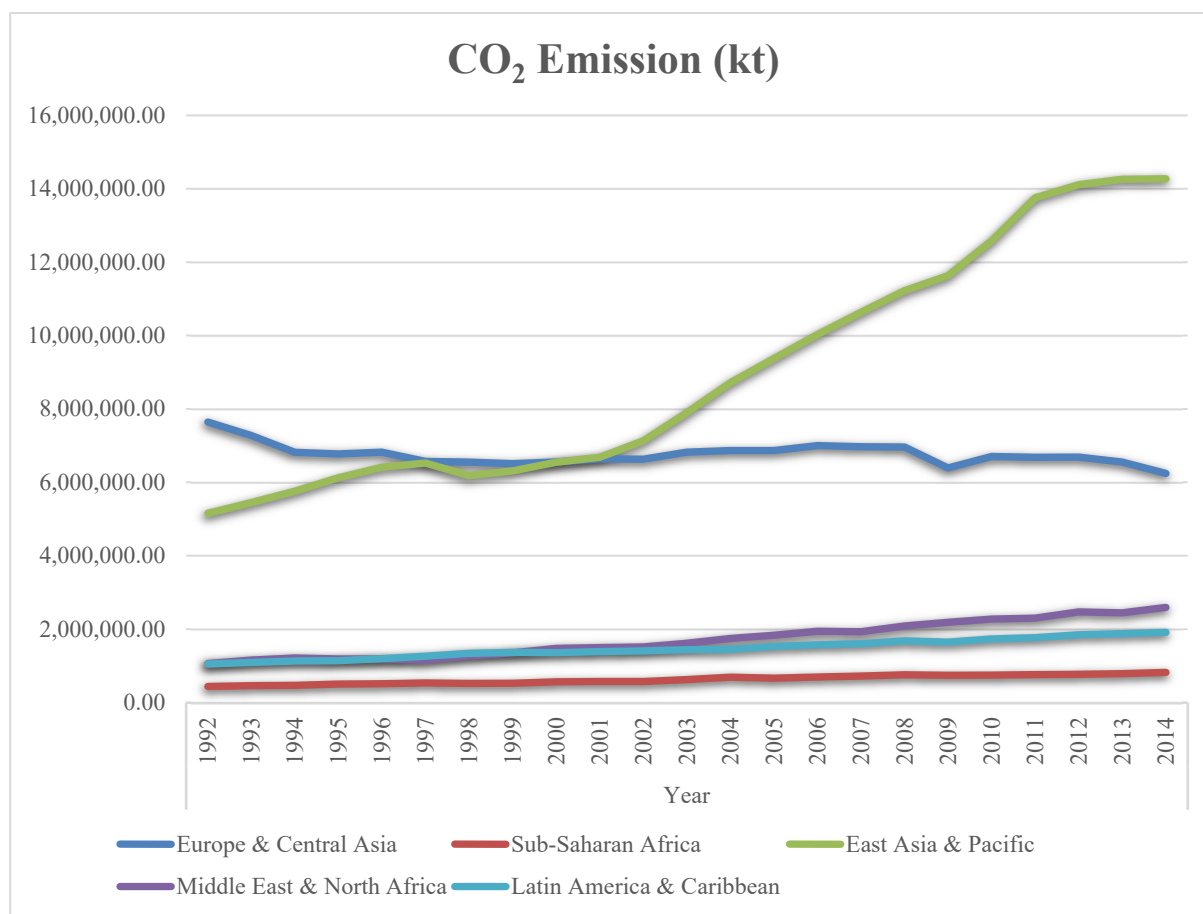
Industrialization is a total process, impacting on society through an unprecedented increase in goods and services (Moyo, 2018). As cited in Nzau (2010) as (Purma C. Samanta, 2001), development experience of countries in Western Europe and North America during the 19<sup>th</sup> and early 20<sup>th</sup> centuries contribute to the existence of industrialization.

Industrialization and worldwide economic integration have brought not only an increase in wealth (Mgbemene et al., 2016) but also in transnational threats. In 2017, the world's largest CO<sub>2</sub> emitters (China, USA, EU, India, Russia and Japan) accounted for 51% of the population and provide 63% of the total primary energy supply and emitted 68% of total global fossil CO<sub>2</sub> (Muntean et al, 2018). While almost all countries have environmental laws designed to protect air, water, land, and flora and fauna from pollution (Morimot, 2005), effectiveness of this rules differ across countries.

There is great difference between countries concerning relationship between industrialization and development. Industrialization, chief development strategy for developing countries, is necessary in such nations because of its historical association with development (Chandra, 1992). Since population of many developing countries is growing, importance of industrialization is high to feed this growing population through creating job opportunities and well as suppling industrial inputs for existing traditional agriculture.

Morris and Fessehaie (2014) pointed out that Africa needs to provide job opportunities to millions of young people through a massive industrialization effort that enable Africa to eradicate poverty (European Commission, 2006) and achieve sustainable development. Industrial policy that may have significant effect on this side is a contested issue, especially for low-income countries (Altenburg, 2010). The provision and use of environmental resources in a way that supports continued improvements in prosperity and wellbeing, for current and future generations has to be managed (Everett et al., 2010). Though industrialization facilitates dynamic processes of technological innovation, skills development, knowledge-intensification and capital accumulation, it will produce large carbon-dioxide emission to global environment.

Carbon dioxide emission by Sub-Saharan Africa is very low compared to that of East Asia and Pacific. According to World Bank data, by 1992 Europe and Central Asian countries were emitted 7,644,380.70 kt (kiloton) of CO<sub>2</sub> while Sub-Saharan Countries were emitted 437,483.81 kt of CO<sub>2</sub>. However, by 2014 East Asia and Pacific Countries were emitted 14,272,114.68 kt of CO<sub>2</sub> which was greater than the sum of the rest of four regions. The effect of these growing emission is not only limited to developed nations but also has high effect on growing economies.



Source: Computed from World Bank Data (1992-2014)

## 2. Review of Related Articles

### 2.1. Effect of Industrialization on Developing Countries Environment

The effects of the emissions are not restricted to only those emitting nations. The effects of industrialization of the western world are felt as far away as in the developing worlds of Africa and Asia (Mgbemene et al., 2016).

In Africa, as a result of growing urbanization and industrialization industrial pollution was growing. Loss of biodiversity and contamination of rivers and other sources of water through human actions is another environmental problem that Africa is facing (Gessese, 2006). According to Gessese (2006) industrial growth reduce pressures on the environment associated with poverty. In another side, However, industry impose constraint on the environment though intensive use of natural resources and energy and with the generation of waste and pollution.

Although industry is by no means the only factor contributing to air pollution in urban areas it is, together with vehicle emissions, a major element. According to Jenkins (1998) total pollution will tend to rise where more polluting industries (like petrochemicals or cement) are increasing their share of production. Industrialization causes tremendous stress on the entire ecosystem and natural system components like water, air, soil, and bio-diversity (Patnaik, 2018 and Bhandari and Garg, 2015).

According to European Commission (2006) and Gessese (2006) industrial processes can cause climate change, loss of natural resources, air and water pollution and extinction of species. These negative environmental impacts of industrialization threaten the global environment as well as economic and social welfare.

In developing world like Africa, there was consensus among researchers on underdevelopment of industry and the effect of industrialization on the environment. For Gessese (2006) environmental impacts of industrialization are not currently as serious a problem as in the rest of the world. According to Ahuti (2015) the impacts of industrial activity on the natural environment has seen differently across developed and developing nations.

Even though industrial activities and growing demand are still putting pressures on the environment and the natural resource base, environmental regulation has great role in reducing the environmental impact per unit produced in industrialized countries (European Commission, 2006). In contrast to this, in developing countries a double environmental effect is occurring: old environmental problems (deforestation and soil degradation) remain

largely unsolved and new problems linked to industrialization (rising greenhouse gas emissions, air and water pollution, growing volumes of waste, desertification and chemicals pollution) are emerging.

As Mgbemene, Nnaji, and Nwozor (2016) described climate change as the persistent change in the weather pattern engendered by activities mostly linked to industrialization. However, though humans have some effect on the global climate there has not been an agreement on whether humans are the chief culprits or not.

## 2.2. Green Industrialization in Africa

As cited in Luken and Clarence-Smith (2019) as UNIDO, (2009 & 2011) green industrialization has two main dimensions: industries green themselves; and green enterprises, i.e., enterprises which offer environmental goods and services, are created.

Industries can green themselves by reducing the environmental impacts of industrial processes, reducing the environmental impacts of the products manufactured, reducing the environmental impacts along the supply chain, in particular, in the logistics and transport systems which move products around and Making industry resilient to the effects of climate change and disasters (Luken and Clarence-Smith, 2019).

Green industrialization also requires establishment of new enterprises or the expansion of existing enterprises that deliver environmental goods and services which industries and, more broadly, the economy as a whole requires to green itself. 'Green entrepreneurs are those who implement innovations and develop new markets that make the economy more efficient in its use of the natural environment and more resilient to environmental impacts, such as climate change' (Brahmbhatt, et al., 2017). Green enterprises encompass a diverse set of industrial activities Manufacture of renewable energy equipment, material recovery and recycling, waste treatment and management, manufacture of pollution control equipment, provision of environmental and energy consulting and services and provision of monitoring, measuring and analysis services as well as service activities such as finance and insurance. The number of researchers conducted on green industrialization (green industries and green enterprises) across Sub-Saharan Africa is very limited.

Industrialized nations emit far more carbon dioxide than the other nations (Mgbemene, et al., 2016). Similarly, policies that these nations follow in coping up problems that arise from industrialization and their regulations in controlling emission by industries is high. The failure of markets to put a price on greenhouse gas emissions has led to an unsustainable mode of industry that is contributing to global warming (Schwarzer, 2013). In developing countries in contrast policies for sustainable environment are either ineffective or non-exist at all.

## 3. Conclusion

In developing world overall impact of industry on the environment need to carefully assessed rather than only focusing on economic benefits into account. In developing countries like Sub-Saharan Africa, production techniques i.e. development and application of environment-friendly technology should be implemented and followed by regulatory bodies in order to have sustainable environment and economic growth.

Developing countries are trying their best in encouraging industrialization through structural change. The Ethiopian government has demonstrated impressive dedication and ability to create the preconditions for a market-based and socially inclusive industrial transformation. One of the problem with this industrialization is that distribution of industries across regions of developing countries is not healthy. A number of industries can be observed around centers of some developing countries like Ethiopia. Waste emission is also high around these places. Governments of developing countries should correct this through distributing industries across regions of their country.

In developing countries, green growth policies need to be encouraged. These policies are most likely required to deliver local benefits in improved environmental management through sustainable waste treatment, better access to water and energy and more desirable health outcomes from controlled pollution. Developing countries government has to promote industrial development that simultaneously satisfy environmental sustainability.

In general, infant and growing industrial expansion in Africa needs support from the government of these nations to increase share of industry in GDP and employment opportunities. In addition, industrial development in Africa requires care from environmental perspective. Environmental protections policies need to be encouraged and the effect of industrialization on the environment requires regular monitoring.

## 4. Reference

- Ahuti, S. (2015). Industrial Growth and Environmental Degradation, *International Education & Research Journal*, 1(5), 5-7
- Altenburg, T. (2010). Industrial Policy in Ethiopia. Discussion Paper, Deutsches Institut für Entwicklungspolitik (DIE), 2010, Bonn
- Bhandari, D. and Garg, R.K. (2015). Effect of Industrialization on Environment (Indian Scenario), *Global Journal for Research Analysis*, 4(12), 281-282
- Brahmbhatt, M., Haddaoui, C. and Page, J. (2017). Green Industrialization and Entrepreneurship in Africa,

- Contributing paper for *African Economic Outlook 2017*
- Chandra, R. (1992). *Industrialization and Development in the Third World*, First Edition, 11 New Fetter Lane, London EC4P 4EE
- European Commission (2006). *Industrial Development*, March 2006
- Everett, T., Ishwaran, M., Ansaloni, G.P. and Rubin, A. (2010). *Economic Growth and the Environment*, Department for Environment, Food and Rural Affairs Evidence and Analysis Series
- Gessese, N. (2006). *Report on the Review of African Sustainable Industrial Development*
- Jenkins, R. (1998). *Industrialization, Trade and Pollution in Latin America: A Review of the Issues*. University of East Anglia
- Luken, R. A. and Clarence-Smith, E. (2019). *Green Industrialization in Sub-Saharan Africa: A Guide for Policy Makers*, The Institute of African Leadership for Sustainable Development, Dar es Salaam, Tanzania
- Mgbemene, C.A., Nnaji, C.C. and Nwozor, C. (2016). *Industrialization and Its Backlash: Focus on Climate Change and Its Consequences*. *Journal of Environmental Science and Technology*, 9 (4), 301-316
- Morris, M., and Fessehaie, J. (2014). *The Industrialization Challenge for Africa: Towards a Commodities Based Industrialization Path*. *Journal of African Trade*, 1(2014), 25–36
- Morimoto, T. (2005). *Growing Industrialization and our Damaged Planet: The Extraterritorial Application of Developed Countries' Domestic Environmental Laws to Transnational Corporations Abroad*, *Law Review*, 1(2), 134-159
- Moyo, T. (2018). *Development of Human Capital for Industrialization: Drawing on the Experiences of Best Performers*. *Africa Development*, Volume XLIII (2), 2018, 107-127
- Muntean, M., Guizzardi, D., Schaaf, E., Crippa, M., Solazzo, E., Olivier, J.G.J., and Vignati, E. (2018). *Fossil CO2 Emissions of all World Countries, 2018 Report*, European Commission, Joint Research Centre
- Nzau, M. (2010). *Africa's Industrialization Debate: A Critical Analysis*, *The Journal of Language, Technology & Entrepreneurship in Africa*, Vol. 2. No.1. 2010, ISSN 1998-1279
- Patnaik, R. (2018). *Impact of Industrialization on Environment and Sustainable Solutions – Reflections from a South Indian Region*, *Earth and Environmental Science* 120 (2018) 012016
- Schwarzer, J. (2013). *Industrial Policy for a Green Economy*, International Institute for Sustainable Development, Winnipeg, Manitoba, Canada R3B 0Y4