

## Are China's Investments in Africa Environmentally Sustainable? A Case Review of Three Projects in Kenya

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### Abstract

China is the second-largest economy in the world with an annual Gross Domestic Product (GDP) of about 6% as of 2019, thanks to the speedy economic growth. However, this has come along with environmental challenges attributed to the application of the 'pollute first control later' policy. Being a global power, China's environmental status has been of global concern and their advocacy for a green economy has been criticized. Here, we review the environmental implications of few Chinese-funded projects in Africa, with a key focus on Kenya's three projects; Standard Gauge Railway (SGR), Lamu Port-South Sudan-Ethiopia-Transport (LAPSSET) and Lamu Coal Plant projects. Our findings show that in most instances, economic growth is prioritized over environmental protection. This has been capped in corruption, misinformation on environmental policies, deprived support towards environmental bureaus, resulting in poor policy implementation. Further, the absence of environmental regulations governing overseas investments, weak bureaucracies, and corruption in the host nations, has played part in environmental degradation. In order to confidently advocate for a green economy, China needs to be an example by investing and funding green projects and promoting sustainable development. The host nations also need to prioritize sustainable development and develop policies that will protect the environment.

**Keywords:** China, Africa, environmental policies, overseas investments, policy implementation, sustainable development.

### 1. Introduction

China is the second largest economy in the world, thanks to rapid industrialization which led to fast economic growth and an annual Growth Domestic Product (GDP) growth rate of 9.5% in 2011 before declining to 7% in 2014 and 6% in 2019<sup>3</sup>. Since the industrial revolution of Chairman Mao's era, China has applied the practice of the "pollute first, control later" policy<sup>4</sup>, which has surely given her 'sweet' economical gains. The economic rise of China came as a surprise to many globally, most especially because of the century of humiliation and numerous domestic challenges that China faced, including the national drought that killed millions of Chinese citizens<sup>5</sup>. This was among the reasons China intensified industrialization in order to sustain her economy and fend for the large population.

However, China's growth has come at the cost of the environment including increased levels of greenhouse gas emissions (GHGs) due to the massive use of environmentally-harmful sources of fuel such as coal. The extensive use of coal in China to power her industries is attributed to its cheap nature, thus proving economically profitable. As a result, China has recorded increased rates of pollution-related diseases resulting in the death of millions of citizens<sup>6</sup>. China, however, has had to take up mitigation measures to reduce GHGs in order to achieve sustainable economic growth.

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<sup>3</sup>Tan, Huileng (2020). China's says its economy grew 6.1% in 2019, in line with expectations. *CNBC*. [Online] Available: <https://www.cnbc.com/2020/01/17/china-gdp-for-full-year-and-q4-2019.html> (January 17, 2020).

<sup>4</sup>Xiangcong, Ma (2007). China's environmental governance. *China Dialogue*. [Online] Available:

<https://www.chinadialogue.net/article/show/single/en/789-China-s-environmental-governance> (February 21, 2007).

<sup>5</sup>Kaufman, A. A. (2010). The "Century of Humiliation," Then and Now: Chinese Perceptions of the International Order. *Inha Journal of International Studies*. 25, 1-33.

<sup>6</sup>David, Sandalow (2019). Guide to Chinese Climate Policy 2019. In *Climate Change and Environment*. New York: Columbia University: University's School of International & Public Affairs (SIPA).

This has included formulation of more than 300 local environmental regulations and laws and over 52 domestic environmental policies through the Ministry of Ecology and Environment (MEE)<sup>7</sup> and the National Development and Reform Commission (NDRC)<sup>8</sup>. In as much as progress is made to expound on these environmental policies, most of the published literature has focused more on the challenges of policy implementation, with minimal discussion on the said policies<sup>9,10</sup>.

Notably, China's participation in the United Nations Conference on Human Environment (UNCHE) in Stockholm in 1972 acted as an eye opener to the pursuance of better ways to manage environmental challenges. It is after this conference that China formulated the first environmental law, the Environmental Protection Law (EPL), which was later revised in 2015<sup>11,12,13</sup>. One of the main aspects of this law was the Environmental Impact Assessment (EIA), a prerequisite for project implementation, which to date has played a huge role in ensuring that construction projects incorporate mitigation measures against damage to the environment<sup>14</sup>. China's Agenda 21 of 1994, the first at a national level, was such a huge milestone as it stood as a declaration towards the implementation of the Brundtland Report that focused on sustainable development, a virtue that China is still striving to achieve<sup>15,16</sup>. However, despite the advocacy for green economy and green financing, China's actions both domestically and overseas has spoken quite the contrary<sup>17,18,19</sup>.

China being an excellent policy-maker has failed in the area of policy implementation<sup>20</sup>. This has mostly been attributed to the national pursuance for economic development vis-à-vis environmental protection. This is even more evident in the local governments as they are given economic growth targets to attain<sup>21</sup> and in order to surpass the expectations; they often have to overlook environmentally-damaging projects<sup>22</sup>. Corruption, lack of incentives and enough resources for the local Environmental Protection Bureaus (EPBs) also undermines sustainable development<sup>23</sup>.

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<sup>7</sup>Ministry of Ecology and Environment, P.R.China. (2019) Environmental Policies. [Online] Available: <http://english.mee.gov.cn/Resources/Policies/policies/>

<sup>8</sup> NDRC, China (2008). Main Functions of the NDRC. [Online] Available:

[https://en.ndrc.gov.cn/mfndrc\\_8237/200812/t20081217\\_1193980.html](https://en.ndrc.gov.cn/mfndrc_8237/200812/t20081217_1193980.html) (December 17, 2008)

<sup>9</sup> Wang, K., Huang, M., & Tang, X. (2017). Significant Changes in Overseas Investment Administration. [Online] Available: <https://www.kwm.com/en/knowledge/insights/significant-changes-towards-china-s-cross-border-investment-regulations-20171103> (November 3, 2017).

<sup>10</sup>Xiangcong, Ma (2007). China's environmental governance. *China Dialogue*[Online] Available:

<https://www.chinadialogue.net/article/show/single/en/789-China-s-environmental-governance>(February 21, 2007).

<sup>11</sup> Gregory, C. C. (2010). China's Environmental Policy: A Critical Survey. Princeton University, Department of Economics, Center for Economic Policy Studies.

<sup>12</sup>Chunmei, W. & L. Zhaolan (2010). Environmental Policies in China over the Past 10 Years: Progress, Problems and Prospects. *Procedia Environmental Sciences***2**: 1701-1712.

<sup>13</sup> Dana, B-S. (2018). Chinese Environmental Protection Policies and Implementation. *Top Scholar*, Western Kentucky University/Thesis Projects. Paper 738.

<sup>14</sup>Were, J. (2013). Environmental Impact Assessment: General Procedures. Presented at *Short Course VIII on Exploration for Geothermal Resources*, Kenya.

<sup>15</sup>Wang, Jin (2010). "China's green laws are useless". *China Dialogue*. [Online] Available:

<https://www.chinadialogue.net/article/show/single/en/3831--China-s-green-laws-are-useless->(September 23, 2010).

<sup>16</sup>Xiangcong, M. (2007). China's environmental governance. *China Dialogue*. [Online]

Available:<https://www.chinadialogue.net/article/show/single/en/789-China-s-environmental-governance>(February 21, 2007).

<sup>17</sup>Zhang, K., Wen, Z., & Peng, L. (2007). Environmental Policies in China: Evolvement, Features and Evaluation. *China Population, Resources and Environment***17**(2): 1-7.

<sup>18</sup>Zhen, Z. (2015). The Dynamic Evolution of China's Environment Policy. *Food and Fertilizer Technology Center (FFTC) Agricultural Policy Platform (FFTC-AP)*.

<sup>19</sup>Xiangcong, Ma (2007). China's environmental governance. *China Dialogue*. [Online]

Available:<https://www.chinadialogue.net/article/show/single/en/789-China-s-environmental-governance>(February 21, 2007).

<sup>20</sup>Wang, Lijun (2010). The Changes of China's Environmental Policies in the Latest 30 Years. *Procedia Environmental Sciences***2**, 1206-12. [Online] Available: <https://doi.org/10.1016/j.proenv.2010.10.131>.

<sup>21</sup>Zhen, Z. (2015). The Dynamic Evolution of China's Environment Policy. *Food and Fertilizer Technology Center (FFTC) Agricultural Policy Platform (FFTC-AP)*.

<sup>22</sup>Wang, Jin (2010). "China's Green Laws Are Useless." *China Dialogue*. [Online]

Available:<https://www.chinadialogue.net/article/show/single/en/3831--China-s-green-laws-are-useless->(September 23, 2010).

<sup>23</sup>Zhang, T., & Yao, H. (2018). The improvement on the implementation level of environmental policies is demanded in China. *Environmental Science and Pollution Research***25**, no. 36, 36035-38.

Compromised legal systems, lack of public participation in policy matters<sup>24</sup> and continuous financing of environmental harmful projects by different financial institutions, both locally and overseas, have greatly undermined national pursuance for a green economy<sup>2526</sup>.

Africa, being a big recipient of Chinese funding in terms of loans, and partnership in economic development, has experienced both positive and negative impacts of this cooperation<sup>27</sup>. While many African leaders are rejoicing over the income-generating projects that the Chinese invest in, environmental Non-Governmental Organizations (NGOs) and other relevant stakeholders are more concerned about the protection of the environment, though not necessarily discrediting or opposing the said projects. Despite the great progress in formulating environmental protection policies domestically, China is yet to formulate policies that would govern her overseas engagements as of 2018<sup>28</sup>. Instead, the Chinese government upholds that the companies operating overseas must abide by the host countries' environmental policies and more so, they are encouraged to export their domestic policies overseas<sup>293031</sup>. However, this has not always been the case as some Chinese companies have not abided by these guidelines.

The Export-Import Bank of China (China Exim Bank), the largest state-owned financier of overseas projects, is one of the main financial corporations that adopted a green financial policy, making their policies public in 2007<sup>32</sup> before the official national introduction of green finance policy in 2015<sup>33</sup>. However, these policies and guidelines made towards overseas projects are voluntary thus resulting in laxity from investors who could either subscribe to them or not<sup>34</sup>. The Chinese government insists that it has no control over the environmental and social behavior of the companies that invest overseas, but only 'hope' that they don't breach the environmental policies of the host countries<sup>35</sup>. This work reviews the environmental impacts of Chinese investments in the African continent, with a special focus on three main projects implemented in Kenya.

## 2. Review of Environmental impacts of Chinese projects in Africa

China's position as a global power and engagement in Africa has made them become the largest Foreign Direct Investor (FDI) contributor on the continent<sup>363738</sup>. As a result, most authors have warned Africa against falling into a 'debt trap' with China and having to trade their resources for the loans they can hardly repay<sup>3940</sup>.

<sup>24</sup>Xiangcong, Ma (2007). China's environmental governance. *China Dialogue*. [Online] Available: <https://www.chinadialogue.net/article/show/single/en/789-China-s-environmental-governance> (February 21, 2007).

<sup>25</sup>Shinn, D.H. (2016). The Environmental Impact of China's Investment in Africa. *Cornell International Law Journal*. 49, 25-67.

<sup>26</sup>Shinn, D.H. (2016). The Environmental Impact of China's Investment in Africa. *Cornell International Law Journal*. 49, 25-67.

<sup>27</sup>Songtian, Lin (2015). Africa: Continent and China Industrial Capacity Cooperation Aims for Win-Win. *AllAfrica*. [Online] Available: <https://allafrica.com/stories/201507131170.html> (July 13, 2015).

<sup>28</sup>Gallagher, K. S., G., & Qi, Q. (2018). Policies Governing China's Overseas Development Finance Implications for Climate Change. *Center for International Environment & Resource Policy, The Fletcher School, Tufts University* 16.

<sup>29</sup>Ministry of Commerce People's Republic of China. (2013). Guidelines for Environmental Protection in Foreign Investment and Cooperation.

<sup>30</sup>Wang, K., Huang, M., & Tang, X. (2017). Significant Changes in Overseas Investment Administration. [Online] Available: <https://www.kwm.com/en/knowledge/insights/significant-changes-towards-china-s-cross-border-investment-regulations-20171103> (November 3, 2017)

<sup>31</sup>Man, J. Y. (Ed.). (2013). China's environmental policy and urban development. *Lincoln Institute of Land Policy*.

<sup>32</sup>Wang, K., Huang, M., & Tang, X. (2017). Significant Changes in Overseas Investment Administration. [Online] Available: <https://www.kwm.com/en/knowledge/insights/significant-changes-towards-china-s-cross-border-investment-regulations-20171103> (November 3, 2017).

<sup>33</sup>Man, J. Y. (Ed.). (2013). China's environmental policy and urban development. *Lincoln Institute of Land Policy*.

<sup>34</sup>Gallagher, K. S., G., & Qi, Q. (2018). Policies Governing China's Overseas Development Finance Implications for Climate Change. *Center for International Environment & Resource Policy, The Fletcher School, Tufts University* 16.

<sup>35</sup>Limo, K. A. (2016). The Environmental Impact of China's Activities in Africa: The Case of Kenya. Institute of Diplomacy and International Studies. University of Nairobi.

<sup>36</sup>Power, C. (2018). Does China dominate global investment? *Diakses pada* [Online] Available: <https://chinapower.csis.org/china-foreign-direct-investment/>.

<sup>37</sup>IMF (2019). World Economic Outlook 2019. GDP, current prices: Purchasing power parity; billions of international dollars, IMF. [Online] Available: <https://www.imf.org/external/datamapper/pppgdp@weo/oemdc/advec/weoworld> (October, 2019).

<sup>38</sup>Lindberg, K., & Lahiri, T. (2018). From Asia to Africa, China's "debt-trap diplomacy" was under siege in 2018. *QUARTZ* [Online] Available: <https://qz.com/1497584/how-chinas-debt-trap-diplomacy-came-under-siege-in-2018/> (December 28, 2018).

<sup>39</sup>TRTWorld (2019). How China's debt trap diplomacy works and what it means. [Online] Available: <https://www.trtworld.com/africa/how-china-s-debt-trap-diplomacy-works-and-what-it-means-32133> (December 13, 2019).

It is through such engagements that China has occasionally funded projects perceived to have negative environmental implications and even in some instances, the EIA reports have been defied and constructions launched without taking into consideration the mitigation measures<sup>414243444546</sup>.

The Forum on China-Africa Cooperation (FOCAC), established in 2001, was meant to strengthen the economic cooperation between China and Africa<sup>47</sup>. Through FOCAC, many African states have benefited from the Chinese loans on development projects, which some African leaders have used as campaign instruments in order to be re-elected into power<sup>48</sup>. The African Ministerial Conference on the Environment (AMCEN), an African corporation that advises and formulates environmental regulations for the African Union (AU) has been a useful instrument on guidance towards environmental matters<sup>49</sup>. In 2017, the China-Africa Environmental Cooperation Centre (CAECC) was launched in Nairobi<sup>5051</sup>. This is yet another Sino-Africa partnership, which was as a result of the Johannesburg meeting of 2005, with the core purpose of improving environmental relations between China and Africa<sup>52</sup>. However, even with these partnering institutions, no environmental policies have been formulated with regard to Sino-Africa investments.

In 2013, President Xi Jinping initiated the Belt and Road Initiative (BRI) with the intention of broadening China's wings in the world through infrastructural investment, not only in Asia but also in Europe and Africa<sup>53</sup>. This project is meant to steer China towards being the largest economy in the world<sup>54</sup> and was even incorporated into China's Constitution<sup>55</sup>. The Belt and Road Ecological and Environmental Cooperation Plan, a policy formulated to guide the BRI into greening the projects was introduced in 2017 with the aim of ensuring that all BRI projects are sustainable and environmental-friendly<sup>565758</sup>. However, there have been allegations that some BRI projects, just like other projects in China, do not safeguard the environment to some extent. An example of such projects is Kenya's Standard Gauge Railway (SGR) project, financed by CEB<sup>5960</sup>.

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<sup>40</sup> Green, Mark (2019). China's Debt Diplomacy. *Foreign Policy*. [Online] Available:

<https://foreignpolicy.com/2019/04/25/chinas-debt-diplomacy/> (April, 25 2019).

<sup>41</sup>Chen, H. (2016). China's 'One Belt, One Road' initiative and its implications for Sino-African investment relations. *Transnational Corporations Review*, 8(3), 178-182.

<sup>42</sup> Hoare, A. (2015). Tackling illegal logging and the related trade: What progress and where next? *Chatham House*. [Online] Available: <https://www.chathamhouse.org/publication/tackling-illegal-logging-and-related-trade-what-progress-and-where-next> (July 15, 2015).

<sup>43</sup>Askouri, A. K. (2004). The Merowe Dam: controversy and displacement in Sudan. *Forced Migration Review*, (21), 56-57.

<sup>44</sup>Okita-Ouma, B., Lala, F., Moller, R., Koskei, M., Kiambi, S., Dabellen, D., ... & Pope, F. (2016). Preliminary indications of the effect of infrastructure development on ecosystem connectivity in Tsavo National Parks, Kenya. *Pachyderm*, 57, 109-111.

<sup>45</sup> Williams, S. (2013). Chinese factory accused of poisoning Somaliland water supplies. *The Guardian*. [Online] Available: <https://www.theguardian.com/environment/2013/jul/02/chinese-factory-somaliland-water> (July 2, 2013).

<sup>46</sup>Divine, O. A., Michael, S., Bridgette, F., & Henrietta, A. (2017). Environmental and socioeconomic perturbations of a dam project on catchment communities, Ghana. *Global Environmental Health Safety*, 1(2), 13.

<sup>47</sup>Forum on China-Africa Cooperation (2009). Forum on China-Africa Cooperation Sharm El Sheikh Action Plan (2010-2012). [Online] Available: [https://www.focac.org/eng/zywx\\_1/zywj/t626387.htm](https://www.focac.org/eng/zywx_1/zywj/t626387.htm). (November 12, 2009).

<sup>48</sup>Bosshard, P. (2008). China's environmental footprint in Africa. *China in Africa Policy Briefing*, 3(1), 12.

<sup>49</sup>African Union (1968) African Union African Convention on the Conservation of Nature and Natural Resources (1968). [Online] Available: <https://au.int/en/treaties/african-convention-conservation-nature-and-natural-resources> (September 15, 1968).

<sup>50</sup>United Nations Environment Programme (2019). China-Africa Environmental Cooperation Centre. [Online] Available: <https://www.unenvironment.org/regions/africa/regional-initiatives/china-africa-environmental-cooperation-centre>.

<sup>51</sup>Morangi, L. (2018). China-Africa Center to address environmental issues. *China Daily*. [Online] Available: <https://www.chinadaily.com.cn/a/201808/20/WS5b79cd0ba310add14f3868e7.html> (September 20, 2019).

<sup>52</sup>Morangi, Lucie (2018). China-Africa Center to address environmental issues. *China Daily*. [Online] Available: <https://www.chinadaily.com.cn/a/201808/20/WS5b79cd0ba310add14f3868e7.html> (September 20, 2019).

<sup>53</sup>Dossou, T. A. (2018). The impact of China's one belt one road Initiative in Africa: The Evidence from Kenya. MPRA Paper 90460, University Library of Munich, Germany.

<sup>54</sup>Mark, Green (2019). China's Debt Diplomacy. How Belt and Road threatens countries' ability to achieve self-reliance. *Foreign Policy*. [Online] Available: <https://foreignpolicy.com/2019/04/25/chinas-debt-diplomacy/> (April, 25 2019).

<sup>55</sup>Ying (2017). Belt and Road Incorporated into CPC Constitution. *Xinhua*. [Online] Available: [http://www.xinhuanet.com/english/2017-10/24/c\\_136702025.htm](http://www.xinhuanet.com/english/2017-10/24/c_136702025.htm) (October 24, 2017).

<sup>56</sup>Zhou, L., Gilbert, S., Wang, Y., Cabré, M. M., & Gallagher, K. P. (2018). Moving the green belt and road initiative: from words to actions. *World Resources Institute and Global Development Policy Center*.

<sup>57</sup>Sandalow, D. (2018). *Guide to Chinese Climate Policy 2018*. Columbia/SIPA Center on Global Energy Policy. *Climate Change and Environment*. New York, Columbia University; University's School of International & Public Affairs (SIPA).

<sup>58</sup>Ministry of Ecology and Environment. (2019) *Environmental Policies*. PRC. [Online] Available <http://english.mee.gov.cn/Resources/Policies/policies/>.

<sup>59</sup>Shinn, D. H. (2016). The Environmental Impact of China's Investment in Africa. *Cornell International Law Journal*. 49, 25-67.

During the construction phase of this project, some fauna and flora and endangered other species in the coastal region of Kenya<sup>61</sup>. It is also alleged that 10 lions died while some escaped from the city's national park, as the rail passes through the Nairobi National Park, causing a habitation disturbance, a detail that sparked the environmentalists and the Kenya Wildlife Society (KWS) to be repulsive towards the project<sup>62</sup>.

Apart from the SGR project, there have been other projects in Africa financed by CEB and other Chinese financial institutions that have faced opposition from the locals, environmental policy makers and relevant NGOs due to the negative environmental impacts they have caused<sup>63</sup>. This has been attributed to the widespread breach of host nations' environmental regulations by Chinese contractors. For instance, despite the Environmental and Social Impact Assessment (ESIA) of Sino-Hydro's Bui Dam in Ghana identifying some possible environmental challenges including resettlement of people, loss of biodiversity, land degradation, destruction of ecosystems, among others<sup>64,65</sup>, the project still took off. Sudan's Merowe dam, whose main contractor is the China International Water and Electric Corporation, is another project which attracted a debate due to the adverse impacts it created, including 20 major negative health-related complications<sup>66,67</sup>. Another project was Gabon's Kongou dam proposed to power the Beling a Iron ore project. The implementation of this project began without the required EIA, despite it being predicted to cause harm to the ecosystems in the Ivindo National Park<sup>68,69</sup>. The China-Africa Overseas Leather Products S.C Plant in Ethiopia encountered pollution complaints, which led to it being forcefully shut down within 40 days after public uprising due to the respiratory complications caused by the air pollutants from this leather tannery<sup>70</sup>. China being a world importer of timber has also abused her investments in Mozambique by being involved in illegal logging causing deforestation<sup>71</sup>. In Chad, the China National Petroleum Corporation (CNPC) solicited \$1 billion in Chinese financing to build a 311-kilometer pipeline connecting the oil fields to a refinery<sup>72</sup>. However, in 2012, it was alleged that the company did not have the equipment for cleaning up oil spills, and more so when construction began, residents complained of air and noise pollution caused by the construction trucks<sup>73</sup>.

There exist more projects with similar environmental challenges, a clear indication of what Bosshard<sup>74</sup> meant by saying "China risks exporting her domestic environmental track record to other parts of the world through her foreign investment strategy". Unfortunately, the Chinese companies and investors accused of breaching the hosts' environmental policies have always gone unpunished and this is attributed to lack of strong environmental bureaucracies and laws that govern investments in these host nations and also the poor implementation of the existing environmental policies<sup>75</sup>.

### 3. Environmental impacts of Chinese investment projects in Kenya

Kenya, located in the Eastern part of Africa, has enjoyed being a major regional power in the Eastern Africa region by having the largest economy in East Africa.

<sup>60</sup>Limo, K. A. (2016). The Environmental Impact of China's Activities in Africa: The Case of Kenya. *Institute of Diplomacy and International Studies*. University of Nairobi. Master of Arts in Diplomacy.

<sup>61</sup>Senelwa, Kennedy (2016) Building of Railway Terminal Delayed as Firm Loses Crucial License. *The East African*. [Online] Available: <https://www.theeastafrican.co.ke/news/ea/Building-of-SGR-terminal-delayed-as-firm-loses-crucial-licence/4552908-3075342-d0gm6yz/index.html> (February 13, 2016).

<sup>62</sup>Githaiga, N. M., & Bing, W. (2019). Belt and Road Initiative in Africa: The Impact of Standard Gauge Railway in Kenya. *China Report*, 55(3), 219-240.

<sup>63</sup>Bosshard, P. (2008). China's environmental footprint in Africa. *China in Africa Policy Briefing*, 3(1), 12.

<sup>64</sup>Owusu, K., Asiedu, B. A., & Yankson, P. (2016). Emerging downstream impacts of the Bui Dam. *Technical Report*. University of Ghana.

<sup>65</sup>Raschid-Sally, L., Twum-Koranteng, R., & Akoto-Danso, E. K. (2008). Research, development and capacity building for the sustainability of dam development with special reference to the Bui Dam Project (No. 616-2016-40981).

<sup>66</sup>Askouri, A. K. (2004). The Merowe Dam: controversy and displacement in Sudan. *Forced Migration Review*, (21), 56-57.

<sup>67</sup>Shinn, D. H. (2016). The Environmental Impact of China's Investment in Africa. *Cornell International Law Journal*, 49, 25-6

<sup>68</sup>Bosshard, P. (2008). China's environmental footprint in Africa. *China in Africa Policy Briefing*, 3(1), 12.

<sup>69</sup>Owusu, K., Asiedu, B. A., & Yankson, P. (2016). Emerging downstream impacts of the Bui Dam. *Technical Report*. University of Ghana.

<sup>70</sup>Ahmed, Liya (2013). Chinese leather factory caught red-handed attempting to export semi-finished leather as finished. *EthioGrio*. [Online] Available: <https://www.ethiogrio.com/news/4586-chinese-leather-factory-caught-red-handed-attempting-to-export-semi-finished-leather-as-finished.html> (May 14, 2013).

<sup>71</sup>Sun, X. (2014). Forest products trade between China and Africa. *An analysis of import and export statistics. Forest Trends Report Series*.

<sup>72</sup>Shinn, D. H. (2016). The Environmental Impact of China's Investment in Africa. *Cornell International Law Journal*, 49, 25-67.

<sup>73</sup>Shinn, D. H. (2016). The Environmental Impact of China's Investment in Africa. *Cornell International Law Journal*, 49, 25-67.

<sup>74</sup>Bosshard, P. (2008). China's environmental footprint in Africa. *China in Africa Policy Briefing*, 3(1), 12.

<sup>75</sup>Shinn, D. H. (2016). The Environmental Impact of China's Investment in Africa. *Cornell International Law Journal*, 49, 25-67.

Kenya's capital, Nairobi, is a renowned world regional hub for technology and business. According to the 2019 census, Kenya's population is approximately 48 million people<sup>76</sup>. Further, the economic growth of Kenya has been evident over the years with a 5.8% annual growth rate in 2018, according to the World Bank (WB) statistics<sup>78</sup>. Constitutionally, the Ministry of Environment and Forestry (MEF) is in-charge of Kenya's environmental matters. There also exists a vital Environmental body in the Government of Kenya (GoK) known as the National Environment Management Authority (NEMA), whose sole purpose is to exercise general supervision and coordination over all matters relating to the environment and is the principal instrument of Government in the implementation of all policies relating to the environment. This article reviews the impacts of three main development projects constructed and funded by Chinese companies and financial institutions.

The SGR is a project that cost 3.8 billion U.S dollars, with ninety percent (90%) of the funding from China through CEB and the remainder from GoK<sup>79</sup>. Project initiation by the China Road and Bridge Corporation (CRBC) took place in December 2004, followed by the official inauguration on 31st March 2017<sup>80</sup>. According to China, this initiative is of a great economic advantage as the location of the SGR serves as a gateway to East and Central Africa as a part of the BRI in Africa. The Lamu Port-South Sudan-Ethiopia-Transport (LAPSSET) Corridor project, also known as the Lamu corridor, is a carriage and infrastructure project that, when finally complete, will be the nation's second transport corridor after the Mombasa - Uganda transport corridor that passes through Nairobi and much of the Northern Rift. A conglomerate of construction companies led by the China Communications Construction Company (CCCC) was reported to have won the bid for construction of the first three berths at Lamu port<sup>81</sup>. CCCC is associated with CRBC, which has historically secured lots of road construction and other tenders in Kenya, including the construction of the SGR.

The Lamu Power Project is a proposed 1,050-megawatt (MW) coal-fired power station in Lamu County, Kenya. The project would include coal-handling facilities at the proposed Lamu Port and will be the very first-ever of its kind in Kenya<sup>82</sup>. In September 2014, it was announced that the plant would be constructed by Amu Power Company, a consortium of Kenyan companies (Centum Investment Group and Gulf Energy Ltd). The Kenyan companies would work in collaboration with some Chinese companies; China Huadian, Sichuan Electric Power Design and Consulting Company, and Sichuan No.3 Power Construction Company<sup>83</sup>. This proposed power plant will initially produce power using coal sourced from South Africa and later on switch to local coal mined from Kitui County's Mui Basin<sup>84</sup>. In February 2015, Amu Power had received US\$1.2 billion financing from Industrial and Commercial Bank of China (ICBC) for the project<sup>85</sup>, and was negotiating with local banks for a US\$300 million loan. The project, valued at US\$2 billion, is expected to be financed through debt totaled at US\$1.5 billion and shareholder equity of \$500 million. Initially, the construction of the plant was expected to start on September 30, 2015, and it was expected to take 21 months to produce electricity<sup>86</sup>.

<sup>76</sup>Githaiga, Hellen (2019) Kenya Census 2019 Data Reveal Population Stands at 47.6m. *The East African*. [Online] Available: <https://www.theeastafrican.co.ke/news/ea/Kenya-population-soars-to-47-million-2019-census/4552908-5336048-7bv3toz/index.html> (November 4, 2019).

<sup>77</sup>Xuxin (2019) Kenyan Population Rises to 47.6 Million. *Xinhua*. [Online] Available: [http://www.xinhuanet.com/english/2019-11/04/c\\_138528075.htm](http://www.xinhuanet.com/english/2019-11/04/c_138528075.htm) (November 4, 2019).

<sup>78</sup>WorldBank (2019). Kenya's Economic Outlook Remains Stable Amid Threats of Drought in 2019. [Online] Available: <https://www.worldbank.org/en/news/press-release/2019/04/08/kenyas-economic-outlook-remains-stable-amid-threats-of-drought-in-2019.i> (April 8, 2019).

<sup>79</sup>Wang, Y., & Wissenbach, U. (2019). Clientelism at work? A case study of Kenyan Standard Gauge Railway project. *Economic History of Developing Regions*, 34(3), 280-299.

<sup>80</sup>Githaiga, N. M., & Bing, W. (2019). Belt and Road Initiative in Africa: The Impact of Standard Gauge Railway in Kenya. *China Report*, 55(3), 219-240.

<sup>81</sup>Jorgic, D. (2013). Kenya says Chinese firm wins first tender for Lamu port project. *Reuters*. [Online] Available: <https://www.reuters.com/article/kenya-port-lamu/kenya-says-chinese-firm-wins-first-tender-for-lamu-port-project-idUSL5N0CX38D2013041> (April 11, 2013).

<sup>82</sup>McVeigh, Karen (2019) Kenya's First Coal Plant Construction Paused in Climate Victory. *The Guardian*. [Online] Available: <https://www.theguardian.com/global-development/2019/jul/11/kenya-first-coal-plant-construction-paused-climate-victory> (July 11, 2019).

<sup>83</sup>Wahito, Margaret (2014) Centum, Gulf Energy Secure Lamu Coal Project. *Capital FM*. [Online] Available: <https://www.capitalfm.co.ke/business/2014/09/centum-gulf-energy-secure-lamu-coal-project/> (September 1, 2014).

<sup>84</sup>Muasya, Philip (2013). Initial Plans to Set up Coal Plant in Lamu Reconsidered in Favor of Kitui. *Standard Digital*. [Online] Available: <https://www.standardmedia.co.ke/article/2000097334/initial-plans-to-set-up-coal-plant-in-lamu-reconsidered-in-favour-of-kitui/?pageNo=1> (November 10, 2013).

<sup>85</sup>Industrial and Commercial Bank of China (2015) ICBC Arranges Financing for the Largest Power Plant Project in Eastern Africa. [Online] Available [https://www.icbc.com.cn/icbc/en/newsupdates/icbcnews/ICBCArranges Financing for the Largest Power Plant Project in Eastern Africa](https://www.icbc.com.cn/icbc/en/newsupdates/icbcnews/ICBCArranges%20Financing%20for%20the%20Largest%20Power%20Plant%20Project%20in%20Eastern%20Africa) (July 3, 2015).

<sup>86</sup>Olingo, Allan (2015). Lamu Coal Plant Ready to Take Off as State Takes over Land. *The East African*. [Online] Available: <https://www.theeastafrican.co.ke/news/Lamu-coal-plant-ready-to-take-off-as-state-takes-over-land/> (November 21, 2015).

### 3.1 Environmental impacts of the Standard Gauge Railway project

As per the Kenyan project construction requirements, an EIA was carried out on the SGR detailing the necessary mitigations to perceived environmental impacts, and a NEMA certificate was obtained. However, the National Environment Tribunal was ‘forced’ to revoke the NEMA license for the CRBC as a result of public outcry from the local residents of Kwale decrying imminent impacts facing them. As a result, the Tribunal required the company to suspend sand sourcing from a location near beach resorts until a fresh EIA could be carried out.<sup>87</sup> This is because, according to the local residents, the sand harvesting would affect the coral reef, fish breeding ground, quality of water, and their livelihoods.

The railway cuts through the Tsavo National Park, which is a great concern for the environmentalists, due to the kind of disturbance this would cause to the wildlife. Noise pollution, loss of vegetation, and disturbance of the natural habitat of these wild animals was, of course, a great concern for the relevant environmental NGOs and touring companies<sup>88</sup>. However, to “resolve” the issue of the disturbance of the migration route of elephants, giraffes, and other wildlife between the two sides of the National Park (Tsavo East and West), CRBC designed wildlife corridors under the railway. During the first phase of the SGR construction, approximately 10 elephants died when they crashed into trains<sup>89</sup>, a report made by Save the Elephants, a wildlife NGO group<sup>90</sup>. Conservationists were and are still concerned that the frequent passage of trains may have a negative impact on some species and eventually affect the National Park’s tourism. In addition, during bridge construction, lions were reportedly driven out from Nairobi National Park<sup>91</sup> and were found roaming in Nairobi city. According to the Kenya Wildlife Service (KWS), there was also a rise in elephant poaching and ivory smuggling, loss of great vegetation and a risk of extinction of special endangered species<sup>92</sup>. Floods were experienced in Makueni area<sup>93</sup> and Mai Mahiu<sup>94</sup> due to poor construction of the drainage systems causing displacement of people, destruction of property and farmlands.

### 3.2 Environmental Impacts of the LAPSSET project

The LAPSSET project is a huge initiative merging numerous mini-projects including road, pipeline, airport, resorts, and Export Processing Zones (EPZs). With the magnitude of the project and the perceived environmental effects it could have on the ecosystem and wildlife, some leaders had proposed a change in the initial project map. However, the CEO of the LAPSSET Corridor Development Authority (LCDA) remained adamant and in 2014, the LCDA received approval and EIA licenses from NEMA and the Kenya Forest Service (KFS)<sup>95</sup>.

<sup>87</sup>Senelwa, Kennedy (2016) Building of Railway Terminal Delayed as Firm Loses Crucial License. *The East African*. [Online] Available: <https://www.theeastafrican.co.ke/news/ea/Building-of-SGR-terminal-delayed-as-firm-loses-crucial-licence/4552908-3075342-d0gm6yz/index.html> (February 13, 2016).

<sup>88</sup>Onyango, P., & Ngasike, L. (2018). Taxpayers to Pay Sh30 Billion for SGR Land. *Standard Digital*. [Online] Available: <https://www.standardmedia.co.ke/business/article/2001292767/taxpayers-to-pay-more-for-sgr-land> (August 21, 2018).

<sup>89</sup>Githaiga, N. M., & Bing, W. (2019). Belt and Road Initiative in Africa: The Impact of Standard Gauge Railway in Kenya. *China Report*, 55(3), 219-240.

<sup>90</sup>Okita-Ouma, B., Lala, F., Moller, R., Koskei, M., Kiambi, S., Dabellen, D., ... & Pope, F. (2016). Preliminary indications of the effect of infrastructure development on ecosystem connectivity in Tsavo National Parks, Kenya. *Pachyderm*, 57, 109-111.

<sup>91</sup>Elle, Bee, (2017). Kenya’s Major Railway Construction Steams Ahead, Jeopardizing the Integrity of More Habitats. *Invironment*. [Online] Available: <https://medium.com/invironment/standard-gauge-railway-construction-steams-ahead-jeopardising-the-integrity-of-more-habitats-b16e43ce6aed> (January 8, 2017).

<sup>92</sup>Githaiga, N. M., & Bing, W. (2019). Belt and Road Initiative in Africa: The Impact of Standard Gauge Railway in Kenya. *China Report*, 55(3), 219-240.

<sup>93</sup>Muasya, Philip (2016). Floods Wash Away Part of Standard Gauge Railway (SGR) Project. *Standard Digital*. [Online] Available: <https://www.standardmedia.co.ke/article/2000224139/floods-wash-away-part-of-sgr-project> (November 21, 2016).

<sup>94</sup>Gitonga, Antony (2018). Chinese Company Assesses Damage by Floods Along SGR. *Standard Digital*. [Online] Available: <https://www.standardmedia.co.ke/business/article/2001306500/chinese-company-assesses-damage-by-floods-along-sgr> (December 17, 2018).

<sup>95</sup>Kasuku, Silvester (2017). Environmental Issues at the Core of Implementing Lapsset Project. *Daily Nation*. [Online] Available: <https://www.nation.co.ke/oped/opinion/-Environmental-issues-at-core-of-implementing-Lapsset-project/440808-4140998-v7hj5s/index.html> (October 15, 2017).

The physical construction of the three Corridor terminals involves activities such as preparation of the turning bay, dredging and reclamation work as well as navigation of sea waves<sup>96</sup>. The dredging activities at the Corridor project have caused water and noise pollution, negatively affected the livelihoods of the local people, and led to the disruption of fish species' breeding grounds in the ocean<sup>97</sup>. Further, the dredging activities at the Lamu port led to a closure of the majority of the fishing channels and this disrupted the livelihood of more than 5,000 fishermen. In a bid to find solutions, the Kenya Red Cross Society advised the fishermen in the area to embrace seaweed farming as an alternative way of earning a livelihood<sup>98,99,100</sup>. According to environmental activists, the project poses serious health risks such as cancer and other respiratory diseases, especially to those residing near the proposed Lamu coal plant. This is due to the hazardous particulate matter emitted from the plant, carbon dioxide (CO<sub>2</sub>) released into the air, and dust emitted into the atmosphere. The mangroves are also at risk of going extinct and the poor waste disposal into the ocean, including the risk of oil spillage, would definitely cause more harm to the fish and other water species<sup>101</sup>.

### 3.3 Perceived Environmental Impacts of the proposed Lamu Coal plant

Construction of the Lamu coal plant was initially expected to start in 2015, and the project would take 21 months to produce electricity<sup>102</sup>. However, it was reported that construction had been delayed as Amu Power Company needed the Kenya National Land Commission (NLC) to finish a resettlement plan for the site before the company could submit an environmental impact report, which needed to be approved before construction began<sup>103</sup>. According to the Sierra Club Foundation, the environmental report of the proposed Lamu plant does not employ the best available technology to limit pollution, and the report did not detail the processes of Selective Catalytic Reduction (SCR) which reduces Nitrogen Oxides<sup>104</sup>. Lamu is also a sensitive location, especially because it is also home to the World Heritage listed-Lamu Old Town according to UNESCO<sup>105</sup>. The African Development Bank (ADB), which had considered funding the project, withdrew its commitment citing its firm stands for sustainable development and green financing<sup>106</sup>. Further, the Lamu County Assembly rejected the ESIA report on the plant and urged the investors to come up with a resettlement plan for residents who would lose their land to the project<sup>107</sup>.

Later, Save Lamu organization petitioned the Environment & Land Court of Kenya in order to determine whether or not the ERC had granted an Electricity Generation License to Amu Power to build the proposed plant and to make full disclosure of the Power Purchase Agreement (PPA) into which it had ratified to. In May 2018, reports made public that General Electric (GE), an American company, wanted to invest in the plant by acquiring a US\$390 million stake in Amu Power.

<sup>96</sup>Kazungu, Kalume (2018). Lapsset route will not change, says CEO. *Business Daily*. [Online] Available: <https://www.businessdailyafrica.com/corporate/shipping/Lapsset-route-will-not-change--says-CEO/4003122-4788464-pi3039z/index.html> (October 2, 2018).

<sup>97</sup>Kabukuru, Wanjohi (2016). A Megaproject Rises in East Africa. *Africa Renewal*. [Online] Available: <https://www.un.org/africarenewal/magazine/august-2016/megaproject-rises-east-africa> (August 2016).

<sup>98</sup>Kazungu, Kalume (2018). Kenya: Lamu Fishermen Affected by Lapsset Urged to Embrace Seaweed Farming. *Daily Nation*. [Online] Available: <https://allafrica.com/stories/201811260049.html>. (November 25, 2018).

<sup>99</sup>Kazungu, Kalume (2018). Kenya: Lamu Fishermen Affected by Lapsset Urged to Embrace Seaweed Farming. *Daily Nation*. [Online] Available: <https://allafrica.com/stories/201811260049.html>. (November 25, 2018).

<sup>100</sup>AlgaeWorldNews. (2018). Lamu Fishermen Urged to Embrace Seaweed Farming. Seaweed Farming. [Online] Available: <https://news.algaeworld.org/2018/11/lamu-fishermen-urged-to-embrace-seaweed-farming/> (November 26, 2018)

<sup>101</sup>Human Rights Watch. (2018). Abuses against Environmental Activists at Kenya's Coast Region. [Online] Available: <https://www.hrw.org/report/2018/12/17/they-just-want-silence-us/abuses-against-environmental-activists-kenyas-coast> (December 17, 2018).

<sup>102</sup>Olingo, Allan (2015). Lamu Coal Plant Ready to Take Off as State Takes over Land. *The East African*. [Online] Available: <https://www.theeastafrican.co.ke/news/Lamu-coal-plant-ready-to-take-off-as-state-takes-over-land/> (November 21, 2015).

<sup>103</sup>Wahito, Margaret (2015). Amu Power to Get Lamu Title in October. *Capital News*. [Online] Available: <https://www.capitalfm.co.ke/business/2015/09/amu-power-to-get-lamu-title-in-october/> (September 18, 2015).

<sup>104</sup>Ghio, Nicole (2015). In Kenya, Proposed Coal-Fired Power Plant Threatens Communities. *Sierra Club*. [Online] Available: <https://www.sierraclub.org/compass/2015/08/kenya-proposed-coal-fired-power-plant-threatens-communities> (August 28, 2015).

<sup>105</sup>UNESCO. (2001). Lamu Old Town. [Online] Available: <https://whc.unesco.org/en/list/1055/>.

<sup>106</sup>Winning, Alexander (2019). African Development Bank decides not to fund Kenya coal project. *Reuters*. [Online] Available: <https://www.reuters.com/article/us-africa-investment-coal/african-development-bank-decides-not-to-fund-kenya-coal-project-idUSKBN1XN1A8>.

<sup>107</sup>Kazungu, Kalume (2016). Lamu County suspends Sh200bn coal plant project. *Daily Nation*. [Online] Available: <https://www.nation.co.ke/counties/lamu/Lamu-County-suspends-Sh200bn-coal-plant-project/3444912-3366756-10x2l88/index.html> (September 2, 2016).

However, a decision was later made to pull out after the investment company came to the knowledge that the plant was not a green project but would cause environmental damage and put the lives of Kenyans at stake<sup>108109</sup>.

In 2017, a Kenyan activist filed a petition at the High Court seeking temporary orders blocking GE from implementing the project arguing that the plant would not use clean coal technology as it had initially claimed<sup>110</sup>. Later in 2018, the activist in collaboration with Katiba Institute filed another court case in the National Environmental Tribunal (NET)<sup>111</sup> on environmental grounds and the project was once again suspended. In 2019, the NET revoked the ESIA license issued by NEMA on the grounds that the environmental agency failed to consider its own regulations when issuing the license to Amu Power<sup>112</sup> and that NEMA failed to inspect the engineering systems and did not consider the effect of climate change the project would have. Also, the Tribunal emphasized on the importance of public participation before such projects are implemented<sup>113</sup>, especially on instances where the locals are likely to be socially and economically affected.

Environmentalists perceive the project will pollute the air, destroy mangroves and breeding grounds for five endangered species of marine turtles, fish, and other marine life<sup>114</sup>. The burning of coal releases toxic particles into the air causing asthma, bronchitis, cardiovascular diseases and cancer. Such particles also affect the fish in the ocean, the crops on land and the wildlife. Additionally, burning coal requires millions of gallons of water to keep the plant cool, and releasing this water into the ocean would increase the water temperature killing the fish and other marine life. This would negatively affect the locals whose main economic venture lies in the marine resources such as fishing<sup>115</sup>. It has been reported, but with minimal evidence, that the opposers of this plant are “silenced” through bribes, but so far, the environmentalists are winning this fight<sup>116117</sup>.

#### 4. Discussion

In a world where states are seeking economic development, in most cases through the advancement of infrastructure, the environment is always at risk. In most instances, environmental protection is seen as a catalyst for slow development leading to low consideration for states seeking faster development. However, according to the World Bank (WB), it is estimated that in 2013, air pollution cost the world economy \$225 billion in lost labor income<sup>118</sup>. This is a clear indication that as much as emerging and already developed nations keep pursuing economic growth vis-à-vis environmental protection, the damage to the environment will always cost more to control than to prevent.

<sup>108</sup>Kangethe, Kennedy (2018). GE to Acquire Stake in Amu Power after Clean Coal Technology Deal. *Capital News*. [Online] Available: <https://www.capitalfm.co.ke/business/2018/05/ge-acquire-stake-amu-power-clean-coal-technology-deal/> (May 16, 2018).

<sup>109</sup>Amadala, Victor (2018). General Electric Reconsiders Investment in Lamu Coal Plant. *The Star*. [Online] Available: <https://www.the-star.co.ke/news/2018-07-19-general-electric-reconsiders-investment-in-lamu-coal-plant/> (July 19, 2018).

<sup>110</sup>Amadala, Victor (2018). General Electric Reconsiders Investment in Lamu Coal Plant. *The Star*. [Online] Available: <https://www.the-star.co.ke/news/2018-07-19-general-electric-reconsiders-investment-in-lamu-coal-plant/> (July 19, 2018).

<sup>111</sup>Siele, Martin (2018). Lamu Coal Plant Stop Order Reinstated by High Court in Nairobi. *Kenya.co.ke*. [Online] Available: <https://www.kenya.co.ke/news/33677-lamu-coal-plant-stop-order-reinstated-high-court-nairobi> (October 3, 2018).

<sup>112</sup>Wang, C. N. (2019). Kenya's Lamu Coal Fired Power Plant – Lessons learnt for Green Development and Investments in the BRI. *Green Belt and Road Initiative Center*. [Online] Available: <https://green-bri.org/kenyas-lamu-coal-fired-power-plant-lessons-learnt-for-green-development-and-investments-in-the-bri> (October 14, 2019).

<sup>113</sup>Wambulwa, Annette (2019). Lamu Coal Plant Project License Revoked by Tribunal. *The Star*. [Online] Available: <https://www.the-star.co.ke/news/2019-06-26-lamu-coal-plant-project-licence-cancelled-by-tribunal/>.

<sup>114</sup>Obulutsa, George (2019). Power from Kenya's planned Lamu plant could cost 10 times more than estimated: study. *Reuters*. [Online] Available: <https://www.reuters.com/article/us-kenya-electricity/power-from-kenyas-planned-lamu-plant-could-cost-10-times-more-than-estimated-study-idUSKCN1TC1MP> (July 11, 2019).

<sup>115</sup>Warah, Rasna (2019). Saving Lamu: How a Campaign for Environmental Justice was fought. *The Elephant*. [Online] Available: <https://www.theelephant.info/op-eds/2019/07/15/saving-lamu-how-a-campaign-for-environmental-justice-was-fought/> (July 15, 2019).

<sup>116</sup>BBC. (2019). Kenya halts Lamu coal power project at World Heritage Site. *BBC News*. [Online] Available: <https://www.bbc.com/news/world-africa-48771519> (June 26, 2019).

<sup>117</sup>McVeigh, Karen (2019). Kenya's First Coal Plant Construction Paused in Climate Victory. *The Guardian*. [Online] Available: <https://www.theguardian.com/global-development/2019/jul/11/kenya-first-coal-plant-construction-paused-climate-victory> (July 11, 2019).

<sup>118</sup>Sawhill, J. C. (1993). Balancing Economic Growth and Environmental Protection. *Management Quarterly*, 34 (1), 24.

Infrastructure projects are in most instances the most affected, with most investors ignoring the mitigation guidelines given in EIA reports and pursuing projects that harm the ecosystem, destroy habitats for flora and fauna, and place different endangered species in jeopardy.

EIA reports act as guidelines towards the attainment of sustainable development and is also reported to be the most effective tools for integrating environmental concerns in development planning and implementation of projects<sup>119</sup>. In India for instance, the major environmental impacts associated with construction projects are habitat destruction, loss of arable land, loss of biodiversity, waste disposal, pollution, desertification, soil erosion, and material wastage, among others<sup>120</sup>. Similar impacts dominated the case projects reviewed in this study. For instance, though the Kenyan SGR project EIA report showed that the natural wildlife habitat would be disrupted, the project still proceeded<sup>121</sup>. The same was evident in the LAPSSET project with the EIA report indicating that the project would be harmful to the environment and the people, but it is still in the construction phase to date<sup>122</sup>. Air pollution is a major concern as some projects, especially industry and energy-based, extract fumes that are harmful to the health of citizens. Records from World Health Organization (WHO) indicate that air pollution is the world's leading single environmental health risk (WHO, 2014) with around 7 million people dying prematurely in 2012 as a result of air pollution exposure from both outdoor and indoor emission sources<sup>123</sup>. However, it is unfortunate that all three Kenyan projects pose this same threat to the lives of Kenyans.

In most cases, the main cause of detrimental impacts emanating from developmental projects is the poor implementation of existing policies governing such projects. According to a report released recently by the United Nations Environment Programme (UNEP), environmental policy implementation has been the greatest challenge since 1972<sup>124</sup>. For instance, despite most nations having ratified to the main environmental agreements in the world, they have still failed to ensure that these agreements are well implemented in their respective countries hence environmental pollution is a major issue of global concern. According to Ortmann (2017)<sup>125</sup>, poor policy implementation is attributed to the existence of strong economic interest groups that act as reform opponents, therefore, weakening the existing environmental institutions.

Corruption also counters the push for environmental protection in that all efforts made by environmental reformers are frustrated by the proponents of the economic side of the project at the expense of sustainable development<sup>126</sup>. For instance, both the SGR and Lamu Coal plant projects are backed by the government and this made it impossible for the outcry of the environmentalists to be heard. The locals in Lamu are alleged to be bribed in order to remain silent about the negative effects the projects have on both the locals and the environment at large<sup>127,128</sup>. One of the questions often asked is if it is possible for a state to pursue environmental protection while at the same time achieve economic growth. Probably, the debate should not be on whether it is possible but it should be on the "how", and this is where the formulation and strict implementation of environmental policies comes in.

<sup>119</sup>Tiwari, V. K., Verma, A., Kumar, A., & Gupta M. (2016). A Review on Environmental Impact Assessment of Construction Projects. *IOSR Journal of Environmental Science, Toxicology and Food Technology*, 10 (1), 21-25.

<sup>120</sup>Puri, V., Chakraborty, P., & Majumdar, S. (2015). *A review of low-cost housing technologies in India*. In *Advances in Structural Engineering* (pp. 1943-1955). Springer, New Delhi.

<sup>121</sup>Githaiga, N. M., & WBing, W. (2019). Belt and Road Initiative in Africa: The Impact of Standard Gauge Railway in Kenya. *China Report* 55, no. 3 (2019): 219-240.

<sup>122</sup>Kazungu, Kalume (2018). Kenya: Lamu Fishermen Affected by Lapsset Urged to Embrace Seaweed Farming. *Daily Nation*. [Online] Available: <https://allafrica.com/stories/201811260049.html>.

<sup>123</sup>Im, U., Brandt, J., Geels, C., Hansen, K. M., Christensen, J. H., Andersen, M. S., .....&Baro, R.(2018). Assessment and Economic Valuation of Air Pollution Impacts on Human Health over Europe and the United States as Calculated by a Multi-Model Ensemble in the Framework of AQMEII3. *Atmospheric Chemistry and Physics*, 18 (8), 5967.

<sup>124</sup>UNEP. (2019). Dramatic growth in laws to protect environment, but widespread failure to enforce, finds report. *UN environment programme*. [Online] Available: <https://www.unenvironment.org/news-and-stories/press-release/dramatic-growth-laws-protect-environment-widespread-failure-enforce> (January 24, 2019).

<sup>125</sup>Ortmann, Stephan (2017). The Failure to Implement Environmental Policies. In *Environmental Governance in Vietnam* (pp. 99-126). Palgrave Macmillan, Cham, 2017.

<sup>126</sup>Ortmann, Stephan (2017). The Failure to Implement Environmental Policies. In *Environmental Governance in Vietnam* (pp. 99-126). Palgrave Macmillan, Cham, 2017.

<sup>127</sup> BBC. (2019). Kenya halts Lamu coal power project at World Heritage Site. *BBC News*. [Online] Available: <https://www.bbc.com/news/world-africa-48771519> (June 26, 2019).

<sup>128</sup> McVeigh, Karen (2019). Kenya's First Coal Plant Construction Paused in Climate Victory. *The Guardian*. [Online] Available: <https://www.theguardian.com/global-development/2019/jul/11/kenya-first-coal-plant-construction-paused-climate-victory> (July 11, 2019).

Negative effects of climate change are not necessarily as a result of economic growth, but rather because of the absence of effective public policies designed to reduce greenhouse gas emissions<sup>129</sup>. However, we cannot be ignorant of the fact that there exist business-oriented individuals and units or organizations that care less about the environment when an economic benefit is involved. This is evidenced by President Bush's move to pull out of the 1997 Kyoto Protocol in 2001 since he believed that the agreement, which is meant to curb greenhouse gas emissions and counter global warming, would negatively affect the US economy. Later on, this was seen in President Trump's move to withdraw from the Paris Agreement in 2017<sup>130</sup>. Such decisions try to insinuate that it is impossible to attain a green economy and that environmental regulations are a deterrent towards economic growth.

China, for instance, has used the principle of "common but differentiated responsibilities"<sup>131</sup> which stated that all countries are responsible for taking action to prevent climate change but the responsibilities should vary based on a country's level of development. However, China, as a state that projects herself as a green economy, needs to lead by example and influence other developing nations into adopting and pursuing sustainable development. This includes financing, investing, and constructing projects that are environmentally-sensitive. Among the projects that China has funded and is still funding is the three mentioned Kenyan projects that have proven to have adverse environmental projects; the SGR, the LAPSSET, and proposed Lamu coal plants. Ninety percent (90%) of the SGR funding for the first phase was by China through CEB<sup>132</sup> and constructed by the CBRC<sup>133</sup>; the Lamu Coal plant is largely funded by the ICBC<sup>134</sup> and meant to be constructed by three Chinese companies<sup>135</sup> while the LAPSSET project is being constructed by CCCC<sup>136</sup>. This is the complete opposite of what leading by example should look like. Another example is Uganda's Isimba Hydroelectric Power Station (IHPS) on the White Nile, which is being constructed by the China International Water and Electric (CIWE) company, a subsidiary of China Three Gorges Corporation. Despite the warnings that this project would destroy the Kalagala offset area, home to the Kalagala Falls, which is of cultural, spiritual, and biodiversity value to the locals, the 85% CEB project pushed forward into implementation<sup>137</sup>.

Weak legal systems contribute highly to environmental degradation, whereby companies go unpunished for violating environmental regulations. This paves way for a lot of irregularities, including companies not conducting EIAs or ignoring the mitigation guidelines given in the EIA reports. For instance, in 2018, three environmental groups called out the leadership of the Environmental Protection Agency (EPA) for failing to enforce penalties against three oil and gas companies responsible for toxic emissions in Oklahoma, US<sup>138</sup>. This is a global challenge whereby rules are broken and the offenders go unpunished. Most investors bribe their way out and go ahead to implement projects that are harmful to the environment, with some being backed by host governments. For instance, despite the iron ore mining venture in Gabon threatening to destroy the Kongou Falls by damming the Ivindo River, the project continued since it had the backing of the then Gabon's president<sup>139</sup>.

<sup>129</sup> Cohen, Steve (2020). Economic Growth and Environmental Sustainability. *State of the Planet*. [Online] Available: <https://blogs.ci.columbia.edu/2020/01/27/economic-growth-environmental-sustainability/> (January 27, 2020).

<sup>130</sup> Beggan, Riley (2017). The last time a US president dumped a global climate deal. *abcNEWS*. [Online] Available: <https://abcnews.go.com/Politics/time-us-president-dumped-global-climate-deal/story?id=47771005> (June 1, 2017).

<sup>131</sup> Bao, Maohong (2006). The evolution of environmental policy and its impact in the People's Republic of China. *Conservation and Society* 4, 36–54.

<sup>132</sup> Wang, Y., & Wissenbach, U. (2019). Clientelism at Work? A Case Study of Kenyan Standard Gauge Railway Project. *Economic History of Developing Regions* 34 (3), 280-99.

<sup>133</sup> Githaiga, N. M., & WBing, W. (2019). Belt and Road Initiative in Africa: The Impact of Standard Gauge Railway in Kenya. *China Report* 55, no. 3 (2019): 219-240.

<sup>134</sup> ICBC. (2015). ICBC Arranges Financing for the Largest Power Plant Project in Eastern Africa. [Online] Available: <https://www.icbc.com.cn/icbc/en/newsupdates/icbc%20news/ICBC%20Arranges%20Financing%20for%20the%20Largest%20Power%20Plant%20Project%20in%20Eastern%20Africa.htm> (July 5, 2015).

<sup>135</sup> Wahito, M. (2014). Centum, Gulf Energy Secure Lamu Coal Project. *Capital News*. [Online] Available: <https://www.capitalfm.co.ke/business/2014/09/centum-gulf-energy-secure-lamu-coal-project/> (September 1, 2014).

<sup>136</sup> Jorgic, David (2013). Kenya Says Chinese Firm Wins First Tender for Lamu Port Project. *Reuters*. [Online] Available: <https://www.reuters.com/article/kenya-port-lamu/kenya-says-chinese-firm-wins-first-tender-for-lamu-port-project-idUSL5N0CX38D20130411> (April 11, 2013).

<sup>137</sup> Nyabiage, Jevans (2019). Chinese-built dam projects failing on environmental standards, green group International Rivers warns. *South China Morning Post*. [Online] Available: <https://www.scmp.com/news/china/diplomacy/article/3041938/green-group-spots-environmental-cracks-chinese-built-dam> (December 13, 2019).

<sup>138</sup> Moon, Emily (2018). There's Nothing They Won't Do for the Industry': A Climate Expert Argues That EPA Bias Let Illegal Emissions Go Unpunished. *Pacific Standard*. [Online] Available: <https://psmag.com/environment/a-climate-expert-argues-that-epa-bias-let-illegal-emissions-go-unpunished> (July 24, 2018).

<sup>139</sup> Polgreen, Lydia (2009). Pristine African Park Faces Development. *New York Times*. [Online] Available: <https://www.nytimes.com/2009/02/22/world/africa/22gabon.html> (February 21, 2009).

In Kenya, the legal system has been tried environmentally, especially through the most controversial of all three projects, the Lamu Coal plant. In 2016, NEMA issued a license to Amu Power allowing the company to start building the plant<sup>140</sup> but this was followed by an objection by an activist group called Save Lamu Natural Justice. However, in February 2017, the ERC over-rode the objection and approved the construction of the plant<sup>141</sup> despite the concerns of the possible air pollution the non-renewable energy plant could cause. This is an indication that sometimes the legal systems meant to advocate for the rights of people may be compromised due to the larger economic interest of governments. There lacks an environmental policy that governs Sino-African projects, even within FOCAC or the African Union (AU). This leaves Africa in a vulnerable position because she cannot safeguard her natural resources or protect her environment from projects that could cause harm. The corruption within African governments and lack of strong environmental agencies and bureaucracies has left the environmental NGOs with no voice.

## 5. Conclusion and Recommendation

Just like many other nations striving to attain great economic growth, China's environmental protection is always a challenge. Chinese investment projects have been criticized by environmental NGOs and activists who decry the immense negative impacts portrayed by most development projects both domestically and overseas. In this study, we review some African projects conducted by Chinese companies and agree that environmental protection is generally accorded low consideration. In order to remain relevant in the global order today and in the future, China needs to uphold the green economy status and lead other nations into attaining sustainable development. China's impressive environmental laws and regulations in existence, mostly just on paper, should be highly implemented without fail. This conduct will be most especially important for other developing nations, particularly in the African continent where China has garnered much support over the years.

As China keeps pursuing a stronger market-based economy, it would be of importance that she invested in more market tools that are applicable to her environmental progress. This may include; elimination of subsidies for environmentally damaging industries, an increase in price for ecosystem services, enhancement of emissions trading to reduce pollution, and an increase of environmental taxes, among others.

On the positive side, Chinese engineers have been praised for their standard infrastructure and quality work they give and this has won them most tenders in the African continent and other regions. Therefore, the only major challenge remains the mitigation of the negative impacts these projects exhibit. This needs special attention and action to maintain a green development strategy. Through FOCAC, environmental policies could be formulated that would ensure that projects funded by Chinese financial institutions are environmental-friendly. The involvement of the CAECC will also play a key role in ensuring the promotion of green investment and financing as China keeps spreading her wings in Africa. Policymakers in China and recipient countries should first understand the characteristics and nature of environmental impacts from various infrastructures in order to devise proper policy and plans as they pursue sustainable development. All projects must be mandated to go through the EIA process and if reports indicate a red light, project implementation must be halted until proper mitigation plans are put in place. This will ensure the attainment of sustainable development, especially in Africa. Tightening of the green finance policy and making mandatory the regulations therein will ensure that companies invest in projects geared towards sustainable development.

Finally, in the same way China has created an economic miracle in the past three decades, she can also create the same miracle environmentally and set a good example for other nations to follow. China can prove to the world that it is possible to achieve economic growth while observing environmental protection, thus attaining sustainable development.

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<sup>140</sup> Money & Markets. (2016). Kirubi-backed firm gets NEMA nod to build Lamu coal power plant. [Online] Available: <https://moneyandmarkets.co.ke/kirubi-backed-firm-gets-nema-nod-to-build-lamu-coal-power-plant/> (September 19, 2016).

<sup>141</sup>Juma, Victor (2017). Coal-Fired Plant Gets Greenlight from Erc. *Nation*. [Online] Available: <https://www.nation.co.ke/business/Coal-fired-plant-gets-greenlight-from-ERC/996-3830384-kuoyo5/index.html>(February 27, 2017).