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The Africa Climate Action Performance Report

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Abstract

Although Africa's greenhouse gas emissions are low, its contribution to climate change mitigation is critical to global climate action. This report evaluates Africa's climate policy through the lens of 'common but differentiated responsibilities,' an asymmetrical allocation of responsibility for climate action, determined by differences in countries' contributions to historical emissions and their current capabilities to fight climate change. The report compares Africa's climate action with the rest of the world by contrasting differences in climate action and development levels. It classifies climate action by four criteria: per capita greenhouse gas emissions, per capita CO_2 emissions from fossil fuel consumption, carbon cost of growth, and the rate of per capita energy use relative to a critical minimum. Policies concerning climate action are input variables, and data from 2019 is used to avoid any bias caused by the COVID-19 pandemic years. This report also makes important recommendations about Africa's climate action based on the evaluation of the performance parameters.

Attribution: Renita D'Souza, Mannat Jaspal, and Shayak Sengupta, "The Africa Climate Action Performance Report," *ORF Special Report No. 196,* August 2022, Observer Research Foundation

Introduction

According to the third instalment of the Sixth Assessment Report by the Intergovernmental Panel on Climate Change, titled 'Climate Change 2022: Mitigation of Climate Change,' keeping the Paris Agreement goal of 1.5 degree Celsius within reach requires greenhouse gas (GHG) emissions to peak by 2025, be halved by 2030, and reach net zero by 2050.[1] Aggressive climate change mitigation is an urgent imperative. Africa's contribution to the climate crisis is paltry, just 3 percent of cumulative global carbon dioxide emissions and it has the lowest per capita emissions in the world.[2] Nevertheless, Africa recognises climate change is a global challenge, disrupting all lives and economies. Moreover, Africa bears a disproportionate burden of the adverse impact of climate change.

Per capita consumption of modern energy sources, such as electricity and natural gas, in Africa is among the world's lowest, with much of the population relying on traditional biomass (dung and firewood) for their energy needs. About 600 million people (approximately 43 percent of the continent's population) in Sub-Saharan Africa lack access to electricity and 970 million lack access to modern cooking fuels, with the pandemic further exacerbating the situation.[3] By 2030, the continent will see its population grow by about 30 percent (to around 1.7 billion) and increasingly urbanise, accelerating energy demand, especially for modern energy services that are the bedrock of human development.[4] Africa will need cheap, affordable, and modern energy to realise its development goals. To achieve universal energy access by 2030 and for further development, the International Energy Agency estimates the continent will need US$25 billion investment annually.[5]

Notwithstanding its share in the global climate problem and its lack of energy access, the African continent is also expected to adopt a green development pathway, which incorporates climate change adaptation and mitigation, for economic growth and development. As such, African countries have undertaken various measures to address climate change. Among high-level international commitments, most African countries have submitted nationally determined contributions (NDCs) for international climate agreements and adopted the Kigali Amendment to the Montreal Protocol,[a] which aims to phase out hydrofluorocarbons and powerful GHGs used in refrigeration and air conditioning by 2047. Moreover, several countries have enacted domestic policies focusing on renewable energy generation and use, curtailing the expansion of coal power use, effective land use planning involving climate smart agriculture, and mitigation of forest degradation.[6] The wealthier regions of North Africa and Southern Africa outperform East Africa, Central Africa, and West Africa in terms of their renewable energy capacities (see Table 1).[b,7] Wind, solar, and hydropower are the primary sources of renewable energy across Africa.

Table 1: African Countries by Renewable Energy Capacity (in megawatts)

Country	Electricity generation from renewables
South Africa	6,065
Egypt	4,813
Ethiopia	4,351
Morocco	4,263
Angola	2,763
Democratic Republic of Congo	2,750
Zambia	4,263
Mozambique	2,235
Nigeria	2,143
Sudan	2,136

Source: Epule et al.[8]

a The Kigali Amendment is an international pact that aims to avoid up to 0.4 degree Celsius of global warming by reducing the production of hydrofluorocarbons.

b **North Africa:** Egypt, Libya, Algeria, Morocco, Tunisia, Sudan, and Western Sahara; **Southern Africa:** Madagascar, South Africa, Mozambique, Botswana, Namibia, Zimbabwe, Zambia, Malawi, Lesotho, Eswatini, and South Sudan; **East Africa:** Burundi, Comoros, Djibouti, Ethiopia, Eritrea, Kenya, Madagascar, Mauritius, Réunion, Rwanda, Seychelles, Somalia, Tanzania, and Uganda; **West Africa:** Benin, Burkina Faso, Cape Verde, Côte D'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, and Togo; and **Central Africa:** Angola, Cameron, Central African Republic, Chad, Democratic Republic of the Congo, Republic of Congo, Equatorial Guinea, Gabon, and São Tomé and Principe.

Several African countries have made remarkable progress in switching to climate-friendly modes of agriculture, including Morocco, Uganda, Tanzania, Kenya, Mail, Cote d'Ivoire, and Benin. Climate smart agriculture practices (such as integrated pest management, biodiversity management, improved water use and management, and sustainable mechanisation), inter alia, have helped these nations cope with drought, enhance productivity, and support the growth of climate smart varieties of crops.[9] For instance, Togo's Programme for Agricultural Investment and Food Security, launched in 2010 and extended to 2026, aims to increase agricultural sustainability and food security while promoting investment to reduce deforestation and desertification for climate change adaptation.[10]

A 2021 assessment of the climate policies implemented by African countries takes into account targets for GHG reduction and expansion of renewable capacities, plans for phasing out fossil fuel subsidies, support for low emissions, and energy efficiency. It rates the policies as very good, good, fair, poor, and very poor. South Africa is the best performer, with its climate policy rated as good. The climate policies of Morocco, Nigeria, Ghana, Senegal, Tanzania, Zambia, and Angola are rated as fair. The climate policies of the other African countries are rated as either poor or very poor.[11]

This report engages with an evaluation of Africa's climate policy anchored in 'common but differentiated responsibilities,' the most widely debated principle of international environmental law in climate action discourse. This principle proposes an asymmetrical allocation of responsibility for climate action among countries, anchored in the differences in country-specific contributions to historical emissions and their current capabilities to respond to the challenge of climate change. The differences in current capabilities refer to the existing financial, scientific, and technological resources available to a country, as well as to the urgency of economic growth to overcome deficits in development levels. While the first of these is directly related to the capacity to embrace an ambitious climate action programme, the second is generally assumed to be inversely related to such capacity. The level of development determines both dimensions to the capacity of climate action. Higher development entails greater resources for climate action and implies less urgency of economic growth.

Consequently, the objective of this report is to compare Africa's climate action with that of the rest of the world. The differences in climate action will be juxtaposed to differences in the levels of development. This analysis is expected to reveal discrepancies in climate action between Africa and the world. Although this analysis evaluates Africa's climate action relative to the world, it does not either implicitly or explicitly endorse that current global climate mitigation is satisfactory for bending the temperature curve to 1.5 degrees Celsius.

This report defines human development by the Human Development Index (HDI) published by the United Nations Development Programme,[12] and uses the 2019 HDI scores for countries. While this conception of human development does not encapsulate all dimensions of development, it can be referred to as a reasonable heuristic of it.

Climate action includes expanding renewable capacities, improving energy efficiency, promoting climate-smart agriculture, enhancing electric mobility, accelerating sustainable waste management, mitigating deforestation, and increasing carbon sinks and sequestration efforts. The ultimate objective of these policies is to reduce emissions, achieve green growth, and ensure sustainable energy consumption. Since it is technically difficult and unviable to define, measure, and aggregate all that constitutes climate action, this report assesses climate action through four key variables: per capita GHG emissions, per capita CO_2 emissions from fossil fuel consumption, carbon cost of growth, and the rate of per capita energy use relative to a critical minimum. The policies comprising climate action can be construed as input variables, the impacts of which are encapsulated in the four parameters.

This report does not evaluate climate action based on how these variables have improved over time for a given country; rather, it provides a snapshot of a nation's performance in terms of these variables vis-à-vis other countries in 2019. Due to the irregular and unsystematic impact of the COVID-19 pandemic on these variables in 2020 and 2021, the report uses data from 2019, the year prior to onset of the pandemic, to avoid bias. The performance of a country with respect to the four variables in 2019 can be reasonably assumed as a proxy for cumulative climate action. Again, these variables are interpreted as being indicative of the cumulative impact rather than an exact measure of the impact to err on the side of caution.

Framework of Analysis

This report uses four criteria of assessment to capture the cumulative impact of the African countries' climate policies on their contribution to climate change in 2019. These are: per capita GHG emissions, per capita CO_2 emissions from fossil fuels, carbon cost of growth, and the rate of per capita energy use.

Per Capita GHG Emissions

The success of a country's climate action reduces its impact on global GHG emission levels. Holding global warming to 1.5 degree Celsius requires altering the current trajectory of global GHG emissions. More specifically, these emissions need to peak by 2025, halve by 2030, and reach net zero by 2050. These emissions include those from fossil fuel consumption and changes in land use. While our analysis does not indicate how distant or close the world is from achieving these imperatives, it does illustrate how the African countries fare in terms of per capita GHG emissions in comparison to other regions with similar levels of development. From the perspective of climate justice and equity, it is fair to compare countries on the basis of per capita GHG emissions rather than total GHG emissions.[13] Since GHG emissions are determined by the needs and wants of the population, the size of the population needs to be taken into account for a fair assessment of climate performance.

Per Capita CO_2 Emissions from Fossil Fuel Combustion

CO_2 constitutes the lion's share of GHG emissions (74.1 percent in 2019), and of these CO_2 emissions, fossil fuel combustion is responsible for 92 percent.[14] Efforts to lower the reliance of the development process on fossil fuels is decisive for substantial progress in GHG emission reduction. Evaluating the per capita carbon dioxide emissions from fossil fuels will indicate the level of decarbonisation and the extent of low carbon transition achieved by nations, and their impact on reducing the dependence of a country on fossil fuels.

Carbon Cost of Growth

This report defines carbon cost of growth as the ratio of the percentage change in carbon emissions to the percentage change in economic growth. This ratio expresses the extent of carbon emissions change in response to a change in economic growth. Since the objective of this metric is to gauge how much economic growth costs in terms of carbon emissions, it is defined only in cases where economic growth is positive. This metric represents the GDP elasticity of carbon emissions—higher the elasticity, higher the carbon cost of growth. This measure is useful in assessing whether the relationship between carbon emissions and economic growth exhibits decoupling, and if this decoupling is absolute or relative. When an increase in economic growth is accompanied by a decline in carbon emissions, the carbon cost of growth is negative, which is indicative of green growth. If the carbon cost of growth is positive, but less than one, it is a case of relative decoupling of economic growth from carbon emissions. If the carbon cost of growth is greater than one, then the percentage increase in carbon emissions exceeds economic growth. Climate action is directed at shifting away from the traditional approach to economic growth to making a green transition while pursuing economic growth. The carbon cost of growth is an assessment of the success achieved by a country in making this shift.

Rate of Per Capita Energy Use Relative to 2,000 Watts

As the global community grapples with climate change, a concerted effort is being made to comprehend various dimensions defining this challenge to address the need for effective solutions. Scientists from the Federal Institute of Technology in Zurich developed one such solution by identifying a threshold of sustainable energy consumption that is sufficient for an average world citizen to live a decent and comfortable lifestyle. It is claimed that such a lifestyle can be achieved by pursuing a rate of energy use equal to 2,000 Watts per capita per annum.[15] In an endeavour to answer the question, "How much energy is necessary for a good life?," Brazilian scientist José Goldenberg concluded that individuals using energy below the rate of 1,000 Watts per year can improve their quality of life by raising this rate to 1,000 Watts. However, any increase beyond 1000 Watts will not enhance their lifestyle.[16]

While the threshold of 2,000 Watts does not appear to have received universal endorsement, an investigation into the relationship between countries' HDI levels and their rate of energy use per capita per annum suggests that for the group of nations with high human development, the average rate of energy use per capita per annum is 2,164 Watts in 2019.[17] Notably, for 36 of the 52 nations for which the relevant data is available, the rate of energy use per capita per annum is either below 2000 Watts or equal to it. Even the world average rate of energy use per capita was 2,899 Watts in 2019.[18] As such, the present analysis considers it reasonable to use 2000 Watts per capita per annum as a critical threshold of energy use. Here, critical threshold refers to the rate of energy use necessary for acquiring a decent standard of living in a sustainable manner. Each individual, whether belonging to the present or the future generation, is entitled to the level of energy use corresponding to the rate of 2000 Watts. From the perspective of climate action, nations with energy use exceeding this threshold need to identify strategies to reduce an overconsumption of the available global carbon budget. Nations with energy use below the threshold of 2000 Watts and relatively lower levels of development need to be assigned their fair share of the carbon budget necessary for development.

African Countries' Climate Action Performance

The performance of an African country on each of the four parameters has been evaluated relative to other countries in the continent belonging to the same human development category and the global average of that human development category.

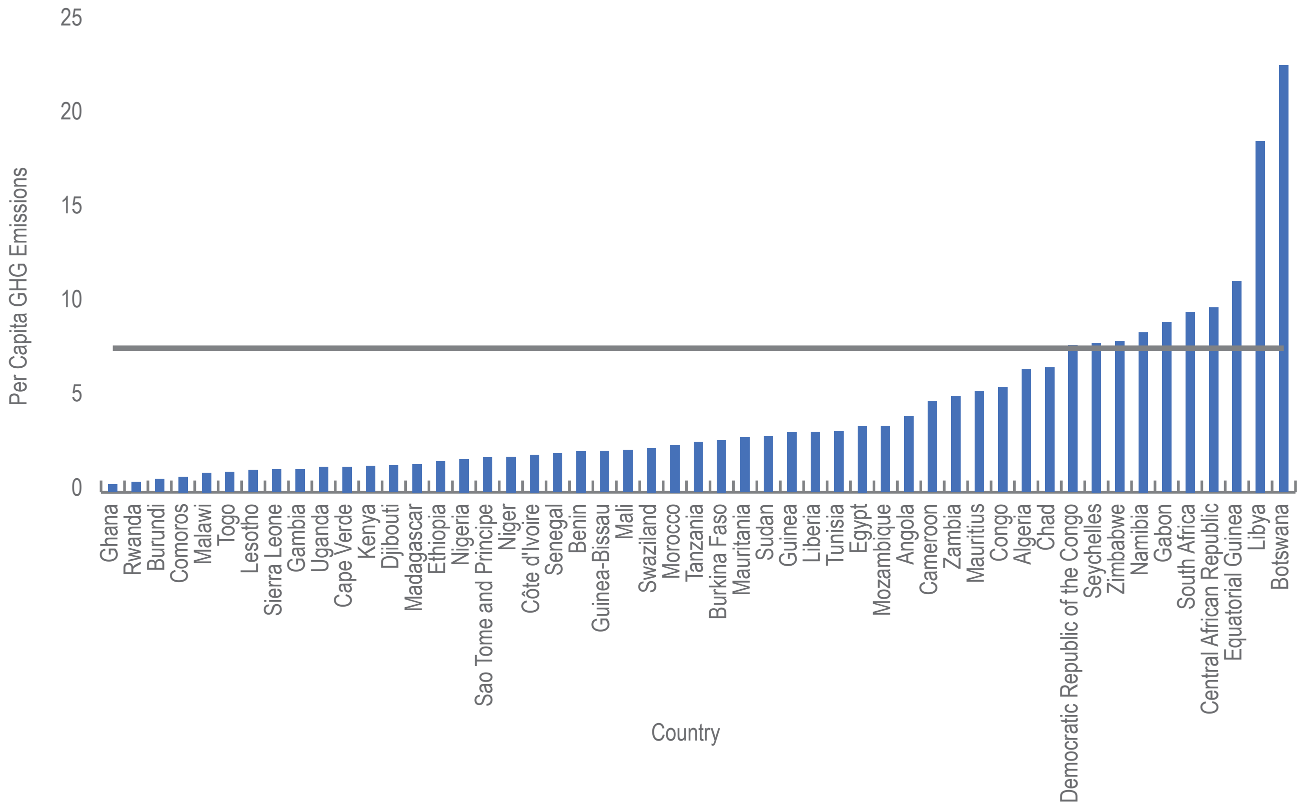
Per Capita GHG Emissions

The present analysis demonstrates that the average per capita GHG emissions for African countries in 2019 is 4.2422 tonnes, only 55 percent of the global average at 7.713 tonnes (see Figure 1). Of the 51 African nations considered for analysis of this parameter,[c] the majority fall below the African and global per capita GHG emission averages. Thirty-five countries had per capita GHG emissions lower than the African average, and 40 nations had values below the global average. Ghana registered per capita GHG emissions of 10 percent and 6 percent against the African and global averages, Rwanda 13 percent and 8 percent, and Burundi 17 percent and 10 percent. Ghana had the lowest per capita GHG emissions among African nations, higher only than the island nation of Fiji in the global comparison.

c Eritrea, Somalia, Western Sahara, and South Sudan are not included.

Only 10 African countries exceeded the global GHG average, Botswana being the highest at almost three times the global average. Among all 189 countries globally, Botswana occupied the 10th position in GHG emissions, superseding the US, Saudi Arabia, Canada, and Russia. Among African nations, Libya closely follows Botswana, with per capita GHG emissions almost 2.5 times the global average. Land use change and forestry are the major contributors to GHG emissions in Botswana, while the energy sector is mainly responsible for Libya's emissions.

Figure 1: Per capita GHG emissions for all African countries compared to the global average (in tonnes)



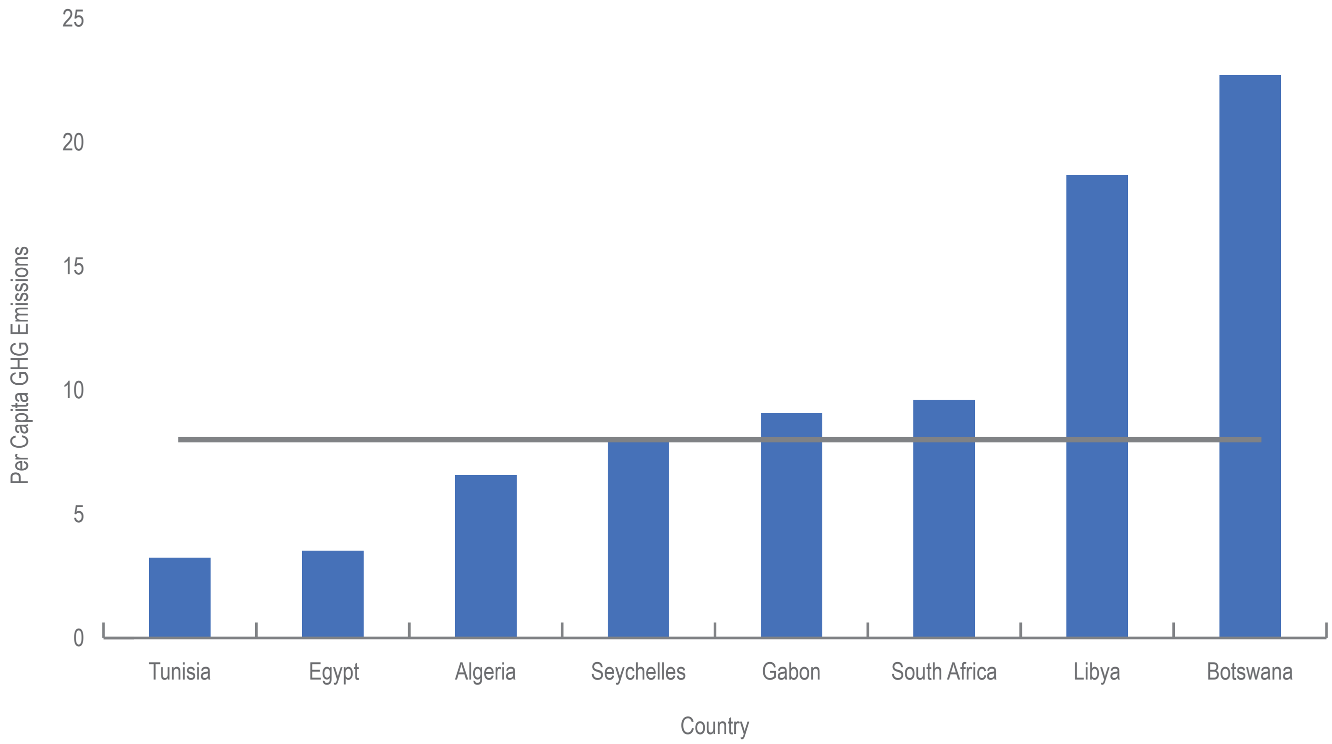
Note: Emissions include fossil fuel use and land-use changes.

Note: The global average is represented by the horizontal line.

Sources: Climate Watch,[19] UNDP HDI[20]

The authors further analyse the interplay between the levels of per capita GHG emissions and human development (see Figure 2 for an assessment of per capita GHG emissions of African countries belonging to the high human development category based on the global average in this category). Mauritius, with very high human development, registered per capita GHG emissions equalling 5.390 tonnes, almost 100 percent lower than the average per capita GHG emissions of 10.823 in the category of very high human development.

Figure 2:
Per capita GHG emissions for high HDI African countries against global average for all high HDI countries (in tonnes)

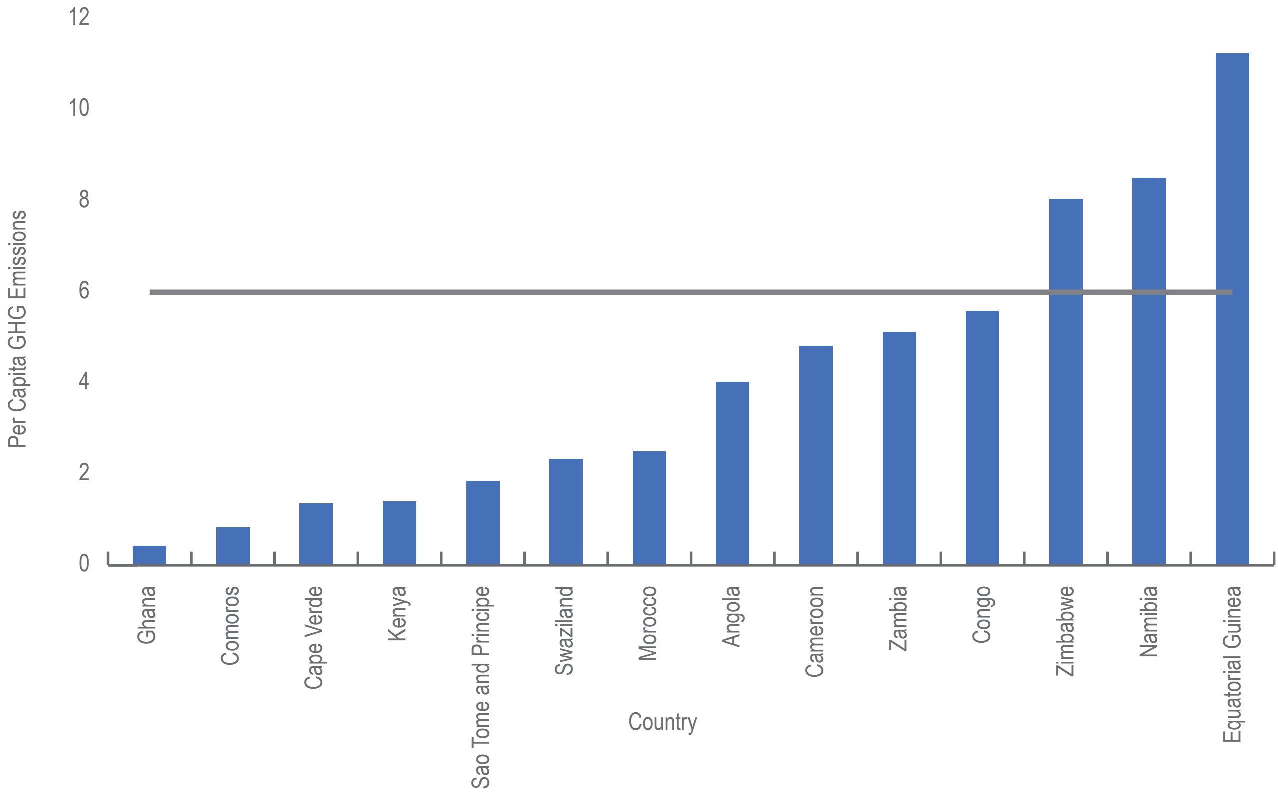


Note: The global average is represented by the horizontal line.

Sources: UNDP HDI,[21] Climate Watch[22]

The African average at 10.17 tonnes of GHG emissions supersedes the global average of 8.035 tonnes. This can be attributed to the large per capita emissions in Libya (18.69 tonne) and Botswana (22.72 tonne), which significantly pull up Africa's average. The other two countries with a higher per capita GHG emission score than the global average are Gabon (9.06 tonne) and South Africa (9.6 tonne), but both are much closer to the global average. Half of the African countries in the high human development category remain below the global average, with Tunisia recording the lowest per capita GHG emissions at 3.23 tonnes. Among all 51 countries across the globe in the high human development category, 85 percent have per capita GHG emissions greater than Tunisia.[23,24]

Figure 3: Per capita GHG emissions for medium HDI African countries against global average for all medium HDI countries (in tonnes)

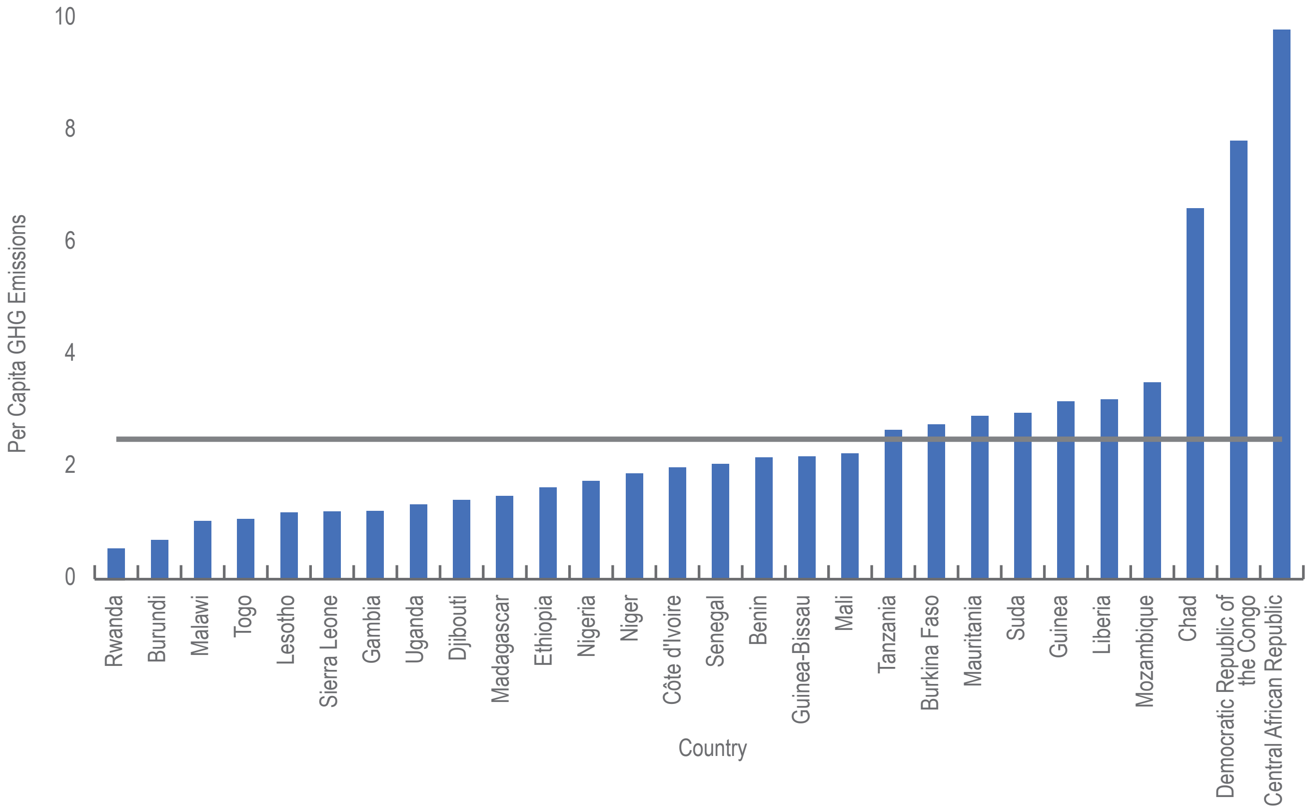


Note: The global average is represented by the horizontal line.

Sources: UNDP HDI[25], Climate Watch[26]

Among the medium human development countries, the African average of per capita GHG emissions is at 4.15 tonnes, only 68 percent of the global average at 6.092 tonnes (see Figure 3). Of the 14 medium human development African countries, only three have GHG per capita emissions above the global average—Zimbabwe (8.05 tonnes), Namibia (8.51 tonnes), and Equatorial Guinea (11.24 tonnes). The majority of African countries in the medium human development bracket fall substantially below the global average threshold, with per capita emissions being lowest for Ghana (0.42 tonnes) at 6 percent, followed by Comoros (0.83 tonne) at 13 percent of the global average. Notably, Ghana and Comoros had the lowest per capita GHG emissions among all countries globally in this category.

Figure 4:
Per capita GHG emissions for low HDI African countries against global average for all low HDI countries (in tonnes)



Note: The global average is represented by the horizontal line.

Sources: UNDP HDI[27]*, Climate Watch*[28]

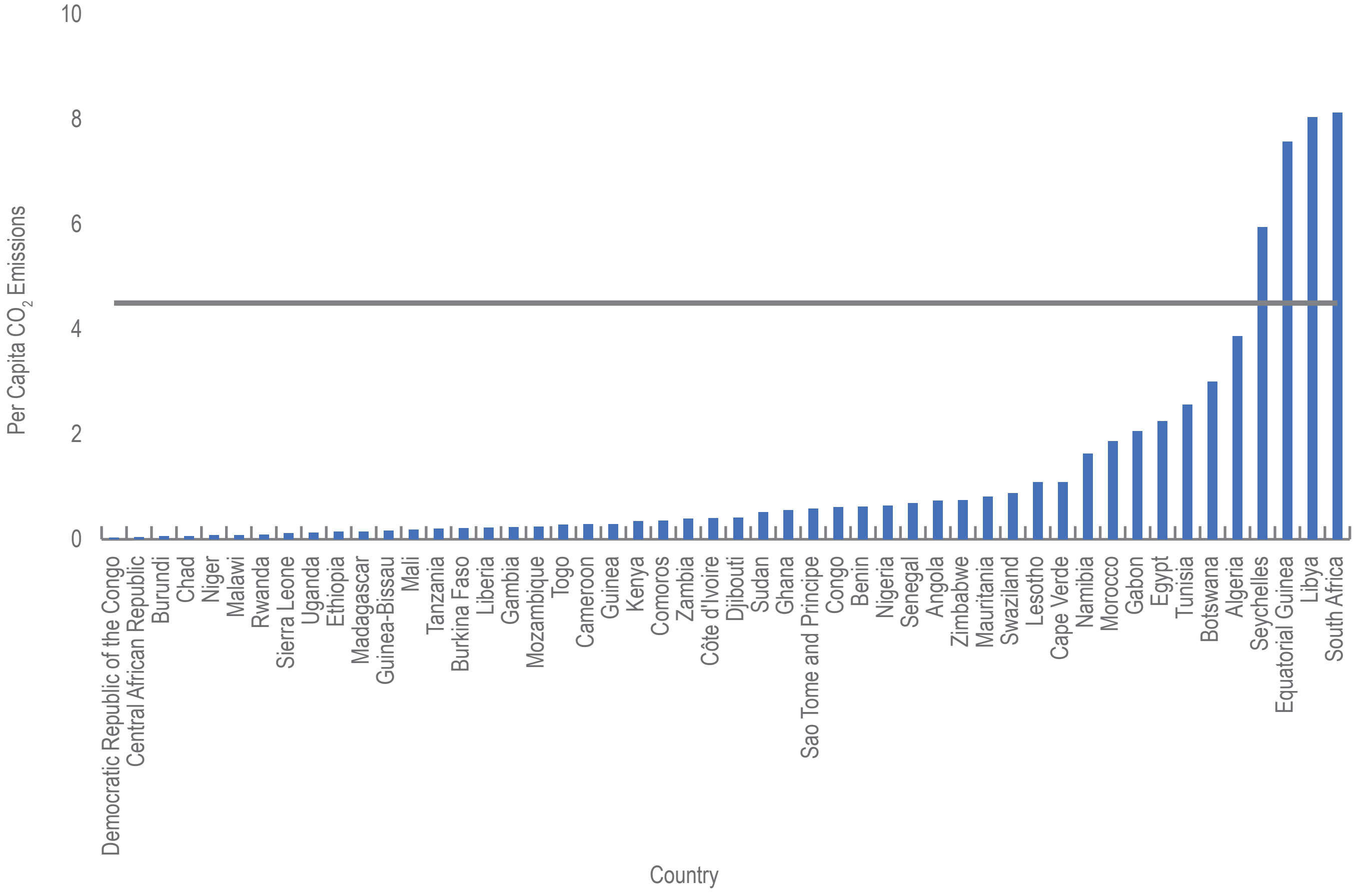
Of the 30 countries that lie in the low human development category, 28 are in Africa. As such, the African average of per capita GHG emission is very close to the global average—approximately 2.5 tonnes. Among low human development countries, while Rwanda (0.55 tonnes), Burundi (0.7 tonnes), and Malawi (1.04 tonnes) record the lowest per capita GHG emissions, Chad (6.63 tonnes), Democratic Republic of the Congo (7.83 tonnes) and the Central African Republic (9.82 tonnes) registered the highest per capita GHG emissions.

Per Capita CO_2 Emissions from Fossil Fuels

The authors' analysis demonstrates that the average per capita CO_2 emissions from fossil fuels for African countries is 1.23 tonnes, or merely 26 percent of the global average at 4.68 tonnes (see Figure 5). Of the 51 African nations analysed for this indicator,[d] the majority registered per capita CO_2 emissions from fossil fuels significantly below both the African and the global averages. The differences between CO_2 per capita emissions and GHG per capita emission underscores the impact of changing land use on Africa countries' emission levels. Thirty-nine countries had emissions lower than the African average, while 46 had values below the global average. Among African nations, the Democratic Republic of the Congo had the lowest per capita CO_2 emissions from fossil fuels at 0.031 tonne (or 0.6 percent of the global average), while South Africa has the highest score, almost double the global average. Only four countries registered emissions greater than the global average—Seychelles (5.945 tonnes), Equatorial Guinea (7.574 tonnes), Libya (8.043 tonnes), and South Africa (8.127 tonnes). At the global level, the Democratic Republic of the Congo continued to occupy the lowest position while Qatar had the highest per capita CO_2 emissions from fossil fuels at 40.619 tonnes, nine times the global average.

d Eritrea, Somalia, Western Sahara, and South Sudan are not included.

Figure 5:
Per capita CO_2 emissions from fossil fuels for all African countries against the global average (in tonnes)

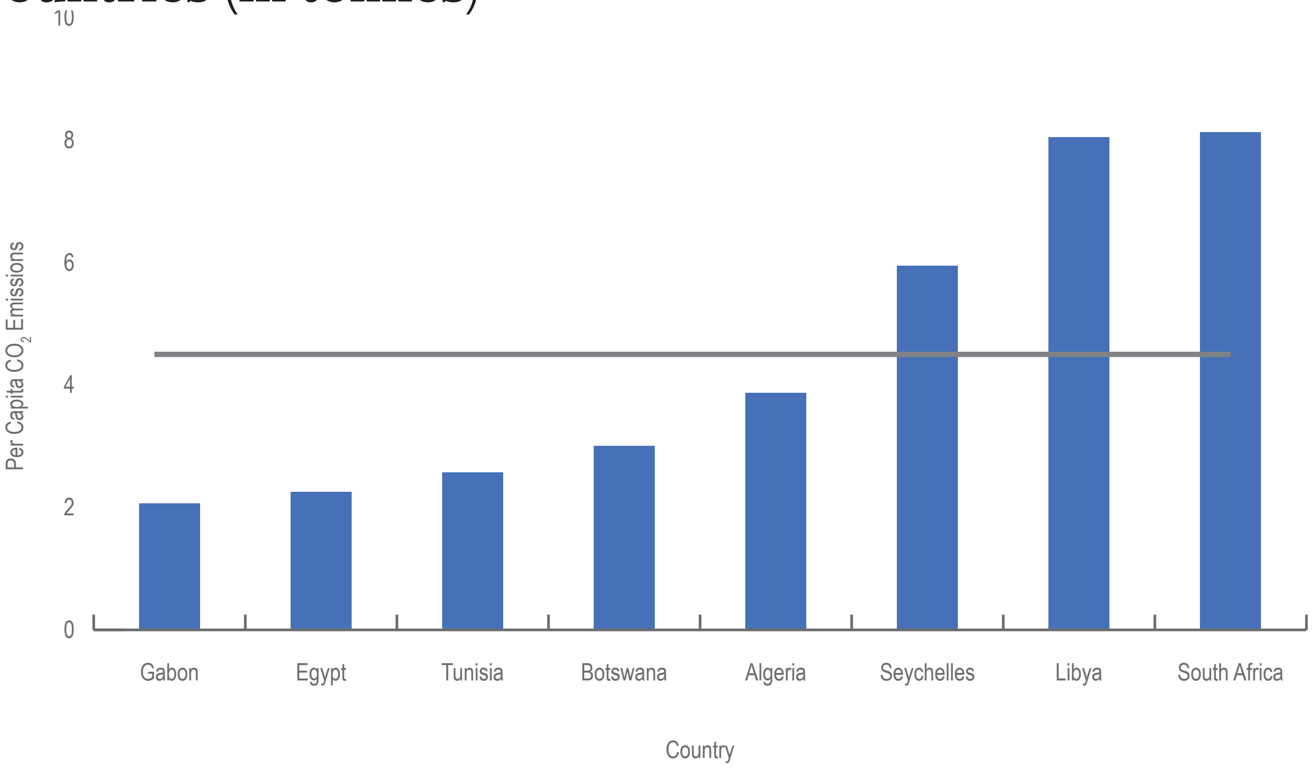


Note: The global average is represented by the horizontal line.

Sources: UNDP HDI,[29] Our World in Data[30]

The authors further analyse the relationship between per capita CO_2 emissions from fossil fuels and the level of human development (see Figure 6 for an assessment of per capita GHG emissions of high HDI African countries based on global average in this development category). Per capita CO_2 emissions from fossil fuels in Mauritius, which has a very high human development, stood at 3.448 tonnes, almost 40 percent of the global average (8.727 tonnes) and only 8 percent of Qatar's emissions.

Figure 6:
Per capita CO2 emissions for high HDI African countries against global average for all high HDI countries (in tonnes)

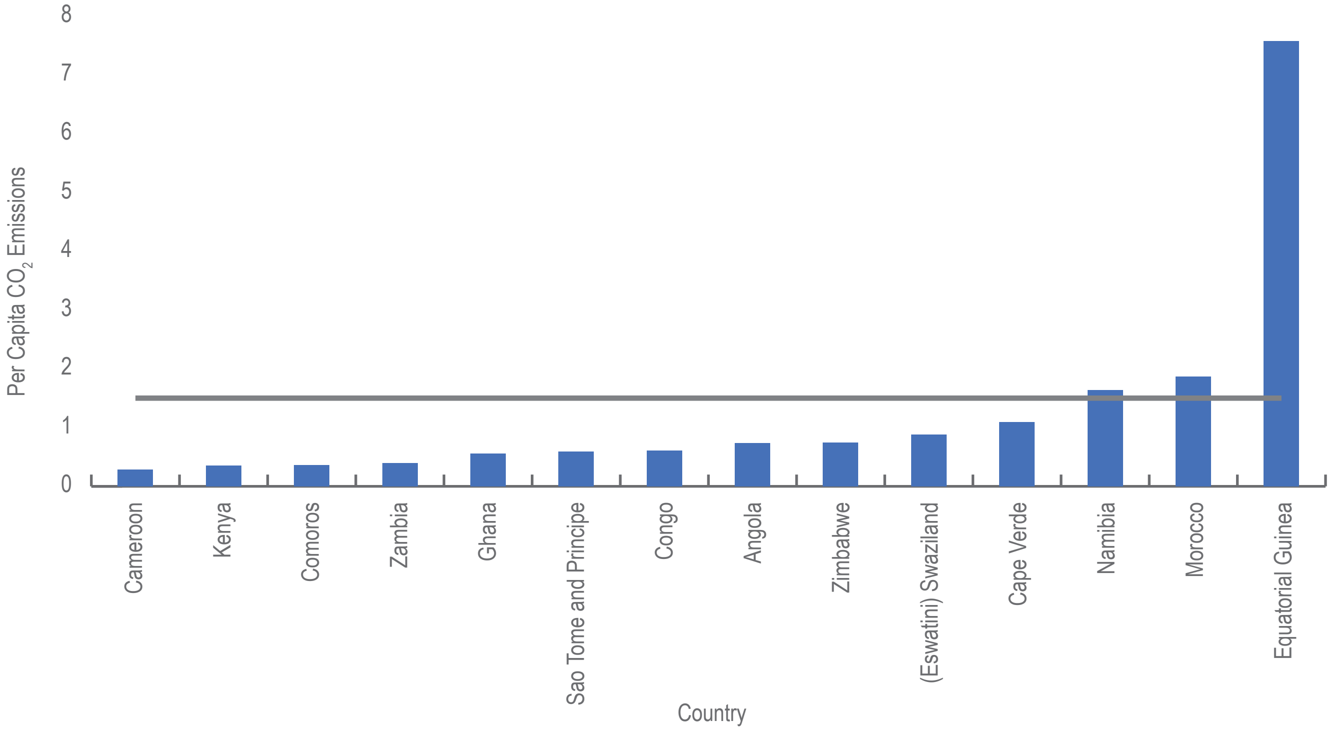


Note: The global average is represented by the horizontal line.

Sources: UNDP HDI,[31] Our World in Data[32]

The African average of per capita CO_2 emissions for high HDI countries (4.48 tonnes) was very close to the global average (4.41 tonnes). Only three countries exceeded the global average—Seychelles (5.94 tonnes), Libya (8.043 tonnes), and South Africa (8.127 tonnes)—and are responsible for raising the African average closer to the global figure. Most of the African countries (63 percent) in the high human development category remained below the global average. Gabon recorded the lowest per capita CO_2 emissions from fossil fuels at 2.066 tonnes, 47 percent of the global average and 7 percent of Trinidad and Tobago, the country with the highest per capita CO_2 emissions from fossil fuels in this category.

Figure 7:
Per capita CO2 emissions for medium HDI African countries against global average for all medium HDI countries (in tonnes)

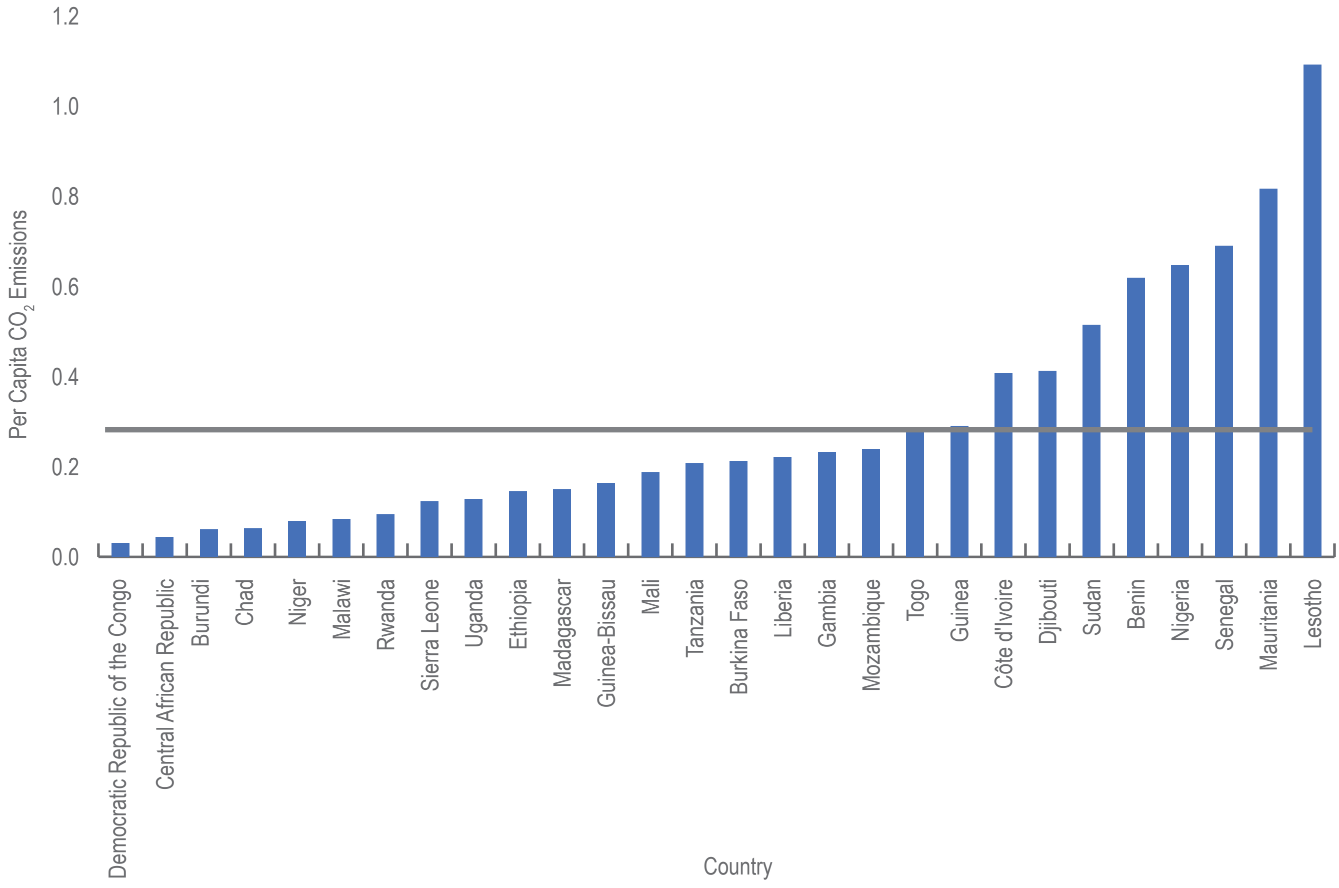


Note: The global average is represented by the horizontal line.

Sources: UNDP HDI[33]*, Our World in Data*[34]

For the medium human development category, the African average of per capita CO_2 emissions from fossil fuels stood at 1.263 tonnes, slightly lower than the global average of 1.419 tonnes (see Figure 7). Only three African countries had emissions greater than the global average, namely Namibia (1.636 tonnes), Morocco (1.87 tonnes), and Equatorial Guinea (7.574 tonnes). The majority of African countries in this development bracket emit much lower than the global average threshold, the lowest being Cameroon (0.286 tonnes) and Kenya (0.349 tonnes). Equatorial Guinea (7.574 tonnes) records the highest per capita CO_2 emissions from fossil fuels even among the 36 other countries in this human development category.

Figure 8:
Per capita CO_2 emissions for low HDI African countries against global average for all low HDI countries (in tonnes)



Note: The global average is represented by the horizontal line.

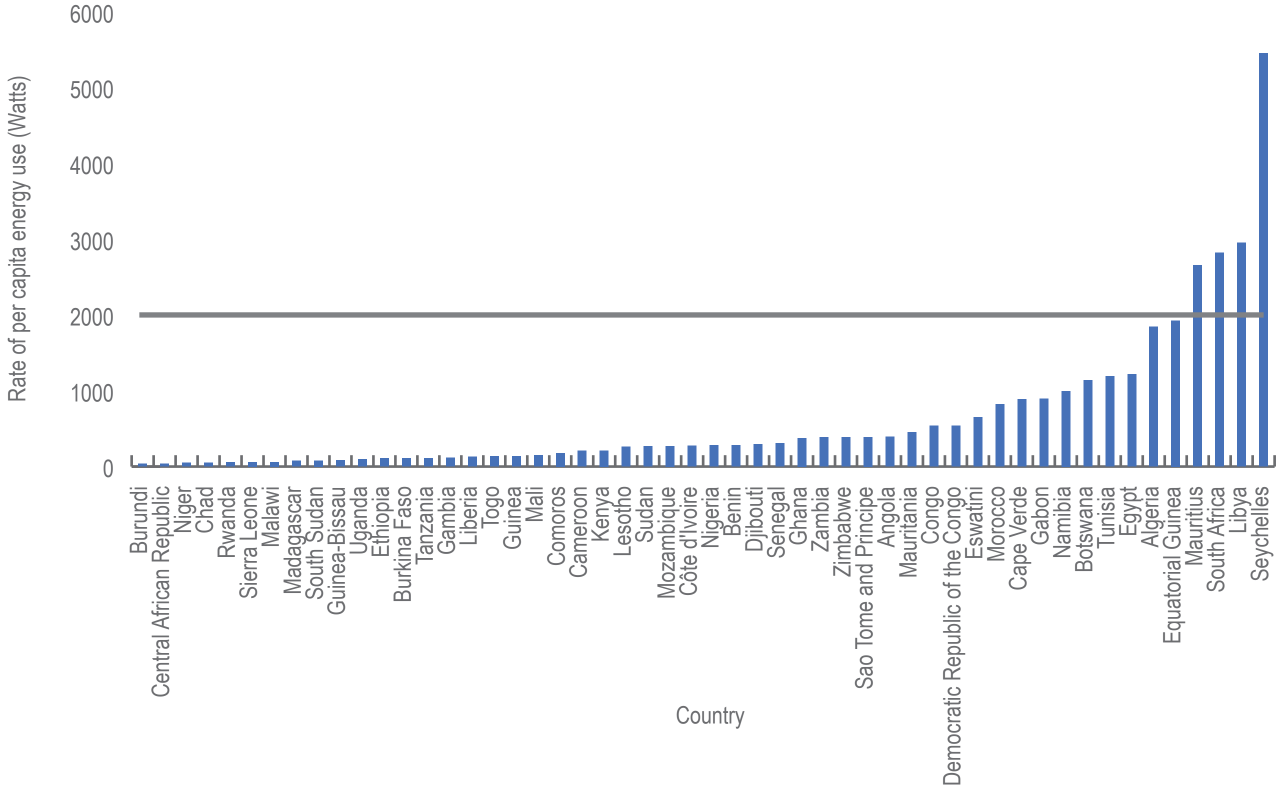
Sources: UNDP HDI[35], Our World in Data[36]

For the same reason as in the case of per capita GHG emissions, the African average of per capita CO_2 emissions from fossil fuels is extremely close to the global average in the category of low human development, at approximately 0.295 tonnes. A significant majority (70 percent) of the African countries in this category lie below the global average (see Figure 8). Lesotho has the highest per capita CO_2 emissions from fossil fuels, at 1.092 tonnes, which is 3.7 times the global average. On the other hand, the Democratic Republic of Congo had the lowest level of emissions at 0.031 tonnes, only 11 percent of the global average.

Rate of Per Capita Energy Use Relative to 2,000 Watts

The authors' analysis finds that in 2019, on average, an African country consumed energy at the rate of 643.48 Watts, only 32.17 percent of the critical energy threshold of 2000 Watts. In other words, the African continent experienced an average deficit of 67.82 percent in energy consumption in 2019. Of the 52 African nations for which data is available,[e] 48 consumed energy at the rate of less than 2,000 Watts (see Figure 9). Mauritius, South Africa, and Libya exceeded the critical threshold by 33 percent, 41 percent, and 48 percent, respectively. Only Seychelles consumed energy almost thrice the critical threshold level.

Figure 9:
Per capita rate of energy use in African countries



Note: The global average is represented by the horizontal line.

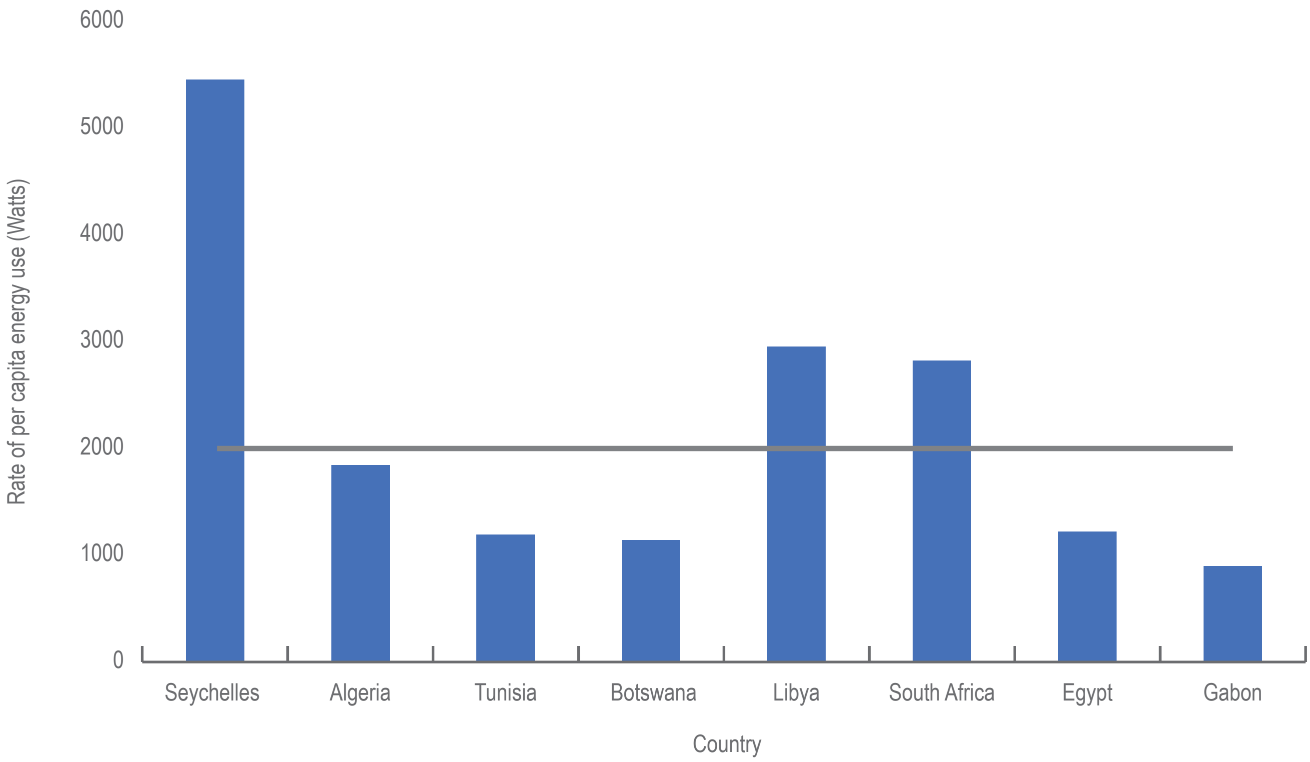
Sources: UNDP HDI,[37] Our World in Data[38]

e Eritrea, Somalia, and Western Sahara are not included.

The authors have further analysed how the level of human development bears upon the rate of per capita energy use in 2019 in the African continent, and further relate the interaction between the level of human development and the rate of per capita energy use in Africa to the way this interaction plays out in the context of the world. Mauritius, the only African nation with very high human development, utilised energy at the rate of 2,657 Watts, exceeding the critical energy threshold by about 33 percent. Mauritius's energy consumption is much below the global average of per capita energy use among nations with very high human development, which stood at 6,197 Watts or about thrice the critical threshold.

African nations in the category of high human development, on average, used energy at the rate of 2,190 Watts, which is slightly higher than the global average of 2,164 Watts for countries in the same development category (see Figure 10). Among African nations with high human development, Gabon had the lowest rate of per capita energy use at 896.1 Watts, while Seychelles had the highest rate of per capita energy use at 5,453 Watts. Apart from Seychelles, the other countries to exceed the 2000 Watts threshold are South Africa (2,820 Watts) and Libya (2,952.5 Watts), and the three countries are responsible for pulling up Africa's average rate of per capita energy use. However, most of the African nations in the high human development category consumed energy at a rate less than 2000 Watts.

Figure 10:
Rate of per capita energy use in African countries belonging to the category of high human development

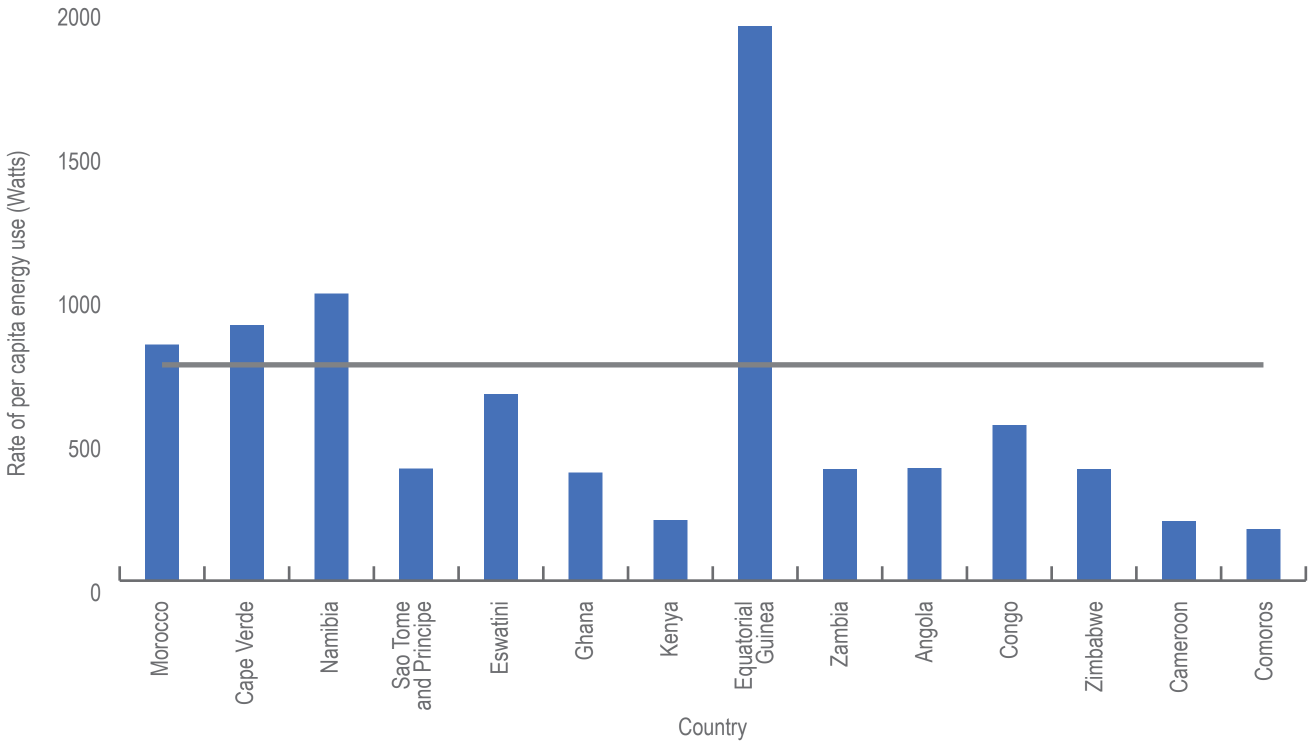


Note: The global average is represented by the horizontal line.

Sources: UNDP HDI,[39] Our World in Data[40]

For medium human development countries, the African average rate of per capita energy use stood at 596.5 Watts, slightly lower than the world average of 754 Watts (see Figure 11). Thus, the African nations with medium human development experienced a slightly larger deficit of 70 percent in energy consumption as compared to the global deficit of 62.3 percent. Among African nations in this human development category, the rate of per capita energy use for Morocco, Cape Verde, Namibia, and Equatorial Guinea exceeded the global average for this category. Most of the African countries in this category registered a rate of per capita energy use lower than the global average. While Comoros registered the lowest rate of per capita energy use at 179 Watts, Equatorial Guinea recorded the highest at 1,927 Watts. No African country in the medium human development category exceeded the critical energy threshold, while at the global level, Laos and Bhutan marginally exceeded this threshold. Nepal is the only country in the world to register a rate of per capita energy use lower than Comoros.

Figure 11: Rate of per capita energy use in African countries belonging to the category of medium human development

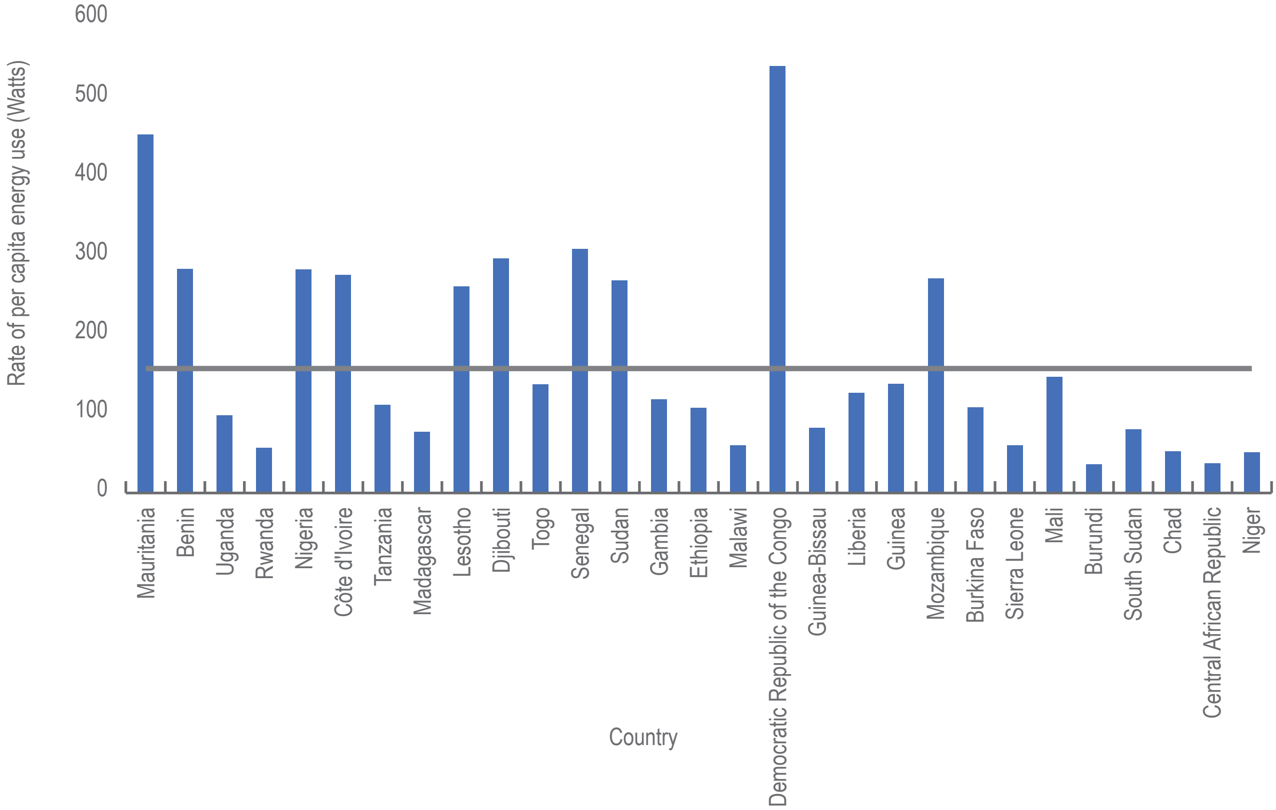


Note: The global average is represented by the horizontal line.

Sources: UNDP HDI[41], Our World in Data[42]

In the category of countries with low human development, the African average of the rate of per capita energy use is very close to the global average (see Figure 12). Both averages approximate eight percent of 2000 Watts, and therefore the resultant average deficit for Africa and the world is a massive 92 percent. As is evident, there is a direct correlation between the level of human development and the rate of per capita energy use. This correlation is accompanied by a stark inequality in the level of energy use.

Figure 12:
Rate of per capita energy use in African countries belonging to the category of low human development



Note: The global average is represented by the horizontal line.

Sources: UNDP HDI[43], Our World in Data[44]

Countries belonging to the very high human development category violate the critical energy threshold. In some cases, such as Iceland, Singapore and Qatar, the extent of overconsumption is as much as 10 times the critical energy threshold. In contrast, the lowest values of the rate of per capita energy use in the category of low human development were registered in the African continent. The lowest value stood at a meagre 2 percent (about 37 Watts) of the 2000 Watts threshold for Burundi and Central African Republic. The highest rate of per capita energy use exceeds the lowest rate of per capita energy use by a whopping 591 percent.

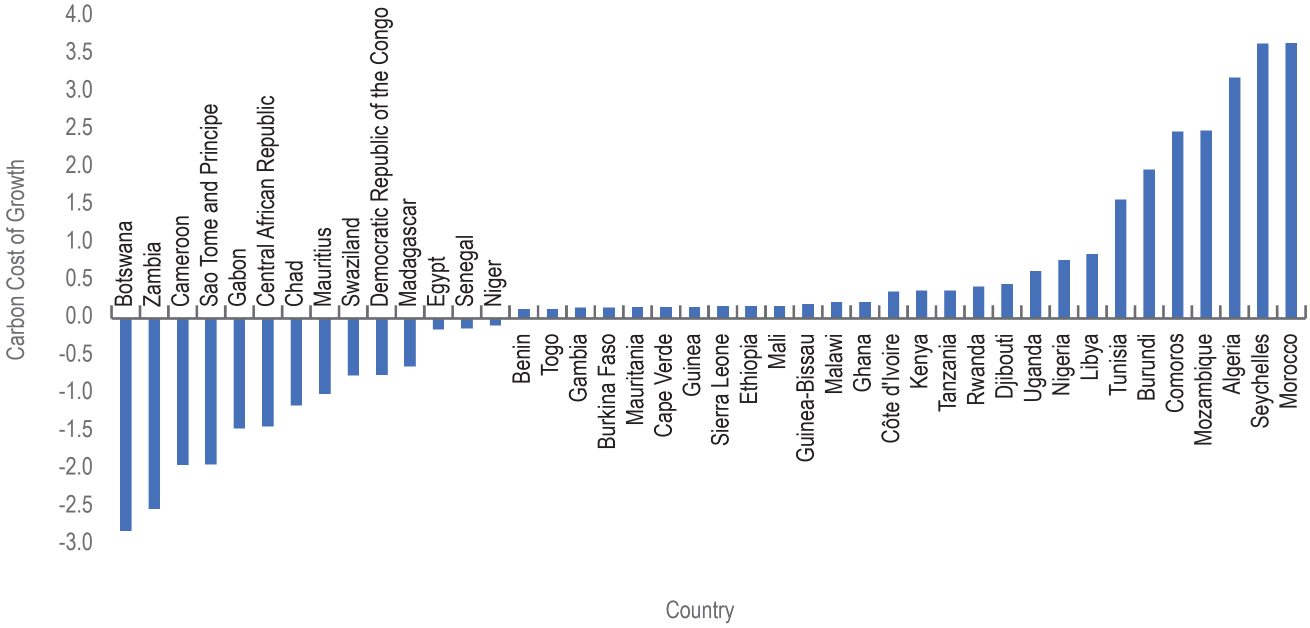
Carbon Cost of Growth

Of the 51 African nations for which the data is available,[f] economic growth was positive for 44 nations.[g] The carbon cost of growth was computed for these nations (see Figure 13). Since the value for South Africa was an outlier, it was excluded from the analysis. Analysis for Africa shows that the average carbon cost of growth was 0.2 in 2019, suggesting relative decoupling between carbon emissions and economic growth. This compares favourably with the global average, which stood at 0.45 in 2019, suggesting that the world experienced relative decoupling between economic growth and carbon emissions. Among the 43 nations being analysed, the carbon cost of growth was negative for 14 nations. Twenty-one African nations being analysed registered a positive carbon growth less than one. Only seven nations under analysis registered a growth in carbon emissions greater than economic growth.

f Eritrea, Somalia, Western Sahara, and South Sudan are not included

g Growth rate was negative for Lesotho, Sudan, Liberia, Namibia, Equatorial Guinea, Angola, Republic of Congo, and Zimbabwe

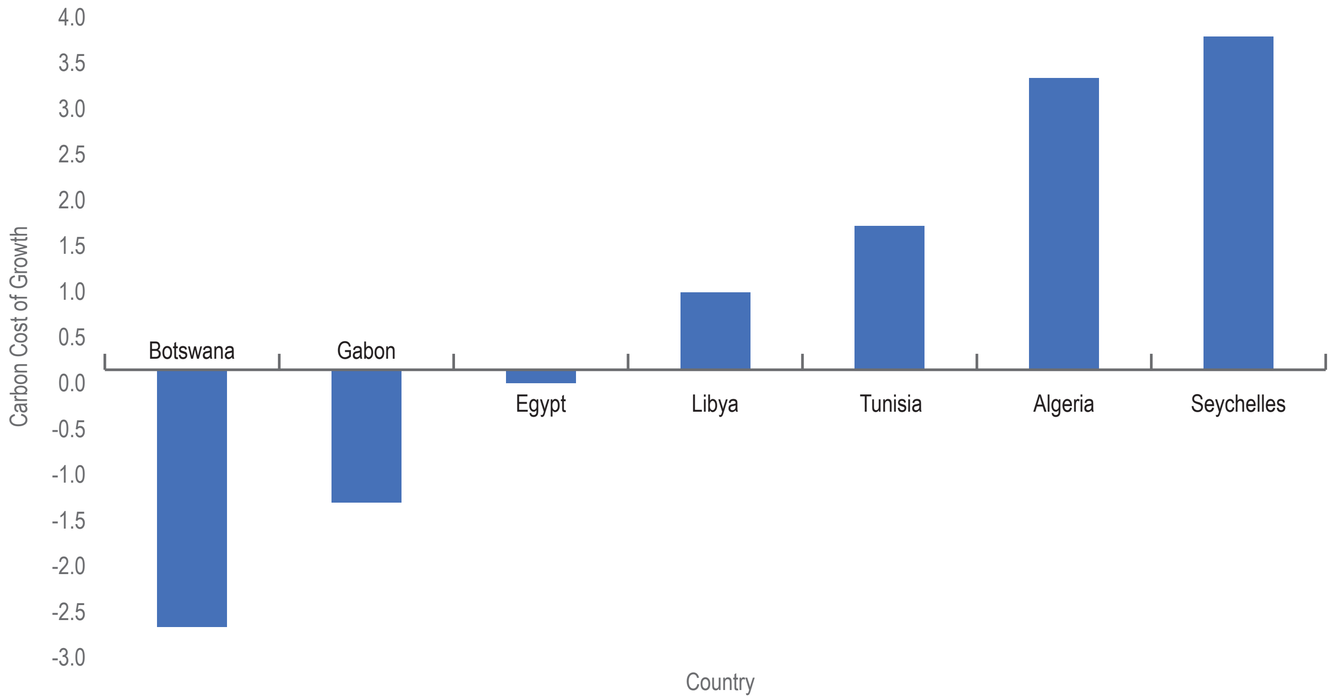
Figure 13:
Carbon cost of growth in African countries



Sources: Global Carbon Project for Territorial CO2 Emissions;[45] *World Development Indicators for GDP growth rates;*[46] *World Development Indicators for GDP per capita.*[47]

The authors have further examined how the relationship between levels of human development and the carbon cost of growth at the global level compares with this relationship among African nations. The category of countries experiencing very high human development registered a negative average carbon cost of growth, at -0.02. This implies that nations with very high human development, on average, experienced absolute decoupling in 2019. The carbon cost of growth for Mauritius in 2019, the only African country belonging to the category of very high human development, was -1, lower than the global average.

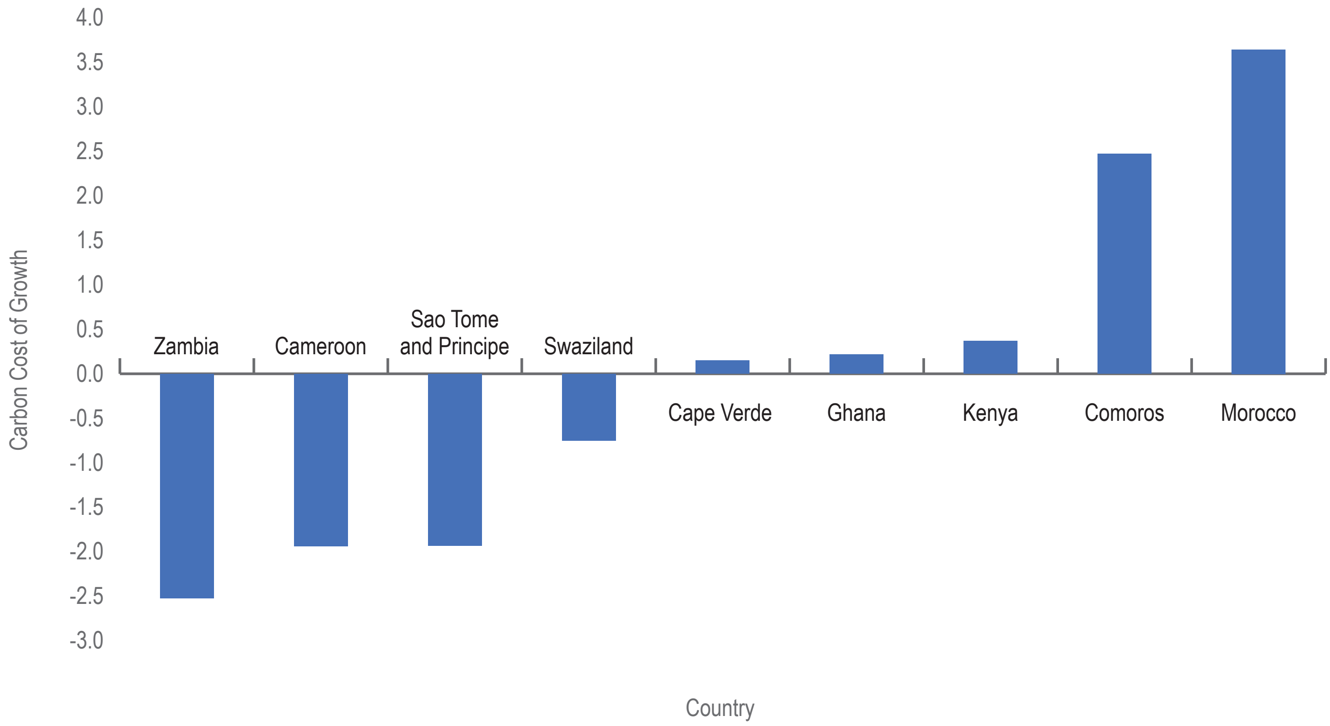
Figure 14:
Carbon cost of growth in African countries belonging to the category of high human development



Sources: Global Carbon Project for Territorial CO2 Emissions;[48] *World Development Indicators for GDP growth rates;*[49] *World Development Indicators for GDP per capita.*[50]

At the global level, the average carbon cost of growth for countries in the category of high human development was the highest at 0.97 in 2019. This average was lower among African countries at 0.7 (see Figure 14). Countries with high human development at the global level and in Africa, on average, exhibited relative decoupling between carbon emissions and economic growth. However, the performance was not uniform among the African nations. Among the seven African nations with high human development, three experienced absolute decoupling, one experienced relative decoupling, while the percentage increase of carbon emissions in the remaining nations exceeded their economic growth.

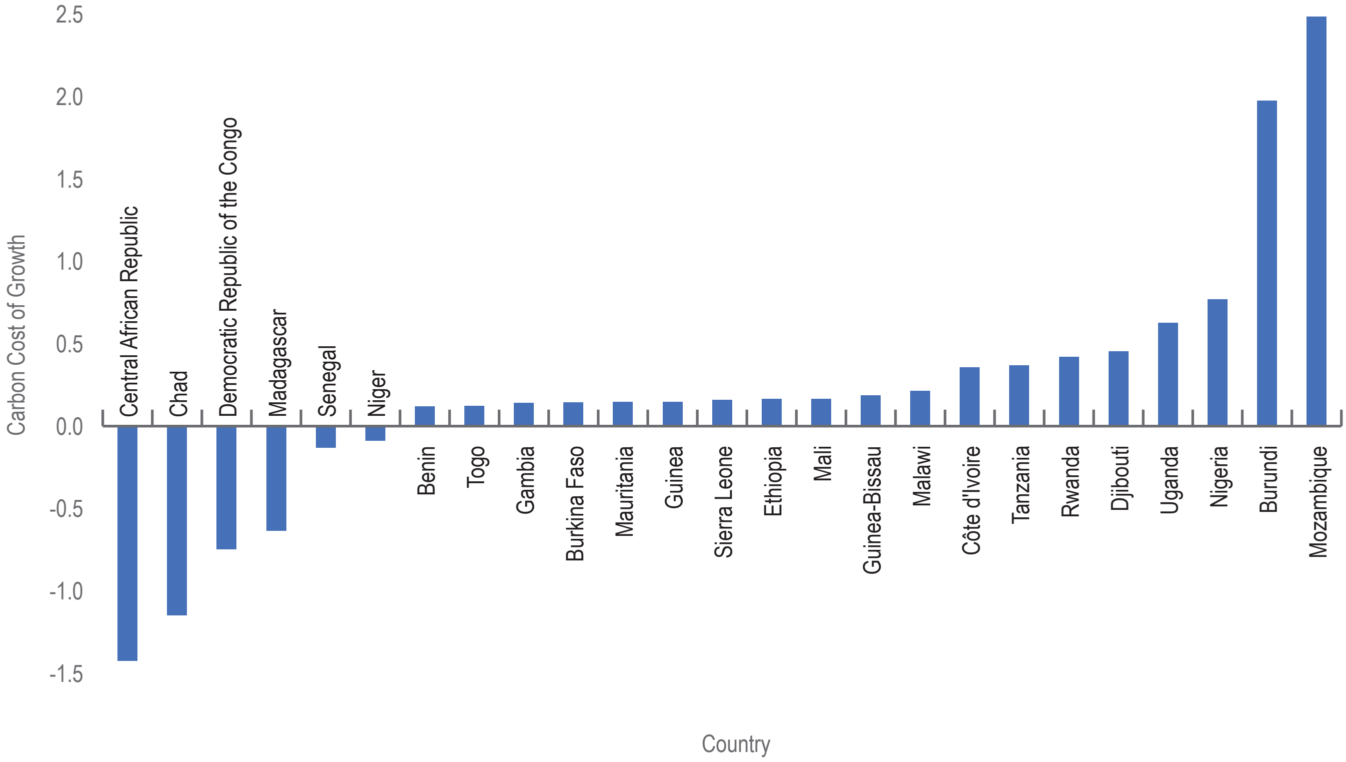
Figure 15:
Carbon cost of growth in African countries belonging to the category of medium human development



Sources: Global Carbon Project for Territorial CO2 Emissions;[51] *World Development Indicators for GDP growth rates;*[52] *World Development Indicators for GDP per capita.*[53]

In 2019, the global average carbon cost of growth was 0.825 for countries with medium human development. However, for nations in Africa belonging to this group of development, the average carbon cost of growth was negative, at -0.03 (see Figure 15). The performance was not uniform across African nations. Among the nine countries analysed in this category, four registered a negative carbon cost of growth, while three experienced positive carbon cost of growth less than one. The remaining two nations experienced a growth in carbon emissions greater than their economic growth.

Figure 16:
Carbon cost of growth in African countries belonging to the category of low human development



Sources: Global Carbon Project for Territorial CO2 Emissions;[54] *World Development Indicators for GDP growth rates;*[55] *World Development Indicators for GDP per capita.*[56]

All countries with low human development at the global level belong to the African continent. The average carbon cost of growth for this category of countries was 0.2 in 2019 (see Figure 16). Among the 25 countries analysed, six registered a negative carbon cost of growth, 17 experienced a positive carbon cost of growth less than one, and the remaining two nations experienced an increase in carbon emissions exceeding economic growth.

Assessing the Data

Africa outperforms the world on all four parameters analysed. The African averages were lower than the global average for per capita GHG emissions, per capita CO_2 emissions from fossil fuel combustion, carbon cost of growth, and the rate of per capita energy use.

Barring the carbon cost of growth, the global averages for the remaining three variables have a positive correlation with levels of human development. Higher the human development, higher are the values for these three variables. It follows that those nations with higher levels of development, on average, were responsible for higher levels of emissions. Also, most nations in the category of very high human development exhibited over consumption of energy relative to 2,000 Watts. Despite their significant achievement in terms of development, countries in the very high and high human development groups exhausted a larger proportion of the per capita carbon budget as compared to nations with medium and low levels of human development. Given the rapid depletion of the available carbon budget, the average carbon/emission inequality between the developed and the developing world is expected to further perpetuate development disparities.

The global averages of carbon cost of growth across different levels of development corroborate the environmental Kuznets curve, according to which there is a non-linear or inverted U-shaped relationship between economic growth and development on the one hand, and environmental quality on the other. The average carbon cost of growth increases as the level of human development increases until high human development is reached. At very high human development, the average carbon cost of growth declines and becomes negative. However, this trend may not exhibit when the individual values of carbon cost of growth is plotted against human development scores. Furthermore, this trend is not exhibited by the average carbon cost of growth in the African continent.

Africa's performance in terms of per capita GHG emissions and per capita CO_2 emissions from fossil fuels corroborate the environmental Kuznets curve. The African averages for both variables increase with the level of human development but only till high human development is reached. At very high human development, the African averages decline with values lower than those for high human development. The average carbon/emissions inequality that accentuates with distance between development levels in the global context is not as severe in the African region since the two emission levels under consideration behave in accordance with the environmental Kuznets curve. This inference must be treated with caution given that only one African country features in the very high human development category.

A comparative analysis of African nations and the rest of the world, disaggregated by development levels, suggests that a majority of the African countries outperform the global average for the human development category to which they belong. This is true for all four variables analysed. It appears *prima facie* that in 2019, for any level of human development, the climate policy adopted by African countries has enabled them to register a better climate change performance than the rest of the world. However, most of the African nations belong to the medium and low human development categories with a rate of per capita energy use less than 2000 Watts. The lack of energy access in these nations appears to have affected the achievement of human development. As such, lower levels of per capita CO_2 emissions from fossil fuel combustion can largely be attributed to the lack of energy access. Indeed, countries that have emission levels below the global average consume per capita energy at rates below the global average. Relatively lower levels of economic activity characterising countries belonging to medium and low human development categories explains, to a large extent, lower average per capita GHG emissions.

The present analysis suggests that some African nations have registered a poor climate performance compared to others with higher levels of development. For example, among high human development nations, Seychelles and South Africa exceed the global average in terms of per capita CO_2 emissions from fossil fuel combustion and rate of per capita energy use. The carbon cost of growth for Seychelles along with Algeria and Tunisia exceeded unity. South Africa along with Botswana and Gabon exceeded the global average in terms of per capita GHG emissions. Although one study[57] classified South Africa as the best performing African nation in terms of climate policy, the current analysis find the country's climate policy to be inadequate in relation to its climate performance in 2019.

Among African nations belonging to medium human development categories, based on their climate performance in 2019, some need to place a relatively greater thrust on integrating climate change mitigation while aspiring for reaching higher levels of development. This applies to (i) Namibia and Equatorial Guinea, which exceed global averages of medium human development countries in the case of per capita GHG emissions and per capita CO_2 emissions from fossil fuel combustion; (ii) Zimbabwe, which exceeds the global average in case of per capita GHG emissions; (iii) Morocco, which exceeds the global average of per capita CO_2 emissions from fossil fuel combustion and carbon cost of growth (with a value greater than one); and (iv) Comoros, which has a carbon cost of growth greater than one.

Despite having low levels of human development, countries like the Central African Republic, Chad, and Democratic Republic of Congo have per capita GHG emissions levels very close to the global average of high HDI countries. Given their significant deficits in development, considerations of climate justice will imply greater carbon space for these countries. Nevertheless, the worsening climate crisis has made the requirement of balancing between growth and development, and environmental protection inevitable.

Recommendations

Any discussion on the way forward for Africa must consider the differences in development levels of the countries in the region in comparison to the rest of the world. Through such an evaluation, the authors present key recommendations for policymaking at the national level and international action and support to improve African nations' climate policies.

Equitable Distribution of the Carbon Budget

Between 1850 and 2021, 2500 billion tonnes of CO_2 have been emitted into the atmosphere, primarily from fossil fuel combustion and land use, leaving only 300 billion tonnes of CO_2 to emit if the world is to stay below 1.5 degree Celsius (with an 83 percent confidence rating) and 900 billion tonnes of CO_2 to stay within 2 degrees Celsius (with the same level of confidence). At current global emissions rates, the 1.5 degree Celsius budget will be depleted in six years, and the 2 degrees Celsius budget in 18 years.[58] Historic emissions by a small group of mostly high-income industrialised countries have depleted the carbon space, severely constraining the ability of developing economies to grow without the same right to burn carbon. Lower and medium human development countries now face the twin challenge of growing their economies along with the pressing mandate for emissions reduction. This is in addition to the fact that the impact of climate change is disproportionally felt in the least developed geographies.

While building consensus on how the balance of the carbon budget should be shared is a long-drawn and perhaps contentious process, the imperative of building an international climate architecture that applies a climate justice prism in climate negotiations and transactions is essential to ensure greater parity between countries. Equity and climate justice must emerge as the cornerstone of an effective international climate arrangement.

Increase Climate Finance Flows to Africa

Even though Africa's contribution to global GHG emissions is the least of all regions, at 3.8 percent, the impact of climate change on the continent has been disproportionate and severe.[59] Of the 10 countries most vulnerable to climate change, seven are located in Africa— Chad, Haiti, Kenya, Malawi, Somalia, Sudan, Niger.[60]

To adapt to the rising temperature levels and mitigate future emissions, which are expected to grow rapidly given the high projections in population growth and concomitant energy needs, Africa will require trillions of dollars in climate financing annually. At the 2021 UN Climate Change Conference, African negotiators demanded that financing to the continent be scale up to US$1.3 trillion per year from 2025.[61]

In the current landscape, climate financing flows are perilously far from the estimated needs, with a 588-percent increase to US$4.35 trillion annually considered critical to meet the set global climate targets. Climate finance flows from all sources reached US$632 billion in 2019/2020, with Sub-Saharan Africa receiving a paltry 3 percent (US$20 billion), and North Africa and West Asia together receiving only 2.5 percent (US$16 billion) of the grand total.[62]

The international community and financial institutions must rise to the occasion by mobilising and ensuring requisite climate investments to Africa. Multilateral development banks (MDBs) and international financial institutions (IFIs) must be reoriented and recapitalised to provide the necessary financing, and must leverage public finance to catalyse and unlock greater private capital investments at concessional rates to African countries. Financing efforts must be complemented with a transfer of technology, information dissemination, institutional capacity building, and assistance with developing policy and regulatory frameworks. Of the 55African countries, only 13[h] have accredited entities that can directly apply to the Green Climate Fund, one of the largest sources of global climate finance, due to the lack of technical capabilities to manage compliance standards and policies.[63] On their part, the African countries could demonstrate serious commitment to climate action and institutionalise robust structures to help achieve their NDCs and incentivise global capital to invest in a pipeline of identifiable and bankable projects.[64]

h Kenya, Namibia, Ghana, Ivory Coast, Senegal, Nigeria, Côte d'Ivoire, Togo, Morocco, Tanzania, South Africa, Ethiopia, Rwanda, Uganda, Benin, and Tunisia.

Leveraging Carbon Credit Markets

About 20 percent of GHG emissions are caused by deforestation and forest degradation. For many countries assessed in this report, their per capita GHG emissions far exceeded their per capita CO_2 fossil fuel emissions, indicating the relative importance of land use and deforestation to GHG emissions. Countries like Gabon and Botswana in the high HDI and the Democratic Republic of the Congo in the low HDI categories record low fossil fuel emissions, but very high GHG emissions.

Most of Africa is home to an immensely rich ecosystem but due to increasing urbanisation, land clearing for agriculture, and demand for wood-derived fuels, ecosystem losses have become a persisting challenge. Carbon credit mechanisms have been touted as an effective measure to help reconcile such conservation and development goals by restoring ecosystem habitats and generating a stream of revenues for the country. Approximately 4.7 billion tCO_2e-worth of carbon credits have been issued since 2007 and the market continues to expand, recording a 48 percent growth in 2021.[65]

The Paris Agreement permits countries to undertake climate protection projects abroad to offset carbon emissions in the home country. For instance, Switzerland has entered into bilateral agreements with many developing countries, including Peru, Ghana, Senegal and Thailand, to implement climate projects pertaining to nature conservation and sustainable development.[66] Entering into similar bilateral agreements that leverage carbon credit markets can be a significant opportunity for Africa to restore its natural capital and invest in environment protection projects.

Furthermore, increasing engagement with emission mitigation mechanisms such as REDD+ (reduced emissions from deforestation and forest degradation) can allow African countries with large forest reserves to receive financial compensation for reducing deforestation rates. However, various governance, technical, and financial constraints have precluded significant engagement with the mechanism.[67] African countries, on their part, must also be willing to undertake serious governance reforms, build institutional capacity, invest in carbon change measurement, reporting and verification technologies and finance REDD+ strategy design and pilot projects. It would serve the African Union well to set up its own domestic compliance market linking local communities with international and independent carbon crediting mechanisms. International support and technical training are prerequisites to achieve these endeavours in Africa.

Catalysing Green Growth in Africa

Among the 14 African nations that experienced negative carbon cost of growth, one was a very high HDI country (Mauritius), three were high HDI countries (Botswana, Gabon, and Egypt), four were medium HDI countries (Zambia, Cameroon , Sao Tome and Principe, and Swaziland), and six were low HDI countries (Central African Republic, Chad, Democratic Republic of Congo, Madagascar, Senegal, and Niger). In the case of very high and high HDI countries, negative carbon cost of growth implies absolute decoupling and green growth. However, in the context of medium and low HDI nations, which have not adequately realised their potential for economic growth, it will not be appropriate to conclude that these countries are experiencing absolute decoupling and, therefore, green growth. Similarly, a positive carbon cost of growth less than one does not necessarily indicate relative decoupling in the case of medium and low HDI countries. This is corroborated by the rate of per capita energy use characterising these countries.

Decoupling growth from emissions requires the financial wherewithal to adopt a green development pathway and switch to a low carbon economy, and the appetite to face reduced growth that may follow green growth. In this sense, very high and high HDI countries can better afford decoupling than medium and low HDI nations. Nevertheless, given that 1.5 degree Celsius demands halving GHG emissions by 2030 and reaching net zero by 2050 at the global level, even the low and medium HDI countries will have to embark on relative and eventual absolute decoupling. International assistance in the form of official development assistance and foreign direct investment needs to focus on enabling the low and medium HDI nations to support their green growth strategy. While there have been a few efforts on this front, more need to be done.[68] Furthermore, these nations will also require technical assistance, knowledge sharing, and exchange of best practices by international stakeholders to articulate a green growth strategy that strikes the right balance between economic growth and environmental protection. International support needs to address the institutional, governance, and capacity constraints confronting these countries that are likely to hinder the process of decoupling.

A Debt-Sustainable Green Development Pathway

Many African countries face debt vulnerabilities, a situation worsened by the COVID-19 pandemic. Most of these nations have poor tax-to-GDP ratios, affecting the level of domestic resources available for pursuing sustainable development priorities and their shift to a green economy. The systemic changes involved in switching to a green economy require exorbitant levels of investment. Most of the debt-vulnerable countries find it difficult to access climate finance due to their poor credit ratings and are burdened by high borrowing costs. Even the negligible international lending received by these countries can further heighten the risk of debt distress for and default by these nations. As such, these nations need to be supported in achieving their green economy priorities in a debt sustainable manner. African nations need to develop a green transition plan that also focuses on increasing their financial absorption and debt-carrying capacities.

As it stands, of the total blended finance disbursed globally, only 6 percent was received by least developed countries and over 70 percent was received by medium income countries.[69] To mitigate the investment risks in the context of African nations, the Bretton Woods institutions, MDBs, and IFIs can enhance the level of blended finance, first loss capital, risk guarantees, and securitised debt disbursed to these nations. This will help in ensuring debt sustainability.

International lenders must consider issuing climate finance in the form of local currency loans to reduce the risks of currency mismatch, real exchange rate volatility, and depreciation. Such lending encourages the development of the local capital markets. Furthermore, climate finance in the form of debt indexed to GDP and countercyclical loans will reduce the risk of default and enhance countries' resilience to external shocks.

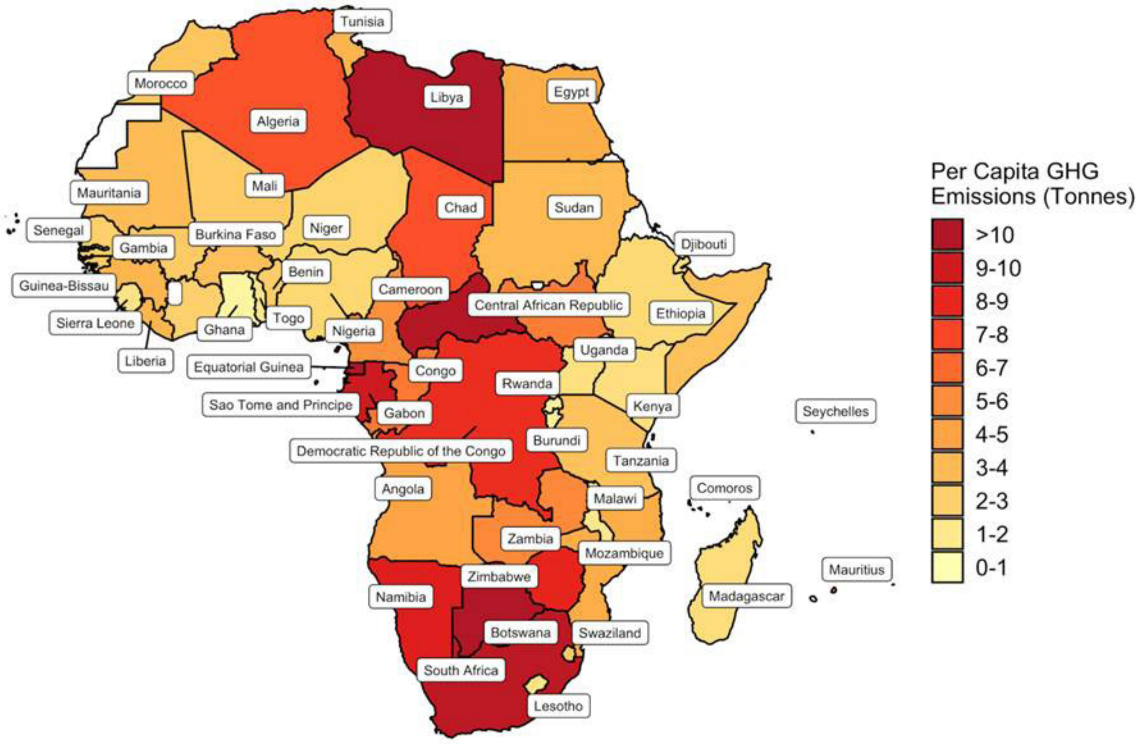
Conclusion

The analysis presented in the report suggests that, overall, Africa outperforms the world on all four parameters of assessment (per capita GHG emissions, per capita CO_2 emissions from fossil fuels, carbon cost of growth, and the rate of per capita energy use relative to 2,000 Watts). Africa's performance in terms of per capita GHG emissions and per capita CO_2 emissions from fossil fuels corroborate the environmental Kuznets curve. As a result, the average carbon/emissions inequality is not as severe in the African region as it is globally.

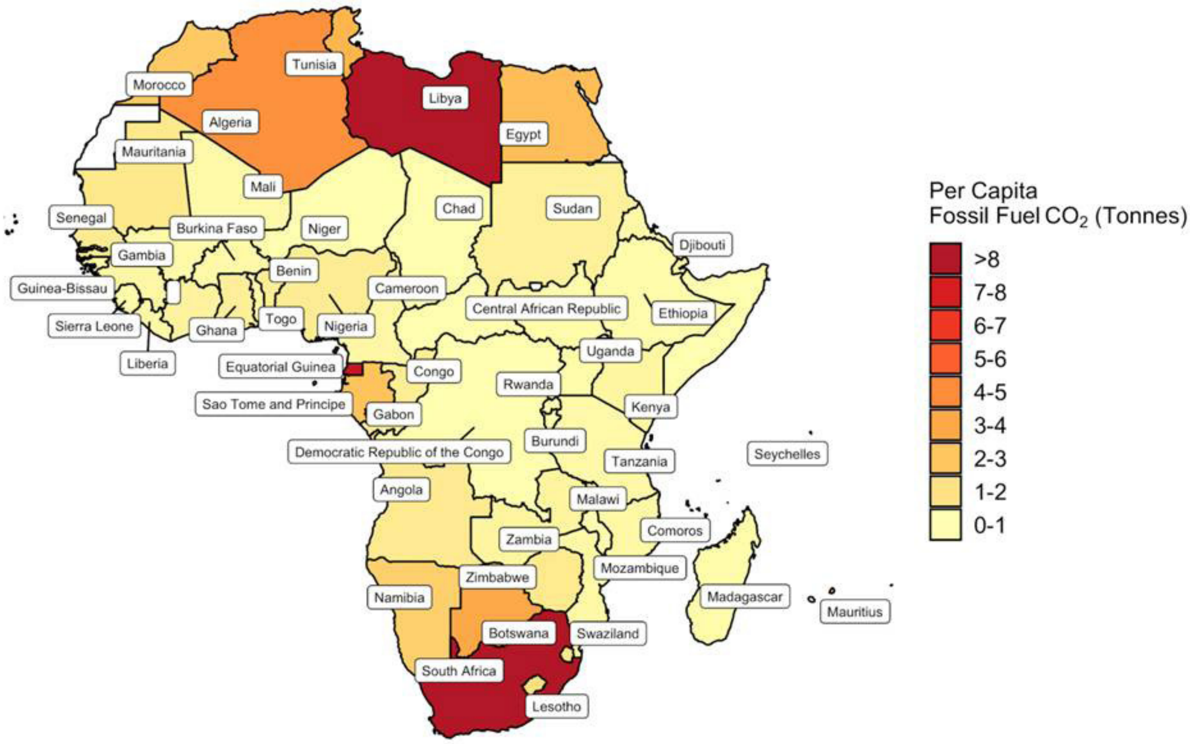
Nevertheless, concerns related to climate change must be integrated into Africa's future development plans. From the point of view of climate justice, Africa's development needs should be addressed by a fair share of carbon space assigned to the continent. The African continent is among those regions that require the largest share of resources for climate change mitigation and adaptation. It is imperative to initiate a comprehensive set of measures at the national and the international level to accelerate the flow of climate finance to Africa. Both Africa and the world need to leverage carbon credit markets to galvanise the green transition in the continent. There is also a need to articulate a coherent strategy for catalysing green growth in Africa. Furthermore, this strategy should define a green development pathway that is debt sustainable.

Appendix
Heat Maps

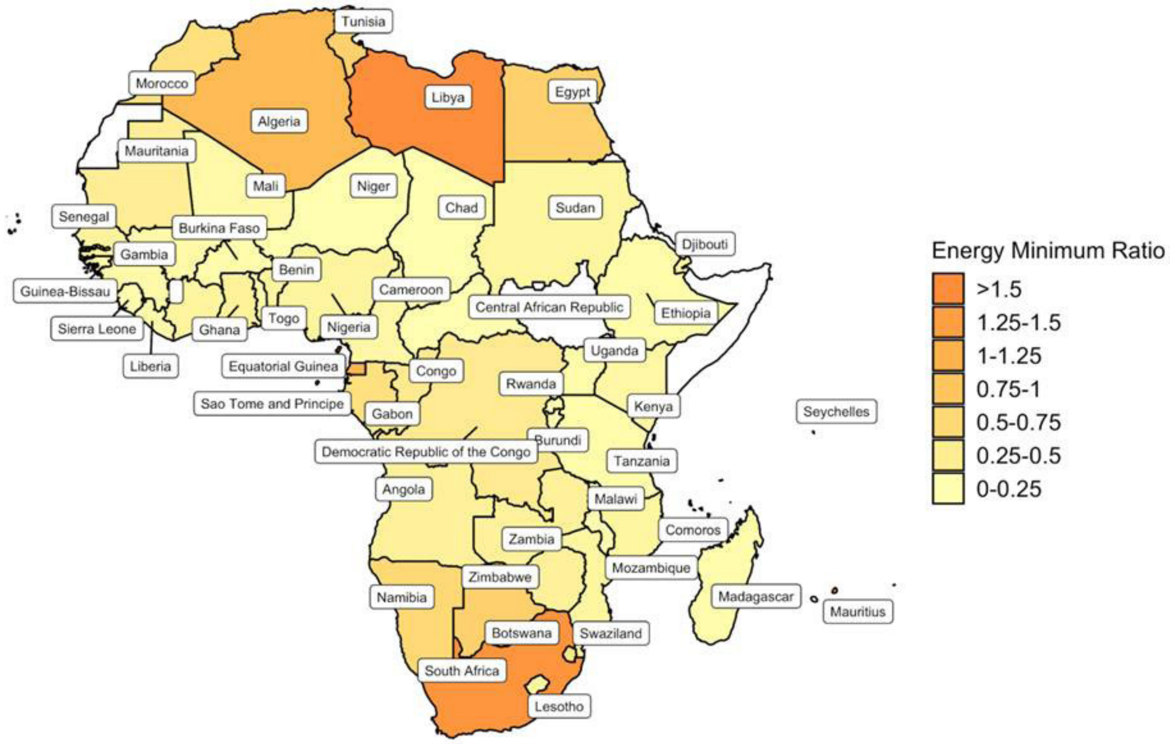
1. **GHG Emissions**



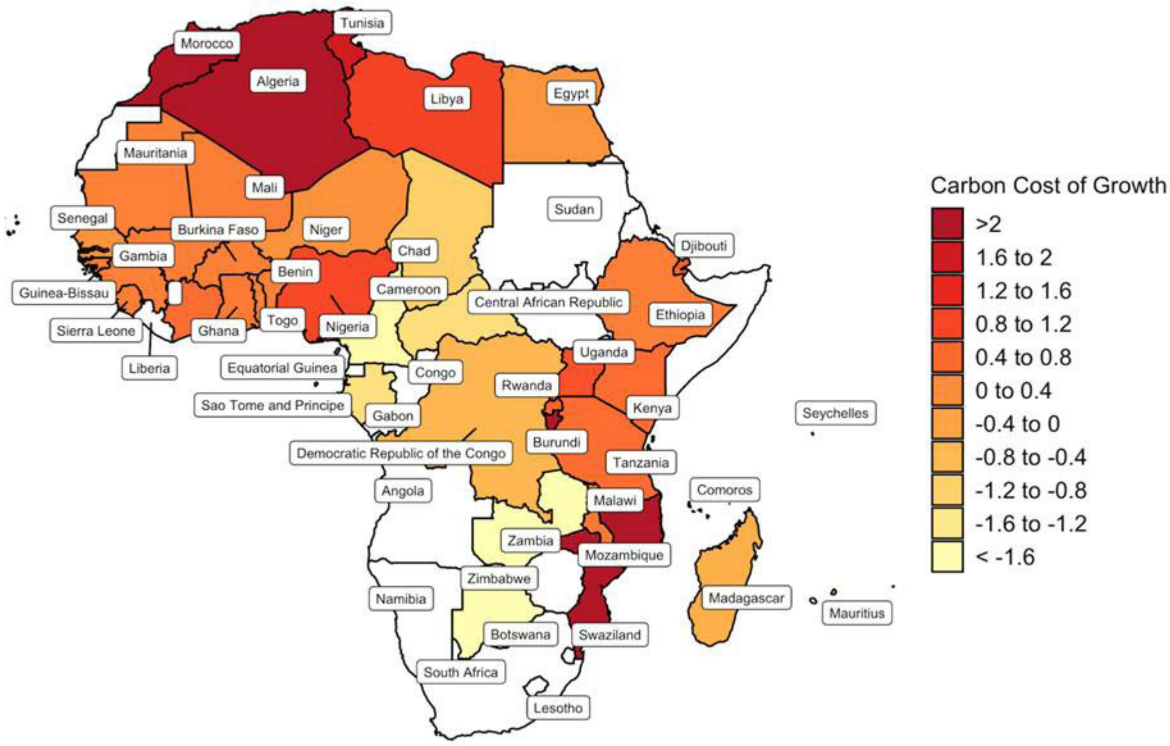
2. Per Capita CO_2



3. Per Capita Energy Use



4. Carbon Cost of Growth



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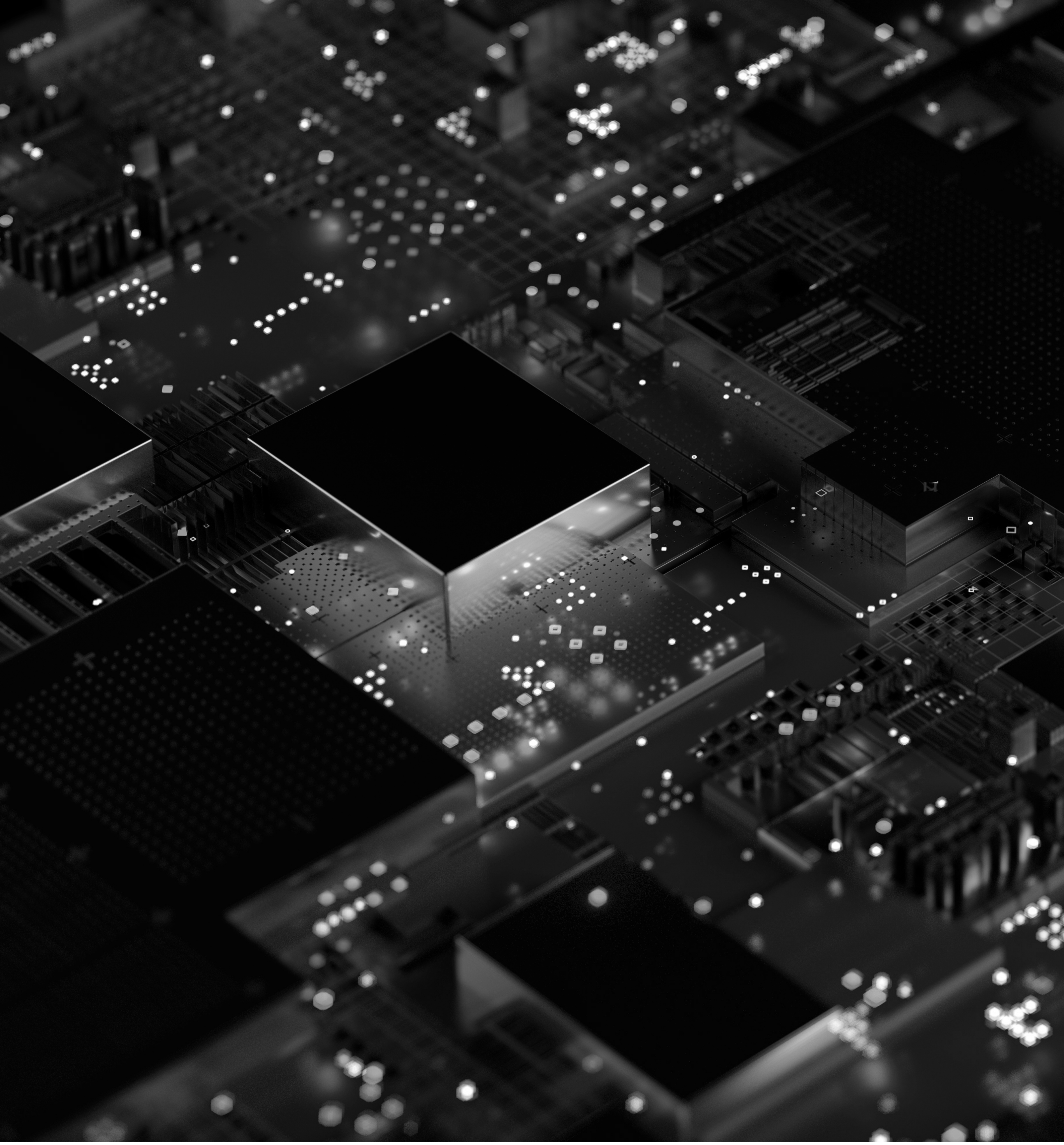

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