



*Global Majority E-Journal*



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# *Global Majority E-Journal*

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The *Global Majority E-Journal* is published twice a year and freely available online at: <http://www.american.edu/cas/economics/ejournal/>. The journal publishes articles that discuss critical issues for the lives of the global majority. The global majority is defined as the more than 80 percent of the world's population living in low- and middle-income countries. The topics discussed reflect issues that characterize, determine, or influence the lives of the global majority: poverty, inequality, population growth and gender issues, excluded and invisible children, unsustainable urbanization, climate change, lack of access to safe water and sanitation, and unethical trade. The articles are based on research papers written by American University (AU) undergraduate students as one of many course requirements for *Econ-110—The Global Majority*, which is an elective course within the New AU Core.

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## **Volume 13, Number 2 (December 2022)**

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# **A Rising Tide that Does Not Lift All the Boats: Ripple Effects of Urbanization in Brazil and South Africa**

Beining Dai

## ***Abstract***

*This article examines the current state of urbanization in Brazil and South Africa, including economic development in two countries whose main economic sources are tourism services, among others, but whose urbanization problems appear at two extremes. Furthermore, the reasons for the false urbanization in Brazil and the possible reverse urbanization in South Africa are briefly explained. The article analyzes the historical and geographical reasons for the large gap between the levels of urbanization among the two countries despite having similar levels of GDP per capita. The article also analyzes the various ripple effects of urbanization in Brazil and South Africa, such as various environmental and health problems. All these ripple effects have ethical implications that require policy changes by the two governments.*

## **I. Introduction**

Brazil and South Africa have different histories, political backgrounds, economic structures and levels of urbanization, but they are similar in terms of trends in economic development. According to the World Bank (2022), Brazil had an urban population of 87.1 percent in 2020, while South Africa's urban population has risen from 47.8 percent in 1970 to 67.4 percent in 2020. Despite the fact that “[n]o country in the industrial age has ever achieved significant economic growth without urbanization,” urbanization increases insecurity, rootlessness, the potential for violence and crime, and environmental problems, all of which are referred here in this article as ripple effects of urbanization.<sup>1</sup>

This article is divided into six sections: after this introduction (Section I), Section II summarizes some of the literature analyzing the different periods of urbanization in Brazil and South Africa. The third section analyzes how three key socio-economic indicators (gross domestic product (GDP) per capita adjusted for purchasing power parity (PPP), life expectancy and adult literacy rates) have evolved over time in the two countries. The fourth section presents an analytical comparison of key facts related to urbanization in both countries. The fifth section outlines ethical

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<sup>1</sup> United Nations Population Fund (UNFPA) (2007), p. 1.

concepts and frameworks related to policy solutions in both countries in the face of urbanization, before the last section provides some conclusions.

## II. Brief Literature Review

There is a large literature on urbanization in developing countries, including specifically for Brazil but there are relatively few studies focusing specifically on South Africa. Martine and McGranahan (2010) and Vicino and Fahlberg (2017) focus on Brazil, while Turok and Borel-Saladin (2014) focus on South Africa. Robertson (2019) covers mental health and urbanization in a variety of countries, including Brazil and South Africa. Chauvin, Glaeser, Ma and Tobio (2016) examine the difference of urbanization in Brazil, China, India and the United States. While each publication looks at different problems related to urbanization, all mention some ripple effects.

- Martine and McGranahan (2010) review the urbanization experience of Brazil, which has reached levels of urbanization that surpass those of most European countries. They acknowledge (p. 54) “that cities, and large cities in particular, have clear advantages in global economic competition and greater potential for improving their residents’ social conditions.” However, the prospects for sustained growth largely depend on the capacity of a country’s cities to compete in the current context of globalization. One of their key lessons for other urbanizing countries is that a regional approach is required to deal with the emerging problems as cities tend to become more spatially, politically and administratively fragmented.
- Vicino and Fahlberg (2017) use Brazil’s largest protest in history in June 2013 as an example to analyze the importance of improving urban life in the process of urbanization from the perspective of globalization and history. They also show how governments and citizens should respond to a variety of challenges, including especially population growth and social change in major cities.
- Turok and Borel-Saladin (2014) study the relationship between urbanization and living conditions in South Africa, highlighting the interaction between the economy, society and environment of a city. They also analyze whether other levels of urbanization in South Africa have a positive trend of synchronous development. They focus on the relationship between labor force growth and employment growth in cities of different sizes. Turok and Borel-Saladin (2014) also examine the ability of cities to provide infrastructure and explore the economic capacity needed to maintain the existing urban system to adapt to the new economic activities and alternative housing for low-income people in South Africa in terms of historical fault repair, resources and health protection.
- Robertson (2019) describes the impact of urbanization on mental health service provision in the Brazil-Russia-India-China-South Africa (BRICS) economic bloc and sub-Saharan Africa. Focusing on Brazil and South Africa, they find that in both countries, the urban health system has insufficient prevention and treatment facilities, and the urbanization process aggravates the shortcomings in the provision of care, including especially the neglect of health problems of vulnerable groups.
- Chauvin, Glaeser, Ma and Tobio (2016) examine the differences of urbanization across Brazil, China, India and the United States. For the implication of the spatial equilibrium hypothesis in Brazil, the authors point out that both the market and the social economy

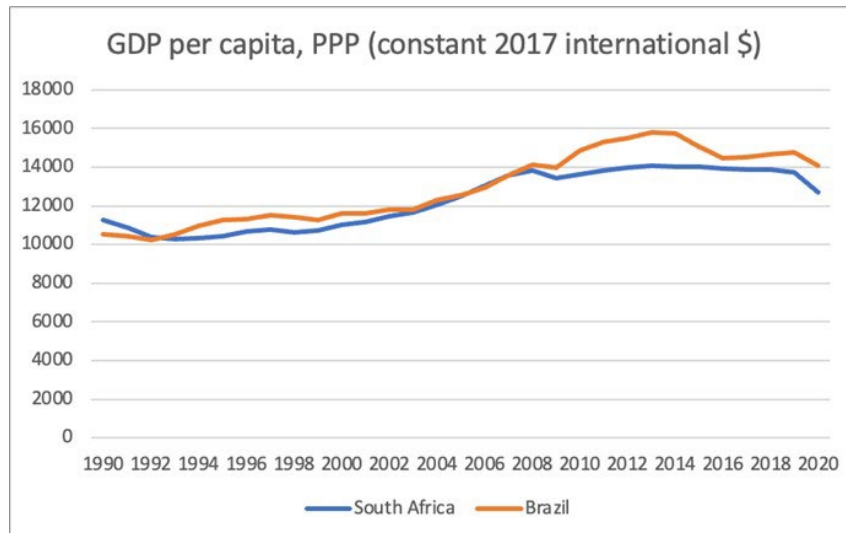
need human capital externalities. They come to the conclusion that differences in regional income growth and limited migration make it more difficult to develop a balanced real estate space.

### III. Socioeconomic Background

Brazil and South Africa are geographically located on two different continents, but they are both BRICS countries with similar economic strength. Yet, they have different technologies and different industrial sectors, and completely different vegetation distribution. As two developing countries, Brazil and South Africa have encountered the problem of urbanization in the process of economic development, and the chain reaction of different types of urbanization is also different. The socio-economic background of the two countries examined in this section provides more information on differences and similarities across the two countries in terms of GDP per capita, average life expectancy at birth and adult literacy.

Figure 1 shows PPP-adjusted GDP per capita in South Africa and Brazil in constant 2017 dollars from 1990 to 2020. South Africa's GDP per capita was \$11,261 in 1990 and reached \$12,666 in 2020. Brazil's GDP per capita was with \$10,521 a bit lower in 1990 but reached \$14,064 in 2020. Although the trend of GDP per capita over time is similar in both countries, Brazil surpasses South Africa in terms of GDP per capita growth from 2009 to 2013, after which the two countries' GDP per capita is again similar as Brazil's GDP per capita experienced a significant decline in 2015 and 2016.

**Figure 1: GDP per capita, PPP (constant 2017 international dollar)**

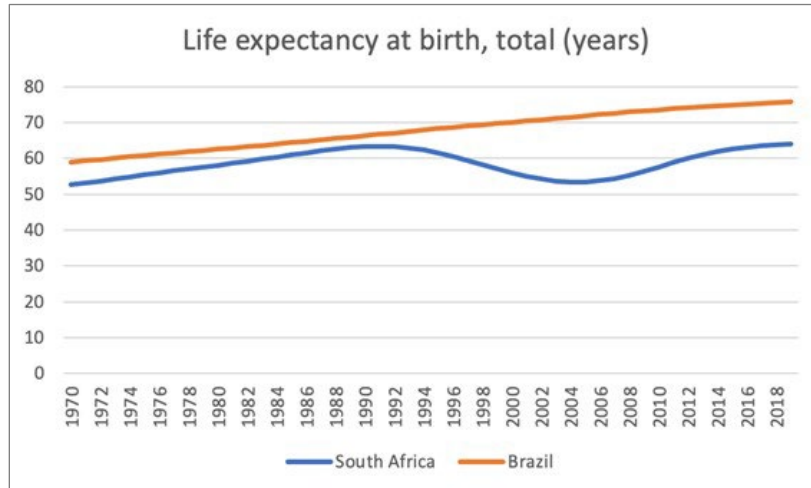


Source: Created by author based on World Bank (2022).

Figure 2 shows the evolution of life expectancy in South Africa and Brazil from 1970 to 2019. In 1970, the average life expectancy in South Africa was 52.6 years and increased steadily to 63.4 years in 1991 and then began to slow down to 53.4 years in 2004 before increasing again and reaching 64.1 years in 2019. Brazil's average life expectancy was 58.9 years in 1970, and has been

increasing steadily over the past five decades, reaching 75.9 years in 2019, a considerably higher level than South Africa.

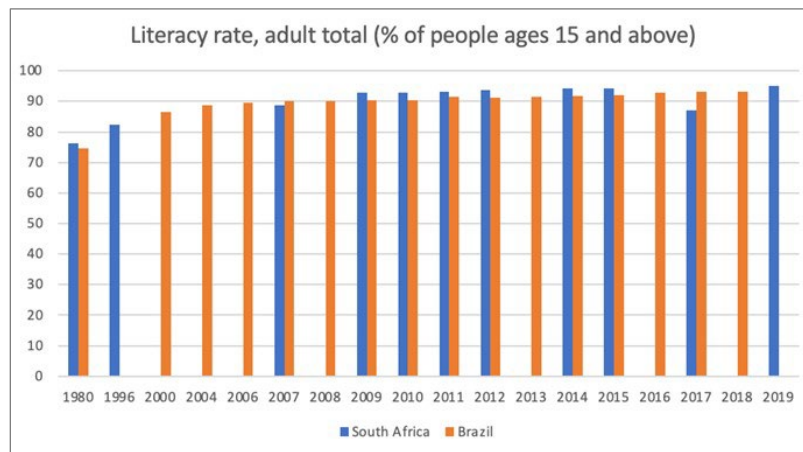
**Figure 2: Adult Life Expectancy at Birth (years), 1970-2019**



Source: Created by author based on World Bank (2022).

As shown in Figure 3, the adult literacy rate of Brazil and South Africa has increased in line with the increase in GDP per capita and life expectancy. Overall, Brazil’s adult literacy rate has been increasing from 74.6 percent in 1980 to 93.2 percent in 2018, with the fastest increase happening from 1980 to 2007, while the period from 2007 to 2018 shows relatively little progress.

**Figure 3: Adult Literacy Rate (percent of people ages 15 and above)**



Source: Created by author based on World Bank (2022).

For South Africa, the overall trend in adult literacy rates has been more volatile than in Brazil. South Africa’s adult literacy rate increased significantly from 76.2 percent in 1980 to 92.9 percent in 2009, it then increased slowly to 94.4 percent in 2015, but suddenly dropped to 87.0 percent in 2017. It then returned to its previous high level two years later in 2019. Comparing the two

countries for the few years we have data for both countries, it is interesting to note that South Africa's adult literacy rate was higher than Brazil's in 1980, then lower in 2007, then again higher from 2009 to 2015, while being significantly lower in 2017.

## **IV. Analysis of Facts**

This analysis of facts related to urbanization in Brazil and South Africa is divided into two subsections. The first subsection outlines some key facts related to the urban populations of Brazil and South Africa, mainly by showing the history of urbanization in both countries and what factors have contributed to the rapid economic development of both countries through the change in the proportion of urban population in both countries, as well as an analysis and comparison of the proportion of urban population living in slums and the proportion of urban population living in the largest cities. The second subsection presents data on some aspects related to urbanization in both countries, such as environmental and health issues.

### **IV.1. History of Urbanization**

Brazil and South Africa have experienced similar economic development but have different histories of urbanization. Brazil's urbanization began as a colonial economy based on exporting agricultural products. Then, the discovery of precious metals led to the establishment of inland cities during the mining era, the expansion of the original cities and the emergence of new cities in the early nineteenth century. This led to a dramatic increase in the population of Rio de Janeiro and rapid urban development, followed by the export of coffee cultivation and the establishment of railroads. These developments gave Brazil's urbanization a boost and material support, followed by mass immigration. The subsequent industrialization led to the further development and modernization of major cities.<sup>2</sup>

South Africa is known for its rich mineral resources such as diamonds and gold, as well as its agricultural development, which makes it one of the world's leading exporters of crops. The Dutch entered South Africa as early as the 17th and 18th centuries with their seafaring skills, and subsequently these native white elites played a crucial role in the early development of South Africa. The subsequent discovery of diamonds and gold in 1867 and 1886 ushered in a large number of European immigrants thus changing the demographic structure and traditional agricultural economy of South Africa. Because of its geographic distance from the world wars, industrial development and economic prosperity showed a different historical course than in many other African countries. However, a complex racial situation with severe racial discrimination, especially the so-called system of apartheid constrained South Africa's development.<sup>3</sup>

#### *IV.1.a. Changes in the Proportion of Urban Population*

As shown in Figure 4, the urban populations of both Brazil and South Africa have shown different patterns of growth over the last fifty years, with the proportion of Brazil's urban population initially growing faster than South Africa's. In 1970, the difference between the two countries was small, with 55.9 percent of the Brazilian population living in urban areas and 47.8 percent of the South African population living in urban areas. The gap between the two countries then grew, reaching its maximum in 2000, with a difference of 24.3 percentage points. The gap then decreased, and the

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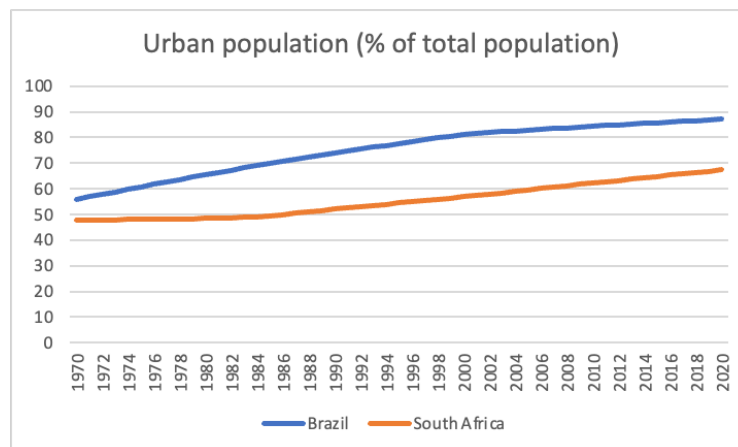
<sup>2</sup> This paragraph is mostly based on Martine and McGranahan (2010).

<sup>3</sup> This paragraph is partly based on information provided in Turok and Borel-Saladin (2014).



two countries show similar trends from 2014 onwards. By 2020, Brazil had 87.1 percent of its population living in urban areas while South Africa had 67.4 percent of its population living in urban areas, hence a large gap of some 20 percentage points still exists in the share of the urban population between the two countries today.

**Figure 4: Urban Population (percent of total population)**

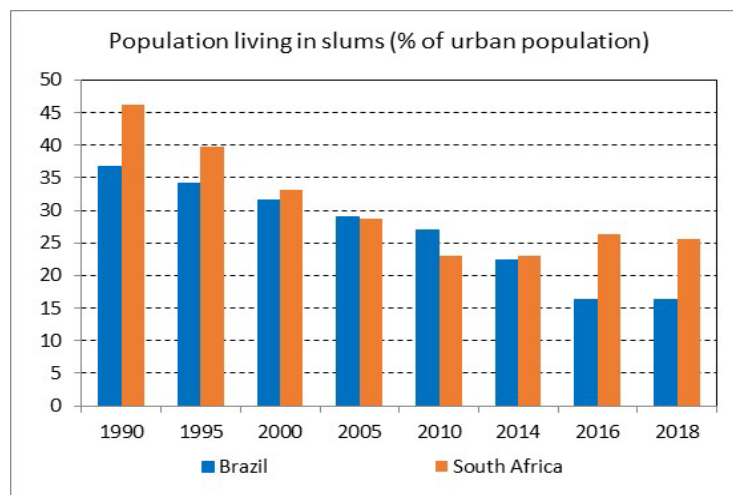


Source: Created by author based on World Bank (2022).

#### *IV.1.b. Slums and Concentration of Population in the Largest Cities*

Urban population ratios are useful quantitative indicators of urbanization but say little about the quality of urbanization. One partly qualitative indicator is the percentage of the urban population living in slums, which is shown in Figure 5. In 1990, 36.7 percent of Brazil’s urban dwellers lived in slums, while a shocking 46.2 percent of South Africa’s urban dwellers lived in slums in the same year. Since then, the urban slum-dwelling population has declined at different rates in the two countries, with South Africa improving faster than Brazil and the two countries having almost the same share in 2005, with 29.0 percent in Brazil and 28.7 percent in South Africa.

**Figure 5: Percentage of Urban Population Living in Slums, all available years**

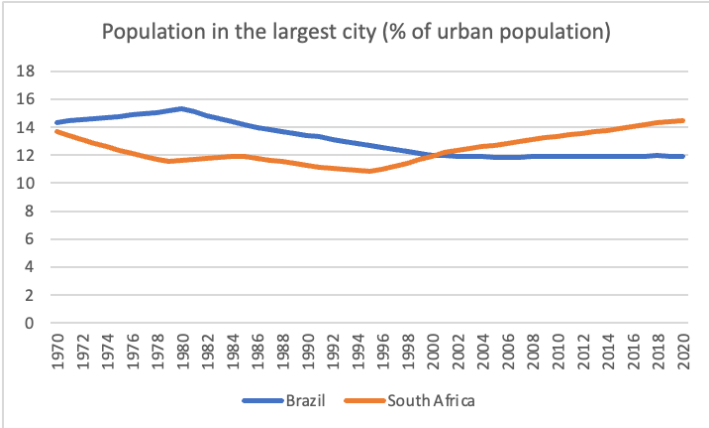


Source: Created by author based on World Bank (2022).

By 2010, Brazil’s urban slum population decreased to 26.9 percent compared to South Africa’s, which decreased to 23.0 percent. By 2016, Brazil’s slum-dwelling population had declined further to 16.3 percent of the urban population and remaining at about that level in 2018. In South Africa, on the other hand, the percentage of the urban population living in slums stagnated from 2010 to 2014, after which it increased to 26.3 percent in 2016, before finally making modest progress, reducing it to 25.6 percent in 2018. All in all, the increase in South Africa’s slum population was small, but dilutes the advantages of urbanization, indicating that South Africa is not doing enough or is affected by other factors, while Brazil’s situation has been improving more smoothly.

The task of reducing the share of the population in slum cities is complicated by higher fertility rates in slums and continued migration from poor rural areas into slums. As Figure 6 shows, while the share of the urban population in the country’s largest city has been decreasing in Brazil since 1982, it has been increasing in South Africa since 1996. The share of the urban population living in South Africa’s largest city (Johannesburg) increased significantly from 11.0 percent in 1996 to 14.5 percent in 2020. On the other hand, the share of the urban population living in Brazil’s largest city (São Paulo) has been increasing from 14.3 percent in 1970 to 15.1 percent in 1981. It then declined steadily to 11.9 percent in 2020, hence, ending up 2.6 percentage points lower than in South Africa. Interestingly, the two countries have alternated between increasing and decreasing trends of the urban population living in the largest city, implying that the problems are different in the two countries and that the process of solving them are therefore also different.

**Figure 6: Population in the Largest City (percent of urban population), 1970-2020**



Source: Created by author based on World Bank (2022).

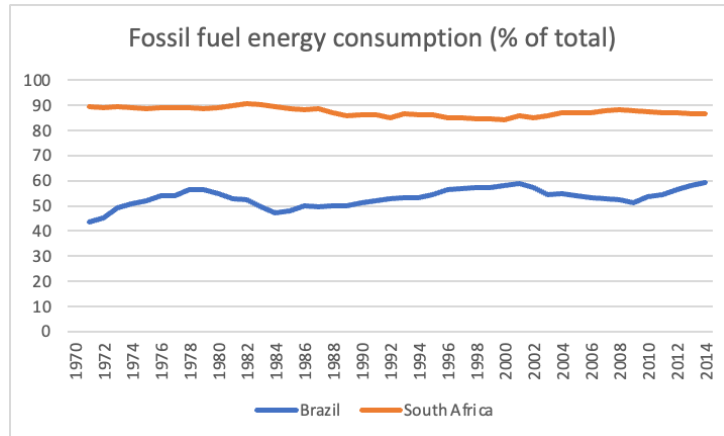
**IV.2. Specific Aspects of Urbanization**

The small but densely populated slum areas of Brazil and South Africa are – combined with industrialization – causing a variety of environmental and health problems.

*IV.2.a. Environmental Problems*

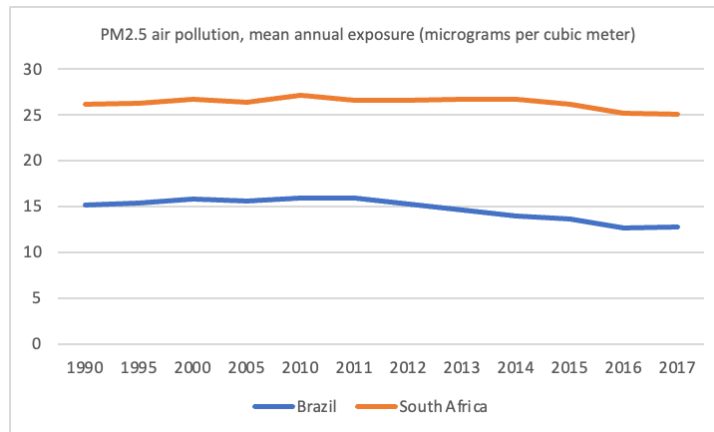
Urbanization and industrialization are expected to lead to an increase in the percent of fossil fuel energy consumption, an increase in pollution and per capita carbon dioxide emissions. However, as shown Figures 7 to 9, the overall trends for these three indicators do not confirm this. The evolution of these three indicators shows an overall stable trend for both countries. The levels for all three indicators are however higher in South Africa than in Brazil.

**Figure 7: Fossil Fuel Energy Consumption (percent of total)**



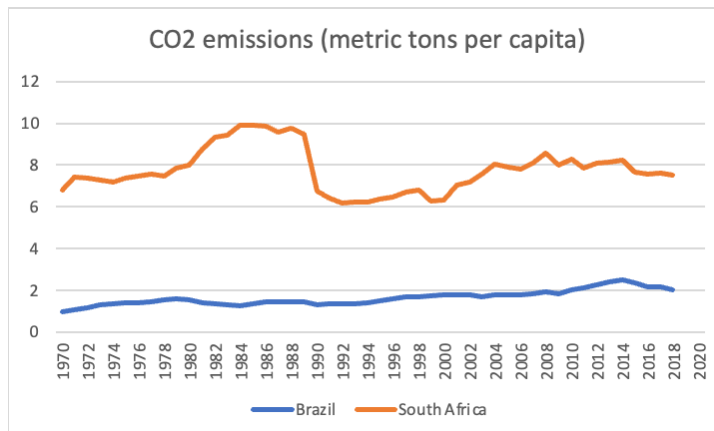
Source: Created by author based on World Bank (2022).

**Figure 8: Mean Annual Exposure to PM2.5 Air Pollution (micrograms per cubic meter)**



Source: Created by author based on World Bank (2022).

**Figure 9: Carbon Dioxide (CO<sub>2</sub>) Emissions (metric tons per capita)**



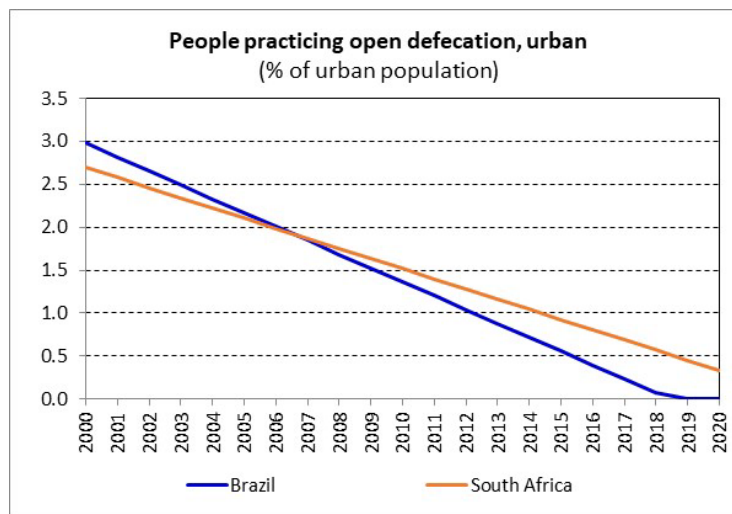
Source: Created by author based on World Bank (2022).

#### IV.2.b. Health-related Issues

In addition to environmental pollution caused by emissions from industrial production and various types of transportation, there are also factors of personal hygiene, such as the behavior of people defecating in the open. For example, the microbial bacteria in excrement pollute water quality through surface runoff, water circulation and other transmission routes. Fortunately, as can be seen in Figure 10, this phenomenon has been reduced for the urban population in both Brazil and South Africa.

In year 2000, 2.9 percent of the Brazilian urban population and 2.7 percent of South Africa's urban population practiced open defecation. Brazil then decreased the problem of open defecation faster than South Africa, finally remaining completely free of this phenomenon after 2019, while in South Africa a marginal 0.45 percent of the urban population still practiced open defecation in 2020. The policy of prohibiting and punishing the practice, the improvement of the education and personal qualities of the population, and the improvement of infrastructure such as the increase of the number of public toilets have helped to reduce open defecation.

**Figure 10: Urban Population Practicing Open Defecation (percent of urban population)**



Source: Created by author based on World Bank (2022).

On the other hand, relatively little progress has been made with decreasing the incidence of malaria and tuberculosis. As Figures 11 and 12 show, while the incidence of malaria is far higher in Brazil than in South Africa, the incidence of tuberculosis is far higher in South Africa than in Brazil.

From Figure 11, we can see that the incidence of malaria in Brazil reached a peak of 22 cases per 1,000 population in 2000, and after several ups and downs, the overall situation has eased, remaining at 5 cases per 1,000 population in 2017, but nevertheless remains a critical health issue. The overall incidence rate of malaria is far lower in South Africa than in Brazil. The incidence of malaria in South Africa has been fluctuating, peaking at 5.8 cases per 1,000 people in 2001, falling to a low of 0.2 cases per 1,000 people in 2015, and then rising to four cases per 1,000 people in 2017 before finally falling back to 1.6 cases per 1,000 people in 2018.

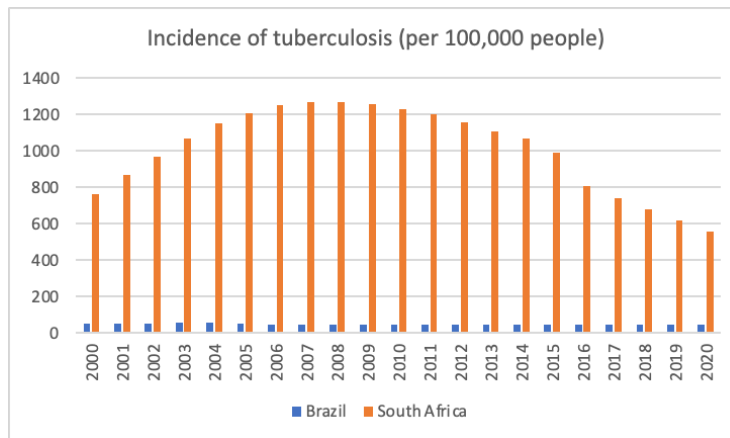
**Figure 11: Incidence of Malaria (per 1,000 population at risk), 2000-2018**

As detailed in the text.

Source: Created by author based on World Bank (2022).

Figure 12 shows that in South Africa, the incidence of tuberculosis has increased from 762 cases per 100,000 people in 2000 to 1,270 cases per 100,000 people in 2008, after which it decreased to 580 cases per 100,000 people in 2020. In Brazil, the incidence of tuberculosis has been a fraction of South Africa's incidence and remained relatively stable at around 47 cases per 100,000 people from 2000 to 2020.

**Figure 12: Incidence of Tuberculosis (per 100,000 people), 2000-2020**



Source: Created by author based on World Bank (2022).

## V. Ethical Analysis

The first subsection of this ethical analysis focuses on describing ethical origins and existing ethical structures of urbanization in Brazil and South Africa. It examines some of the policies that have been used in both countries to ameliorate some of the problems caused by urbanization and how these policies can reduce the percentage of people living in slums as well as improve the allocation of resources such as urban land and employment opportunities. The second subsection relates the Universal Declaration of Human Rights and the framework of ethical standards to modern urbanization.

### V.1. Ethical Origins

Both Brazil and South Africa have problems caused by urban population growth and rural-urban migration, which have been reduced but remain difficult to solve. There remains a lack in the quality of urban life, infrastructure and especially health care in both countries due to poor land use and inadequate resource allocation. This subsection examines the reasons for the lack of urban services in both countries based on an ethical analysis and reviews to some extent how governments can improve the situation.

### *V.1.a. Ethical Origins in Brazil*

In Brazil, where demographic urbanization preceded economic urbanization and the urbanization rate surpassed that of most industrialized countries, urbanization came at the cost of creating a large number of slums. The interaction between household mobility and housing supply elasticity then makes the imbalance in urban economic growth apparent as the supply of low-income housing is more flexible than the supply of quality-housing in response to changes in market conditions.

At the same time, as the population of the largest cities increases to near saturation levels, the process of urbanization spreads to other high wage cities such as the second largest cities and leads to the escalation of slums and high demand for urban services.<sup>4</sup> The unresolved slum problem is related to the large number of unemployed people caused by forced industrialization and forced urbanization. The government's policy of high taxation has invested in the construction of industrial parks rather than in public education and health, while the government's use of administrative land acquisition has created a poor and poorly qualified workforce.

On this basis, the Brazilian government's approach to slums was inadequate. Specifically, the government increased employment opportunities by providing large subsidies to businesses and through economic projects such as the creation of parks and infrastructure, while creating the National Housing Bank and the Urban Planning Service in 1964 to handle urban planning and low-income housing. Similarly, the government encouraged and supported private sector financing of housing development.

However, the lack of government guarantees in the implementation process has resulted in a vicious circle in which resources are not really distributed equitably as intended, subsidies are misappropriated by corporations for their own benefit, and housing benefits are disguised by real estate companies, whose primary responsibility and provision of housing remains with the rich and powerful. In short, the actual problems of training, employment and housing for the poor are beyond the control of the government, the gap between the rich and the poor is growing, and there is a real concentration of land and resources in the hands of a few, which implies a moral failing.<sup>5</sup>

### *V.1.b. Ethical Origins in South Africa*

In the 1940s, in response to the growing number of African people entering the cities, the government introduced apartheid policies to avoid the urbanization of Africans, but while the capital-intensive industrial development strategy provided more skilled jobs for Africans, the contradiction between this strategy and the apartheid education system led to structural unemployment in the cities. Moreover, under apartheid, in addition to the formal employment discrimination enshrined in South Africa's legal system, black South Africans were severely restricted in their choice of residence and forced to live in their own homelands.

While they were able to move freely after the abolition of apartheid, the cost of distance to move continued to affect the inflow of rural people from different urban areas. This population distribution emphasizes the complementarity between low-skilled and high-skilled labor in urban areas, but not in rural areas. In other words, if the foreign population hits both urban and rural

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<sup>4</sup> Alves (2021).

<sup>5</sup> Martine and McGranahan (2010).

areas, it will increase the proportion of the population living in the cities, which in turn leads to the growth of slums.<sup>6</sup>

Geyer Jr, Geyer, du Plessis and Eeden (2012) also suggest that the periphery of large South African cities generally tends to decentralize development rather than grow indefinitely within the city, and that this trend of migration from large urban agglomerations in South Africa illustrates the delayed urbanization of low-income urban migrants despite the fact that productivism is an active driver of urbanization. More importantly, they show that socio-economic factors such as high land costs and traffic congestion in central areas play a role in the housing problem, and that South African cities still need to work on integrating social urban spaces.

As an example, the Reconstruction and Development Programme (RDP) in South Africa is providing housing for the poor, but due to high unemployment and low incomes, many people are not eligible for housing, and the ensuing poverty and housing crisis is reoccurring. At the same time, the government's existing redevelopment program, which involves building houses on cheap and readily available land far from the city, means that the land is not being used efficiently and results in a lot of money being spent on transportation for many people. In short, building good housing and infrastructure closer to the city could go a long way to alleviating this problem of spatial dislocation, which could be followed by reducing the number of slums in South Africa through increased subsidies and rental options or by reshaping slums by design to improve housing quality.

Turok and Borel-Saladin (2014) also do find that there is capacity for building infrastructure for cities of different sizes including formal housing and alternative housing construction for low-income South Africans, and that these combinations can also improve resources and health as well as maintain existing urban systems to accommodate new economic activity. Furthermore, "during the course of HABITAT III, one of South Africa's most crucial urbanization summits, the establishment of a new urban agenda was reaffirmed. The aim of the summit is to set South Africa on the path of achieving sustainable urban development."<sup>7</sup> As a result, the South African government has a moral responsibility to recognize the need for long-term planning for urbanization issues.

## **V.2. Ethical Concepts and Frameworks for Urbanization**

Article 13 and article 25 of the UN's Universal Declaration of Human Rights (1948) state respectively that "everyone has the right to freedom of movement and residence within the borders of each state" and that "everyone has the right to a standard of living adequate for the health and well-being of himself and of his family". These basic rights relate to the rightful abolition of apartheid in South Africa but at the same time the legacy of the policy needs to be addressed. Moreover, it is an ethical argument for the simple needs of people and their basic right to happiness, that the state and government should not drive away the poor or restrict the rural-urban influx or migration, but rather support them as much as possible and identify the real causes of the slum problem and compare the different urbanization problems in Brazil and South Africa in order to find a positive and sustainable model of urban development.

Ethical inferences are also essential. Specifically, the distribution and domination of benefits and subsidies for housing and employment for the poor by the powerful in Brazil, corporations and

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<sup>6</sup> Bakker, Parsons and Rauch (2020).

<sup>7</sup> Ekkannath (2017), p. 9.

real estate companies, the irrational use of land for housing construction in South Africa, and the racial discrimination in the migration of black South Africans to white South African areas or other urban centers and employment issues, all violate the same basic ethical principles or impede the right of the poor to live in cities.

From a philosophical point of view, among the five approaches for ethical decision making summarized by the Markkula Center for Applied Ethics (2009), the utilitarian approach and the common good approach seems the most applicable ethical frameworks to modern urbanization. Since the utilitarian approach, as philosophers have emphasized, focuses on producing the greatest balance of benefits over harms, reducing the gap between rich and poor by providing more jobs and infrastructure while directing urbanization into a sustainable development model is maximizing the benefits of urbanization. And when the housing and health security of the poor or immigrant population gathered in slums is improved and they are no longer marginalized but enter into a fair and virtuous economic model, the country's workforce and population quality will grow significantly and contribute to a virtuous cycle in the national economy, with more innovative ideas and human resources to find new materials or recyclable alternatives to protect the environment.

For the common good approach, it emphasizes that it is important to focus on the well-being of each individual, because people are interconnected and the collective or community is better off when the individual is better off. Hence, when the state and the government are aware of the needs of the people especially the disadvantaged and find solutions, the whole country will be better. For example, Robertson (2019) describes the lack of prevention and treatment facilities in urban health systems resulting from the urbanization process in Brazil and South Africa together, thus neglecting the health problems and care needs of vulnerable populations.

Therefore, the executives who identify the problem need to call on the general public to be aware of the problem and put aside discriminatory ideas such as race and gender to help each other and even influence the future career plans of some people such as becoming doctors. In summary, the continuing problems are a challenge for developing countries with growing economies and increasing urbanization, but policy changes in the right direction and moral support will make urban planning better and more effective.

## **VI. Conclusion**

Both Brazil and South Africa have experienced significant levels of urbanization, mostly due to migration from rural to urban areas. This article examined the phenomenon of urbanization in these two countries and the complex chain reactions associated with it. It also analyzed the interventions in the governance process from an ethical perspective. Though the percentage of the urban population living in slums has been reduced, environmental and health problems as well as employment pressures and economic inequality remain. Better policies need to be adopted and implemented without being prevented by the powerful elite. Both governments have a moral obligation to increase education and awareness in order to give more equitable opportunities and resources. They have to try to understand their respective urbanization trends in order to being able to identify the advantages and disadvantages of different kind of urbanizations. They have to invest in infrastructure such as housing, water and health care, and more broadly, focus on sustainable development.



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# **What is There to Drink? The Lack of Access to Clean Water in Ethiopia and the Democratic Republic of the Congo**

Ally Fox

## ***Abstract***

*This article looks at the drinking water situation in both Ethiopia and the Democratic Republic of the Congo. Both of these countries rank extremely low when it comes to access to clean water and sanitation, despite various domestic and international agencies and programs that have intended to help both countries. This article analyzes why this lack of access to clean water and sanitation exists in these two developing countries and what some ethical implications are. It also examines how the two governments and other organizations attempted to help with the issue.*

## **I. Introduction**

A lack of access to clean water is extremely dangerous to any type of community affected. Many people and global organizations recognize having clean water as a human right. Unfortunately, more than 750 million people around the world did not have access to safe water in 2020, and more than 3 billion people did not have access to proper sanitation in 2020.<sup>1</sup> Poorer communities are more likely to suffer from these conditions. Additionally, there is a large contrast between the situations in rural and urban areas within these countries that already struggle. Due to the detrimental effects that are occurring from these unethical situations, the global community must face this problem head-on.

This article is a case study of the Democratic Republic of the Congo (DRC) and Ethiopia. It explores the ways in which a lack of access to clean water has impacted these two countries through a lack of clean drinking water and sanitation issues that have become so serious that it leads to fatalities, thus affecting mortality rates. This article analyzes water-related data for both countries and discusses the ethical issues and decision makings surrounding the issue.

After this introduction, the article begins with a literature review outlining some of the prior research conducted regarding clean water access in the DRC and Ethiopia. Following the literature

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<sup>1</sup> World Bank (2022).

review, the article provides some socioeconomic background for the two countries. Next, the article provides visuals such as graphs and charts to show the impacts of the water crisis in the DRC and Ethiopia before reviewing the issue under several ethical lenses. Finally, the article offers insights and recommendations for possible solutions and what the next steps are to improve access to clean water.

## II. Literature Review

There is a satisfactory amount of literature on the lack of access to clean water in both Ethiopia and the DRC. For the most part, there has been an increase in publications during the past few years as the issue has continued to worsen during recent crises such as the COVID-19 pandemic, and more international agencies have attempted to help. This has all led to more research on the issue. Jgarkava (2021) and Adane, Swedenborg and Yohannes (2021) discuss the water crisis in Ethiopia, with the former focusing on the issue itself while the latter focuses on suggestions and attempts for improvement. Similarly, Bokor (2020) focuses on the DRC's water crisis as a whole, while Partow (2011) prioritizes suggestions to attempt to fix the problem. For the most part, the authors all discuss the causes and effects of the lack of access to clean water in these two countries.

- Adane, Swedenborg and Yohannes (2021) focus on the strategies to improve the water crisis in Ethiopia, providing background information on the situation before elaborating upon the three main suggestions. The article elaborates upon the benefits of creating a balance between water withdrawals and water supply, building water resilience-based strategies, as well as creating a plan for transformation across sectors. Furthermore, there is an emphasis on the idea of how sustainable socio-economic growth is dependent on quality approaches to fix the water problem.
- Bokor (2020) describes the DRC's water crisis by elaborating upon the impacts of the crisis, lessons learned from the issue, the consequences or challenges that now persist because of it, and recommendations on fixing the issue. The article details how a lot of the issues stem from a lack of infrastructure and sanitary issues, sometimes even resulting from practices of the citizens themselves. Additionally, the challenges are separated via sub-sectors, including urban and rural sectors, thus showing how there are different causes and effects of the issue in each region of the country.
- Jgarkava (2021) reviews Ethiopia's access to clean water, primarily focusing on the water crisis in Ethiopia, the health consequences of the issue, and any progress made. The article details how the issue is primarily a problem in rural parts of the country, and how it leads to many water-borne illnesses such as cholera and diarrhea, as well as issues such as malnutrition, inadequate hygiene, and other sanitation issues. Multiple organizations and charities are attempting to help the situation, as seen by projects such as the "Water and Gasi Spring Project", which have all been funded to serve the people struggling in this situation.
- Partow (2011) discusses the water crisis issue in the DRC while building up to a conclusion of opportunities to fix the ongoing water crisis in this country. Most of these recommendations are infrastructure-based, prioritizing water sector governance reform, technical and institutional capacity building, and the establishment of scientific information about the crisis.

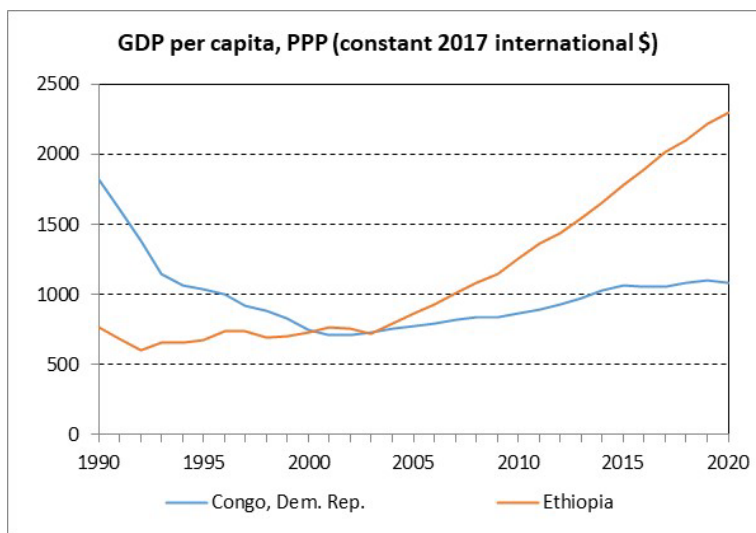
### III. Socioeconomic Background

The DRC is located in Sub-Saharan Africa and had a population of 89.5 million in 2020. It is currently classified as a low-income country, with most of its gross domestic product (GDP) in 2020 originating from the agriculture sector. In 2020, 4.5 percent of the workforce were unemployed. In 2016, 50.7 percent of the population had completed lower secondary education at the age of 25 or older.<sup>2</sup>

Ethiopia is also located in the Sub-Saharan part of Africa, with a population of almost 115 million in 2020. Like the DRC, Ethiopia is also classified as a low-income country and most of Ethiopia's GDP also comes from its agricultural sector. As of 2011, only 12.5 percent of the population had completed lower secondary education at the age of 25 years or older.<sup>3</sup>

As shown in Figure 1, the DRC's purchasing power parity (PPP)-adjusted GDP per capita (in constant 2017 international dollars) saw a drop from 1990 until 2001, reflecting the DRC's unstable political situation during those years. Since then, there has been a nearly steady but only slight increase, reaching \$1,082 in constant 2017 international dollars. Ethiopia has shown a different pattern, with an overall steady GDP per capita from 1990 to 2003, followed by a solid increase, reaching a GDP per capita of \$2,296 in constant 2017 international dollars in 2020.

**Figure 1: GDP per capita, PPP (constant 2017 international \$), 1990-2020**



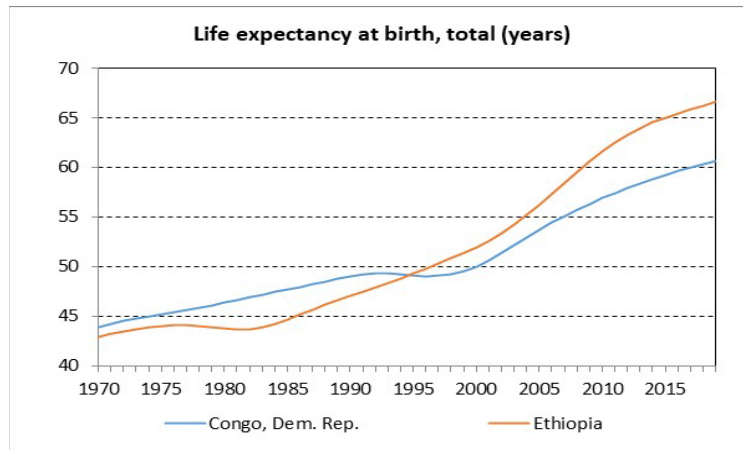
Source: Created by author based on World Bank (2022).

Along with an increase in GDP per capita over time for both countries since 2004 comes an overall steady increase for both countries in life expectancy, as shown in Figure 2. In 1970, the DRC's life expectancy was 43.9 years, and in 2020 it was 60.7 years, thus reflecting an increase of almost 17 years. In Ethiopia, the life expectancy was 42.9 years in 1970, and in 2020 it had reached 66.6 years, thus an increase of 23.7 years in life expectancy.

<sup>2</sup> This paragraph is based on World Bank (2022).

<sup>3</sup> This paragraph is based on World Bank (2022).

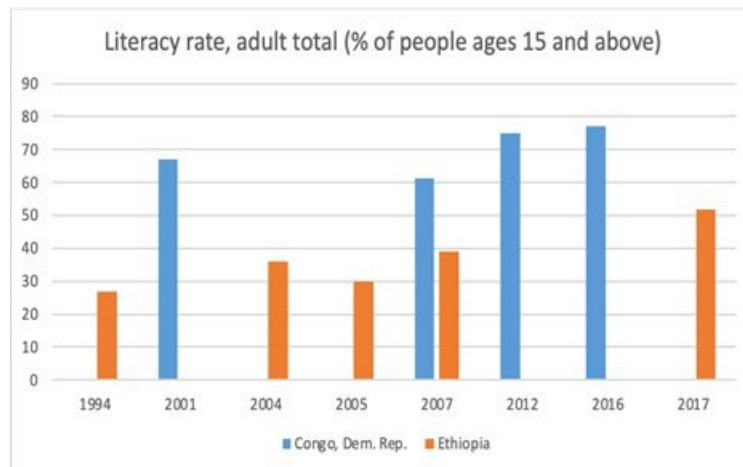
**Figure 2: Life Expectancy at Birth (years), 1970-2019**



Source: Created by author based on World Bank (2022).

Furthermore, even though Ethiopia’s GDP per capita has been higher than in the DRC since 2003, literacy rates (shown in Figure 3) have always been higher in the DRC than in Ethiopia. Both countries have seen some volatility in their literacy rates, with DRC experiencing a decline from 2001 to 2007, while Ethiopia experienced a decline from 2004 to 2005. Both countries saw moderate increases in more recent years, with the DRC reaching a literacy rate of 77 percent in 2016 and Ethiopia reaching a literacy rate of 52 percent in 2017.

**Figure 3: Adult Literacy Rate (percent of people 15 years and above)**



Source: Created by author based on World Bank (2022).

In terms differences across gender, in the DRC, as of 2016, the literacy rate for females 15 years and older was 66.5 percent, but for males 15 years and older the literacy rate was 88.5 percent.<sup>4</sup> In Ethiopia, women 15 years and older had a literacy rate of 44.4 percent in 2017, whereas men 15 years and older had a 59.2 percent literacy rate in the same year.<sup>5</sup> Therefore, Ethiopia experiences

<sup>4</sup> World Bank (2022).

<sup>5</sup> World Bank (2022).

less gender inequality in terms of literacy rates than the DRC. However, there is still a lot of gender inequality in both countries, even if in varying degrees.

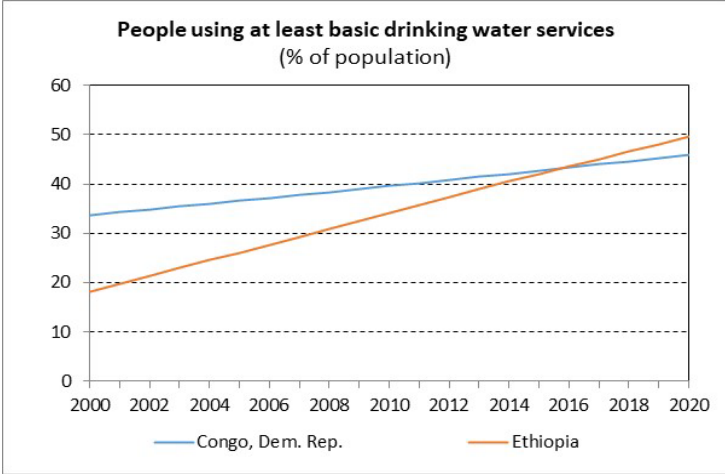
#### IV. Analysis of Facts

This analysis of facts is divided into two subsections. The first subsection examines access to basic water services while the second subsection examines access to sanitation in the DRC and Ethiopia.

##### IV.1. Access to Basic Water Services

When comparing access to safe water, it is important to analyze the percentage of people who have access to at least basic drinking water services. As shown in Figure 4, while both countries continue to have access rates below 50 percent, progress made over time has been different for the two countries. In year 2000, Ethiopia had a much lower share (18 percent) of the population using at least basic drinking water services than the DRC (34 percent). However, by 2020, 49 percent of Ethiopia’s population had access to basic drinking water services, while only 45 percent of the DRC’s population had access to basic drinking water services.

**Figure 4: People Using at Least Basic Drinking Water Services (percent of population)**



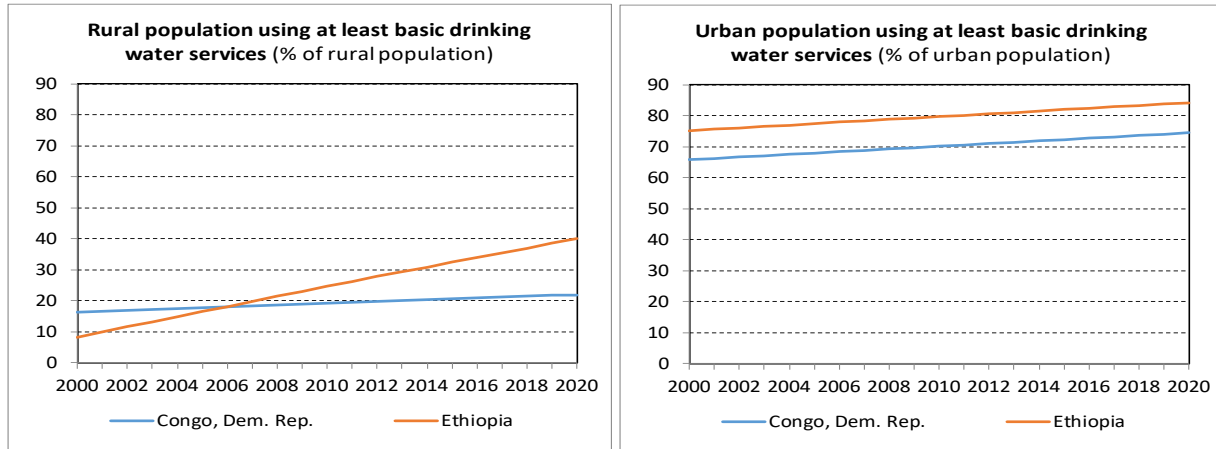
Source: Created by author based on World Bank (2022).

However, it is important to note that these trends vary in both nations depending on if the population is rural or urban. As shown in Figure 5, the DRC’s rural population has made very little progress throughout all the 20 years there is data, with access to at least basic drinking water services increasing from around 16 percent in 2000 to 22 percent in 2020. However, a significant amount of progress was made in Ethiopia’s rural areas, where the percentage of people using at least basic drinking water services has increased from 8 percent in 2000 to 40 percent in 2020. Although there has been a significant amount of progress in Ethiopia, there is still a long way to go for the rural populations in both countries.

Comparing Figure 5 with Figure 6, there is a significantly higher percentage of the urban population than the rural population having basic access to drinking water services in both countries. However, there have been relatively minor increases in both nations over time, increasing by less than 9 percentage points from 2000-2020. Additionally, there are relatively

small differences across the two countries, with Ethiopia having around 84 percent of its urban population having access to drinking water services in 2020, while about 75 percent of the DRC's urban population had access to basic drinking water services in the same year.

**Figures 5 and 6: Rural and Urban Access to Basic Drinking Water Services (percent of rural or urban population)**

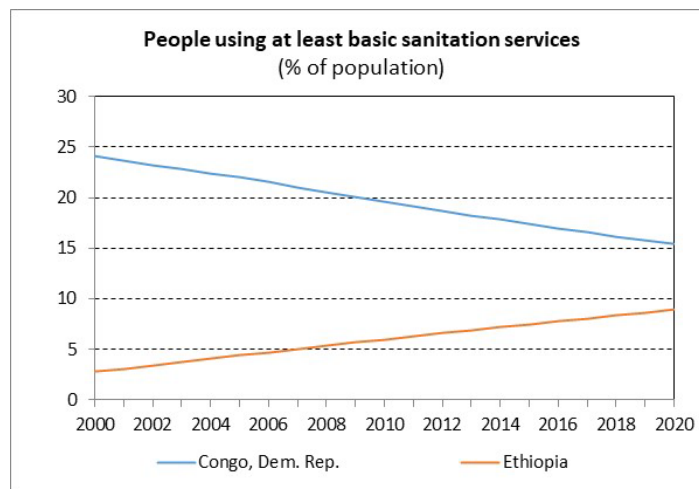


Source: Created by author based on World Bank (2022).

## IV.2. Access to Sanitation

Water and sanitation are very much connected. If clean water is not available, then sanitation will become an issue. As shown in Figure 7, the DRC had a decline in the percentage of the total population who have access to basic sanitation services, decreasing from 24.1 percent in 2000 to 15.4 percent in 2020. Ethiopia had the opposite trend for this indicator, increasing from a very low 2.8 percent in 2000 to 8.9 percent in 2020. Even though Ethiopia's overall access to basic sanitation services still remains below that of the DRC, Ethiopia is at least on the right path, and if these trends continue, Ethiopia could surpass the DRC around 2035.

**Figure 7: Access to Basic Sanitation Services (percent of population)**

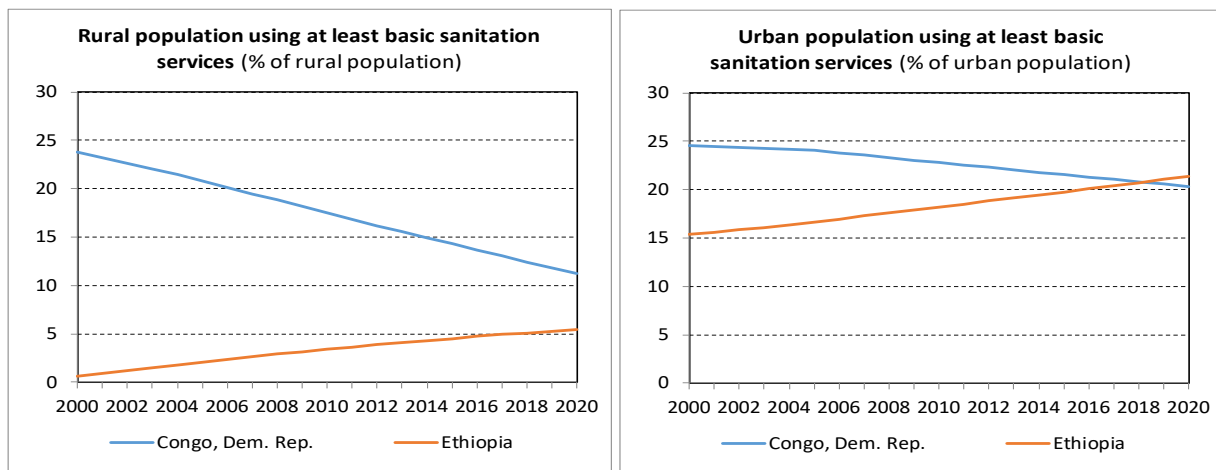


Source: Created by author based on World Bank (2022).

Just like for water access, it is also important to analyze the differences between rural and urban access to basic sanitation services in each country as well as across country. As shown in Figures 8 and 9, there has been a decrease over time in the usage of basic sanitation services for both, the rural and urban population in the DRC, while there has been an increase in Ethiopia.

Taking a closer look at the rural population shown in Figure 8, access to basic sanitation services decreases greatly over time in the DRC, dropping from 23.8 percent in 2000 to only 11.2 percent in 2020. This decrease of 12.6 percentage points is driving the overall decline in the access to basic sanitation services in the DRC shown in Figure 7 above. On the other hand, in Ethiopia's rural areas, access to basic sanitation services increased from 0.6 percent in 2000 to 5.5 percent in 2020.

**Figures 8 and 9: Rural and Urban Access to Basic Sanitation Services (percent of population)**



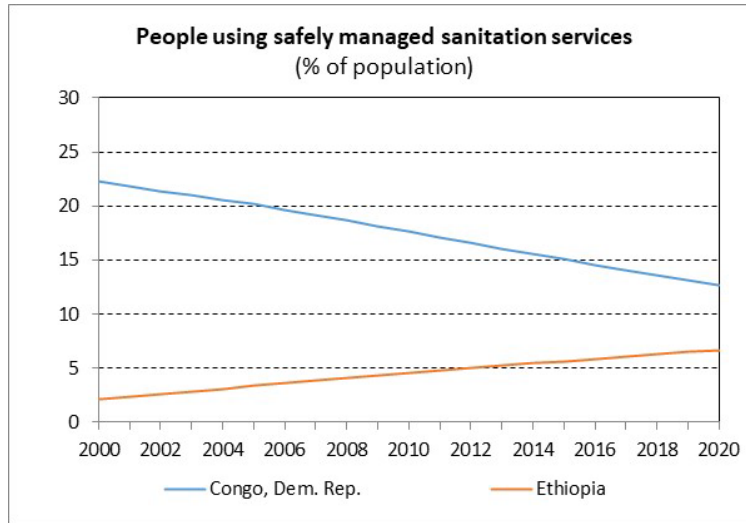
Source: Created by author based on World Bank (2022).

Taking a closer look at the urban population shown in Figure 9, access to basic sanitation services also decreased in the DRC for the urban population, dropping from 24.6 percent in 2000 to 20.4 percent in 2020, while it increased in Ethiopia from 15.4 percent in 2000 to 21.4 percent in 2020. Comparing Figure 8 with Figure 9, we can see that the urban populations of both countries are doing better than the rural populations.

Finally, when analyzing sanitation, even if there may be basic access, it does not mean it is necessarily safe. Figure 10 shows the percentage of people using safely managed sanitation services. Comparing Figure 10 below with Figure 7 above, we can see that the percentage of people using safely managed sanitation services has always been below the percentage of people using at least basic sanitation services in both countries, though the differences within each country are relatively small and the trends within each country are the same. In 2000, the difference between having access to at least basic sanitation services and using safely managed sanitation services amounted to 1.8 percentage points in the DRC and to 0.6 percentage points in Ethiopia. Twenty years later, the difference between having access to at least basic sanitation services and using safely managed sanitation services amounted to 2.7 percentage points in the DRC and 2.2 percentage points in Ethiopia. In other words, the difference between having access to at least basic sanitation services and using safely managed sanitation services has increased over time in both countries.



**Figure 10: People Using Safely Managed Sanitation Services (percent of population)**

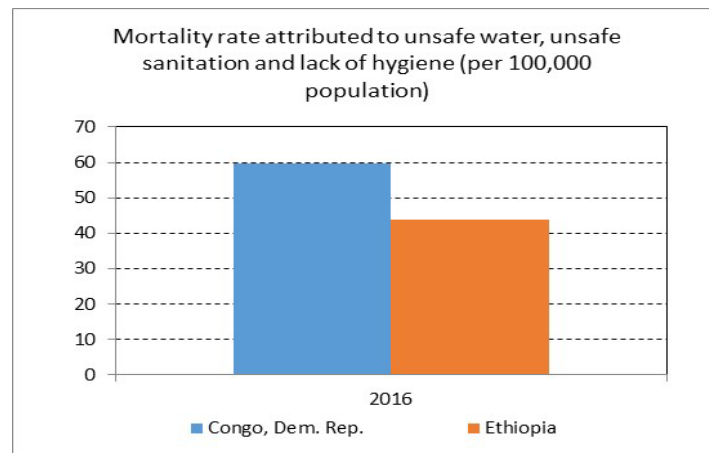


Source: Created by author based on World Bank (2022).

## V. Ethical Analysis

The low levels of people having access to basic water services and sanitation imply that some people die due to not having access to water and sanitation, which is highly unethical. As Figure 11 shows, in 2016 (which is the only year such data is available), the mortality rate attributed to unsafe water, unsafe sanitation, and lack of hygiene was 59.8 per 100,000 people in the DRC and 43.7 per 100,000 people in Ethiopia. This section discusses the ethical aspects of clean water access in the DRC and Ethiopia. The first subsection goes deeper into the ethical issues related to clean water access, in particular the origins of it, by discussing the foundations of the ethics of water and its discourse. The second subsection applies ethical perspectives using the framework for ethical decision-making suggested by the Markkula Center for Applied Ethics (2009).

**Figure 11: Mortality Rate Attributed to Unsafe Water, Unsafe Sanitation, and Lack of Hygiene (per 100,000 population) in 2016**



Source: Created by author based on World Bank (2022).

## **V.1. Ethical Origins for Water**

### *V.1.a. Foundations for the Ethics of Water*

Before evaluating the ethics of the handling of the water crisis in both countries, it is important to review the understanding of why a lack of clean water is an ethical issue, in particular, the foundations for water being a human right. Risse (2014) states that water is a justice issue for two reasons: first, because water is life-giving and non-substitutable, and second, because water is part of nature in the sense that the existence of water is not owed to human accomplishments (even though the access to water is at least sometimes owed to human accomplishments).

Risse (2014) continues to expand on these points by stating that since water is a human right, a global water compact to regulate its distribution should be put into place. Additionally, Risse (2014) discusses how the human rights framework is the leading proposal for a globally acceptable normative approach to regular human affairs, especially in terms of access to water. On a more philosophical level, Risse (2014, p. 181) states how “humanity collectively owns the earth, the resources, and spaces that exist without human accomplishments.” Therefore, this means that all humans own water collectively, and hence, everybody has a right to water.

Risse (2014) also argues that common ownership rights, like to water and other natural resources, are a pre-institutional right. Hence, another argument that Risse makes is related to having a global order based on sovereign nation-states. Risse (2014) argues that a consequence of having a nation-state system implies that nations-states have to preserve each person’s natural right to water. But the fact that so many people do not have access to safe water implies a violation of human rights as well as moral failure.

### *V.2.b. Discourse on the Ethics of Water*

Additionally, besides just looking at the foundations of the ethics for water, it is also important to look at the water ethics discourse that frames the way the issue is discussed and the action that is taken. Schmidt and Peppard (2014) discuss what else needs to be integrated into the discussion of water ethics, such as environmental pragmatists. Additionally, the two authors mention how feminist theorists should be included in this discussion due to gender relations and power issues in sovereign spaces. Schmidt and Peppard (2014) also discuss how instead of just analyzing ethics through academic discourse and policy work, it is also important to frame the ideas around the place-based art (photography, documentary, landscape analysis) to better understand the value of a place and why these values are important. This is so others can cultivate and understand the experience there, thus leading to better water discourses.

## **V.2. Applying Ethics to Problem Solving the Water Crisis in the DRC and Ethiopia**

It is useful at this point to analyze the ethics of access to water and sanitation in reference to a framework for ethical decision making as it is, for example, summarized by the Markkula Center for Applied Ethics (2009). The Markkula Center concludes that making good ethical decisions requires a trained sensitivity to ethical issues, a practiced method for exploring the ethical aspects of a decision, and weighing the considerations that impact our choice of action. The Markkula Center for Applied Ethics also has a framework for ethical decision-making that includes the following: recognizing an ethical issue, getting the facts, evaluating alternative actions, making a decision and testing it, and acting and reflecting on the outcome. As a multitude of actions have been taken to aid both countries in their scenarios, it is important to see if these decisions were

being made based on ethics. Due to the inequities between urban versus rural regions in both the DRC and Ethiopia, it seems as if although the problem is being addressed, it is not being addressed to its fullest. We will now use an ethical reasoning strategy when analyzing reform-based solutions and infrastructure-based solutions.

#### *V.2.a. Reform-based Solutions: Policy and Financial*

A United Nations Environment Programme (UNEP) technical report on water issues in the DRC by Partow (2011) discusses a key component of current water sector reforms, the Water Code. This reform plan was designed specifically to help with the problem after the major conflicts the country went through and the problems it caused, including a lack of human resources including water.<sup>6</sup> According to Partow (2011), the code creates institutional architecture based on the devolution and the transfer of water services to administrations while establishing three tiers of water governance. This example of reform does a good job of exemplifying the step from the Markkula Center for Applied Ethics framework for ethical decision-making known as “recognizing an ethical issue”. By recognizing that there are a lot of resource problems, not even just for water, because of the conflict, they were able to better act on the issue. Also, there was a clear focus to address the ethical issue, thus showing it is truly recognized.

Additionally, the report discusses how the DRC focused on mobilizing financial resources post the conflict in the country to help with issues such as water access.<sup>7</sup> It helped with funding for reducing the differences between supplying water and sanitation to rural and urban inhabitants in the country,<sup>8</sup> which had been illustrated above in Figures 5 and 6 for water, and in Figures 8 and 9 for sanitation. Additionally, there was a draft law that removed state monopoly over water supply and allowed for community-level organizations to engage as well as private sector investment. This example of reform does a good job of exemplifying the steps from the Markkula Center for Applied Ethics known as “evaluating the facts”. This is because there was an evaluation of the differences in issues with water access and sanitation in the rural and urban areas, thus allowing the government to decide on how to handle the issue based on these facts.

#### *V.2.b. Infrastructure-based Solutions*

Jgarkava (2021) from the Borgen Project discusses the progress the country has made on clean water and sanitation. The Ethiopian government along with international agencies took action due to the urgency of the crisis. One of the things the government did was develop something called “Pit Latrines” which are toilets built outside a house that keep insects and flies out to reduce the spread of diseases.<sup>9</sup> This example of reform does another good job of exemplifying the step from the Markkula Center for Applied Ethics known as “recognizing an ethical issue” because in this case a problem was noticed, thus leading to this decision to specifically address the ethical issue.

Jgarkava (2021) also discusses a charity called the “Water and Gasi Spring Project” to help with Ethiopia’s access to clean water. One of the projects it implemented was a protection system for the Gasi Spring that locals used to collect water. Since it was created, the spring has created so much water that it became possible to establish a community shower, a washing station for clothes,

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<sup>6</sup> Partow (2011).

<sup>7</sup> Partow (2011).

<sup>8</sup> Partow (2011).

<sup>9</sup> Jgarkava (2021)

and a cattle trough for animals.<sup>10</sup> This example of reform does a good job of exemplifying the steps from the Markkula Center for Applied Ethics known as “making a decision and testing it”. This is because the charity made the decision to implement the protection system, and because of its positive outcome after testing it out, they decided to keep it which allowed for a lot of progress.

## VI. Conclusion

To summarize, both the DRC and Ethiopia have improved overtime when it comes to aspects of socio-economic and human development. However, this development will not be able to be sustained and more progress will not be able to occur if there continues to be a lack of access to clean water. Rates of clean water access, as well as clean sanitation services, even when slowly rising remain overall at low some of the lowest percentages globally.

Furthermore, as discussed in Section V, multiple attempts have been made through both governments and organizations to help parts of both countries to help. However, it appears that it is forgotten that rural and urban areas suffer from the problem differently, thus affecting the policy, infrastructure plans, and projects put in place to help with the issue. Inequalities in aid reveal a lack of ethical application to helping with these water crises, even while there was good intent.

Moving forward, there is a lot that can be done. There needs to be more project work done by organizations that focus on specific issues, instead of trying to problem solve as a whole. The infrastructure solutions seem to be relatively effective. Additionally, there needs to be a more inclusive policy that makes sure to address both rural and urban regions of each country. Additionally, the marginalized, in particular, the lowest-income communities need to have policy focus on them since a lack of clean water causes many health-related issues. Countries should work together at a global level to put more money and effort into this issue as so many people are denied the basic human right to clean water.

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<sup>10</sup> Jgarkava (2021).

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[https://reliefweb.int/sites/reliefweb.int/files/resources/DDB8149182AD305BC125785B00476984-Full\\_Report.pdf](https://reliefweb.int/sites/reliefweb.int/files/resources/DDB8149182AD305BC125785B00476984-Full_Report.pdf).

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# **The Future is Female: Women are the Key to Successful Population Control in Nigeria and Angola**

Eli LeRoy

## ***Abstract***

*This article analyzes the patterns of population growth in the developing countries of Nigeria and Angola. Over the last several decades, population has soared in the two countries due to high birth rates, early marriages, and a lack of female agency in family planning. Government intervention in the form of population control programs has been successful, but recent periods of steadily high birth rates indicate a need for further action. As these programs are designed, a focus on female agency must be included to ensure successful implementation. Although cultural differences have previously prevented these methods, they must be overcome in order to successfully mitigate population growth and assist development in Sub-Saharan Africa.*

## **I. Introduction**

Until recently, most scientists had concluded that the Earth can hold up to nine or ten billion people,<sup>1</sup> a target that the human population is expected to hit within the next thirty years. This large number of people will exacerbate current issues with food and water supply, emphasizing the need to ethically control this growth. Population growth has also been inexplicably tied to poverty, especially in developing countries. Women in wealthier countries have more access to modern contraceptives, and social and cultural norms in developing countries can further limit female decisions related to family planning.

This article analyzes some of these connections between female agency and population growth in developing countries. Using the family planning programs of Nigeria and Angola, the efficacy of different approaches will be examined based on several standard indicators provided by the World Bank (2022). The various cultural factors that influence these rates will be also considered when doing so. Lastly, the various ethical approaches that these programs are based on will be identified and analyzed.

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<sup>1</sup> McGuigan (2011).

In order to do so in an organized manner, this article is structured in six sections. Following this introduction (Section I), Section II reviews existing articles on population growth in Nigeria and Angola. Section III provides a socioeconomic background to both countries in terms of their GDP per capita, life expectancy at birth, and adult literacy rate over time. Section IV expands upon this basic knowledge, analyzing rates more specific to population growth. Section V examines some ethical issues by first detailing past and present family planning programs in Nigeria and Angola, and then analyzing ethical dimensions of these programs. Section VI summarizes the findings of this article and lists additional considerations for future programs.

## II. Literature Review

Due to the typically negative relationship between population growth and economic development, there is a considerable amount of research and analysis on several aspects of this relationship. Countries that are still developing and experiencing high population growth have become the subject of several different theories, many of which are outlined below. This brief literature review covers four recent contributions: Esseini (2016) and Alimi, Fagbohun and Abubakar (2021) focus on population growth and development in Nigeria, while Ben-Ari (2014) and Oden (2019) discuss economic development and population growth of Angola.

- Esseini (2016) discusses the provisions necessary to utilize the growing Nigerian population for the development of the economy. Using time series data from the last three decades, Esseini's econometric analysis concluded that Nigeria is capable of economic growth if it puts forward measures to increase the quality of its working population. Such policies include skill-enhancing education and training in both formal and informal educational settings. Other general provisions, most notably being accessible and affordable healthcare, are necessary to protect the welfare of the workforce and, in turn, the economy of the developing country.
- Alimi, Fagbohun and Abubakar (2021) is a very recent analysis of Nigeria's income per capita growth, population growth and growth in output from 1981-2018. The authors concluded that population growth is beneficial to Nigeria's economy in the long-run but has adverse effects in smaller portions of time. These short-term consequences result from the high number of dependents in the population, who eventually reach workforce age. The paper concludes that this demographic dividend is potentially beneficial when the younger population becomes economically productive, but not guaranteed. Government support in human capital development, including health and education, are recommended to maximize the economic potential of the younger population groups.
- Ben-Ari (2014) highlights several problematic factors of Angola's expanding economy and its social repercussions. Although the country has one of the fastest growing economies, it lacks diversification and relies heavily on its natural resources. Ben-Ari states that this reliance is not beneficial for the long-term economy. It also does not take advantage of the quickly growing workforce population. Additionally, the money generated is not equitably invested into the country's infrastructure, hence, increasing inequality.
- Oden (2019) explains some of the reasons for the rapid population growth in Angola. The article relays that high infant mortality rates have created a culture in which families are more inclined to have more children. This strategy increases the odds of having more children reach adulthood. Oden describes several fallbacks of the current Angolan

healthcare system, including understaffed clinics and a lack of broad availability. By increasing the strength of the healthcare system, infant mortality rates would decrease enough to stabilize the fertility rate. This ripple effect will in turn allow for overpopulation to slow and give room for further development in the healthcare system.

### III. Socioeconomic Background

Within the African continent, Nigeria has both the largest population (which was 206.1 million people in 2020)<sup>2</sup> and the highest GDP (which was US\$432.3 billion in 2020),<sup>3</sup> making it frequently looked at as one of the leaders of the continent. It is an extremely young country, with over 75 percent of the population below the age of 35 years.<sup>4</sup> Natural resource extraction was the main driver of the \$432 billion GDP in 2021.<sup>5</sup> Large deposits of crude oil, coal and natural gas have brought wealth to the country, and a mostly untapped solar energy market has a promising future. A dependence on these resources caused Nigeria to enter a recession in 2016 when oil prices fell, worsening poverty. Some progress has been made since the drop, but economic stagnation due to the Coronavirus pandemic has prevented a full recovery.

Angola is with its 32.9 million people in 2020 only the 12<sup>th</sup> most populous country in Africa, but it has one of the highest population growth rates of the continent, and boasts a fertility rate of 5.5 births per woman.<sup>6</sup> The country is extremely young as well, with a median age of 16.7 years.<sup>7</sup> Decades of civil war severely limited the development of the Angolan economy for many decades, and infrastructure was a policy priority in the years following the civil war. Today, Angola is one of the world's fastest growing economies, almost entirely dependent on gas and natural resources. In 2017, the oil sector accounted for 90 percent of export value and over half of all government revenues.<sup>8</sup> An immense amount of corruption has ruled and distorted Angola's economy since its development.

Figure 1 on the next page depicts Nigeria and Angola's development of gross domestic product (GDP) per capita, purchasing power parity (PPP)-adjusted, in constant 2017 international dollars. Although Nigeria has a GDP seven times higher than Angola,<sup>9</sup> its GDP per capita is lower than that of Angola. Both countries experienced an economic contraction when oil prices dropped in 2016. Angola's recession, however, was much worse than Nigeria's due to Angola's heavier reliance on the oil sector. During this time both countries continued to experience high birth and fertility rates.

Figure 2 illustrates average life expectancy of people born in Angola and Nigeria from 1970 to 2019. Both countries had very similar levels of life expectancy until 2002. Since its initial economic growth in 2002, however, Angola's higher life expectancy is consistent with its higher GDP per capita. The HIV/AIDS epidemic in the 1990s caused both countries' life expectancies to similarly flatten out, and still presently impacts citizens. Other causes for Nigeria's lower life expectancy are Nigeria's high infant and maternal mortality rates, which are, respectively, 75 per

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<sup>2</sup> World Bank (2022).

<sup>3</sup> World Bank (2022).

<sup>4</sup> United Nations, Department of Economic and Social Affairs, Population Division (2021).

<sup>5</sup> World Bank (2022).

<sup>6</sup> World Bank (2022).

<sup>7</sup> World Bank (2022).

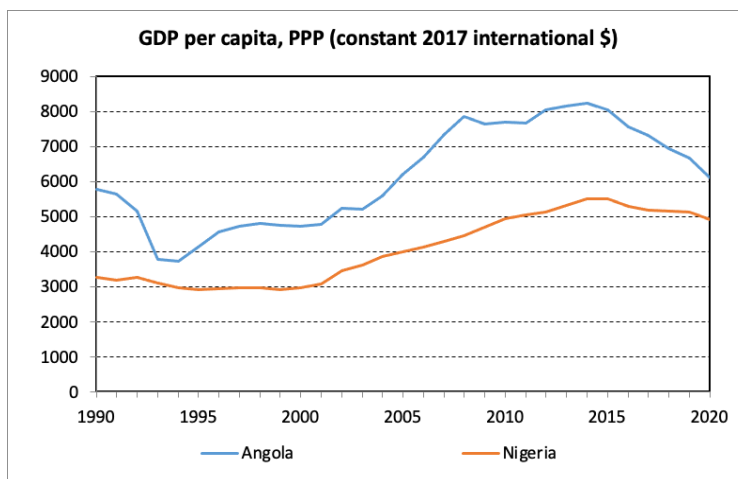
<sup>8</sup> International Monetary Fund (2018).

<sup>9</sup> World Bank (2022).



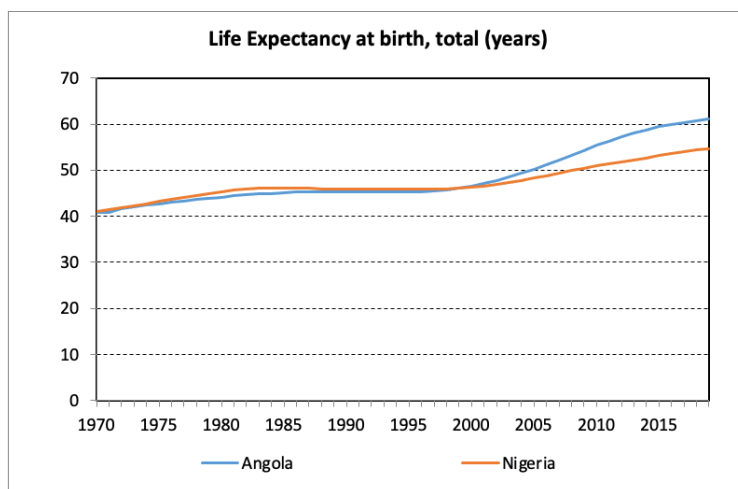
1,000 live births and 917 per 100,000 live births. Both of these figures are some of the highest on the continent.<sup>10</sup>

**Figure 1: GDP per capita, PPP (constant 2017 international \$), 1990-2020**



Source: Created by author based on World Bank (2022).

**Figure 2: Life Expectancy at Birth (years), 1970-2019**



Source: Created by author based on World Bank (2022).

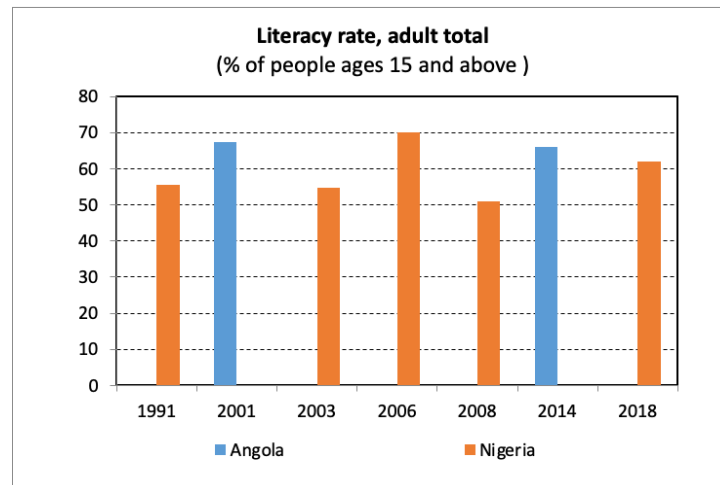
Figure 3 shows the available adult literacy rates for Angola and Nigeria. Angola's rate remains consistently higher than Nigeria's with the exception of 2006. However, the large gap in data makes it difficult to use this figure as an indication of differences in education between the two countries. Both countries have experienced a large increase in youths not in education, employment, or training, with Nigeria having 21.4 percent categorized as such in 2016, while Angola's percent of youths not in education, employment or training was 27.9 percent for the same year.<sup>11</sup> Once again, the higher GDP per capita in Angola is consistent with higher literacy rates in

<sup>10</sup> World Bank (2022).

<sup>11</sup> World Bank (2022).

Angola than in Nigeria. Low literacy rates can be detrimental to the economic future of a country, limiting the amount and quality of employment opportunities.

**Figure 3: Adult Literacy Rate for Angola and Nigeria (all available years)**



Source: Created by author based on World Bank (2022).

## IV. Analysis of Facts

This section is structured into four subsections. The first subsection analyses patterns of population growth, fertility, and infant mortality rates. The second subsection reviews gender differences primary, secondary and tertiary school enrollment. The third subsection examines gender differences in employment-to-population ratios while the fourth subsection examines differences in contraceptive prevalence.

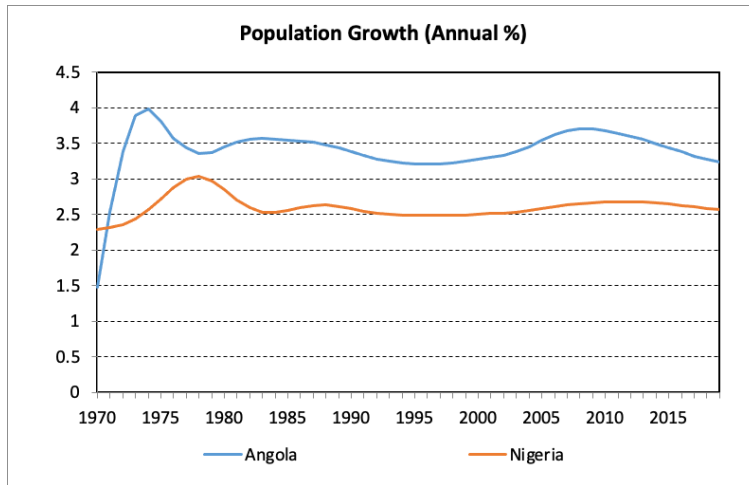
### IV.1. Population Growth, Fertility, and Infant Mortality Rates

Over the last five decades, both Angola and Nigeria have experienced high population growth, with both countries staying above the average world population growth rate of 1.05 percent.<sup>12</sup> As Figure 4 shows, Angola underwent its highest period of population growth from 1972 to 1973, peaking at precisely four percent. This time period saw the tapering and ultimate end of Angola's nearly 15 year war of independence, lowering the death rate and causing the increase in population growth. Immediately after, however, Angola's population growth rate dropped by half of a percentage point due to the civil war that followed the country's independence in 1975. Nigeria experienced the height of its population growth during same period in which Angola's rate decreased, with its maximum height of 3 percent in 1978. An end to Nigerian military rule and economic success in the petroleum industry assisted this growth in Nigeria's population, which ultimately leveled out in the following decades at around 2.5 percent. Angola's population growth rate fluctuated more than Nigeria's in recent history, gradually rising and falling in decade-long increments. This difference can be partially attributed to the difference in a.) the HIV/AIDS incidence and b.) the implementation of population controls. While Nigeria has adopted some population controls in the early 1980s, Angola has not implemented any such initiatives.

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<sup>12</sup> World Bank (2022).

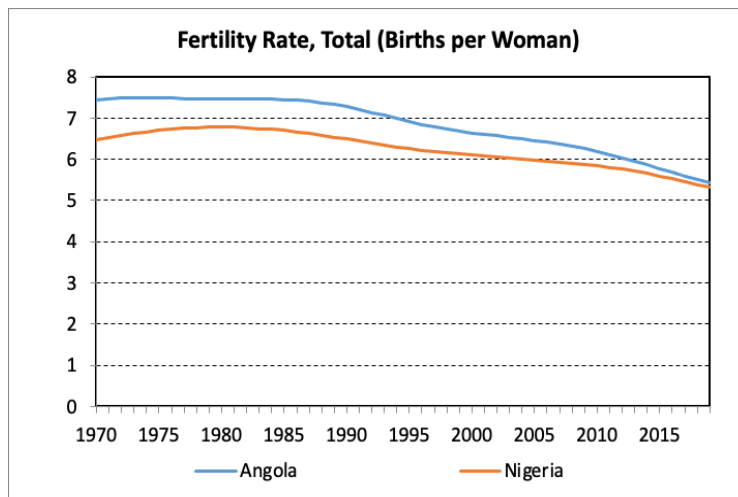
**Figure 4: Population Growth (percent) in Angola and Nigeria, 1970-2019**



Source: Created by author based on World Bank (2022).

Despite ignoring death rates, fertility rates are an essential determinant of population growth. Typically, countries with high fertility rates also have high infant mortality rates as families increase the number of births to compensate for these young deaths. Health programs that make pregnancy and postnatal care safer are essential to lowering infant mortality rates, which in turn decrease fertility rates and overall population growth. Such programs were implemented in African nations like Nigeria and Angola in the 1990s, causing the steady decrease in both fertility and infant mortality rates that can be seen in figures 5 and 6.<sup>13</sup>

**Figure 5: Fertility Rate (births per woman) in Angola and Nigeria, 1970-2019**



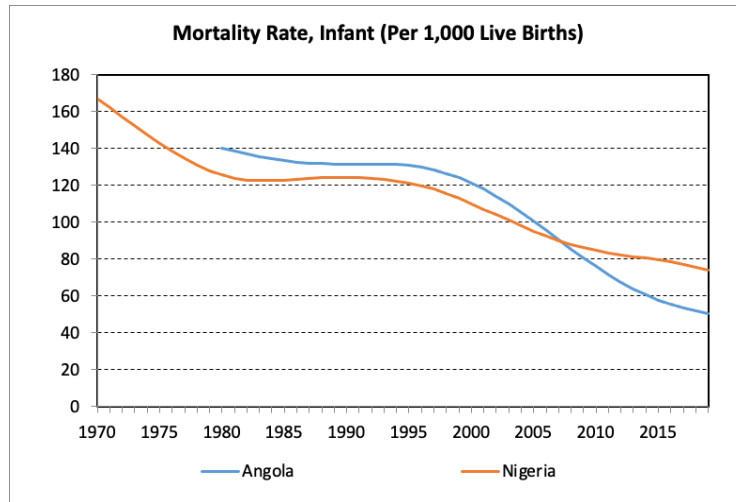
Source: Created by author based on World Bank (2022).

<sup>13</sup> Adetunji (1994).

Overall, both countries experienced a steady decline in fertility over the last half century, and currently rest at just over five births per woman. Angola’s fertility rate began and stayed at one birth higher than Nigeria’s during this period of decline until meeting it within the last five years.<sup>14</sup> Both countries' rates are presently twice that of the global average of 2.5 births per woman.<sup>14</sup> Although fertility rates are generally indicative of population growth, the rise and fall of these particular countries do not perfectly align with their population growth rates due to external factors. The HIV/AIDS epidemic increased the mortality rate in both countries from 1990-2005. This unusually high number of deaths caused the visible dip in Figure 5, although fertility rates can be seen in decline during the same time in figure 5.

Figure 6 demonstrates the nearly steady decrease in the infant mortality rate over the last several decades. As previously mentioned, similar health initiatives were implemented in both countries around the same time, causing nearly equivalent periods of decline. Efforts were furthered in the 2000s ending the two decade-period of stagnation that occurred before. These decreases in infant mortality align with those in the fertility rate shown in Figure 5, emphasizing the connection between the two figures. While Angola had a higher infant mortality rate than Nigeria from 1980 to 2006, Angola caught up with Nigeria in 2007 and starting in 2008, Angola had a lower infant mortality rate than Nigeria.

**Figure 6: Infant Mortality Rate (per 1,000 live births) in Angola and Nigeria**



Source: Created by author based on World Bank (2022).

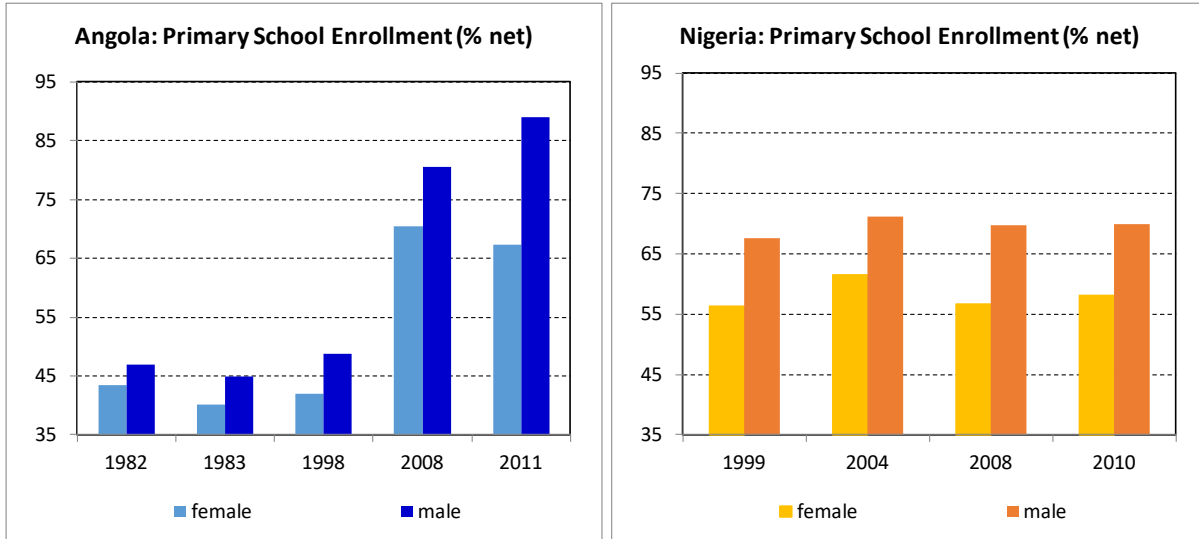
#### IV.2. Gender Differences in Education

Figures 7 and 8 show female and male net primary school enrollment ratios in percent, respectively for Angola and Nigeria. Even though the available data does not match exactly across the two countries, with exception for 2008, it is clear that Angola had lower net primary school enrollment ratios for both females and males until at least 1998. However, since at least 2008, Angola had higher net primary school enrollment ratios for both females and males. Persistent across countries and years, female net primary school enrollment ratios are always lower than male net primary school enrollment ratios. The gap between female and male net primary school enrollment ratios

<sup>14</sup> World Bank (2022).

has actually become larger over time in Angola, while it remained about the same over time in Nigeria.

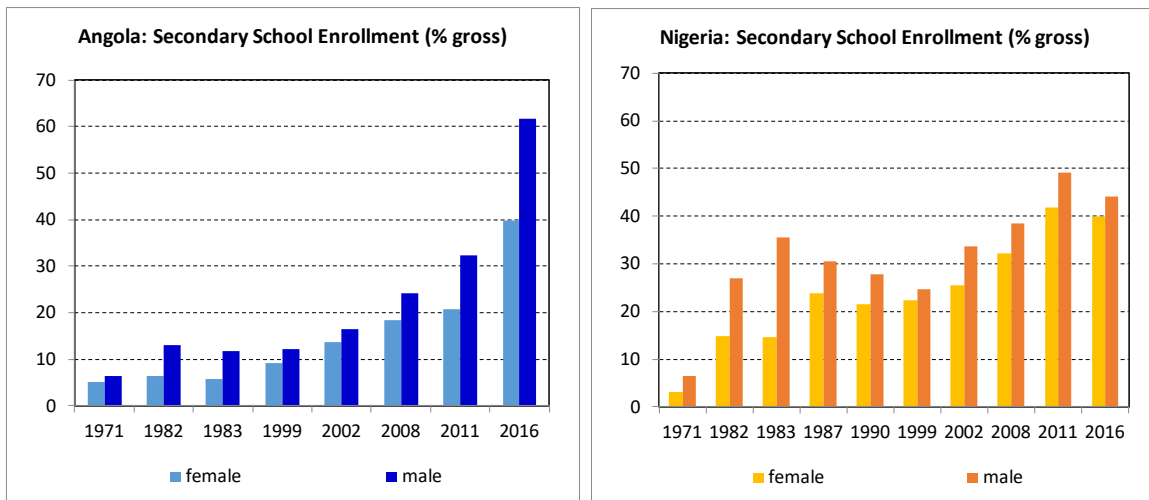
**Figures 7 and 8: Female and Male Primary School Enrollment in Angola and Nigeria**



Source: Created by author based on World Bank (2022).

Figures 9 and 10 show female and male gross secondary school enrollment ratios in percent, respectively for Angola and Nigeria. Though Angola overtook Nigeria in net primary school enrollment ratios by at least 2008, Nigeria remains ahead of Angola in gross secondary school enrollment ratios for all the years, except for 2016, which is the last year such data is available for both countries. Consistent with net primary school enrollment ratios there is large gender gap for gross secondary school enrollment ratios, which has increased over time in Angola while it remained about the same for Nigeria.

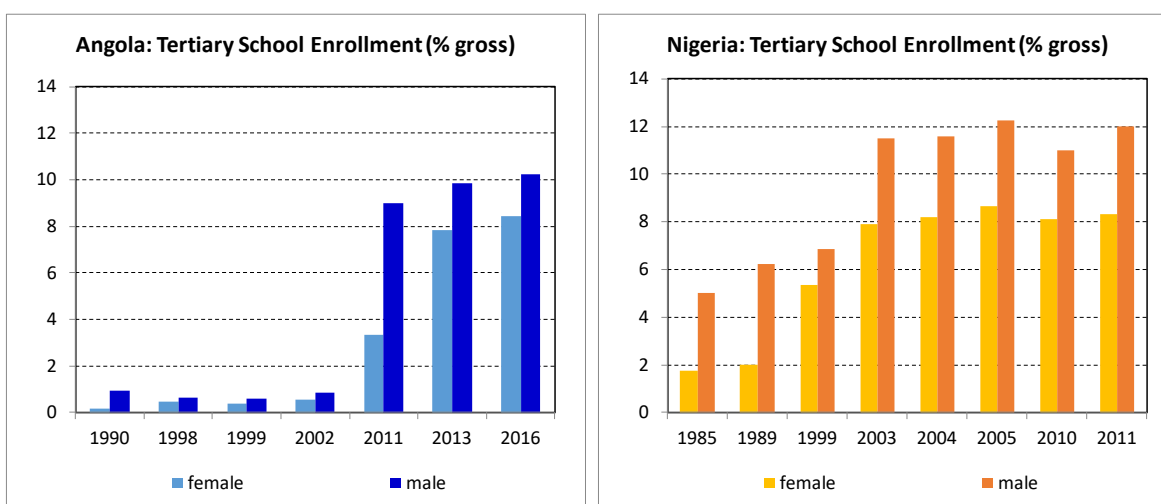
**Figures 9 and 10: Female and Male Secondary School Enrollment in Angola and Nigeria**



Source: Created by author based on World Bank (2022).

Figures 11 and 12 show female and male gross tertiary school enrollment ratios in percent, respectively for Angola and Nigeria. Even though the data available does not match exactly across the two countries, with exception for 1999 and 2011, it is clear that Angola had always much lower gross tertiary school enrollment ratios for both females and males than Nigeria. Persistent across time and country is however once again that females lack considerably behind males. While the gap has become much smaller from 2011 to 2013 in Angola, the available data for Nigeria shows a narrowing of the gap from 1989 to 1999. By at least 2003, Nigeria's gender gap has again increased, and remained relatively stable until 2011, which is the last year such data is available for Nigeria.

**Figures 11 and 12: Female and Male Tertiary School Enrollment in Angola and Nigeria**



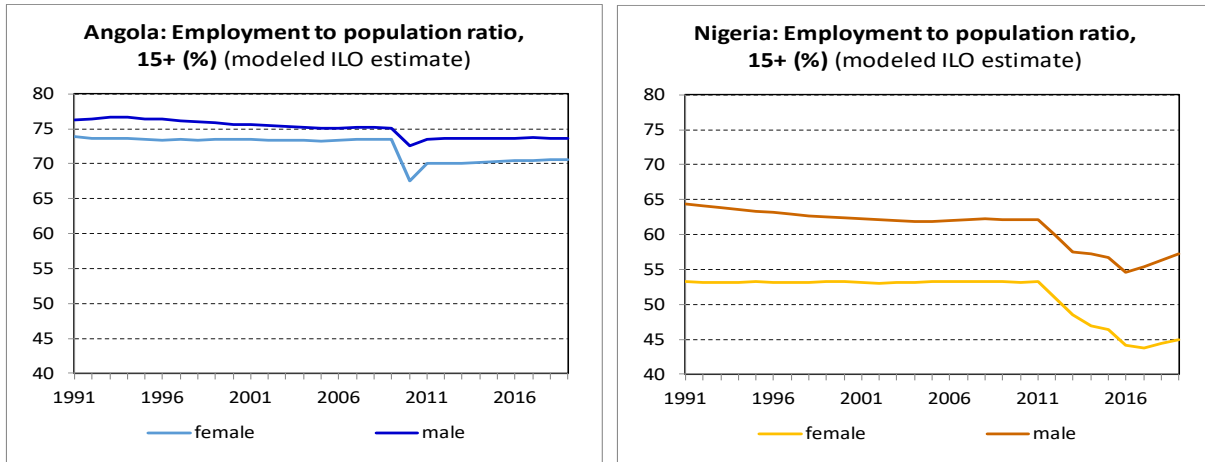
Source: Created by author based on World Bank (2022).

### IV.3. Gender Differences in Employment-to-Population Ratios

Figures 13 and 14 show female and male employment-to-population ratios, respectively for Angola and Nigeria. Comparing Figure 13 with Figure 14, we can first of all see that the employment-to-population ratios are much higher in Angola than in Nigeria, for both females and males. Furthermore, we can see that despite Angola having higher ratios than Nigeria, the gender gap in the employment-to-population ratio is relatively small in Angola compared to Nigeria.

Neither country shows much progress in terms of reducing the gender gap in the employment-to-population ratio over time. In Angola, the gender gap has increased from 2.3 percentage points in 1991 to 5.1 percentage points in 2010, and then narrowed to 3.0 percentage points in 2019. In Nigeria, the gender gap remained relatively stable between 8.6 and 12.3 percentage points, with 2019 being the year with the largest gender gap in Nigeria. Though there remain considerable differences between the evolution of the gender gap in education and the evolution in the gender gap for the employment-to-population ratio, the gender gap in education is overall consistent with the gender gap for the employment-to-population ratio.

**Figures 13 and 14: Female and Male Employment-to-Population Ratio for Women and Men at Least 15 Years Old (percent) for Angola and Nigeria**

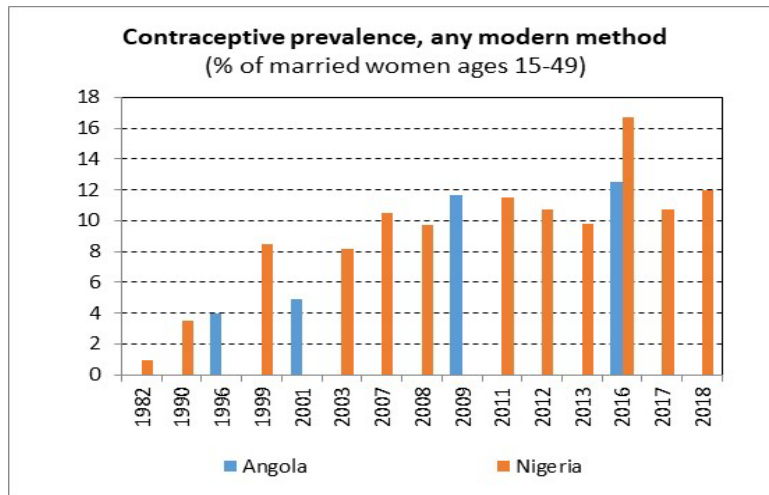


Source: Created by author based on World Bank (2022).

#### IV.4. Contraceptive Prevalence

Low levels of access to modern contraception are another key indicator for both population growth and gender discrimination. Figure 15 shows the contraceptive prevalence for any modern contraception as percent of married women between ages 15 to 49 years. Our first observation is that contraceptive prevalence rates are very low in both Angola and Nigeria, even though they have increased considerable over time. In Angola, they increased from 4.0 percent in 1996 to 12.5 percent in 2016. In Nigeria, they increased from 0.9 percent in 1982 to 16.7 percent in 2016, but then declined to 10.7 percent in 2017, after they increased slightly to 12.0 percent in 2018. It is not clear based on this limited data which country has higher access to modern contraceptives.

**Figures 15: Prevalence of Modern Contraception in Angola and Nigeria**



Source: Created by author based on World Bank (2022).

Based on the unmet need for contraception, for which there is unfortunately data available for only one year (2016) for Angola, Angola is doing worse than Nigeria as Angola had an unmet need for contraception of 38 percent of married women ages 15 to 49 years, while Nigeria had an unmet need for contraception of 28.9 percent.<sup>15</sup> On the other hand, in 2016, 62 percent of Angola's women ages 15 to 49 years stated that they make their own informed decisions regarding sexual relations, contraceptive use and reproductive health care, while the percentage of Nigeria's women stating so was estimated at 48.6 percent.<sup>16</sup>

## **V. Ethical Analysis**

This section examines ethical perspectives on population growth and population control in Nigeria and Angola. The first subsection reviews past and present efforts made to create and maintain population control policies, and the ethical reasoning behind them. The second subsection analyzes current attitudes to gender roles and female agency in connection to population growth and fertility.

### **V.1. Population Control Policies and Ethical Reasoning**

The Nigerian and Angolan governments' views and actions on population control have made considerable progress since their initial introduction, and results can clearly be seen. Assisted by global organizations and donations, many goals set by various presidents and health ministers have continuously been met. This progress has not been accomplished easily, however, as many religious and ethnic groups have resisted efforts to increase family planning education and contraception use. In both countries, cultural differences were not accounted for when designing programs, which has been cited by many as the reasoning for the failure of many population goals.<sup>17</sup>

In 1988, the Nigerian government implemented its first population control policy, a landmark in the development of Sub-Saharan Africa. This initial policy, designed in conjunction with the World Bank, aimed at decreasing the fertility rate by improving the success of birth. While the infant mortality rate did decrease, the population growth rate did not decrease to 2 percent as planned, and instead stayed at 2.5 percent.<sup>18</sup> In 2006, Nigeria shifted its focus to contraception use and set its new goals based on family planning statistics. Continuous advancements in education, gender standards and quality of life assisted the obtention of these goals.

In 2022, the Nigerian government responded to the unwavering fertility rate with a revised population control policy. This initiative was similar in content to the family planning goals of 2006 yet expanded the scope of contraceptives available with funding from the United States Agency for International Development (USAID). President Buhari stressed the importance of educating the youthful population, 72 percent of which were under 30 years of age, and increasing the amount of space between births to a minimum of two years.<sup>19</sup> The plan failed to fix existing distribution problems. Local and state governments are tasked with distributing the free contraceptives and family planning programs, yet many do not have the financial or physical

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<sup>15</sup> World Bank (2022).

<sup>16</sup> Nigeria's value of 48.6 percent for 2016 has been estimated based on data available for 2013 (50.8 percent) and 2018 (46.3 percent).

<sup>17</sup> Adegbola (2008).

<sup>18</sup> Adegbola (2008).

<sup>19</sup> Adesina (2022).



ability to do so. The religious and ethnic majorities that comprise some states also purposefully do not do so. The acknowledgement of these cultural and logistical differences is essential in diminishing the disparities between many regions.

Angola's population control and family planning commitment has changed throughout history as the country experienced bouts of violence and stagnation. Immediately after its independence from Portugal in 1975 the Angolan civil war broke out and continued, with some interludes, until 2002. This destabilization prevented any central government from holding the power to make population policies, which fell short from being a priority. After the conclusion of the war, international bodies like the World Bank and USAID helped Angola implement family planning policies similar to others in Sub-Saharan Africa, with a focus on lowering maternal and infant mortality rates and educating the public on contraceptive use. Angola as a whole had a lower quality of life than other Sub-Saharan countries, and the implementation of all of these goals at once was not expected to be a quick success. It is difficult to assess the progress of these goals, as there is no census data from the times of war and very little from present day.

When forming the ethical basis for their past population control programs, both Nigeria and Angola used the well-established common goods approach. This approach seeks to benefit a group as a whole, rather than individuals. The logic behind the use of this approach is sound, as both countries pursue a well maintained population at the national level. However, this ethical approach has a large weakness, as it diminishes the lives of some.

The contraceptive methods implemented in both countries have primarily been medications and treatments for women. Although effective in preventing pregnancy, these methods have documented physical and psychological effects on its users. Barrier methods, such as condoms, are sound alternatives for these medications and produce none of these side effects. Sexual education and formal family planning are also crucial yet are not used. Nigeria and Angola's governments have not included sexual education in their population programs, citing backlash from conservative religious groups.

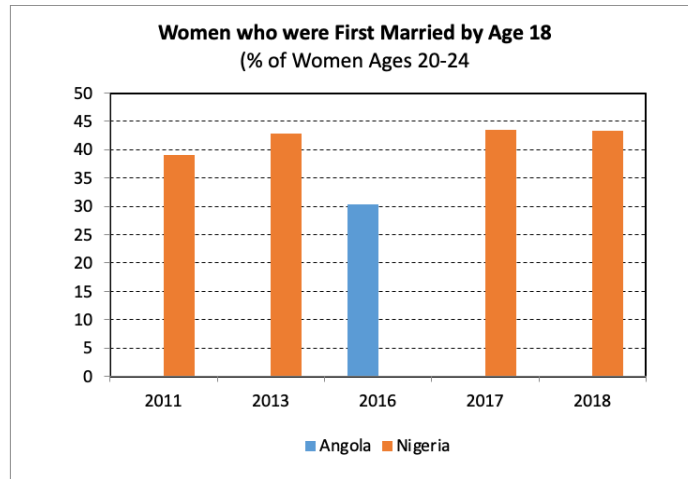
The current ethical justification for the population programs used in Nigeria and Angola focuses on the overall good of the community but ignores the negative effects these types of programs have on women. Alternative approaches for future population policies should contain elements of the rights and justice approaches. These schools of thought emphasize the rights and equal treatment of all who are affected. Making this change would ensure the health of the women in Nigeria and Angola, while still focusing on the goal of establishing a steady population.

## **V.2. Ethical Perspectives on Gender Roles and Contraceptive Use**

In both countries, stark cultural and religious differences have proved difficult to plan for, especially regarding attitudes about contraception and women's roles in society. Both Nigeria and Angola have large, conservative Muslim and Christian populations, with elements of both religions worked into daily life. Historical ethnicities and cultures vary from region to region and determine social structures where they are present. The cross section of these two influences mostly views reproduction and women's roles in similarly restrictive manners. It is imperative for population control that women command their own destinies and decisions, making the dismantling of these barriers to reproductive health essential.

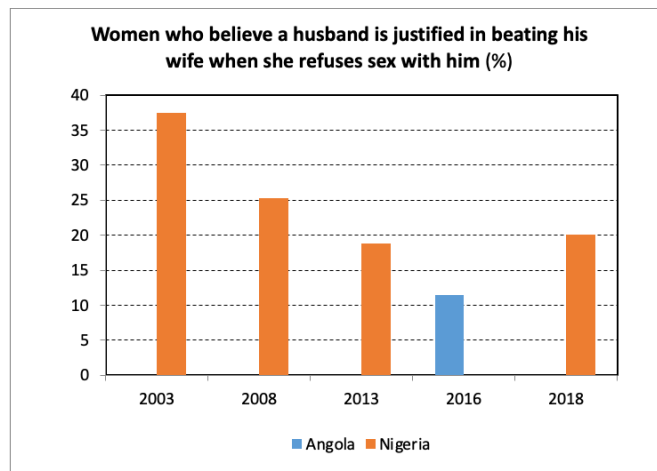
Abstinence was very prevalent among youth in Nigeria and Angola before modern family planning was introduced and is still seen by many as the primary form of birth control.<sup>20</sup> This method is effective but contributes to the high rates of young marriages seen in Figure 16. Women who are married longer are more likely to have given birth at a young age, and more children over their lifetime. Having children at such a young age also prevents women from pursuing further education or employment at points, decreasing the financial stability of the family. Lower financial stability decreases the quality of life, which has been frequently connected to the population growth of a country. Therefore, younger marriages contribute to a higher population growth rate in several ways.

**Figure 16: Women who were First Married by Age 18**



Source: Created by author based on World Bank (2022).

**Figure 17: Woman Who Believe a Husband is Justified in Beating His Wife when She Refuses Sex with Him (percent)**



Source: Created by author based on World Bank (2022).

<sup>20</sup> Somefun (2019).

Female agency is another item that has been controlled by religion and culture in Nigeria and Angola. Access to healthcare and contraceptives are important to population control, but a woman's decision on when to have sex is an even larger determinant. As seen in figure 17, large portions of women believe that physical abuse is justified if sex is refused, clearly influencing the woman's decision. These social stigmas that grant men the power to make decisions also influence decisions on contraceptive use and desired fertility, no matter what the desire of the woman is. This reality stresses the importance of changing these attitudes, because no matter how many contraceptives and resources there are available, if a man chooses not to use them then they are useless. If women are able to control reproductive decisions for themselves, population growth rates would most certainly decrease.

The data in figure 17 shows promising progress, with percentages being reduced by nearly half in Nigeria in only a decade. The rate did slightly increase in recent years, however, signaling the need for further education and change. If population control methods are to be implemented successfully, attitudes towards women will need to be changed and agency must be improved.

## **VI. Conclusion**

This article sought to address the problem of high population growth in Nigeria and Angola by analyzing past and present government efforts to mitigate this growth. This examination was performed through the review and evaluation of several standard indicators and their connection to several general cultural instances. The indicators reviewed clearly show that the implementation of family planning programs and an increased availability of healthcare services help to slow population growth. Population growth rates, fertility rates, and infant mortality rates all decreased at points related to the inclusion of these new strategies, demonstrating the efficacy of intervention as a whole.

While overall beneficial, a lack of further action influenced the present periods of stagnation that annual population growth has remained at since the various policies were introduced. The still-declining infant mortality rates indicate that expansion of healthcare is not the source of the stasis. Rates detailing female agency and contraceptive use have experienced relative steadiness similar to that of the population growth rate, naming these factors the more likely cause of influence. The seemingly direct effect that contraceptive use and female agency have on population growth rates emphasizes the importance of their inclusion in future programs. Unfortunately, this action cannot be completed easily, as both countries have cited cultural differences as the reason for their absence in present programs.

Empowerment programs in Sub-Saharan Africa have typically emphasized female agency in the form of running a household. As modernization has occurred, these roles have adapted to include the acceptance of women pursuing higher education and a living wage outside of the household. This transformation demonstrates the ability for cultural norms to continue to develop and include ideas that presently seem foreign. It is essential that these programs include ideas related to women's control over family planning when encouraging female agency in communities. Once it becomes more culturally acceptable for women to decide what contraceptive methods and number of children are right for them, it is likely that population growth rates will begin to decrease to a manageable level.

The expansion of current ideas of female agency to include control over contraceptive use and birthing factors are necessary. The inclusion of these views in future family planning programs

will assist with further declines in Nigeria's and Angola's population growth and aid the general development of both countries.

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# **In the Hot Seat: Climate Change and Agriculture in Ethiopia and Malawi**

Timothy McGill

## ***Abstract***

*This article evaluates climate change and its effects on food security and agriculture in Ethiopia and Malawi. In Ethiopia and Malawi, climate change has caused an uptick in extreme weather events, most notably droughts and floods, which threaten the agricultural sector of the countries. Ethiopia and Malawi are both agro-dependent countries with high food insecurity, which will be exacerbated by climate change. Climate change and its effects pose an ethical dilemma for the people of Ethiopia and Malawi and for the global community as a whole. On the one hand, neither country contributes significantly to carbon emissions, which are driving human-induced climate issues. On the other hand, however, both countries are highly vulnerable to the effects of climate change. Ethiopia and Malawi have both made concerted efforts to adapt to the effects of climate change to reduce food insecurity and bolster the food production sector.*

## **I. Introduction**

Climate change is possibly the most significant issue facing the global community today. Though changes in the climate occur naturally, human-induced climate change due to the emission of greenhouse gasses, such as carbon dioxide and methane, is causing severe consequences for the world's population. There are two aspects of climate change: long-run rising temperatures and increasing volatility of weather conditions. In many parts of the world, increasing weather volatility amounts to more extreme weather events, including droughts and flooding, which have massive impacts on human and animal populations. Much of the responsibility for the greenhouse gas emissions that are causing climate change is assigned to industrialized countries which have been contributing to emissions for longer and at higher rates than developing countries. However, the developing countries are the most vulnerable to the effects of climate change, reflecting what is referred to as climate injustice.

This article will evaluate the disproportionate effects of climate change on two such developing countries, Ethiopia and Malawi. It evaluates how the two most common forms of extreme weather in these countries, drought and flooding, impact the agriculture sectors in both countries. In Ethiopia and Malawi, agriculture, especially small-scale farming, accounts for a massive portion of the economies, employing more than half of their populations, and providing food for a majority of the countries' residents. The reliance on agriculture has, however, made Ethiopia and Malawi vulnerable to the effects of climate, which they are largely irresponsible for. This article assesses

the ethical perspectives applicable to situations that Ethiopia and Malawi face as populations with high vulnerability to climate change, but with low impact on global emissions.

Following the introduction is a review of the literature that delves into prior research regarding climate change in Ethiopia and Malawi. Next, this article analyzes the socioeconomic background of both countries, including factors such as GDP per capita, life expectancy, and literacy rate. The fourth section analyzes the specifics of the climate change crisis and how it impacts Ethiopia and Malawi, especially in the context of their extreme vulnerability to shocks in the agricultural sector. Then, the article assesses the ethical perspectives of climate change in Ethiopia and Malawi and examines the measures taken to reduce the effects of climate change in the two countries. Lastly, the paper concludes by making recommendations for steps that should be taken to mitigate climate change effects and reduce climate injustice in Ethiopia and Malawi, and in the rest of the developing world.

## II. Literature Review

Climate and global development experts have, in recent years when climate change has come to the forefront of current international discussion, conducted a significant amount of research on the effects of climate change on the vulnerability of African states. Ethiopia and Malawi are two such states in which vulnerability is significantly high in large part due to economic dependence on domestic agriculture, especially by small-scale household farms. Both of these countries also face food security dilemmas posed by climate change which only contribute further to their vulnerability. Hope (2009) focuses on the entire African continent, Di Falco, Veronesi and Yesuf (2011) and Bedeke et al. (2020) focus on Ethiopia, while Warnatzsch and Reay (2020) and Nordhagen and Pascual (2013) focus on Malawi. All of the articles note the severity of the vulnerability, economically and in terms of food security, in Ethiopia and Malawi as a result of climate change, as well as provide outlines for measures that farmers can take to resist the effects.

- Hope (2009) evaluates how climate change in Africa is leading to an increase in poverty due to the impacts of climate change on the agriculture sectors of African countries, which are crucial to the economies of these nations. It reveals that in Africa, like in other places, the poor are the most vulnerable to issues caused by climate change. The article also notes that African nations contribute little to carbon dioxide emissions but are some of the most vulnerable to its effects. The author concludes that this conundrum has informed Africa's strategy of adaptation to climate change, rather than carbon emission reduction.
- Di Falco, Veronesi and Yesuf (2011) discuss how climate change is impacting food security in Ethiopia, especially as it relates to agricultural productivity. A large portion of Ethiopia's citizens is employed in farming, predominantly household farming. The article explores the factors that motivate household farmers to take adaptive measures against climate change. It also evaluates how such adaptations impact the crop yields of Ethiopia's farmers. Lastly, the author suggests a number of adaptive measures that will best prevent climate change-related decreases in crop yields.
- Bedeke et al. (2020) assess the impacts of climate change on the vulnerability of Ethiopian maize production. Maize, as it is explained, is a staple crop of Ethiopian agricultural production and is crucial to providing food security for much of the population, as well as comprising a significant portion of revenue for farmers. The article explains that food production by household farmers in Ethiopia is hindered by socio-economic factors as well

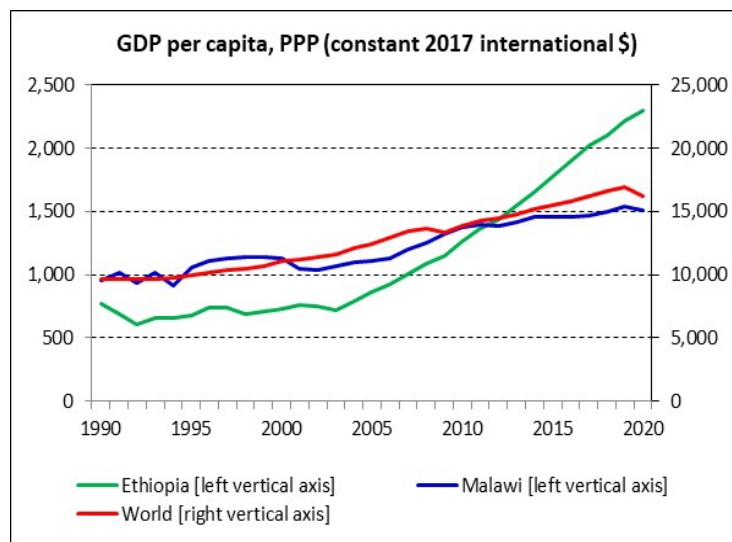
as biophysical factors. In response, the author suggests specifically tailoring solutions to improve agricultural productivity.

- Warnatzsch and Reay (2020) examine Malawi’s reliance on maize production and propose projections of the effects that climate change will have on maize farming. The article evaluates the characteristics that make maize susceptible to climate change factors. Like Ethiopia, the authors note that Malawi is highly vulnerable because of its reliance on domestic and small-scale agriculture for food production and economic output. They suggest that bolstering the Malawi government’s Farm Input Subsidy Program will improve the capacity for the country’s institutions to adapt to climate change.
- Nordhagen and Pascual (2013) focus on how the procurement of crops’ seeds can impact the ability of Malawi’s farmers to make adaptations to rising temperatures and lower precipitation. The article highlights the importance of promoting genetic diversity among crops as a partial solution to projections of decreasing crop yields. The authors also point out that giving farmers useful knowledge on their farming practices will improve their ability to initiate adaptive measures.

### III. Socioeconomic Background

Ethiopia and Malawi are both classified by the United Nations as Least Developed Countries (LDCs).<sup>1</sup> As displayed in Figure 1, purchasing power parity (PPP)-adjusted GDP per capita in Ethiopia and Malawi has been roughly about one tenth of the international average (shown on the right vertical axis) from 1990 to 2020. Ethiopia caught up a bit over the last 15 years, while Malawi has fallen a bit further behind. In 1990, Ethiopia’s PPP-adjusted GDP per capita was \$767 (in 2017 constant \$), while that of Malawi was \$953. In 2020, Ethiopia’s PPP-adjusted GDP per capita was \$2,297 (in 2017 constant \$), while that of Malawi was \$1,509.

**Figure 1: GDP per capita (PPP, constant 2017 international \$)**

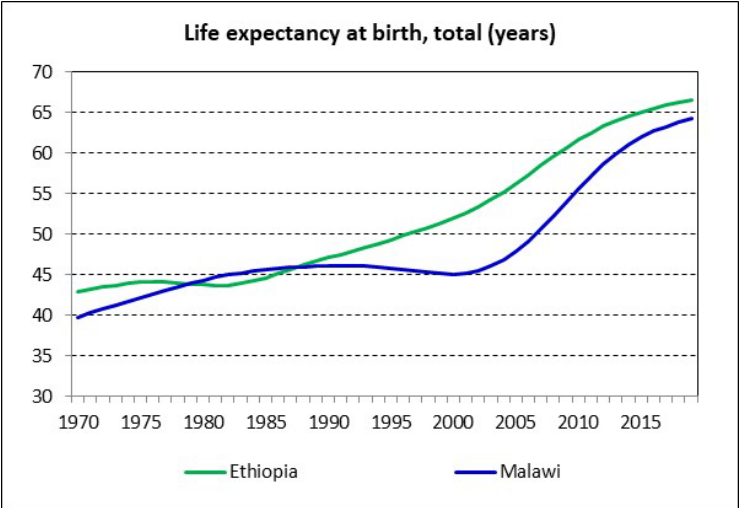


Source: Created by author based on World Bank (2022).

<sup>1</sup> <https://www.un.org/development/desa/dpad/least-developed-country-category.html>

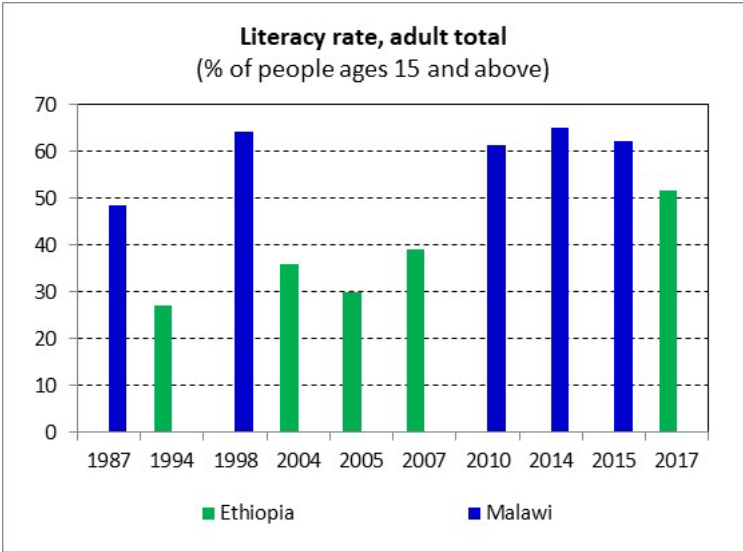
The average international life expectancy has risen from 65 years in 1990 to 73 years in 2020.<sup>2</sup> As shown in Figure 2, residents of both Ethiopia and Malawi can expect to live a shorter life than the average person around the world. As of 2019, the life expectancy in Ethiopia was 66.6 years, whereas it was 64.3 years in Malawi in the same year. Both countries have experienced significant growth in life expectancy between 1970 and 2019, having had a life expectancy of 43.0 years and 39.8 years in 1970, respectively in Ethiopia and Malawi.

**Figure 2: Life Expectancy at Birth (years), 1970-2019**



Source: Created by author based on World Bank (2022).

**Figure 3: Adult Literacy Rate (percent of people ages 15 years and above), available years**



Source: Created by author based on World Bank (2022).

<sup>2</sup> World Bank (2022).



As shown in Figure 3 above, Ethiopia and Malawi both suffer from low literacy rates. Based on the latest data reported by the World Bank (2022) for Ethiopia, only 51.8 percent of adult Ethiopian residents were literate in 2017. Despite this low proportion, Ethiopia has seen growth in its literacy rate since the first data collection in 1994, when the literacy rate was only 27.9 percent. Malawi also increased its literacy rate from 48.6 percent in 1987 to 64.1 percent in 1998, but then saw a drop in its literacy rate to only 61.3 percent twelve years later in 2010. Malawi's literacy rate then improved to 65.1 percent in 2014, but it decreased again in the subsequent year to 62.1 percent. Hence, Malawi had a lower literacy rate in 2015 (which is the last year such data is available for Malawi) than it had 17 years earlier in 1998.

## **IV. Analysis of Facts**

### **IV.1. Carbon Dioxide (CO<sub>2</sub>) Emissions**

The threat of climate change is one that looms large over the entire world, as it will have global impacts. Primarily, climate change will lead to increased average temperatures in all parts of the world, changes in precipitation patterns, and an increase in extreme weather events, such as cyclones and droughts. All of the primary impacts of climate change on the world have auxiliary effects outside of the realm of physical changes to weather patterns. Climate change, though naturally occurring, has been concentrated within a shorter period of time than is natural and exacerbated by human activity, most notably the emission of greenhouse gases. It is crucial to note that, while developed countries are the highest emitting countries, the people most affected by climatic changes will be the world's poorest people, who are heavily concentrated in developing countries, including Ethiopia and Malawi.

In 2021, the Intergovernmental Panel on Climate Change (IPCC) released a report summarizing the scientific basis for understanding current trends in climate change. The report noted, crucially, that the concentration of greenhouse gases has been consistently increasing since 1750 due to human behaviors.<sup>3</sup> Most of these emissions have come from developed countries, those that have the largest industrial capabilities. The top ten highest contributors to carbon dioxide emissions between 1750 and 2020 accounted for nearly 70 percent of all carbon dioxide emissions in the world during the period.<sup>4</sup> On the other end of the spectrum, the 133 lowest contributing countries each account for less than 0.1 percent of emissions between 1750 and 2020.<sup>5</sup> What this data reveals is that, despite climate change being a shared-fate issue, the problem has historically been caused by only a small portion of the world's countries. More recently however, the world's greatest contributors to current carbon dioxide emissions also account for a massive portion of the world's total population.

As demonstrated in Figure 4, Ethiopia had nearly nine times the carbon dioxide emissions of Malawi in 2018. Ethiopia contributed 16,280 kilotons of carbon dioxide into the atmosphere, whereas Malawi contributed only 1,570 kilotons. The difference in total carbon dioxide emissions between Ethiopia and Malawi can, in large part be attributed to Ethiopia's significantly larger population. A better measure of the two countries' climate change contributions is by assessing the trends of carbon output. Ethiopia has continued to increase the amount of CO<sub>2</sub> it emits, whereas Malawi has managed to stabilize its emissions. In the same timeframe, Ethiopia's total carbon

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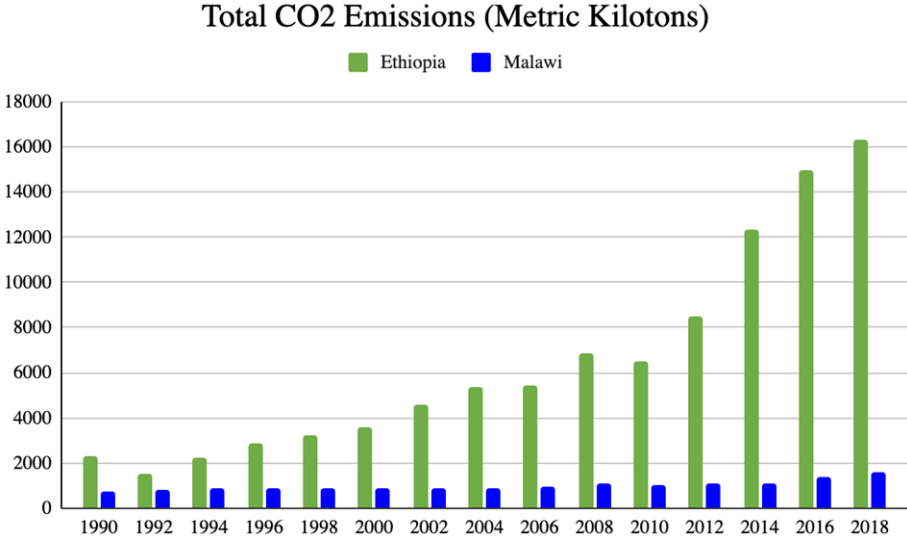
<sup>3</sup> Intergovernmental Panel on Climate Change (2021) p. 5.

<sup>4</sup> Ritchie and Roser (2020).

<sup>5</sup> Ritchie and Roser (2020).

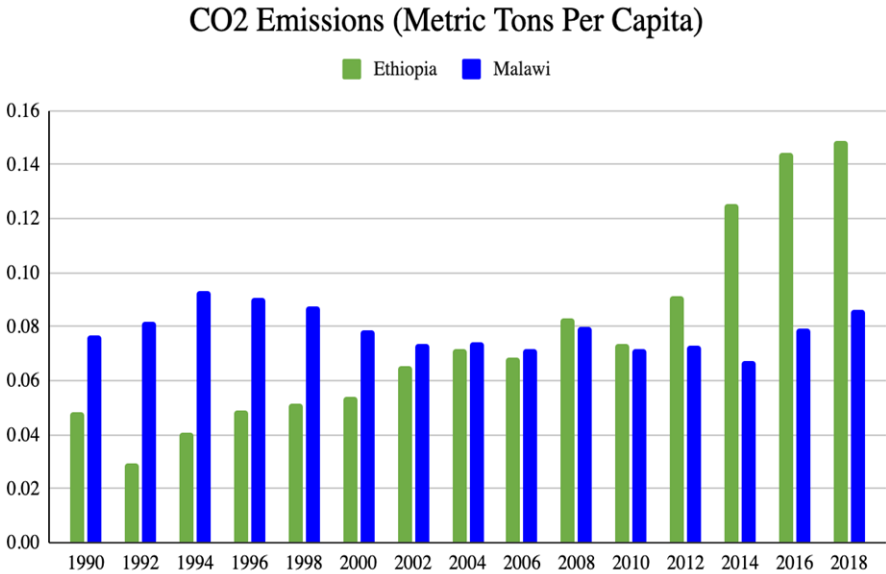
dioxide emissions have increased nearly eightfold, whereas Malawi’s total emissions have doubled over the past 28 years. In any case, it is important to keep in mind that neither Ethiopia nor Malawi have a significant carbon output compared to the rest of the world. Both countries account for less than 0.1 percent of the world’s emissions since 1750.

**Figure 4: Total CO<sub>2</sub> Emissions (metric kilotons)**



Source: Created by author based on World Bank (2022).

**Figure 5: Per capita CO<sub>2</sub> Emissions (metric tons)**



Source: Created by author based on World Bank (2022).

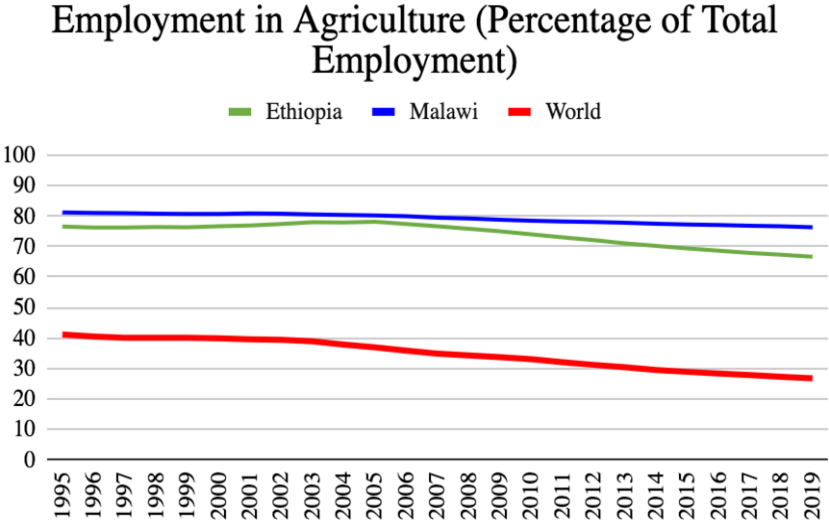
The trend in emission rate is also somewhat apparent in Figure 5, which depicts carbon dioxide emissions per capita in metric tons. While Ethiopia’s per capita emissions have continually risen over time, Malawi’s have fluctuated, finishing 2018 with roughly the same about of carbon dioxide emissions per capita as in 1990. While total emissions can be blamed on population growth, per capita emissions cannot. In Ethiopia, carbon dioxide emissions have outpaced population growth. In Malawi, on the other hand, population growth and carbon dioxide emissions have, on average over the 28-year span, mirrored each other.

Though Malawi has seemingly handled its carbon output better than Ethiopia, this is largely due to Malawi achieving little economic growth and industrialization. In 2011, Ethiopia’s industrial sector produced ten times as much carbon dioxide as Malawi’s industrial sector.<sup>6</sup> Yet, despite Ethiopia’s edge over Malawi in terms of industrialization, carbon dioxide emissions from both countries come overwhelmingly from their agricultural and land-use sectors, accounting for 79 percent of Ethiopia’s total emissions and 96 percent of Malawi’s emissions in 2011.<sup>7</sup>

**IV.2. Vulnerability to Climate Change**

Despite contributing little to human-induced climate change, Ethiopia and Malawi, like other developing countries worldwide, will suffer far greater consequences due to the effects of climate change in comparison to the developed countries that are largely responsible for the phenomenon. A host of issues accompany the rise in temperatures and other related issues associated with climate change, most of which will have severe consequences for the countries’ critical agricultural sector, which employs most of their citizens. As displayed in Figure 6, despite declining over time, nearly 67 percent of Ethiopians and 76 percent of Malawians still worked in agriculture in 2019.

**Figure 6: Employment in Agriculture (percent of total employment)**

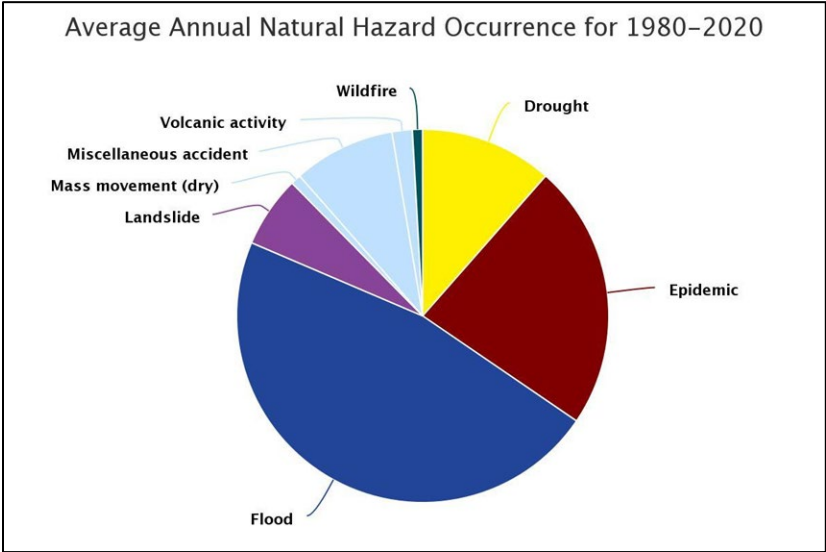


Source: Created by author based on World Bank (2022).

<sup>6</sup> Ritchie and Roser (2020).  
<sup>7</sup> Ritchie and Roser (2020).

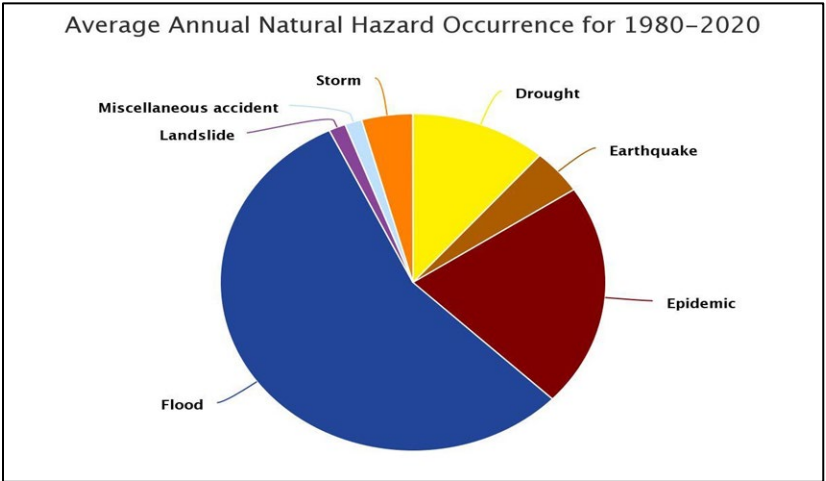
Ethiopia and Malawi must expect similar consequences of climate change, which could have drastic effects on the agricultural productivity of both countries. Figure 7 and Figure 8 display the most common extreme natural events from 1980-2020 in Ethiopia and Malawi, respectively. In both countries, floods, droughts, and epidemics are the three most common forms of extreme natural occurrences. Though epidemics are linked to climate change, they have a much less significant impact on the agricultural capabilities of a country. Droughts and floods, however, will have major impacts on farming in Ethiopia and Malawi.

**Figure 7: Ethiopia: Average Annual Natural Hazard Occurrence for 1980-2020**



Source: World Bank Climate Change Knowledge Portal (2021), <https://climateknowledgeportal.worldbank.org/country/ethiopia/vulnerability>.

**Figure 8: Malawi: Average Annual Natural Hazard Occurrence for 1980-2020**



Source: World Bank Climate Change Knowledge Portal (2021), <https://climateknowledgeportal.worldbank.org/country/malawi/vulnerability>.

In Malawi, over 90 percent of agricultural workers work on smallholder farms, which are characterized by smaller size in comparison to corporate farms and high intrafamilial employment.<sup>8</sup> Small farms are more susceptible to climatic changes the most crucially of which are variations in precipitation levels and extreme weather events. In Malawi, the two most significant weather conditions for the health of the agriculture sector are droughts and floods, which generally only occur in the Shire River basin in southern Malawi.<sup>9</sup> Droughts, occurring throughout the whole of Malawi, tend to be more devastating for crop production amongst small farmers and large plantations, in comparison to floods. Small farms lose on average 2.97 percent of their crop production due to droughts, which can result in a significant decline of 2.02 percent in annual GDP.<sup>10</sup>

For Malawians, climatic shocks can be truly devastating and threaten the security of large swathes of the population. With climate change and rising temperatures, the soil will retain less moisture as water evaporates faster, causing the soil to become hard and less conducive to growing crops. The lack of crop variety also threatens the livelihoods of many Malawian farmers who tend to grow local maize varieties.<sup>11</sup> Maize is the most important crop for Malawi's farmers, but because most small farms grow local varieties, rather than drought-modified modern varieties, like the large-scale farms, the maize is highly susceptible to drought. Decreased production for a staple crop like maize could threaten the livelihood of many Malawi farmers and threatens to plunge many Malawians into poverty and serious food insecurity.

For Ethiopian farmers, the effects of climate change differ slightly compared to those felt by Malawian farmers. In Ethiopia, variations in precipitation can actually benefit farmers, if they fall in the right season. For example, higher precipitation rates during the spring can increase farmers' revenue by \$225 per hectare, whereas more rain during the winter could cost farmers \$465 per hectare.<sup>12</sup> Higher precipitation in the spring benefits crops by promoting earlier germination, whereas rain and higher temperatures in the winter could promote the spread of disease and pests, both of which harm crop yields. Ultimately, though, experts predict that climate change would serve to harm total farming productivity and revenue for Ethiopian farmers. They project that agricultural revenue in Ethiopia will decrease by 9.7 percent by 2050 and will be even greater by 2100.<sup>13</sup>

While Ethiopian farmers may enjoy boosts in productivity and revenue during some harvests, they will ultimately find themselves less productive. Interestingly, it seems that agricultural production and carbon dioxide emissions are inversely related in Ethiopia. As carbon dioxide emissions continue to rise, farming revenue decreases. This could be due to increasing urbanization, which often accompanies industrialization, which can cause, or be caused by, a decrease in rural farming. As farming becomes less productive, more Ethiopians will likely abandon the trade to work in the growing industry sector in Ethiopia, which will ultimately raise food prices and increase carbon emissions. It is important to remember, however, that neither in the case of Malawi nor Ethiopia are the two countries solely responsible for the effects of climate change on the agriculture industries.

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<sup>8</sup> Stevens and Madani (2016), p. 1.

<sup>9</sup> Pauw, Thurlow, Bachu and van Seventer (2011), p. 180.

<sup>10</sup> Pauw, Thurlow, Bachu and van Seventer (2011), p. 188 and 191.

<sup>11</sup> Pauw, Thurlow, Bachu and van Seventer (2011), p. 191.

<sup>12</sup> Deressa and Hassan (2009), p. 542.

<sup>13</sup> Deressa and Hassan (2009), p. 545.

## V. Ethical Analysis

This section will analyze the ethical implications implicit in the issue of climate change, which is a shared-fate issue that disproportionately affects developing countries like Ethiopia and Malawi. The first section explains the ethical issues associated with climate change, as well as evaluates the steps that Ethiopia and Malawi are taking to reduce the effects of climate change. The second section will discuss the applicable ethical perspectives and approaches associated with the issue of climate change as it applies to Ethiopia and Malawi.

### V.1. Ethical Implications of Climate Change

In addition to the threat of destruction that climate change presents to the livelihoods of massive portions of the Ethiopian and Malawian populations, it also reflects an ethical issue. The effects of climate change are felt worldwide. However, as the theory of distributive justice suggests, “climate change impacts will not be evenly distributed across space”.<sup>14</sup> In Ethiopia and Malawi, as well as other developing countries, where the agriculture sector employs the majority of workers and accounts for a massive portion of the countries’ GDP, the effects of climate change will have a massive impact on people’s livelihoods. Conversely, in countries that are not agriculture-dependent, predominantly developed countries, climate change will have a less significant impact on people’s lives. Thus, in developing countries, such as Ethiopia and Malawi, climate change poses a far more serious risk to the people than in developed (or advanced industrialized) countries, which poses a major ethical issue.

A second crucial aspect of the ethical question of distributive justice is in assessing the responsibility for climate change. Despite being less severely impacted by the climatic changes, developing countries disproportionately produce carbon emissions, the cause of human-induced climate change trends. According to the Union of Concerned Scientists (2020), the top ten highest emitting countries in the world emit about 68.4 percent of the world’s total CO<sub>2</sub> emissions. Comparatively, Ethiopia, which ranks 114th in the world for carbon emissions, and Malawi, which ranks 163rd, both contribute less than 0.1 percent of the world’s total CO<sub>2</sub> emissions.<sup>15</sup> Yet, Ethiopia and Malawi will continue to be affected by the actions of developed countries unless serious measures are taken to reduce carbon dioxide emissions to quell the effects of climate change.

Unfortunately for developing countries like Ethiopia and Malawi, the process of developing solutions to climate change poses a different barrier described as procedural justice. As stated in Jouni, Adger and Huq (2006, p. 264), in international negotiations, developing countries are frequently not given the same powers to take action and make decisions as more politically powerful, developed, countries. In world forums, such as the United Nations, which has been critical in developing solutions to climate change and its accompanying issues, developed countries hold disproportionate amounts of power compared to developing countries. Another aspect of procedural justice is that many countries are not held accountable by the international community when they fail to follow international guidelines.<sup>16</sup> For example, the United States, in 2019, filed to leave the Paris Climate Agreement despite being one of the largest contributors to carbon dioxide emissions in the world. Developing countries, like Ethiopia and Malawi, which

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<sup>14</sup> Jouni, Adger and Huq (2006), p. 263.

<sup>15</sup> World Bank (2022).

<sup>16</sup> Jouni, Adger and Huq (2006), p. 264.

have ratified the Paris Agreement and are more vulnerable to climate change, have, meanwhile, undertaken massive initiatives to reduce their own infinitesimal emissions.

As part of the Paris Agreement, Ethiopia and Malawi have submitted so-called Nationally Documented Contributions (NDC) to the United Nations Framework Convention on Climate Change (UNFCCC), which detail the measures they have taken to reduce carbon dioxide emissions and mitigate climate change-related issues in their respective countries and report on the progress they have made. For example, in 2010, Ethiopia launched the Ethiopian Program of Adaptation on Climate Change and Nationally Appropriate Mitigation Actions, among other initiatives.<sup>17</sup> Ethiopia has set a target of 68.8 percent reduction in carbon dioxide emissions by 2030, compared to the business-as-usual (BAU) scenario.<sup>18</sup> Likewise, Malawi enacted the National Climate Change Management Policy (NCCMP) in 2016, which provides strategic direction for the country's priorities for climate change interventions covering both adaptation and mitigation.<sup>19</sup> They set their target for carbon emission reduction at 51 percent less than the BAU scenario.<sup>20</sup> Thus, despite their small contribution to total global carbon emissions, Ethiopia and Malawi have demonstrated a commitment to contributing to limiting global warming.

## V.2. Ethical Perspectives and Approaches

Despite the efforts to reduce carbon dioxide emissions by Ethiopia and Malawi, the main emphasis of both countries' climate change mitigation efforts is to reduce economic vulnerability to climate change, mainly by bolstering their agricultural sectors. The efforts by the Ethiopian and Malawi governments to reduce economic vulnerability reflect the priority perspective to solving ethical issues, which states that "benefits to the worst off have higher ethical value than benefits to the better off".<sup>21</sup> As stated in Ethiopia's National Adaptation Plan of 2019: "With significant numbers of people in Ethiopia living in conditions of chronic food insecurity, building resilience and adaptive capacity for vulnerable communities and groups is critical."<sup>22</sup> Likewise, Malawi establishes that one of the three pillars of its climate adaptation plan should hinge on "resilience of the most vulnerable".<sup>23</sup> Due to the reliance on agriculture, Ethiopia and Malawi have massive vulnerable populations who would suffer severely from climate change impacts on the agricultural sector, so it makes sense that they would prioritize the most vulnerable.

In addition to the priority perspective, Ethiopia's policy also reflects the utilitarian approach of ethical decision making, which emphasizes balancing costs and benefits.<sup>24</sup> Ethiopia's National Adaptation Plan<sup>25</sup> tries to balance the positive impacts of economic growth on development with the negative impacts of economic growth on climate change vulnerability. The document states (p. 35) that "Ethiopia aims to achieve middle-income status by 2025 while developing a green (low emissions) economy."

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<sup>17</sup> Government of the Federal Democratic Republic of Ethiopia (2021), pp. 4-5.

<sup>18</sup> Government of the Federal Democratic Republic of Ethiopia (2021), p. 9.

<sup>19</sup> Government of Malawi (2021), p. VIII.

<sup>20</sup> Government of Malawi (2021), p. IX.

<sup>21</sup> Barrientos et al. (2016), p. 12.

<sup>22</sup> Government of the Federal Democratic Republic of Ethiopia (2019), p. 42.

<sup>23</sup> Government of Malawi (2021), p. X.

<sup>24</sup> Markkula Center for Applied Ethics (2009), p. 2

<sup>25</sup> Government of the Federal Democratic Republic of Ethiopia (2019).

Malawi seems to utilize the common good approach. The common good approach places an emphasis on the “interlocking relationships of society” as the basis for solving ethical problems.<sup>26</sup> Unlike Ethiopia, Malawi does not appear to have plans for becoming a middle-income or developed nation in the near future. Instead, their climate change policies focus entirely on benefitting the people of Malawi and focus much less on economic development. In their National Adaptation Plan, Malawi outlines using a “community-based participatory approach” and a “gender and human rights approach” to solving issues related to climate change.<sup>27</sup> They seem to place an emphasis on community building as a method to reduce climate change vulnerability, which is the most crucial issue facing Malawi. In fact, one of the five mandates of the National Adaptation Plan is to “improve community resilience to climate change” by enhancing agricultural production.<sup>28</sup> Malawi differs from Ethiopia in the sense that improving agricultural production revolves around strengthening the bonds of communities to create support networks to reduce vulnerability to climatic shocks.

#### **IV. Conclusion**

The populations of Ethiopia and Malawi are highly vulnerable to the effects of climate change. The rise in droughts and flooding in both countries threaten the agriculture industries of both countries, which employ significantly more than 50 percent of the population. However, the countries, which are at different stages in the development process are taking two different approaches to deal with climate change issues.

Ethiopia, which has aspirations of becoming an industrialized nation, is seeking to employ the use of technology in the agriculture sector to reduce its vulnerability to extreme weather shocks. While this method may create better food security for the people of Ethiopia, it will also result in a massive increase in unemployment, as well as an increase in Ethiopia’s contribution to global greenhouse gas emissions, which has been rising since 1990. Conversely, Malawi is less developed than Ethiopia and is pursuing a more traditional approach to climate change mitigation, focusing on strengthening community bonds to create contingency options to reduce food insecurity vulnerabilities. As Malawi is not industrializing, it has significantly lower carbon emission rates, which have remained relatively stable since 1990.

Despite the differences in approaches to climate change mitigation and contribution to carbon dioxide emissions, neither Ethiopia nor Malawi is responsible for a significant portion of global emissions. Independently, neither country contributed more than 0.1 percent of global carbon emissions. Regardless, both countries have made commitments in international forums, such as the UNFCCC to take measures to reduce carbon emissions, and both are signatories to the Paris Climate Agreement. Ultimately, their efforts will be in vain if the main carbon-emitting countries are not able to significantly reduce their emissions.

In order to ensure these carbon-emitting developed nations are being held accountable for their commitments to reduce carbon emissions, Ethiopia and Malawi, in collaboration with other low emission countries, should form a coalition to demand accountability from the main emitters. Often in international forums, such as the UN, small, developing, countries are discounted by the larger, more economically and politically powerful, countries. By forming a coalition of low-emission

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<sup>26</sup> Markkula Center for Applied Ethics (2009), p. 2

<sup>27</sup> Government of Malawi (2020), p.vi.

<sup>28</sup> Government of Malawi (2020), p. vii.



countries, Ethiopia, Malawi, and other such countries, would be able to form a united front against the more powerful developed countries.

In the short term, it will be crucial for Ethiopia to Malawi to take drastic measures to reduce the vulnerability of their populations. Climate change mitigation efforts should focus on utilizing technology that can reduce the effects of extreme weather events on the agricultural production of the countries. This will provide more food security, while simultaneously increasing the countries' GDPs, which would benefit all of the citizens of Ethiopia and Malawi. It will also be important to educate farmers, especially on small, family-operated, farms about methods to reduce the vulnerability of their crops to climate change effects, such as using a greater variety of seed types and crops.

Ultimately, the success of Ethiopia and Malawi in mitigating climate change effects will rely on their ability to advocate for themselves at the international level, as well as protecting their populations. For that, both countries will need to improve their low literacy rates, which will allow both countries to a.) better adapt to the negative impacts of climate change, b.) better prevent increases in their national carbon dioxide emissions, and c.) be more competitive in the world economy and having a bigger say at the international level.

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