West Africa Economic Outlook 2022

Supporting Climate Resilience and a Just Energy Transition

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Performance on other macroeconomic indicators was mixed. Driven by hikes in energy prices, inflation swelled to 12.7% in 2021 from 10.2% in 2020. The price of fuel on the international market surged to $79 per barrel in 2021 from $50 in 2020, a 55% increase. Nigeria was a major driver of regional inflation : it experienced inflation of 16.9%, higher than the regional average of 12.7%. The average fiscal deficit narrowed to 5.7% of GDP in 2021 from 6.4% in 2020 as economic activities resumed, more revenue was collected, tax cuts were reversed (the cuts had been introduced in 2020 to mitigate the pandemic's impacts on households and businesses), and COVID-19-related health spending fell. Cabo Verde, Ghana, Guinea Bissau, and Nigeria contributed the most to narrowing the region's fiscal deficit. Similarly, the current account deficit narrowed to 3.5% of GDP from 4.3% in 2020. Negative balances in resource-intensive economies—namely Burkina Faso, Ghana, Guinea, and Nigeria—contributed the most to the region's external position.

Despite these advances, countries in the region have not yet come out of the woods. New headwinds have emerged, including the resurgence of COVID-19 in China; shifts in monetary policy in advanced economies; the Ukraine-Russia war, which is worsening inflation; and climate change, which is causing extreme weather events. These headwinds have dampened West Africa's medium-term outlook. GDP growth in West Africa is projected to decelerate to 4.1% in 2022 and 4.2% 2023. It is also expected that headline inflation may surge to 13.6% in 2022 and decline to 10.2% in 2023, driven by food and energy inflation. The impact is expected to be pronounced in countries whose local currency is depreciating and that have little of the fiscal buffer needed to cushion the effects of global inflation on domestic prices. The fiscal deficit is projected to narrow slightly because of better revenue collection, reaching 5.4% of GDP in 2022 and 5.3% in 2023. But if the war drags on and international financial market conditions worsen, it is highly likely that fiscal deficits will grow. The current account deficit is projected to narrow to 2% of GDP in 2022 and 2023.

The risks to the economic outlook are substantial. Among other things, they emanate from continued shortages of food and fuel in the global market caused by a post-pandemic mismatch between demand and supply that has been exacerbated by the prolonged Russia-Ukraine war. They are also the consequence of the rising cost of borrowing, caused by worsening liquidity in the international financial market; recessionary

pressures in the region's trading partners, due to tight monetary policy; the resurgence of COVID-19 and new variants amid slow vaccine rollout; and adverse weather conditions (e.g., drought). These developments could dampen the growth outlook, heighten inflationary pressures, and widen fiscal and current account deficits. Risk mitigation measures include embarking on growth-friendly fiscal consolidation programs, obtaining financial support from the international community to create fiscal space in impacted countries, conducting information campaigns to counter COVID-19 vaccine hesitancy, and accelerating structural reforms.

If the headwinds strengthen, policy makers could find themselves in a quagmire caused by constrained policy space. Much of the space they enjoyed one year ago has been depleted. Therefore, protecting vulnerable households from rising food and energy prices in the immediate term will be a daunting task. Policy space is also needed to sustain recovery in the short term and build resilience to shocks (through structural change) in the medium-to-long term. The structural change could aim at broadening the growth base, investing in pharmaceutical manufacturing to mitigate disease outbreaks, and supporting the transition to green growth (e.g., by supporting climate adaptation and mitigation measures).

As for monetary policy, countries with lower inflation levels (and with measures to manage capital outflows caused by the rising differential in domestic and global interest rates) could opt to maintain their accommodative monetary policy to support growth. When growth recovery is the policy target, a difficult policy choice countries could consider instead of hiking interest rates is soft monetary tightening: e.g., selling securities to mop up excess liquidity in the system. Countries whose debt levels are rising due to increased reliance on the domestic financing of fiscal deficits may attempt to hike interest rates to address elevated inflation levels, but should consider the implication of such a hike on debt accumulation. Of late, interest rates and the depreciation of exchange rates have become major drivers of debt accumulation in the region. In general, monetary authorities should weigh the pros and cons of monetary policy options on important macroeconomic variables, such as growth, inflation, exchange rates, and debt.

As regards fiscal policy, one option in the immediate term is to mitigate vulnerability by diverting the additional revenues generated by price increases to subsidize essentials. In the short term, countries might consider enhancing domestic and external resource mobilization through growth-friendly policy reforms: for example, introducing or expanding digital taxes and property taxes, curtailing illicit financial flows, plugging tax gaps, prioritizing/rationalizing government spending, and making government investments more efficient. In the medium-to-longer term, they should build fiscal buffer through countercyclical policies.

On the external sector front, it is important to note that surpluses in financial accounts, which have been major sources of finance for current account deficits in the region, could be impacted by capital reversals caused by policy shifts in advanced economies. Countries with a strong external position could use external reserves to finance their current account deficit, and countries with fiscal space could borrow from external sources. In the immediate-to-short term, countries could limit their dependence on a single supplier of food (wheat, maize, fertilizer, etc.,), and in the medium-to-long term, they could build resilience to external shocks by diversifying their export base (e.g., value addition and mineral beneficiation). In these cases, the African Continental Free Trade Area comes in handy.

The energy transition : Climate change in West Africa is causing extreme natural events: drought, floods, storms, heat waves, and a rise in sea levels. The region is home to 10 of the countries most affected by climate risks: Niger, Nigeria, Ghana, Senegal, Sierra Leon, Liberia, Côte d'Ivoire, Guinea-Bissau, Mali, and Burkina Faso (ranked in order of decreasing risk). Extreme natural events tend to have socioeconomic consequences. In Nigeria, Benin, and Niger, for instance, poor rains could force people to migrate in search of water and pasture for their livestock. This could lead to social tensions. In Benin, Ghana, Mali,

and Sierra Leone, floods caused by heavy rains, sea level rises, or storm surges could cause fatalities, displace people and damage property in cities, and cause crop losses in rural areas. Extreme natural events could also cause macroeconomic imbalances. In Burkina Faso, Mali, and Niger, poor rains could slash agricultural production and productivity and provoke food shortages; could reduce the water-holding capacity of hydroelectric dams and increase the cost of energy; and could increase food import bills and threaten the livelihoods of rural dwellers. As noted in Chapter 1, rankings on the Global Climate Risk Index are strongly correlated to macroeconomic performance.

The use of fossil fuels to generate energy is a major contributor to global warming. Recognizing this, countries in the region have committed to the Paris Declaration of meeting a global warming target of 1.5 degrees by 2030. In response to this global call, many countries in the region have updated their nationally determined contribution. A nationally determined contribution now forms part of their climate strategy to transition energy towards renewable sources (e.g., geothermal, hydropower, solar and wind power). Climate strategies consider the region's energy potential of 17 billion tons of proven oil reserves, 5200 billion m3 of natural gas reserves, and 25,000 MW of hydraulic potential. Access to electricity in the region is among the world's lowest—only 42% of the total population and 8% of rural residents had access in 2015. The region is also confronted with fuel price volatility and system unreliability. The region must therefore balance the need for universal access to energy while transitioning to renewable energy. Countries cannot do this without international financial support.

Climate resilience and financing : Although countries in the region have strategies to transition to renewable energy, they are preoccupied with meeting immediate needs prompted by recent shocks (e.g., the COVID-19 pandemic and weather variability). These shocks have undermined countries' fiscal space to invest in climate-smart projects and deterred the implementation of more impactful long-term strategies. Bridging the financing gaps and supporting the energy transition requires concessional financing. The African Development Bank has provided financing instruments such as the Green Baseload Program and the Sustainable Energy Fund for Africa. In addition, countries could capitalize on the falling cost of renewable energy technologies to leapfrog their way to greener energy. They could adopt other innovative financing instruments and creative implementation strategies. For example, by coordinating renewable projects nationally and regionally, West African governments could optimize energy plans and prevent renewable projects from fragmenting into inefficient clusters decoupled from national and regional electricity grids. In addition to financing, the transition to renewable energy entails revamping regulatory instruments and developing policy frameworks conducive to the development and adoption of technologies that address climate challenges. In particular, West African countries should integrate a climate-change focus when planning infrastructure, designing and improving emergency responses, and preparing for natural disasters.

Policy recommendations vary depending on countries' circumstances. **In the immediate term**, where policy space allows it, countries could focus on better coordinating monetary and fiscal policy to stimulate growth and protect the development gains of the past decade. This implies cushioning vulnerable groups from rising food and energy prices through targeted subsidies and transfers. In countries where policy space is limited, the resources could come from additional revenues collected from rising prices (inflation), a reprioritization of government expenditure, and international support. International support could take the form of an extension of G20 countries' Debt Service Suspension Initiative, which expired in December 2021; debt restructuring under the G20's Common Framework; and concessional loans.

In the short-to-medium term, countries could enhance government revenue collection by closing the tax gaps (both the compliance gap and the expenditure gap) by improving tax administration and streamlining tax expenditure; by expanding the tax base (e.g., by introducing digital and property taxes in countries that don't have them); by making government expenditure more efficient; and by gradually transitioning to

to countercyclical fiscal policies to build fiscal buffer.

In the medium-to-longer term, policies could build resilience to shocks through structural change. Five areas of change are on top :

First is to transform agriculture by improving agricultural productivity, among other things, with improved farming techniques, access to modern inputs, access to finance, advisory services, and value addition. In this regard, the region has a comparative advantage: a large labor force in agriculture and abundant arable land.

Second is to invest in the development of regional and cross-border infrastructure and diversifying exports to take greater advantage of the opportunities offered by the African Continental Free Trade Area.

Third is to promote green growth, integrating a climate-change focus when planning infrastructure, designing and improving emergency responses, and preparing for natural disasters.

Fourth is to accelerate the energy transition while increasing access to electricity. Clean, indigenous, and affordable renewable energy gives the region the opportunity to move toward low-carbon development and build resilience, thereby achieving its economic, social, environmental, and climate objectives. Sustainable development and use of the region's massive biomass, geothermal, hydropower, solar, and wind power could rapidly change the region's circumstances.

Fifth and last is to tap into innovative financing instruments. Investing in climate-resilient infrastructure in key sectors such as agriculture would reduce the impact of climate shocks and provide a foundation for sustainable economic growth. But the region is already carrying large debt, and the pandemic undermined fiscal strength in many countries. This calls for more innovative financing instruments.

INTRODUCTION

West Africa's economy showed signs of recovery in 2021. In indicating a V-shaped recovery, the average gross domestic product (GDP) of the region is estimated to rebound by 4.3% in 2021, higher than its pre-COVID-19-pandemic growth of 3.5% in 2019. In all, it can be argued that West Africa, like other regions on the continent, navigated the pandemic well as a result of robust monetary, fiscal, and financial policies, the easing of social restrictions, global partnerships (e.g., the Debt Service Suspension Initiative, emergency responses by the International Monetary Fund, the World Bank, and the African Development Bank Group), and the rollout of COVID-19 vaccine.

Nevertheless, countries in the region have not yet come out of the woods. New headwinds have emerged, including the resurgence of COVID-19 in China; shifts in monetary policy in advanced economies; the Ukraine-Russia war, which is worsening inflation; and climate change, which is causing extreme weather events. These headwinds have dampened West Africa's medium-term outlook and created new monetary, fiscal, and external policy challenges for macroeconomic management. As in 2021, policy makers have limited policy space and could struggle to find the right policy mix.

Chapter 1 of this report looks at these conditions in some length. The analysis covers all the 15 member countries of the Economic Community of West African States (ECOWAS): Benin, Burkina Faso, Cabo Verde, Cote d'Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo. It also enumerates outlooks and risks and policy options that might be pursued in the immediate/short term and the medium-to-long term.

Chapter 2 of this report is devoted to the theme of the 2022 edition of the African Development Bank's African Economic Outlook: supporting climate resilience and a just energy transition. The chapter conducts a thorough analysis of climate resilience and a just energy transition in West African economies.

Finally, Chapter 3 proposes policy recommendations for improving climate resilience and accelerating the energy transition. It discusses challenges and opportunities for low-carbon development and identifies innovative financing instruments to support climate resilience and the energy transition in West Africa.

CHAPTER 1

RECENT MACROECONOMIC TRENDS AND PROSPECTS

This chapter discusses macroeconomic performance in the West Africa region in 2021. The chapter describes the performance of member countries, the factors that fuelled growth, and national policy choices. It concludes by highlighting the medium-term outlook and risks to the outlook in 2022 and 2023. The chapter takes stock of variations in countries' economic structure.

KEY MESSAGES

- **The West Africa region rebounded strongly in 2021 despite the COVID-19 pandemic.** Showing signs of a V-shaped recovery, the average GDP of the region is estimated to rebound by 4.3% in 2021, higher than its pre-COVID-19-pandemic growth of 3.5% in 2019.

- **Growth was fuelled by monetary, fiscal, and financial policies, the easing of social restrictions, global partnerships (e.g., the Debt Service Suspension Initiative, emergency responses by the International Monetary Fund, the World Bank, and the African Development Bank Group), and the rollout of the COVID-19 vaccine.** GDP growth in 2021 was stimulated by household consumption and investment on the demand side, and by services on the supply side.

- **The economic outlook faces substantial risks.** New headwinds have emerged, including the resurgence of COVID-19 in China, a major trading partner; sharp monetary tightening in advanced economies; the Ukraine-Russia war, which is worsening inflation; and climate change, which is causing extreme weather events.

- **GDP growth is projected to decelerate to 4.1% in 2022 and 4.2% 2023, and headline inflation is expected to edge up to 13.6% in 2022 and 10.2% in 2023.** The fiscal deficit to GDP is likely to narrow to 5.4% in 2022 and 5.3% in 2023, and the current account deficit to fall to 2% GDP in 2022 and 2023.

- **Should the headwinds strengthen, policy makers could be confronted with an even tighter policy space that makes it more difficult to protect vulnerable groups in the immediate term, support recovery in the short-to-medium term, and build resilience to shocks through structural change in the medium-to-longer term.**

- **Risks to the outlook include prolongation of the Russia-Ukraine war, further tightening of liquidity in the international financial market, a recession among the region's trading partners, the resurgence of the COVID-19 pandemic amid slow vaccine rollout, and adverse weather conditions.** Risk mitigation measures include growth-friendly fiscal consolidation programs, financial support from the international community, an information campaign to counter vaccine hesitancy, and the acceleration of structural reforms.

- **In the immediate term, where policy space allows it, countries could focus on better coordinating monetary and fiscal policy to stimulate growth and protect the development gains of the past decade.** This implies cushioning vulnerable groups from rising food and energy prices through targeted subsidies and transfers. Commodity-exporting countries that benefit from the surge in commodity prices could use the additional revenues for this purpose. Where policy space is limited, countries need to reprioritize government expenditure. In these cases, support from the international community is warranted.

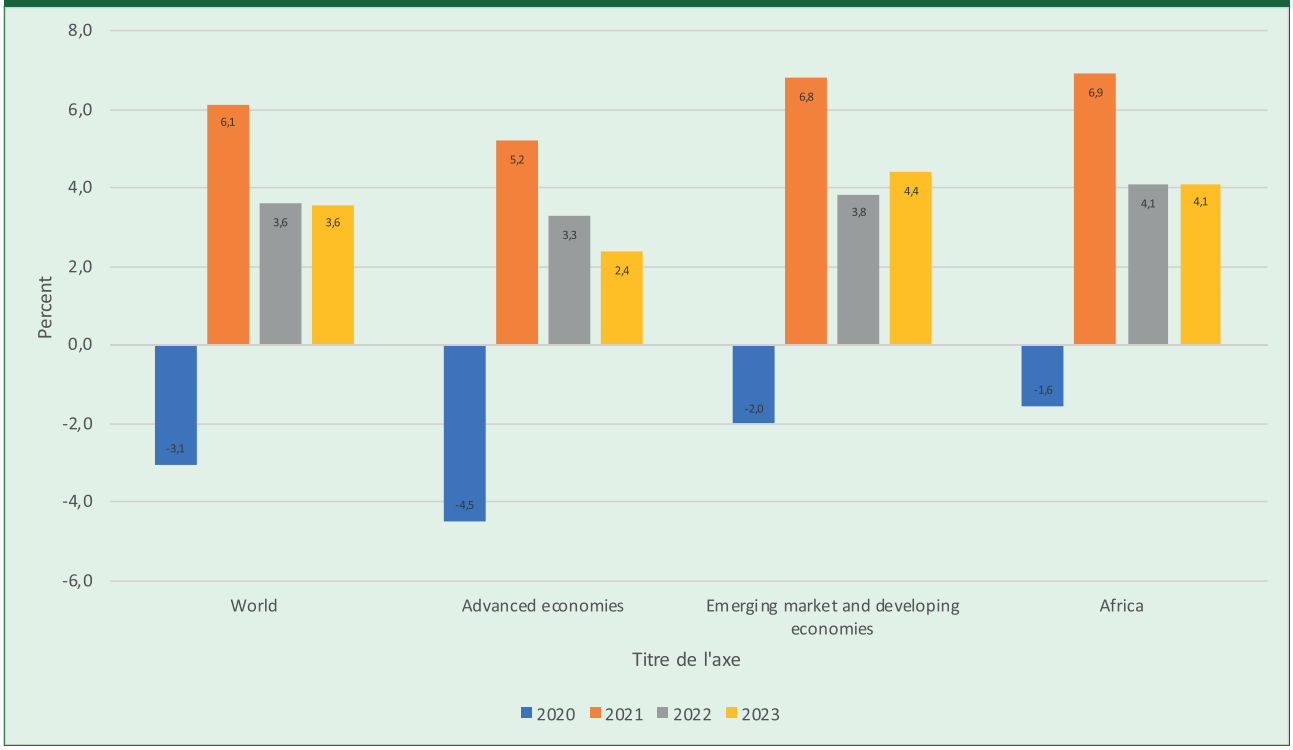
1.1 The global economy rebounded in 2021

After declining by 3.1% in 2020 because of the COVID-19 pandemic, the global economy is estimated to have rebounded by 6.1% in 2021 (Figure 1). The recovery varied across groups of economies, with Africa rebounding the fastest (6.9%), followed closely by other emerging and developing economies (6.8%) and advanced economies (5.2%). In general, the rebound was made possible by helpful monetary, financial, and fiscal policies, the reopening of economies, and the rollout of the COVID-19 vaccine.

Naturally, countries' responses varied, especially as regards economic stimulus programs and the rollout of the vaccine. These variations, coupled with the Ukraine-Russia war, are expected to affect recovery. As at end-March 2022, close to 58.2% of the global population was fully vaccinated, lower than the World Health Organization's target of 70% by mid–2022.

Vaccination rates vary by economic group: only 14% of Africans are vaccinated, compared to 60% in the Americas, Europe, and the Western Pacific. On the policy front, policy space has narrowed in most countries, debt levels have increased, and inflationary pressures have grown. The latter is due to supply chain disruptions, increased global demand following the reopening of economies, and the invasion of Ukraine by Russia. These developments are expected to adversely impact countries' ability to withstand shocks and recover. In April 2022, the International Monetary Fund's World Economic Outlook projected that global growth would decelerate to 3.6% in 2022–2023, down from its January 2022 projection of 4.4%.

Figure 1 : GDP growth in Africa and the world, 2013-2023



Sources: African Development Bank, International Monetary Fund (2022)
Note: 2021 data are estimates; data for 2022 and 2023 are projections.

The recovery from the pandemic was accompanied by higher inflation caused by supply-demand mismatches. Since the beginning of 2021, the rise in the headline consumer price index was rapid in most countries. It was driven by core inflation as well as by food and energy inflation. In 2021, food prices increased by 27.8% and energy prices more than doubled, soaring by 101.8% (IMF, 2022). In Europe, higher energy prices were the principal driver of inflation; in low-income countries, such as in sub-Saharan Africa, rising food prices were the most important. The elevated inflationary environment is expected to persist because of Russia-Ukraine war and sanctions on

[1] https://covid19.who.int/table

Russian energy (Russia is the world's largest energy exporter). Similarly, food prices have soared, especially the price of wheat: Russia and Ukraine supply about 30% of the world's exports (20% from Russia and 10% from Ukraine). According to the International Monetary Fund's projections, inflation in advanced economies is expected to reach 5.7% in 2022 and recede to 2.5% in 2023 (IMF, 2022). For emerging markets and developing economies, inflation is projected to increase to 8.7% in 2022 and decline to 6.5% in 2023.

The labor market's recovery has lagged the rebound in real output. Before the Russia-Ukraine war, output was projected to regain its pre-COVID-19 levels by the end of 2022 in most countries but employment was expected to regain earlier levels in only two-thirds of countries (IMF, 2021). Because of the Russia-Ukraine crisis, employment and output are projected to remain below pre-pandemic trends until 2026 (IMF, 2022). As employment increases to its pre-pandemic level or more, pressure to raise wages will be felt, further feeding inflation and complicating policy interventions. The recovery of labor markets was stronger in high-income countries than in low and middle-income countries, particularly in Africa, owing to limited fiscal stimuli and lower vaccination rates. According to the International Labur Organization (ILO, 2021), global hours worked during the third quarter of 2021 were 3.2% lower than the pre-pandemic level in the fourth quarter of 2019: the difference amounts to a loss of 94.6 million full-time-equivalent jobs. In Africa, pandemic-induced losses of total working hours in the fourth quarter of 2021 relative to the fourth quarter of 2019 are estimated at 4.0%, the equivalent of 15.6 million full-time-equivalent jobs. Women, young people, and informal workers were hit the hardest in 2021 as in 2020.

After a pandemic-induced contraction of 8.2% in 2020, the volume of global trade is estimated to have rebounded by 9.7% in 2021. At the same time, foreign direct investment and portfolio investments in low- and middle-income countries have continued to decline. The volume of imports in sub-Saharan Africa is estimated to have risen by 6.9% and the volume of exports by 4.9% in 2021. The region continued to record declines in foreign direct investment and portfolio investment in 2021 estimated at 24.2% and 10.5%, respectively, as investor confidence remained weak.

According to World Bank estimates, remittances to low- and middle-income countries are estimated to have expanded strongly at a rate of 7.3% in 2021, reaching $589 billion, after having declined by 1.7% in 2020, when they were worth $549 billion. In sub-Saharan Africa, where remittances are an important source of external financing, the pandemic-related decline was more severe in 2020, about 14.1%. The flows are estimated to rebound by 6.2% in 2021, reflecting strong recovery in source countries.

The tourism sector was hit hard in 2021 because of pandemic-related disruptions. According to the World Tourism Organization, international tourism rose by 4% in 2021 to 415 million tourist arrivals, from 400 million in 2020. The numbers were still 72% below the pre-pandemic level of 2019. As travel restrictions eased, international tourism arrivals in Africa increased by 12% between 2020 and 2021, but were still 74% below their pre-pandemic value.

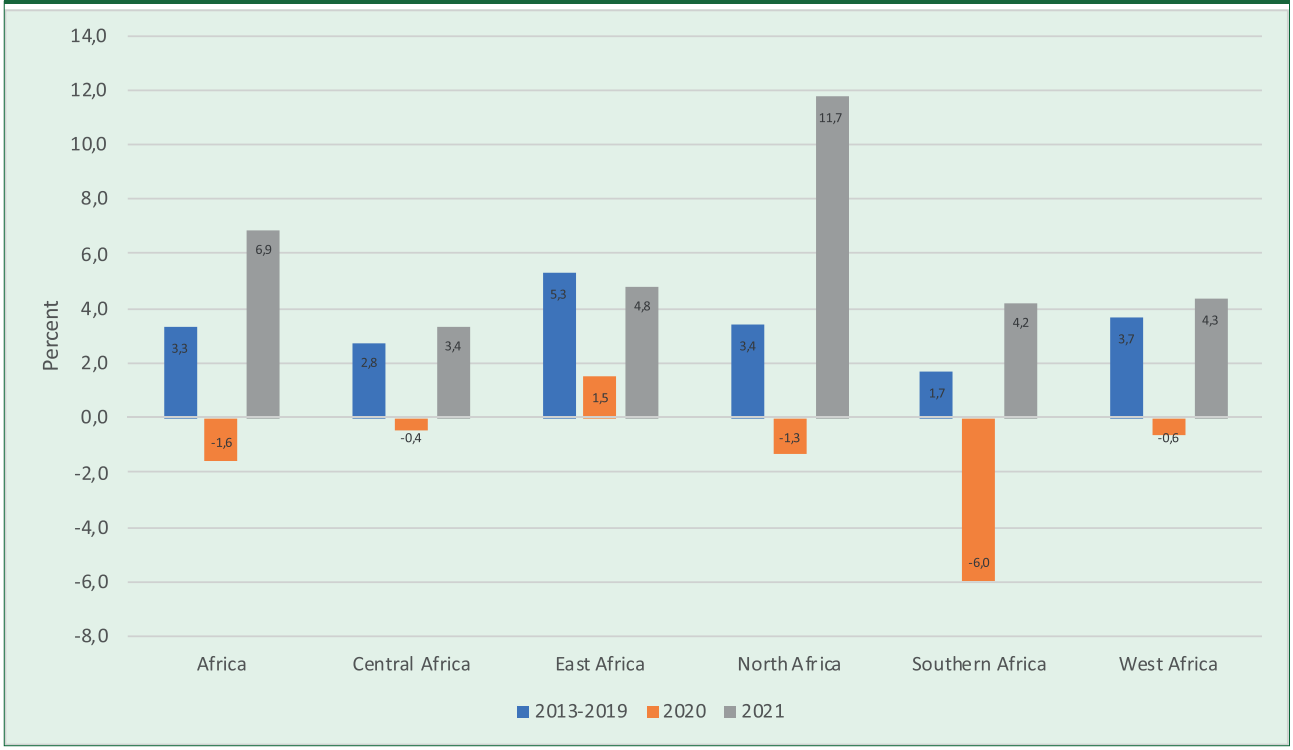
1.2 Growth drivers and drags

West African economies depend on commodity exports and rain-fed agriculture. This makes them more vulnerable to extreme weather events that are growing in frequency because of climate change. After an average growth of 3.7% over 2013–2019, West Africa's GDP contracted by 0.6% in 2020 due to the pandemic (Figure 2). Growth is estimated to have rebounded strongly to 4.3% in 2021, thanks to sustained monetary and fiscal stimuli and the easing of pandemic-related restrictions. The growth rate in West Africa was similar to that of Southern Africa (4.2%), stronger than that of Central Africa (3.3%), and less than that of North Africa (11.7%) and East Africa (4.8%).

Before the pandemic, economic performance in West African countries was heterogeneous (Figure 3). For instance, during 2013–2019, GDP growth was lower in countries most affected by climate-related shocks (Table 1). The average real GDP growth rate in the countries most affected by climate-related shocks was 3.5% over 2013–2019 versus 5.3% in the countries least affected. During the same period, GDP growth per capita averaged 0.8% in the countries most affected by climate-related shocks and 2.7% in the countries least affected (Figure 4).

[2] https://www.unwto.org/international-tourism-and-covid-19.

Figure 2 : GDP growth in Africa by region, 2013-2021



Source: African Development Bank
Note: 2021 data are estimates.

Although Niger is most exposed to extreme weather events, its real GDP growth averaged 5.7% during this period, thanks to its endowment in natural resources. In 2019, the Global Climate Risk Index of Germanwatch ranked Niger the ninth country most affected by extreme weather events in the world. Heavy rains caused the Niger River to burst its banks and affect more than 210,000 people, killing 57, destroying 16,000 houses, causing crop losses, and damaging hydro-agricultural developments. Despite its exposure to climate-related shocks, Niger demonstrated strong economic performance during 2013–2019 thanks to its production of uranium and oil.

During 2013–2019, Togo was the least affected by climate shocks. Its economy grew by 5.4% on average per year. The Togolese economy benefited from the good performance of its export-oriented sectors (phosphate extraction, coffee and cocoa, and cotton production) and strong activities in the tertiary sector (including at the port and the airport).

Liberia, which recorded the lowest GDP growth over 2013–2019, is one of the countries most affected by extreme weather events. In 2016, Liberia was in a recession caused by the Ebola outbreak. It experienced growth of only 1.2% in 2018, partially due to floods, and contracted by 1.4% in 2019 because of low commodity prices.

Figure 3 : Real GDP growth in West Africa by group and country, 2013–2021

Source: African Development Bank
Note: 2021 data are estimates. The terms "most affected countries" and "least affected countries" refer to countries that Germanwatch's Global Climate Risk Index ranked the most and the least affected by climate-related shocks.

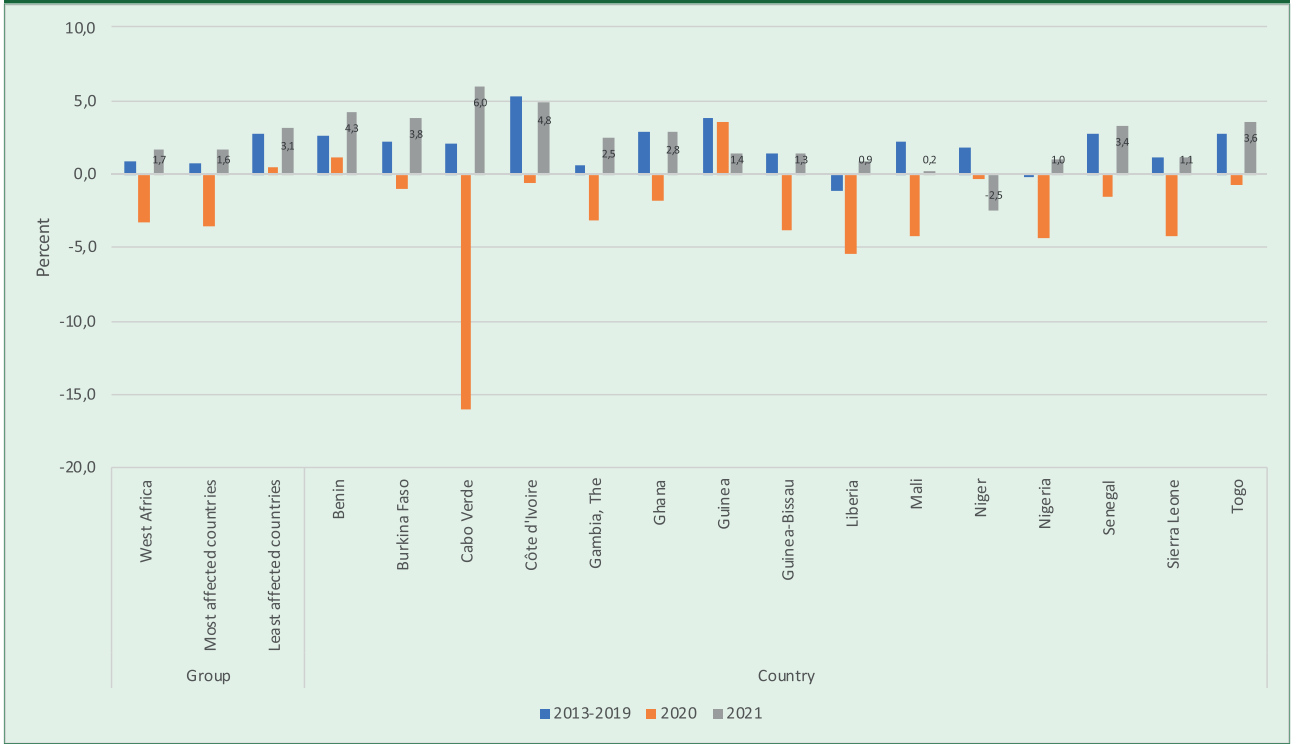
Table 1 : Global Climate Risk Index score by country, 2013–2019

Most affected countries by climate-related shocks (score, global rank)	Least affected countries by climate-related shocks (score, global rank)
Niger (37.22 ; 9) Nigeria (68.24 ;73) Ghana (72.50 ;42) Senegal (83.90 ; 70) Sierra Leone (84.33 ;86) Liberia (91.31 ; 101) Côte d'Ivoire (94.45 ;129) Guinea-Bissau (96.12; 130) Mali (96.45,90) Burkina Faso (99.26,130)	Gambia, The (101.76;41) Cabo Verde (106.79;130) Guinea (107.21;115) Benin (107.21; 130) Togo (113.00;130)

Source : Global Climate Risk Index scores (https://www.germanwatch.org/).
Notes : Numbers in parentheses represent the Global Climate Risk Index score averaged over 2013–2019. The index quantifies impacts of extreme weather events in terms of fatalities and economic losses. The index assigns higher scores to countries that are more affected by extreme weather events. If a country's score is higher than 100, it is classified as a most-affected country. Otherwise, it is classified as a least affected country.

[2] https://www.unwto.org/international-tourism-and-covid-19.

Figure 4 : Real GDP per capita growth in West Africa by group and country, 2013–2021

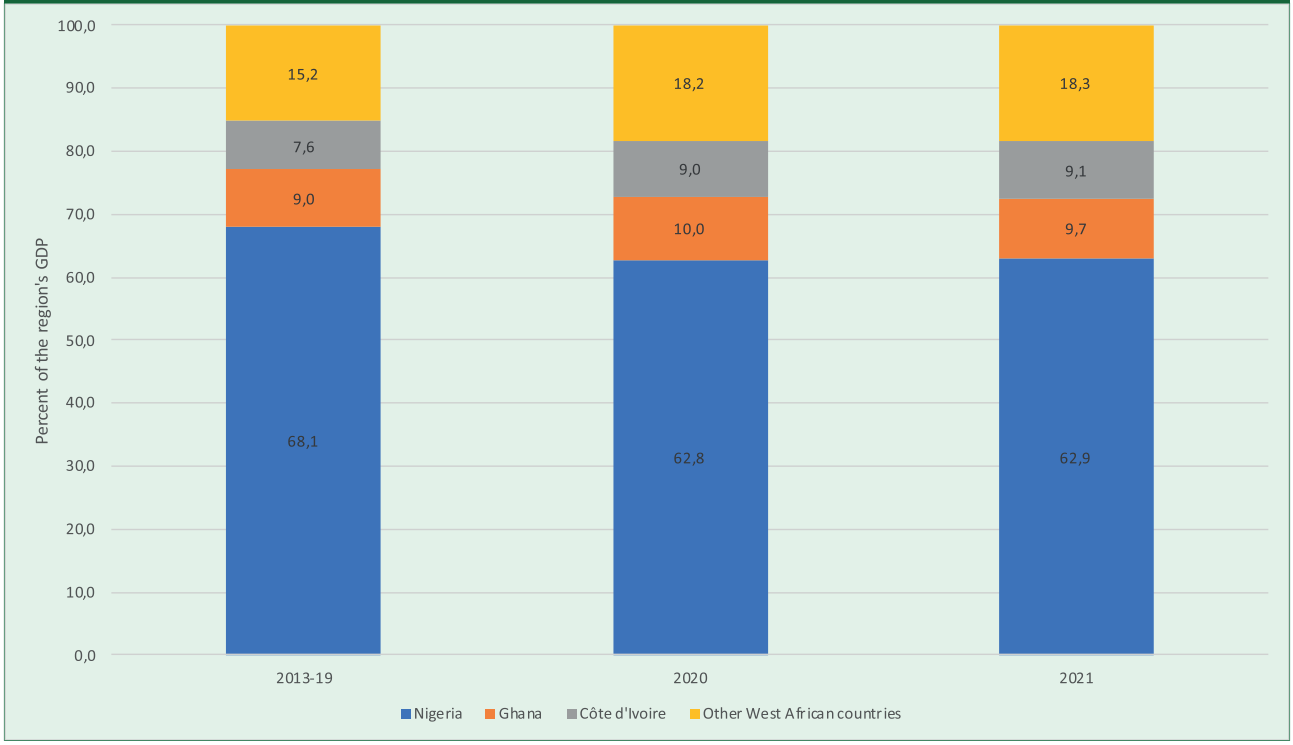


Source : African Development Bank
Note : 2021 data are estimates. The terms "most affected countries" and "least affected countries" refer to countries that Germanwatch's Global Climate Risk Index ranked the most and the least affected by climate-related shocks.

Nigeria is the region's largest economy and accounted for nearly two-thirds of regional GDP in 2021 (Figure 5). Nigeria, which figures among the countries most affected by climate-related shocks, grew less during 2013–2019 (2.5%). Its GDP growth rate was lower than its population growth rate, causing its GDP per capita to fall by 0.2% over the period. The Niger Delta, which is the most climate-vulnerable region in the country, is frequently affected by flooding and is at risk of rising sea levels. Floods recurred across Nigeria through seasonal rainfalls, inducing high-water levels in the Niger River and the Benue River and causing casualties, crop losses, and damage to infrastructure.

In 2021, the economic recovery from the pandemic varied across West African countries (Figure 3). The recovery was facilitated by monetary and fiscal stimuli implemented in 2020. Nigeria recovered in 2021 with a growth rate of 3.3% after having contracted by 3.0% in 2020. Côte d'Ivoire is estimated to have had the fastest recovery in 2021 (7.4%), due to sustained investment and higher oil prices. After experiencing in 2020 the region's largest contraction of output (14.8%) due to restrictions on international tourism and a fall in remittances, real GDP growth in Cabo Verde is estimated to have expanded by 7.1% in 2021 as a result of a strong resumption of tourism and more investment. Owing to a revival in industrial production and the services sector, Senegal recorded strong real GDP growth of 6.1% in 2021. Guinea was the most resilient to the crisis in 2020 (it grew at 6.4%, because of a rise in mining activities) and declared real GDP growth of 4.3% in 2021.

Figure 5 : Countries' shares of West Africa's GDP, 2013–2021



Source: African Development Bank
Note: 2021 data are estimates

1.2.1 On the supply side, the services sector contributed most to growth

The service sector was a major driver of growth in the West Africa region in 2021. It contributed 2.9 percentage points, 67% of the 4.3% growth in regional GDP. This was more than agriculture and industry, which contributed 1.0 and 0.7 percentage points, respectively. Except in 2020, when services dragged growth by 0.7 percentage points, the service sector's contribution to growth has trended upward over the years. It contributed 2 percentage points or 54% of growth between 2013–2019 (Figure 8).

The share of services in the region's GDP averaged 53.0% between 2013–2019, 47.1% in 2020, and 48.9% in 2021. The services sector is not only the most important driver of growth, but also accounts for the largest share of GDP and total employment. For example, the sector accounted for 47.2% of GDP and 53% of total employment in Nigeria, 47% and 49% in Ghana, and 57% and 47% in Côte d'Ivoire. The service sector's share of GDP was higher than the regional average of 48.1% in Benin (52.7%), Cabo Verde (79.4%), Côte d'Ivoire (57.1%), Senegal (57.5%), and Togo (53.2%) (Figure 7). The sector benefited the most from the factor accumulation-led growth model (i.e., human and physical capital) pursued by most countries in the region.

On average, the industrial sector accounted for 29.5% of regional GDP in 2021, higher than 20.0% in 2020 and 24.0% over 2013–2019. This shift is happening on the back of stagnating agriculture (22% of GDP since 2013) and declining services (53% over 2013–2019 and 48% in 2021). The rise in industry's share of the region's GDP is a welcome development, but it masks the reality on the ground; the rise is driven by Nigeria, where the share of industry increased from 24% in 2013–2019 to 28% in 2020 and 32% in 2021. In contrast, in Ghana and Côte d'Ivoire—the second- and third-largest economies in the region—it stagnated at 33% and 21%, respectively. The share of industry is only higher than the regional average in three countries: Ghana (33%), Guinea (33%), and Nigeria (32%). This data, together with significant variations in sectoral shares among other countries in the region, suggests that more countries must work to ensure that economic transformation drives growth.

The need for economic transformation-led growth (i.e., growth in industry/value added) is evident from the slow growth in industry. The industrial sector contributed only 0.4

[2] https://www.unwto.org/international-tourism-and-covid-19.

percentage points to GDP growth in 2021 (9% of 4.3% in growth). This is lower than the pre-crisis of 0.7 percentage points over 2013–2019 (18% of 3.7% in growth). Guinea contributed most to industry's growth in 2021, when it benefited from rising mining activities. Indeed, Guinea's industry contributed more than half (6.6 percentage points) to its GDP growth of 11.6%.

In 2021, the industrial sector grew in all countries in the region except Nigeria, Ghana, and Liberia (Figure 8). This did not translate into significant increase in regional GDP growth. This could be attributed to countries' small share in reginal industrial GDP. Indeed, without economic transformation, stagnation in sector shares in Ghana and Côte d'Ivoire and growth contractions in Nigeria and Ghana could make de-industrialization at the reginal level possible in the medium term.

In 2021, agriculture contributed 1 percentage point or 23% of the region's 4.3% growth in GDP. This is the same as agriculture's average contribution to regional GDP growth during 2013–2019. All countries in the region contributed to growth in regional agriculture GDP in 2021, but contributions were greatest in Liberia (over 100% of the growth in GDP), Niger (49% of the growth), and Sierra Leone (57% of the growth). Growth was supported by favorable weather.

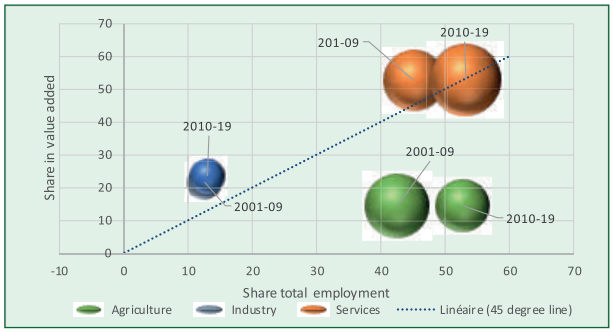
According to available data (Figure 8), expectations of a positive correlation between higher dependency on agriculture and vulnerability to climate change were realized in a few countries. Mentionable in this regard are Liberia and Cabo Verde. Liberia's economy is highly dependent on agriculture, and Liberia is among those countries most impacted by extreme weather events. In contrast, Cabo Verde, where agriculture's share of GDP is the lowest in the region, is among those least affected by extreme weather events.

In summary, the non-inclusive nature of service sector-led growth in the region manifested in a high level of poverty (43%), high unemployment (e.g., 20% in Nigeria), and income inequality (Gini coefficients range from 0.3 and 0.5). These are all evidence of slow economic transformation, continued agriculture's high contribution to GDP and total employment, and the movement of labor from agriculture, where labor productivity is low, to the services sector instead of to industry. Studies suggest that labor productivity in the industrial sector is about twice as high as in services.

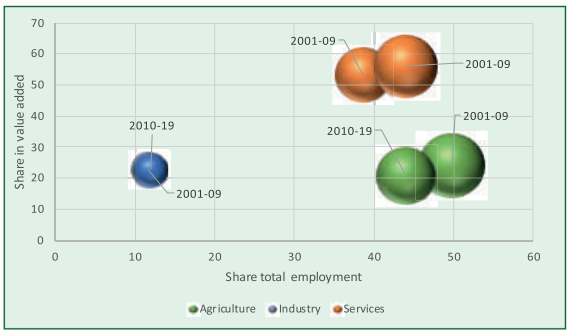
Figure 6 provides that in Nigeria, Ghana, Côte d'Ivoire, and Senegal, which together account for over 81% of West Africa's GDP, the share of agriculture in GDP has fallen since 2001 while that of services increased and that of industry more or less stagnated. The figure further indicates that labor is moving out of agriculture into services, not into industry, as noted above. This suggests that the inter-sectoral movement of labor is not guided by labor productivity differential, and calls for supporting economic transformation, among other things by addressing labor market rigidities on the supply side (e.g., through human capital development). This would help reduce skills shortages in existing and emerging activities within the industrial sector. On the demand side, it calls for introducing policies that encourage investments to flow into sectors with a higher labor absorptive capacity (i.e., industry/manufacturing).

Figure 6 : Sectoral value added and employment in selected West African countries, 2001–2019

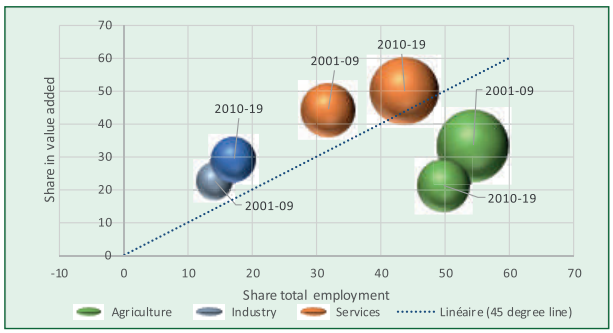
Nigeria



Ghana



Côte d'Ivoire

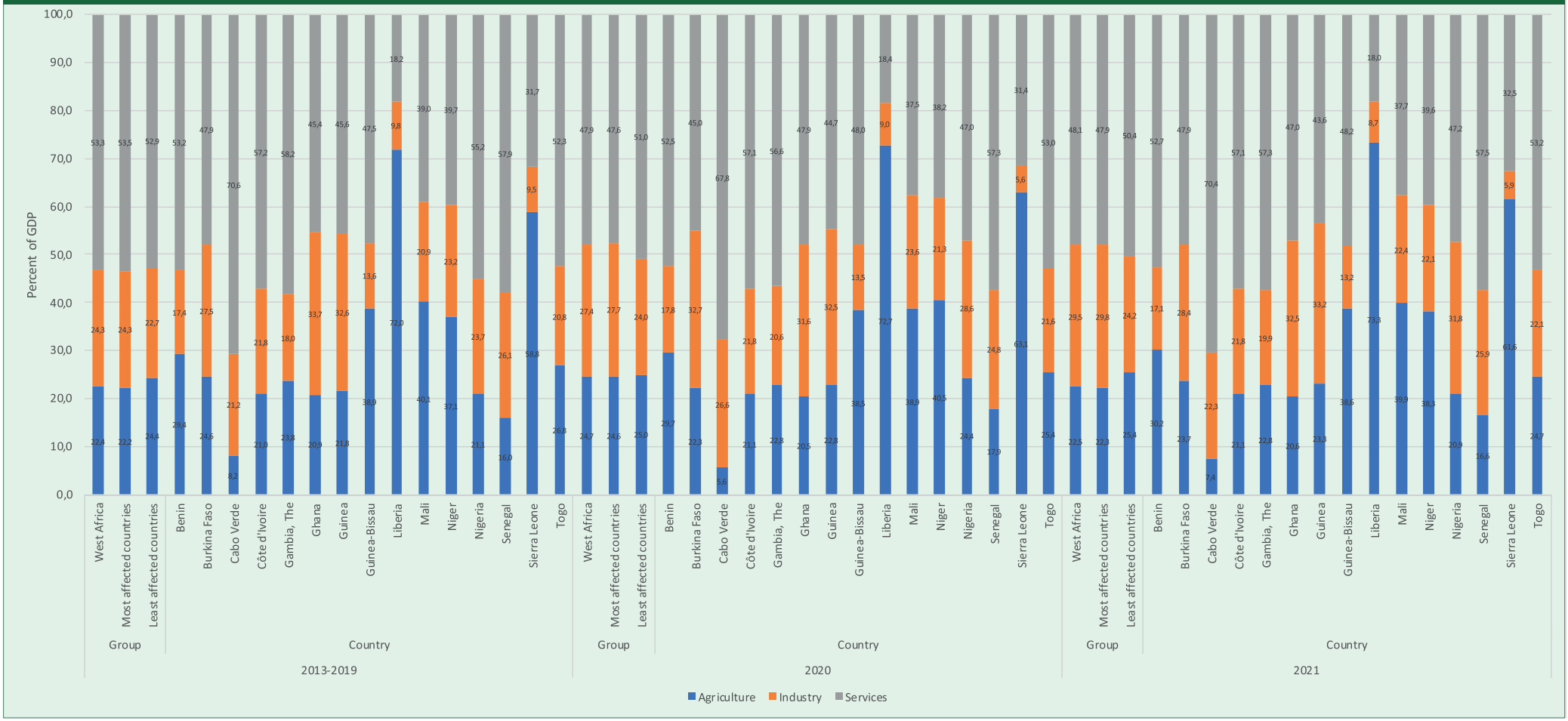


Senegal

Source: African Development Bank computations based on data from World Development Indicators

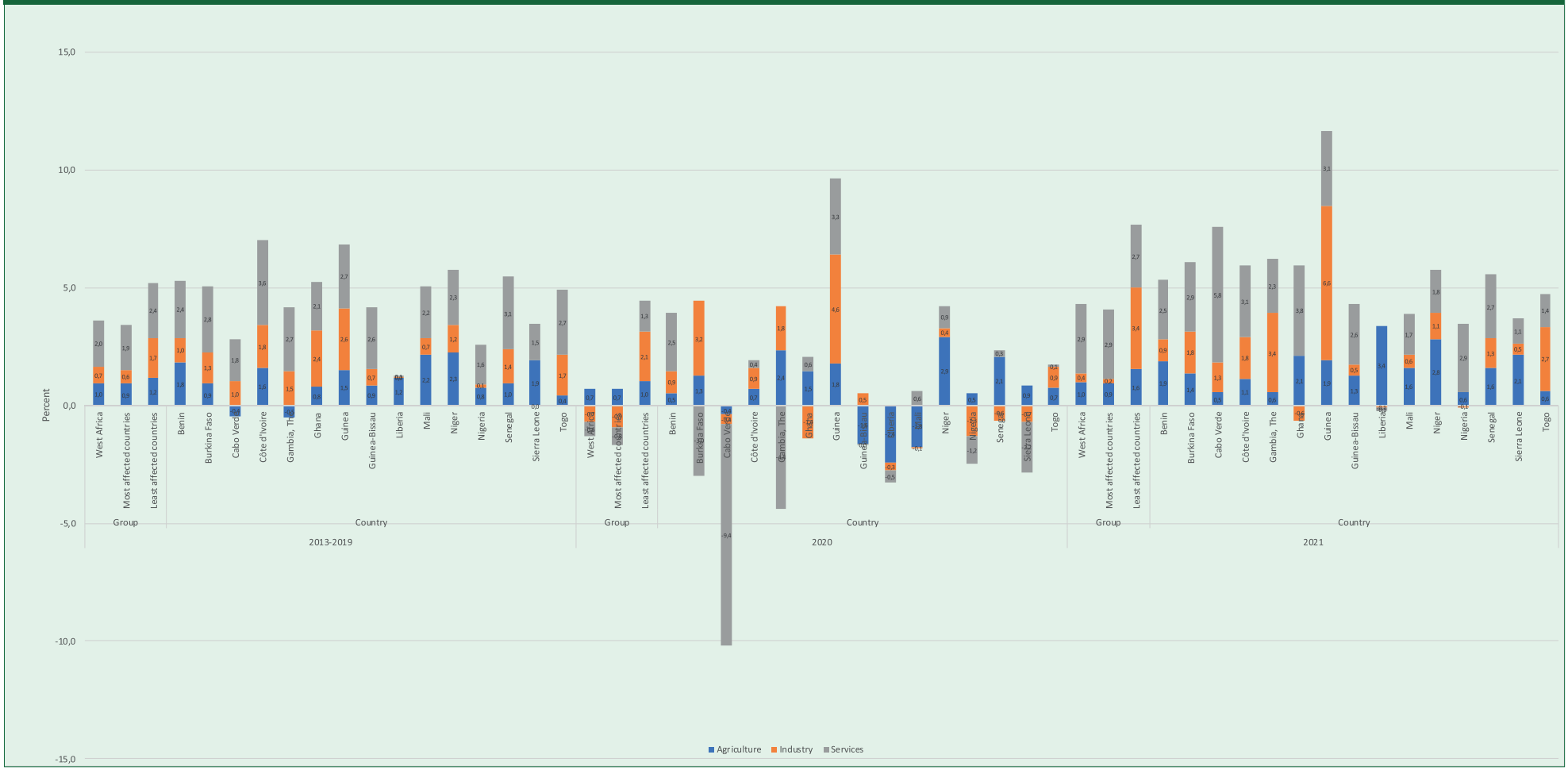
[2] https://www.unwto.org/international-tourism-and-covid-19.

Figure 7 : Sectoral components of GDP in West Africa by group and country, 2013–2021



Source: African Development Bank
Note: 2021 data are estimates. The terms "most affected countries" and "least affected countries" refer to countries that Germanwatch's Global Climate Risk Index ranked the most and the least affected by climate-related shocks.

Figure 8 : Sectoral contributions to GDP growth in West Africa by country, 2013–2021



Source: African Development Bank
Note: 2021 data are estimates. The terms "most affected countries" and "least affected countries" refer to countries that Germanwatch's Global Climate Risk Index ranked the most and the least affected by climate-related shocks.

1.2.2 On the demand side, private consumption contributed most to growth

Despite a strong reliance on commodity exports, West Africa's economy is driven most by domestic demand, particularly private consumption. Figure 9 shows that household consumption, on average, contributed 2.2 percentage points to the region's 3.7% growth in GDP, equivalent to 59% of growth. Investment contributed 1.2 percentage points (32.4% of growth), external demand contributed 0.2 percentage points (5.4% of growth), and government consumption contributed 0.1 percentage point (2.7% of growth). At the country level, however, growth drivers varied across countries. For example, the contribution of household consumption to growth was low in Liberia (21% of 3.3% in growth) and highest in Nigeria (68% of 2.5% in growth) and Côte d'Ivoire (60% of 6.9% in growth). Investment was a major driver of growth in Guinea (88% of 12% in growth). External demand only supported growth in three countries: Nigeria (16% of growth), Ghana (29% of growth), and Liberia (40% of growth).

Investment's contribution to economic growth was higher in the group of countries least affected by climate shocks, where it averaged 5.1 percentage points in 2013–2019. In countries most affected by climate shocks, investment's average contribution to growth was only 0.9 percentage points. This could be attributed to credit constraints: extreme weather events discourage external financing, penalizing investment more than consumption (David 2011). In Guinea, which is one of the economies least affected by climate risks, investment contributed the most to real GDP growth (10.5 percentage points over 2013–2019). This is the consequence of sustained investments in mining.

Figure 9 : Demand-side contributions to GDP growth in West Africa, 2013–2021

Source: African Development Bank
Note: 2021 data are estimates. The terms "most affected countries" and "least affected countries" refer to countries that Germanwatch's Global Climate Risk Index ranked the most and the least affected by climate-related shocks.

In 2020, public consumption (2.5 percentage points) and household consumption (0.9 percentage points) were the major drivers of growth in West Africa. These positive contributions were offset by contractions in total investment (1 percentage point) and external demand (3.7 percentage points), which together caused regional GDP to contract 1.3%. The increases in public spending sought principally to mitigate the health and socioeconomic impacts of the pandemic and stimulate aggregate demand. Most countries in the region lacked the fiscal space to meet the additional financing gap and resorted to borrowing from domestic and external debt markets, contributing to surges in debt. The magnitude of public consumption's contribution to GDP growth varied across countries, depending on countries' fiscal space and debt levels. In the four richest economies in the region (Nigeria, Ghana, Côte d'Ivoire, and Senegal), public consumption accounted for 134%, 164%, 6%, and 125% of GDP growth respectively. Increases in private/household consumption followed from increases in government spending, some of which was used to support households impacted by the pandemic (e.g., social welfare programs).

West Africa's economy started recovering in 2021, with private consumption contributing the most to real GDP growth (1.9 percentage points), and public consumption's contribution declining by 1.0 percentage point as fiscal stimuli fell. With the resumption of economic activity, investment in the region contributed 0.7 percentage points to growth after having made a negative contribution of -1.0 percentage points in 2020. The contribution of external demand (net trade) to the region's growth in real GDP improved in 2021 to -0.2 percentage points against -3.7 percentage points in 2020.

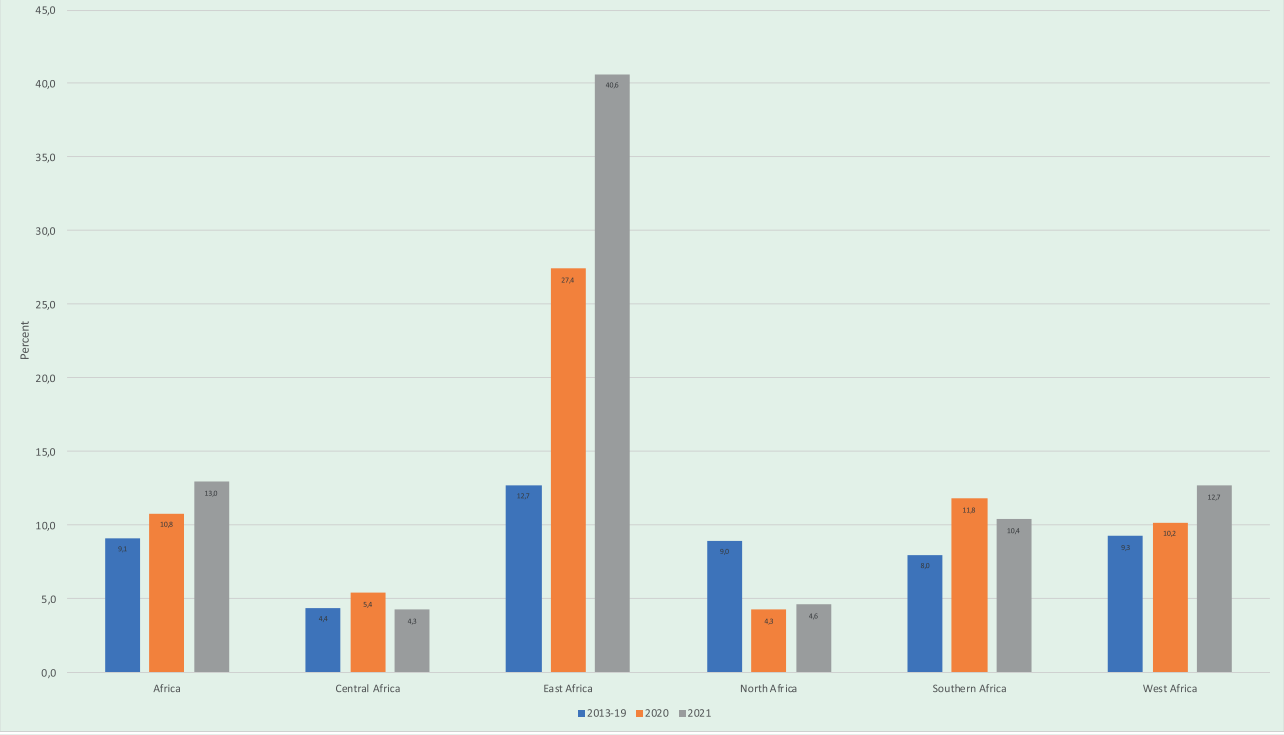
In 2021, the contribution of public consumption to GDP growth was highest in Guinea-Bissau (2.3 percentage points), where external demand (net trade) dragged the most (-3.7 percentage points) because of unfavorable terms of trade, despite strong exports of cashew nut, Guinea-Bissau's main export. In Nigeria, the contribution of public consumption to GDP growth declined to 1.1 percentage points in 2021 after recording the highest contribution in 2020 (3.5 percentage points) because of the pandemic-induced fiscal stimulus. Niger recorded the highest contribution of private consumption to real GDP growth in 2021 as in 2020: 5.1 percentage points in 2021 and 5.7 percentage points in 2020. Thanks to a good business and investment environment, Cabo Verde revived in 2021, recording the region's highest contribution of investment to growth (5.5 percentage points). As in Guinea-Bissau, trade made a negative contribution to growth in 2021 in many countries. This was not the case in Benin, Guinea, and Liberia, where exports revived strongly, or in Ghana, where the terms of energy trade were favorable.

1.3 Inflation edged up; the drivers varied by monetary union

In West Africa, the rate of inflation rose from an average of 9.3% in 2013–2019 to 10.2% in 2020 and 12.7% in 2021. These values are close to the continental figures (Figure 10). Because of the conventional peg regime of the West African Economic and Monetary Union (WAEMU), inflation in West Africa tends to be much lower than in East Africa, where currencies are not pegged (East Africa recorded inflation of 12.7% in 2013–2019, 27.4% in 2020, and 40.6% in 2021). The inflation rate is, however, higher in West Africa than in Central Africa, where all countries are members of the Central African Economic and Monetary Community and operate under a conventional peg regime where their common currency, the central African franc (CFA), is, like in WEAMU, anchored to the euro. Central Africa recorded inflation rates of 4.4% in 2013–2019, 5.4% in 2020, and 4.3% in 2021. Higher inflation in 2020 and 2021 in West Africa and on the continent is partly due to rising food and energy prices caused by pandemic-related disruptions and falling agricultural output occasioned by climate shocks. Increased inflation in 2020 reflects supply/demand mismatches that resulted from pandemic-related supply chain disruptions. In oil-importing countries, the pandemic-related fall in energy prices was another mitigating factor in 2020.

Average inflation was higher in countries most affected by climate-related shocks between 2013–2019 (9.8% versus 3.2%). This reflects the negative correlation between adverse climate conditions and production in general. According to Table 1, 10 of the region's 15 countries were among the countries most impacted by climate change between 2013–2019. This partly explains high inflation and the variations on inflationary pressures between grouping of countries that are most and least affected. Table 1 shows Nigeria ranking top in the list of most impacted countries in the region. Nigeria's sheer economic size, coupled with formal and informal trade linkages with its neighbors and the region, makes it an important driver of inflation in the region. In other words, climate change-induced shocks originating in Nigeria are likely to have a spillover effect.

Figure 10 : Inflation in Africa and Africa's regions, 2013–2021



Source: African Development Bank
Note: 2021 data are estimates.

Variations in the levels of inflation in West African countries could also be explained by differences in exchange rate management. Inflation is generally weaker in WAEMU countries (0.6% on average in 2013–2019) and Cabo Verde, which operate under a conventional fixed regime pegged to the euro (0.4% in 2013–2019). This protects domestic inflation somewhat from inflation originating in the euro area. During 2013–2019, in each WAEMU economy and in Cabo Verde, inflation averaged less than 1.0% compared to 11.6% in Nigeria, 13.2% in Ghana, and 13.9% in Liberia (Table 2).

Table 2 : Inflation in West Africa by group and country, 2013–2021 (percent)				
		2013-2019	2020	2021
Group	West Africa	9.3	10.2	12.7
	Most affected countries	9.8	10.7	13.3
	Less affected countries	3.2	5.3	6.3
	WAEMU countries	0.6	3.1	2.3
	Non-WAEMU countries	11.6	12.7	15.6
Country	Benin	0.1	3.1	2.3
	Burkina-Faso	0.3	1.9	3.6
	Cabo Verde	0.4	0.6	1.7
	Côte d'Ivoire	1.0	2.4	3.9
	Gambia,The	6.7	5.9	6.9
	Ghana	13.2	9.9	9.7
	Guinea	9.4	10.6	11.6
	Guinea-Bissau	0.6	1.5	1.9
	Liberia	13.9	17.0	12.3
	Mali	0.1	0.5	3.1
	Niger	0.4	4.4	1.9
	Nigeria	11.6	13.2	16.9
	Senegal	0.6	2.5	2.1
	Sierra Leone	11.0	13.4	11.1
	Togo	0.8	1.8	2.6

Source: African Development Bank statistics.
Note: 2021 data are estimates. The terms "most affected countries" and "least affected countries" refer to countries that Germanwatch's Global Climate Risk Index ranked the most and the least affected by climate-related shocks.

To contain the adverse economic consequences of the pandemic and provide fiscal support, central banks in West African countries introduced monetary stimulus through various conventional measures: lowering policy rates, providing liquidity to the banking system, and relaxing prudential constraints. They also implemented unconventional monetary policies, such as measures to ease guarantees and temporarily suspend loan repayments to relieve businesses and non-financial companies.

In West Africa, conducting monetary stimulus amid the pandemic was difficult because of pandemic-induced capital outflows and decreases in external financing, including remittances. This caused a decline in international reserves and the depreciation of currencies, depending on exchange rate arrangements. With lower oil prices, a decline in foreign reserves led Nigeria to devalue the naira's official exchange rate from N360 per US dollar to N379 per US dollar in March 2020 and N410 per US dollar in May 2021.

In Ghana, which maintains a floating exchange rate regime, the cedi depreciated against the US dollar on a year-to-date basis by 3% in September 2020 and 1.8% in September 2021. In Liberia, which operates under a managed floating exchange rate regime, the increase in foreign reserves led the Liberian dollar to appreciate to LRD186.5 per US dollar at end-December 2020 from LRD162.9 per US dollar at end-December 2019 (a depreciation of 14.6% on a year-to-date basis) and LRD144.2 per US dollar at end-December 2021 (appreciation of 13.0% on a year-to-date basis). In countries where exchange rate depreciations or devaluations happened, it exacerbated the already higher price of imported food. For example, in Nigeria, inflation rose to 13.2% in 2020 and 16.9% (the highest) in 2021 from 11.6% in 2013–2019. Ghana recorded an increase in inflation from 8.7% in 2019 to 9.9% in 2020 and 9.7% in 2021. Inflation in Liberia moved from 13.9% in 2013–2019 to 17.0% (the highest) in 2020 and 12.3% in 2021.

1.4 Public finances and external imbalances

1.4.1 Budget deficits continued to accumulate in 2021

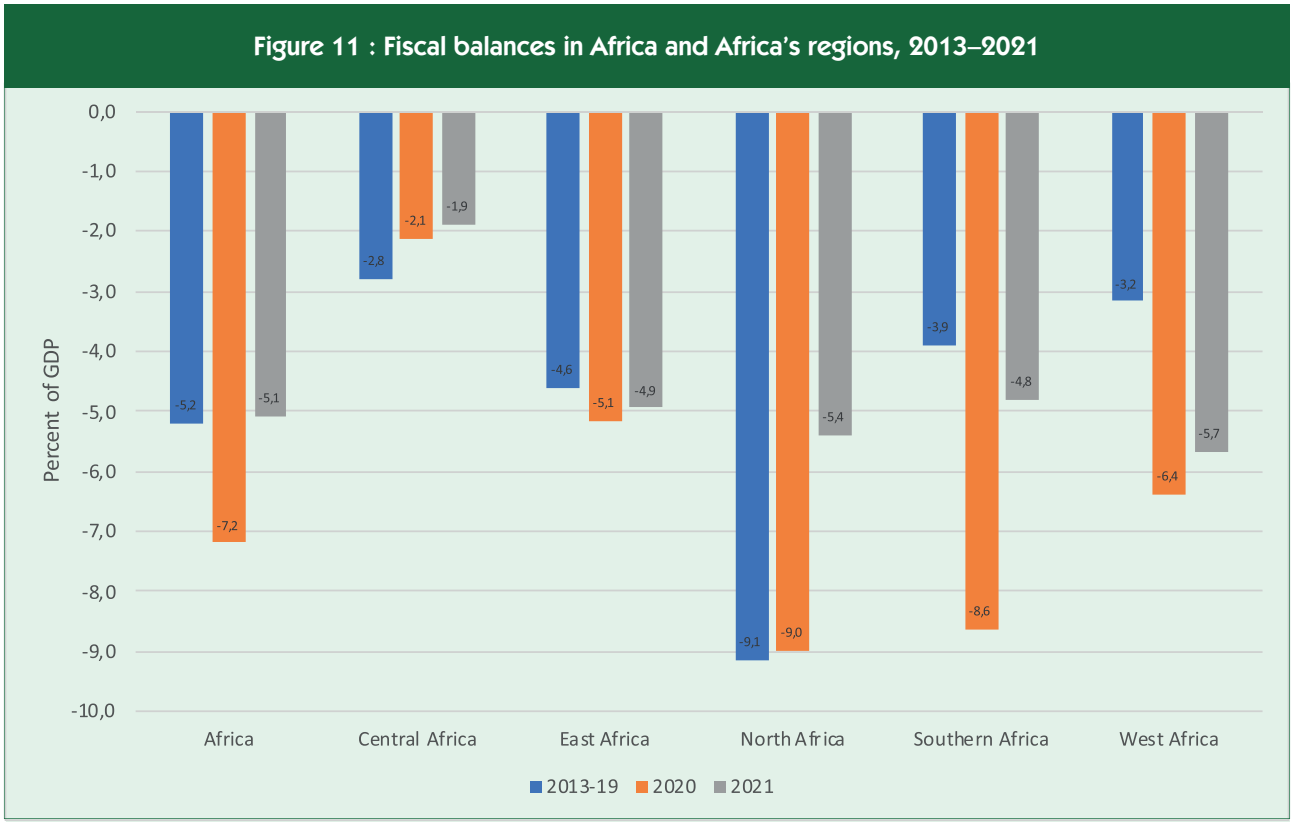
As in most African economies, West African countries are characterized by structural fiscal deficits, resulting from sustained public infrastructure spending and low domestic resource mobilization. In all West African economies except Nigeria, the main sources of government revenue are taxes on goods and services, trade, incomes, profits, and capital gains. In Nigeria, the bulk of public revenue is nontax revenue from oil production. Tax systems in West Africa have a narrow base and are subject to inefficient collection—see the West Africa Economic Outlook 2021 (AfDB, 2021).

In 2013–2019, fiscal deficits in West Africa averaged 3.2% of GDP, lower than the continental average of 5.2% (Figure 11). Also below average were Central Africa (2.8%), Southern Africa (3.9%) and Eastern Africa (4.6%). The deficit was largest in North Africa (9.1%).

In 2020, due to the COVID-19 pandemic, governments in the West Africa region and elsewhere implemented policy measures with important fiscal implications (e.g., tax relief, social assistance programs, and better access to credit). Although the measures achieved their goals—they saved lives by increasing health spending and protecting the economy through economic stimulation programs—they produced significant surges in government spending. This happened amid a decline in revenue collection caused by tepid economic activity which contributed to surges in fiscal deficits and public debt. The region's fiscal deficit doubled to 6.4% of GDP in 2020 compared to an average of 3.2% between 2013–2019—the third-largest increase after North Africa (9.0%) and Southern Africa (8.6%). Public debt in the region grew to 43.9% of GDP in 2020.

In 2021, estimates suggest that on average, the fiscal deficit narrowed, especially in North Africa (5.4%) and Southern Africa (4.8%). The fiscal deficit in West Africa is expected to have narrowed to 5.7% of GDP, largely because of Nigeria's fiscal position.

Figure 11 : Fiscal balances in Africa and Africa's regions, 2013–2021



Source: African Development Bank
Note: 2021 data are estimates

Countries most affected by climate shocks had higher fiscal deficits, yet again demonstrating the correlation between climate shocks and macroeconomic performance (fiscal positions). In countries where climate shocks are frequent, fiscal support mitigates the negative social and economic consequences of climate-related shocks. Countries classified as most impacted by climate change registered a larger fiscal deficit (3.2% of GDP) than countries least impacted (2.8% of GDP) in 2013–2019 (Table 3).

At the country level, Liberia registered a higher fiscal deficit in the region (6.1% of GDP). This can be explained by weaker tax collections, large spending on infrastructure, and government spending on the Ebola crisis. In contrast, Cabo Verde, which figures among the countries least affected by extreme weather events, registered the lowest fiscal deficit during the period (0.7% of GDP). This was due to better resource mobilization efforts and other factors (see West Africa Economic Outlook 2021 (AfDB, 2021).

Table 3 : Fiscal balances in West Africa by group and country, 2013-23 (percentage of GDP)				
		2013-2019	2020	2021
Group	West Africa	-3.2	-6.4	-5.7
	Most affected countries	-3.2	-6.5	-5.7
	Least affected countries	-2.8	-4.7	-4.7
Country	Benin	-2.9	-4.7	-6.1
	Burkina-Faso	-4.0	-5.3	-5.6
	Cabo Verde	-0.7	-9.0	-8.6
	Côte d'Ivoire	-2.4	-5.6	-5.0
	Gambia,The	-4.7	-2.2	-4.0
	Ghana	-5.3	-15.2	-12.8
	Guinea	-2.6	-2.9	-2.3
	Guinea-Bissau	-3.2	-9.8	-5.6
	Liberia	-6.1	-3.6	-3.3
	Mali	-2.9	-5.4	-4.7
	Niger	-4.2	-5.2	-5.2
	Nigeria	-3.0	-5.4	-4.8
	Senegal	-3.6	-6.4	-5.9
	Sierra Leone	-5.4	-5.6	-7.1
	Togo	-2.4	-7.0	-5.8

Source: African Development Bank
Note: 2021 data are estimates. The terms "most affected countries" and "least affected countries" refer to countries that Germanwatch's Global Climate Risk Index ranked the most and the least affected by climate-related shocks.

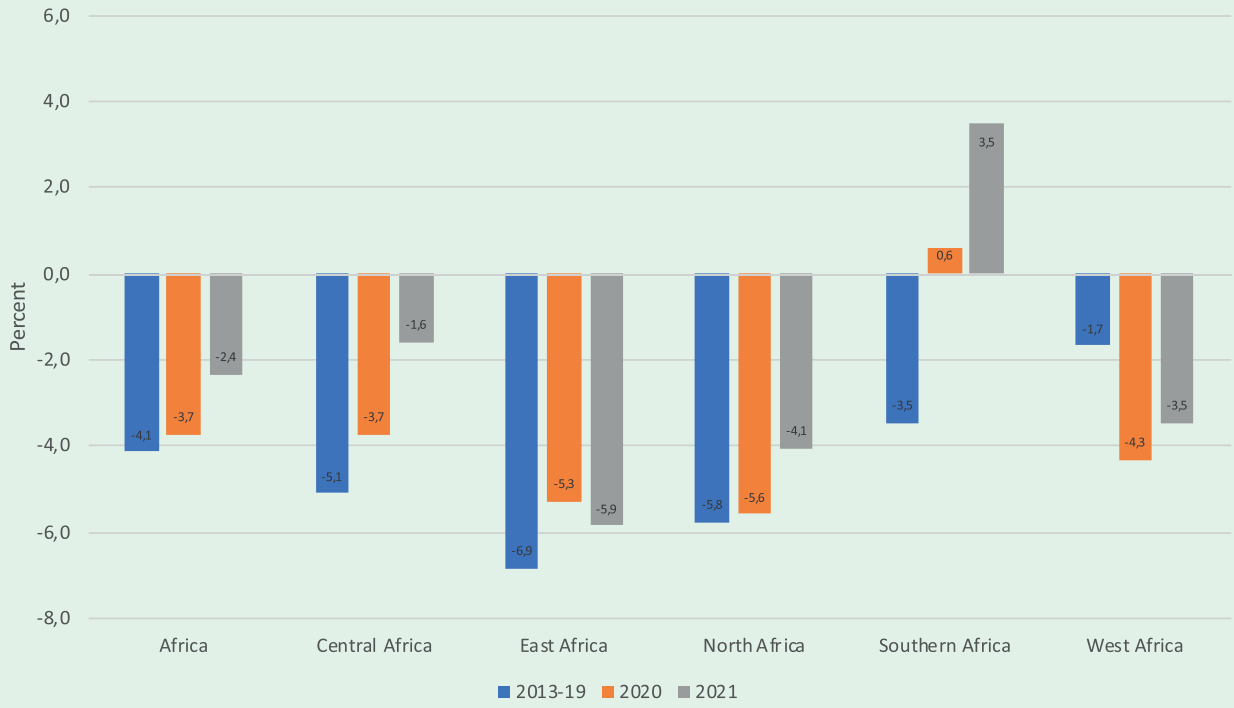
In 2020, the budget deficit-to-GDP ratio rose most in Cabo Verde (a relatively tourist-dependent economy) because of the decline in revenue from international tourism. The deficit increased by 11.9 percentage points, from a surplus of 2.9% in 2019 to a deficit of 9.0% in 2020. Ghana's fiscal deficit was higher in 2020 as well (15.2% of GDP). This originated from two factors: fiscal measures to support pandemic-affected households and businesses, and lower public revenues, particularly from oil production.

In 2021, fiscal deficits narrowed in all countries in the region except Benin, Burkina Faso, The Gambia, and Sierra Leone, where it widened by 1.3, 0.3, 1.8, and 1.6 percentage points, respectively. The decline in the fiscal deficit was the largest in Guinea-Bissau, where it fell from 9.8% in 2020 to 5.6% in 2021. This stemmed from a fiscal consolidation plan that improved revenue mobilization and expenditure controls in the country's 2021 budget. Despite higher debt servicing costs, Nigeria's fiscal deficit narrowed in 2021 by 0.6 percentage points (from 5.4% in 2020 to 4.8% in 2021) thanks to more public revenues from the energy sector. The increase in oil revenue also improved the fiscal balance in Ghana in 2021, from a deficit of 15.2% of GDP in 2020 to a deficit of 12.8% of GDP in 2021 (an increase of 2.4 percentage points).

1.4.2 The economic recovery caused current account deficits to narrow

Before the pandemic, in West Africa and in the continent in general, lower savings limited investments—despite the need to develop infrastructure—and worsened external imbalances. In 2013–2019, the West Africa region registered the lowest current account deficit on the continent; it averaged 1.7% of GDP, compared to 4.1% for Africa as a whole (Figure 12). The current account deficit averaged 6.9% of GDP in East Africa, 3.5% in Southern Africa, 5.1% in Central Africa, and 5.8% in North Africa.

Figure 12 : Current account balances in Africa and Africa's regions, 2013–2021



Source: African Development Bank
Note: 2021 data are estimates.

The size of the current account deficit differs widely across West African economies. On average, the ratio of the external imbalance to GDP is less elevated in countries most affected by climate-related risks. In 2013–2019, the West African economies most affected by extreme weather events posted a current account deficit of 1.3% of GDP, versus 7.9% of GDP in countries least affected (Table 4). The lower current account deficit in the most affected countries arose from the finding, mentioned earlier, that natural disasters may put developing countries under debt stress (Raddatz, 2007) and, by destroying public infrastructure, cause returns on private capital to decline and private capital flows to fall (David, 2011). The resulting contraction of external financing leads the affected economies to improve their current account balance. In other words, in the case of a negative disaster, economies have difficulty borrowing and are more likely to serve debt obligations (Raddatz, 2007).

Due to the Ebola crisis and continued imports of capital goods for the mining sector, Liberia experienced the highest current account deficit as a percentage of GDP in 2013–2019, at 30.2% (Table 4). As a consequence of massive imports for mining activities and infrastructure development, Guinea also had a higher current account deficit in 2013–2019: 15.8% of GDP. Nigeria was the only country in the region that registered a current account surplus (0.3% of GDP) in 2013–2019. This is attributable to higher oil revenue.

Table 4 : Current account balances in West Africa by group and country, 2013–2021 (percentage of GDP)

		2013-2019	2020	2021
Group	West Africa	-1.7	-4.3	-3.5
	Most affected countries	-1.3	-4.1	-3.4
	Least affected countries	-7.9	-6.7	-4.7
Country	Benin	-4.8	-1.8	-3.7
	Burkina-Faso	-6.1	3.8	5.2
	Cabo Verde	-5.0	-15.9	-13.1
	Côte d'Ivoire	-1.3	-3.2	-3.8
	Gambia,The	-8.0	-3.3	-9.3
	Ghana	-5.1	-3.1	-2.1
	Guinea	-15.8	-13.7	-4.0
	Guinea-Bissau	-1.8	-2.6	-3.3
	Liberia	-30.2	-16.4	-17.4
	Mali	-5.7	-2.3	-4.5
	Niger	-12.3	-13.1	-13.6
	Nigeria	0.3	-4.0	-2.9
	Senegal	-7.1	-10.9	-10.4
	Sierra Leone	-17.2	-16.7	-13.9
	Togo	-3.2	-3.0	-5.2

Source: African Development Bank
Note: 2021 data are estimates. The terms "most affected countries" and "least affected countries" refer to countries that Germanwatch's Global Climate Risk Index ranked the most and the least affected by climate-related shocks.

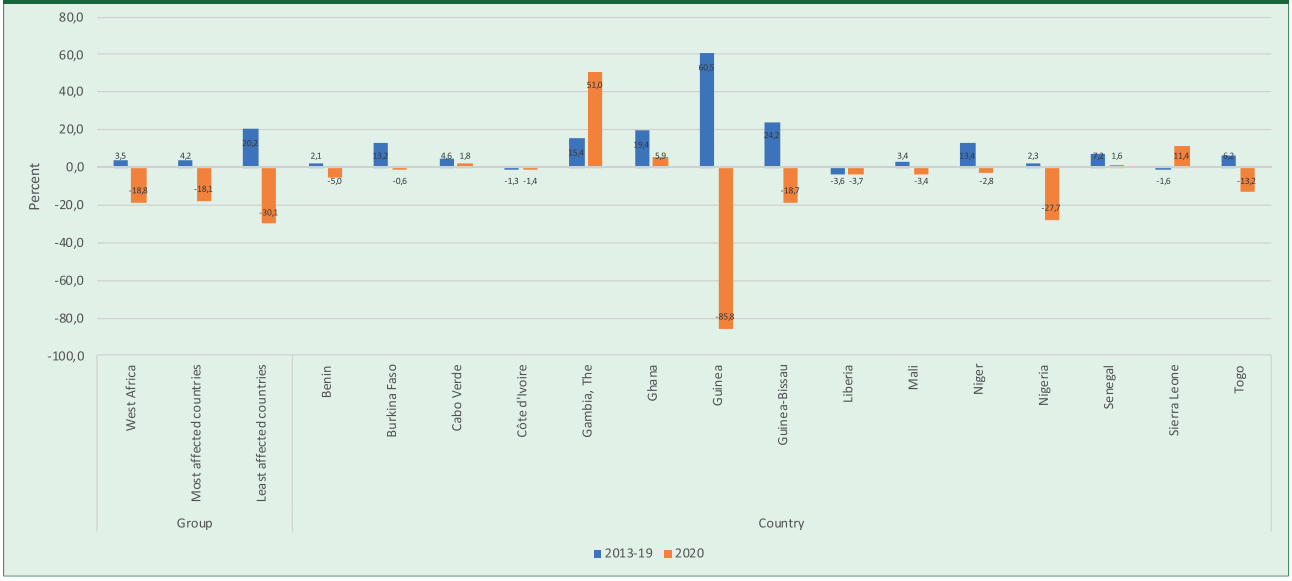
In 2020, the current account deficit in the West Africa region widened to 4.3% of GDP from an average of 1.7% between 2013–2019. This was higher than the continental average of 3.8%. The West Africa region is the only region whose current account deficit increased. The main drivers were the terms of trade and remittances (AfDB, 2021). The pandemic caused a rise in the price of imported consumer goods and a decline in commodity exports, the result of lower global demand. These contributed to the terms of trade deteriorating by 7.9% between 2019 and 2020 after having improved by 3.6% over 2017–2019 (Figure 13). Similarly, remittances to the region declined by 18.8% in 2020 after having grown 3.5% in 2013–2019 (Figure 14).

Figure 13 : Changes in the terms of trade in West African countries, 2017–2021

Source: African Development Bank
Note: 2021 data are estimates. The terms "most affected countries" and "least affected countries" refer to countries that Germanwatch's Global Climate Risk Index ranked the most and the least affected by climate-related shocks.

Rising global uncertainty associated with the pandemic increased risk aversion towards the assets issued by developing countries. This led to reversals or decreases in capital inflows (foreign direct investment and portfolio investments) and contributed to a deterioration in financial accounts. Financial accounts were used to finance current account deficits in most countries in the region during 2013–2019, but following the decline in external financial inflows during the pandemic (i.e., exports, foreign direct investment, portfolio investments, remittances, and official development assistance), deficits in the current account were financed either by depleting foreign exchange reserves (in countries with a strong external position) or by increasing loans. The latter was the case in most countries in the region in 2020.

Figure 14 : Changes in remittances in West African countries, 2013–2020



Source: African Development Bank
Note: 2021 data are estimates. The terms "most affected countries" and "least affected countries" refer to countries that Germanwatch's Global Climate Risk Index ranked the most and the least affected by climate-related shocks.

In West Africa, the current account balance deteriorated the most in Cabo Verde, where it fell from a surplus of 0.1% of GDP in 2019 (it averaged 5.0% of GDP in 2013–2019) to a deficit of 15.9% of GDP in 2020 (Table 4). This was caused by the drop in international tourism. The terms of trade in Cabo Verde deteriorated by 33% in 2020 due to the rising price of imported food and declining tourism (Figure 13). According to the World Bank (2020), the deterioration in the country's current account balance in 2020 was attenuated by an 1.8% increase in remittances against a projected decline of 9.9%. The increase could be attributed to a switch from informal to formal channels of remittance transmission, due to pandemic-instigated travel bans and the counter-cyclical behavior of remittances in receiving countries. This was observed in The Gambia, where international remittances were projected ex-ante to decline by 5.2% in 2020 (KNOMAD, 2020) but where official data reports a rise of 51.0% (Figure 14). In The Gambia, 84.6% of households declared a drop in remittances received from March to August 2020 (they did not refer to the channels through which remittances were received) (Avdiu and Meyer, 2021). Because of the high cost of transferring remittances (about 11%), Gambian migrants largely opt for informal channels.

In contrast, the current account balance improved in Burkina Faso, from a deficit of 3.2% of GDP in 2019 (6.1% of GDP in 2013–2019) to a surplus of 3.8% in 2020. This was supported by a 26.5% increase in the terms of trade, the result of higher prices for the country's main exports, including gold and cotton, even as the price of imported petroleum declined. For the same reasons, Mali's current account deficit narrowed from 7.5% of GDP in 2019 (5.7% in 2013–2019) to 2.3% of GDP in 2020. In Guinea, again thanks to the rise in the price of gold, terms of trade increased by 121.7% in 2020, causing the current account deficit to narrow from an average of 15.8% of GDP in 2013–2019 to 13.7% of GDP in 2020. An increase in mineral prices also led the terms of trade to improve by 15.5% in Sierra Leone in 2020, causing the current account deficit to narrow from 22.5% of GDP in 2019 (17.2% in 2013–2019) to 16.7% in 2020.

In Nigeria, which is Africa's largest oil and gas exporter, the unprecedented drop in energy prices during the pandemic reduced the terms of trade by 20.0% in 2020. This led the average current account surplus of 0.3% of GDP in 2013–2019 to move to a deficit of 4.0% of GDP in 2020. The lower price of oil in 2020 was also a factor in the widening current account deficits in Ghana and Côte d'Ivoire, which also export oil.

In 2021, amid the economic recovery, current account deficits narrowed to 3.5% of GDP from 4.3% in 2020. This was caused by the narrowing of the current account deficit in bigger economies, like Nigeria (it fell from 4% of GDP to 2.9% of GDP) and Ghana (it fell from 3.1% of GDP to 2.1% of GDP). This could be attributed, among other things, to increases in the trade balance caused by higher oil prices on the international market following the reopening of the global economy. The current account deficit widened in some West African economies, such as Benin, The Gambia, Mali, and Togo.

[3] https://blogs.worldbank.org/africacan/how-covid19-changed-path-remittances-gambia

1.4.3 The higher debt burden slowed economic recovery

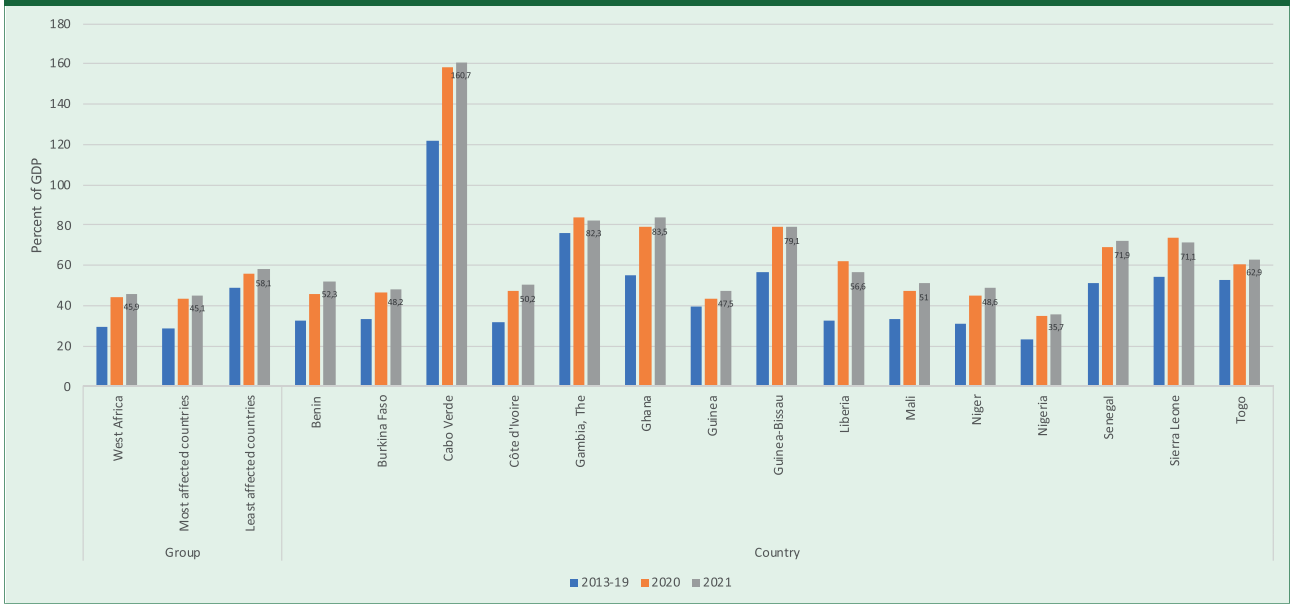
Even with the chronic fiscal deficits that stemmed from large financing needs for infrastructure and weak domestic resource mobilization, West African countries maintained a manageable level of sovereign debt before the pandemic. In the region, general government gross debt averaged 29.5% of GDP in 2013–2019 (Figure 15).

Even though countries most affected by extreme weather events have a higher fiscal deficit, they have a lower ratio of sovereign debt to GDP, due to tighter credit constraints that occurred after the shocks as mentioned above. Cabo Verde, which is among economies least affected by climate change, had the highest external debt-to-GDP ratio in 2013–2019, at 121.6%, owing to sustained investment.

The pandemic raised fiscal deficits considerably, increasing already elevated sovereign debt. General government debt in the region soared by 6.6 percentage points of GDP, from 37.3% in 2019 to 43.9% in 2020. Due to lower tourism revenues and fiscal stimuli, Cabo Verde, which already had the region's highest debt-to-GDP ratio, endured the highest rise, with debt soaring from 124.9% in 2019 to 158.1% in 2020, an increase of 33.2 percentage points. In Nigeria, more spending and lower oil revenues caused general government debt to increase from 29.2% of GDP in 2019 to 35.0% of GDP in 2020. For the same reasons, an increase in general government debt-to-GDP ratio was strong in 2020; it grew to 78.9% from 62.6% in 2019.

In 2021, public debt as a share of GDP is estimated to have increased slightly, to 45.9% of GDP from 43.9% in 2020. The lightness of the increase can be explained in part by a narrower fiscal deficit in the region, from 6.4% of GDP in 2020 to 5.7% in 2021. As in other regions on the continent, the primary deficit continued to be an important driver of debt accumulation in the region, accounting for nearly half the change in public debt. On the revenue front, the decline in fiscal deficits (contributing to the steady debt level) can be attributed to an increase in collections and the reversal of tax cuts following the normalization of economic activities, as well as to a decrease in health-related government spending. This is happening in tandem with the region's largest economies. In Nigeria, for example, public debt is estimated to be steady—35.7% of GDP in 2020 against 35.0% in 2021—on account of an expected increase in oil revenue following an increase in the price of and demand for fuel on the international market. The increase in oil revenue is expected to help narrow the fiscal deficit in Nigeria to 4.8% of GDP in 2021 against 5.4% in 2020.

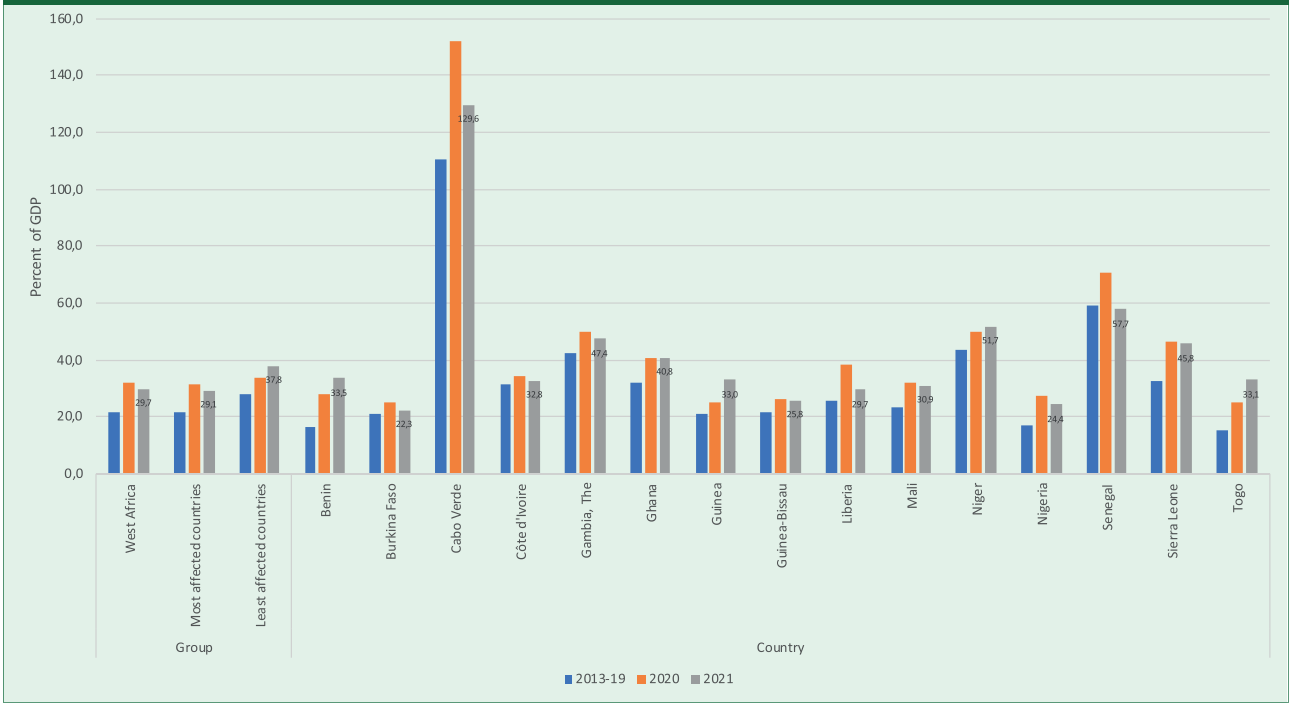
Figure 15 : General government gross debt in West Africa by group and country, 2013–2021



Source: Staff calculations based on the International Monetary Fund's World Economic Outlook (IMF, 2022).
Note: 2021 data are estimates. The terms "most affected countries" and "least affected countries" refer to countries that Germanwatch's Global Climate Risk Index ranked the most and the least affected by climate-related shocks.

In terms of the composition of public debt, external debt accounts for the largest proportion of the total public debt portfolio in most countries except Nigeria and Togo (AfDB, 2021). This suggests that exchange rate depreciation is an important risk for these countries. External debt accumulation was facilitated by a rise in the issuance of eurobonds. Eurobonds have been issued by Côte d'Ivoire, Ghana, Nigeria, and Senegal since 2011, and by Benin since 2019. Thanks to the rise in energy prices, the external debt-to-GDP ratio declined in 2021 in Nigeria and the region. In Cabo Verde, the region's most indebted country, external debt decreased from 151.8% of GDP in 2020 to 129.6% of GDP in 2021.

Figure 16 : Public external debt of West African countries, 2013–2021



Source: Staff calculations based on the International Monetary Fund's World Economic Outlook (IMF, 2022).
Note: 2021 data are estimates. The terms "most affected countries" and "least affected countries" refer to countries that Germanwatch's Global Climate Risk Index ranked the most and the least affected by climate-related shocks.

To increase fiscal space for pandemic relief, the International Monetary Fund and the World Bank recommended that the G20 implement the Debt Service Suspension Initiative, which temporarily suspended debt service payments to official bilateral creditors. Among 73 eligible countries, 48 countries participated in the initiative before it expired at the end of December 2021. All countries in West Africa were eligible except Benin, Ghana, and Nigeria (Table 5). Guinea-Bissau, although eligible, did not participate. Among participating countries, the amount suspended in 2020 in terms of the percentage of GDP was highest in The Gambia, at 0.8% ($14.5 million).

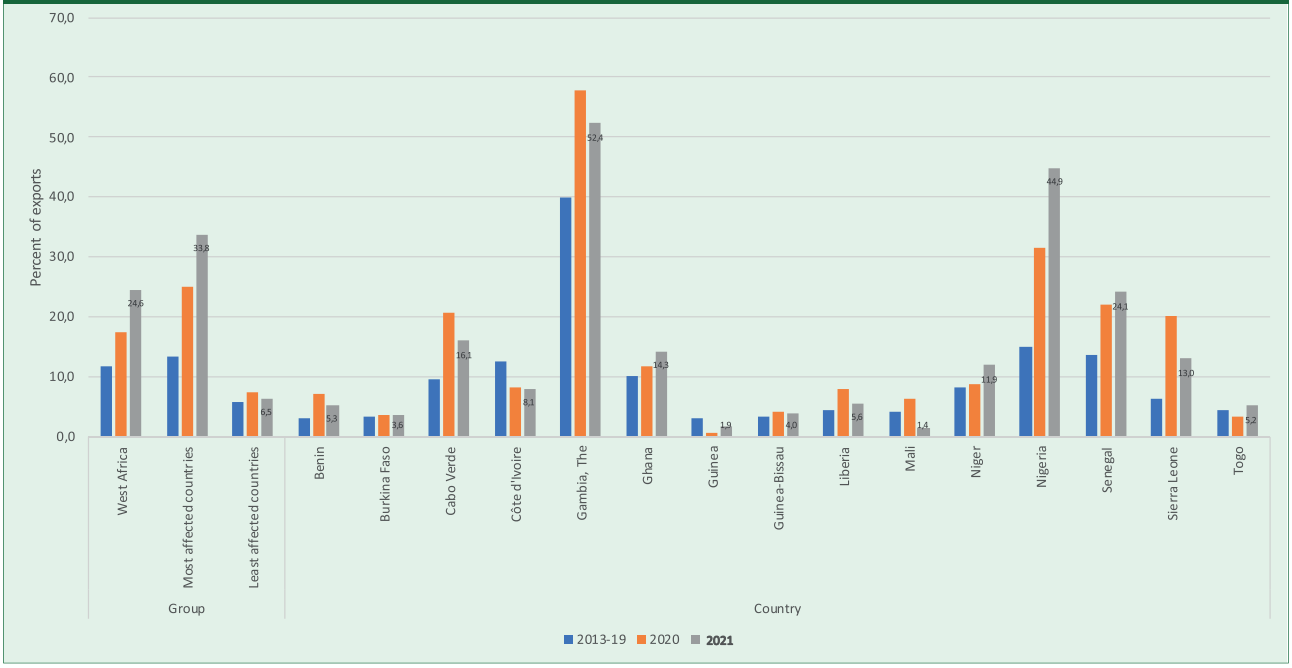
Before the pandemic, high external debt generated higher debt servicing. In West Africa, the debt-service-to-exports ratio—the indicator that shows how much of a country's export revenue is used to service the country's debt—was 11.9 % in 2013–2019 (Figure 17). During the same period, The Gambia registered a ratio of 40.0%.

Table 5 : Amounts suspended and potentially suspended by the Debt Service Suspension Initiative in West Africa, 2020–2021					
Country	Debt Service Suspension Initiative participation	Amount suspended in 2020		Amount potentially suspended in January - December 2021	
		Percentage of GDP	Millions of US dollars	Percentage of GDP	Millions of US dollars
Benin	No	0	0	0.2	32.5
Burkina-Faso	Yes	0.1	14	0.2	32.7
Cabo Verde	Yes	0.7	14	1.7	34.3
Côte d'Ivoire	Yes	0.2	131.6	0.3	150.3
Gambia,The	Yes	0.8	14.5	0.7	13.1
Ghana	Yes	0	0	0.8	516.5
Guinea	Yes	0.2	33.4	0.8	103.6
Guinea-Bissau	Yes	0	0	0.5	6.8
Liberia	Yes	0	0	0.1	4.5
Mali	Yes	0.1	12.6	0.6	101.5
Niger	Yes	0.1	11.4	0.4	54.8
Nigeria	Yes	0	0	0.1	342.1
Senegal	Yes	0.6	144.8	1.5	338.5
Sierra Leone	Yes	0.1	4.1	0.4	16.8
Togo	Yes	0.3	22	0.7	49.4

Source: World Bank (2022).
Note: Estimates are as of 28 February 2022.

In 2020, during the pandemic, the region's debt service costs equated to 17.4% of the value of its exports. Despite the Debt Service Suspension Initiative, the ratio increased to 24.6% of exports in 2021 (Figure 17). This increase mainly originated in Nigeria, where the debt-service-to-exports ratio soared from 31.7% in 2020 to 44.9% in 2021, even though favorable terms of trade for energy increased the value of Nigeria's exports in 2021. The Gambia had the highest debt-service-to-exports ratio in 2020 (57.9%) and 2021 (52.4%). Its ratio was also highest in 2013–2019.

Figure 17 : Debt service costs in West African countries, 2013–2021 (percentage of exports)



Source: African Development Bank
Note: 2021 data are estimates. The terms "most affected countries" and "least affected countries" refer to countries that Germanwatch's Global Climate Risk Index ranked the most and the least affected by climate-related shocks.

1.5 Macroeconomic outlook and risks

1.5.1 The Russia-Ukraine crisis dealt a blow to the region's macroeconomic outlook

The growth outlook is negative. GDP growth in West Africa is projected to decelerate from 4.3% in 2021 to 4.1% in 2022 and 4.2% in 2023 (Table 6). On the demand side, growth is projected to be driven by domestic demand (household consumption and investment) and external demand (net exports). However, risks are high that the Russia-Ukraine crisis and developments in the international financial market will constrain domestic and external demand. First, expected surges in inflation could slow growth in real per-capita income and constrain domestic demand by reducing private consumption. Private consumption accounted for over 60% of GDP growth in the region prior to the 2020 crisis. Second, tighter liquidity in the international financial market could cause the cost of borrowing to surge and constrain debt-financed public investment. Third, the crisis could cause surges in the food and fuel bills of countries that are net importers of food and energy.

On the supply side, growth is projected to be fuelled by the services sector. This sector was the hardest hit in 2020 and its contribution to growth is projected to strengthen in the medium term as social restrictions have lifted and COVID-19 vaccinations continue to roll out. Adverse weather conditions could also constrain growth. According to the Global Climate Risk Index, 10 of the 15 countries in the West Africa region are classified as countries that are most affected by extreme climate variations.

From a policy management perspective, minimizing countries' vulnerability to shocks requires mobilizing domestic and external resources in the immediate-to-short term. This could entail introducing growth-friendly structural policy reforms (e.g., digital taxes, property taxes, measures to counter illicit financial flows, measures to plug tax gaps, the prioritization/rationalization of government spending, and more efficient government investments). In the medium-to-longer term, this could entail building resilience by embarking on structural policy reforms, promoting intra-regional trade (e.g., diversifying exports and export destinations), broadening the growth base (a structural change), building regional capacity in pharmaceutical manufacturing, and adopting good climate mitigation and adaptation measures.

[3] https://blogs.worldbank.org/africacan/how-covid19-changed-path-remittances-gambia

Table 6 : Real GDP growth forecasts in West Africa by group and country, 2021-2023 (percent)				
		2021 (April 2022 estimation)	2022 (April 2022 projection)	2023 (April 2022 projection)
Group	West Africa	4.3	4.1	4.2
	Most affected countries	4.2	4.0	4.0
	Least affected countries	5.8	5.5	6.1
Country	Benin	7.0	6.1	6.4
	Burkina-Faso	6.7	5.0	5.4
	Cabo Verde	7.1	5.1	5.7
	Côte d'Ivoire	7.4	6.0	6.7
	Gambia,The	5.5	4.8	5.8
	Ghana	5.0	5.3	5.1
	Guinea	4.3	4.9	5.7
	Guinea-Bissau	3.8	3.7	4.5
	Liberia	3.3	3.5	4.3
	Mali	3.2	2.1	5.4
	Niger	1.4	6.5	7.2
	Nigeria	3.6	3.4	3.0
	Senegal	6.1	4.6	8.2
	Sierra Leone	3.2	4.0	4.2
	Togo	6.0	5.8	6.8

Source: African Development Bank
Note: 2021 data are estimates. The terms "most affected countries" and "least affected countries" refer to countries that Germanwatch's Global Climate Risk Index ranked the most and the least affected by climate-related shocks.

Inflation is projected to edge up. Demand and supply mismatches in the global market caused by the easing of social restrictions and the invasion of Ukraine by Russia are projected to contribute to the surge in global food and energy prices. Ukraine and Russia account for 30% of wheat exported globally and 14% of all wheat production. Ukraine accounts for 31% of maize supplied to Africa, and Russia produces 10% of the world's oil. Net food and fuel-importing countries in West Africa are expected to be impacted the most by rising food and energy prices. Only Côte d'Ivoire and Ghana registered a surplus in their food trade balance over 2016–2019 (Table 7). Furthermore, most food imported in the region comes from outside the continent 93% in Nigeria, 83% in Ghana, and 80% in Côte d'Ivoire (Table 8). The region is thus highly exposed to food price shocks originating from outside Africa. The shocks pass directly to domestic inflation, as nearly one-third of the weight of the region's consumer price index is attached to food. The impact will be felt by the region's households. According to the Organization for Economic Co-operation and Development/the Food and Agriculture Organization, nearly half of household budgets in developing countries is spent on food (households in advanced economies spend approximately 10%).

Table 7 : Food trade in West African countries, 2016–2019				
	Food Exports (USD millions)	Food Imports (USD millions)	Food Trade Balance (USD millions)	Food Trade Balance (% GDP)
Benin	224.17	1112.97	-888.80	-6.18
Burkina-Faso	322.84	457.19	-134.35	-0.84
Cabo Verde	50.05	244.23	-194.18	-9.80
Côte d'Ivoire	6727.23	2239.24	4487.99	7.67
Gambia	5.98	163.82	-157.84	-8.74
Ghana	3685.73	1817.71	1868.02	2.73
Guinea	103.58	920.30	-816.72	-9.45
Mali	249.05	731.48	-482.43	-3.14
Niger	730.52	745.00	-14.48	-0.11
Nigeria	963.55	4696.06	-3732.51	-0.83
Senegal	1335.20	1596.39	-261.19	-1.12
Sierra Leone	93.72	316.70	-222.98	-5.46
Togo	181.80	359.01	-177.21	-2.45

Source: Staff calculations based on the World Integrated Trade Solution (WITS) of the World Bank.
Note: For each country, data are from the most recent year for which data were available: 2019 for Benin, Burkina Faso, Cabo Verde, Côte d'Ivoire, The Gambia, Ghana, Nigeria, Senegal and Togo, 2018 for Niger and Sierra Leone, 2017 for Mali, and 2016 for Guinea. Recent data are not available for Guinea-Bissau and Liberia.

As a result of the above, the region's average inflation is projected to edge up to 13.6% in 2022 before easing to 10.2% in 2023 (Table 9). All countries in the region are projected to face inflationary pressures in 2022, with Ghana (15%), Nigeria (16.9%) and Sierra Leone (16.8%) projected to drive regional inflation. Rising inflation in the region leaves countries little monetary policy space to sustain their recovery in the medium term. This is made worse by developments in the international financial market. Policies in advanced economies to tame inflation could weaken local currencies, contributing to rising inflation through imported inflation. This could confront monetary authorities in the region with hard policy choices. Countries with lower inflation could maintain an accommodative monetary policy to support recovery. This assumes that the Ukraine-Russia-instigated surge in inflation would not last long: that is, that the Ukraine-Russia conflict will not drag on and prices will normalize. Countries with higher inflation and a weakening local currency could opt for a contractionary monetary policy. Where possible, impacted countries could consider implementing soft monetary tightening (e.g., selling securities to mop up excess liquidity in the system) instead of hiking rates to mitigate inflationary pressures. In countries whose debt levels are rising due to more reliance on the domestic financing of fiscal deficits, hiking interest rates could affect debt accumulation. In all countries in the region, interest rates on domestic loans are higher than on external loans. It is important to note that of late, interest rates and exchange rate depreciations have become major drivers of debt accumulation in the region.

Table 8 : The origin of food imported by West African countries, 2016–2019

	Food imported from outside Africa (%)	Top five origins of food imports				
		1st (%)	2nd (%)	3rd (%)	4th (%)	5th (%)
Benin	84.12	India (27.04)	Thailand (13.62)	UAE (7.06)	Mauritania (5.52)	Togo (5.01)
Burkina-Faso	41.42	Côte d'Ivoire (24.29)	India (12.37)	France (9.64)	Thailand (7.96)	Russia (4.74)
Cabo Verde	98.83	Portugal (39.19)	Spain (14.36)	Netherlands (10.57)	Brazil (8.13)	Belgium (5.37)
Côte d'Ivoire	79.66	France (18.18)	Vietnam (11.88)	China (8.34)	Mauritania (6.63)	Senegal (6.46)
Gambia	93.69	Brazil (31.41)	Malaysia (11.92)	Netherlands (6.24)	Indonesia (4.90)	Pakistan (4.21)
Ghana	82.82	Vietnam (14.97)	Canada (7.35)	Belgium (6.66)	China (5.54)	Malaysia (4.86)
Guinea	96.32	UAE (47.11)	India (18.15)	Lebanon (5.13)	Thailand (4.02)	Netherlands (2.96)
Mali	59.49	Côte d'Ivoire (17.09)	France (9.96)	Senegal (9.26)	Brazil (8.53)	South Africa (8.43)
Niger	70.16	Thailand (29.78)	Nigeria (7.16)	Côte d'Ivoire (6.85)	China (6.81)	United States (5.36)
Nigeria	94.12	United States (12.79)	Brazil (10.99)	Russia (8.16)	Netherlands (7.15)	China (6.23)
Senegal	87.97	France (13.74)	Argentina (6.40)	India (6.39)	Thailand (6.06)	Russia (5.96)
Sierra Leone	91.77	China (14.98)	Pakistan (11.00)	UAE (10.56)	India (7.89)	Brazil (7.24)
Togo	72.55	Malaysia (10.48)	Indonesia (7.74)	Brazil (6.66)	Ghana (6.34)	France (6.28)

Source: Staff calculations based on the World Bank's World Integrated Trade Solution
Note: The data are for the most recent year for which they are available: 2019 for Benin, Burkina Faso, Cabo Verde, Côte d'Ivoire, The Gambia, Ghana, Nigeria, Senegal, and Togo; 2018 for Niger and Sierra Leone; 2017 for Mali; and 2016 for Guinea. Recent data are not available for Guinea-Bissau and Liberia.

Table 9 : Inflation forecasts in West Africa by group and country, 2021–2023 (percent)				
		2021 (April 2022 estimation)	2022 (April 2022 projection)	2023 (April 2022 projection)
Group	West Africa	12.7	13.6	10.2
	Most affected countries	13.3	14.1	10.7
	Least affected countries	6.3	7.6	6.4
Country	Benin	1.7	4.3	2.8
	Burkina-Faso	3.9	5.8	2.4
	Cabo Verde	1.8	5.2	2.5
	Côte d'Ivoire	4.2	5.4	2.3
	Gambia	7.5	8.0	7.5
	Ghana	10.0	15.0	11.1
	Guinea	12.5	12.6	12.4
	Guinea-Bissau	3.3	4.1	3.2
	Liberia	8.0	9.8	8.1
	Mali	4.1	7.8	3.1
	Niger	3.1	4.4	3.4
	Nigeria	17.0	16.9	13.1
	Senegal	2.1	3.2	2.2
	Sierra Leone	11.0	16.8	14.3
	Togo	4.3	4.6	2.4

Source: African Development Bank
Note: 2021 data are estimates. The terms "most affected countries" and "least affected countries" refer to countries that Germanwatch's Global Climate Risk Index ranked the most and the least affected by climate-related shocks.

The fiscal balance is projected to narrow. The region's average fiscal deficit is projected to narrow to 5.4% of GDP in 2022 and 5.3% in 2023 (Table 10). This is on the back of projected increases in revenue collection, caused by normalization of economic activities and policy reforms, and a gradual reduction of COVID-19-related spending. Countries whose fiscal deficit is expected to exceed the regional average include Burkina Faso (5.9%), Cabo Verde (6.4%), Ghana (13.3%), Liberia (5.5%), Senegal (5.5%), and Togo (6.2%).

The headwinds mentioned earlier (increasing global inflation, a worsening international financial market, the Ukraine-Russia war) are expected to impact fiscal operations in the region. In the absence of fiscal space, budget resources could be diverted to subsidize food and energy. This could happen at the expense of capital expenditure, thereby undermining future growth (e.g., in the case of fiscal consolidation that is hostile to growth). Countries could respond differently to mitigate the headwinds' impact. Countries with fiscal space (i.e., a positive debt sustainability gap) could resort to borrowing. This could increase the cost of borrowing, lower credit ratings, and reduce fiscal operations as less revenue goes to finance development.

In general, countries' fiscal space is limited. In the immediate term, policy options include diverting the additional revenues generated by price increases to subsidize essentials. In the short term, countries might consider enhancing domestic and external resource mobilization through growth-friendly policy reforms: for example, introducing or expanding digital taxes and property taxes, curtailing illicit financial flows, plugging tax gaps, prioritizing/rationalizing government spending, and making government investments more efficient. In the medium-to-longer term, they could build fiscal buffer through countercyclical policies.

Table 10 : Fiscal balance forecasts in West Africa by group and country, 2021–2023 (percentage of GDP)

		2021 (April 2022 estimation)	2022 (April 2022 projection)	2023 (April 2022 projection)
Group	West Africa	-5.7	-5.4	-5.3
	Most affected countries	-5.7	-5.5	-5.4
	Least affected countries	-4.7	-4.5	-4.0
Country	Benin	-6.1	-4.3	-3.7
	Burkina-Faso	-5.6	-5.9	-5.1
	Cabo Verde	-8.6	-6.4	-4.6
	Côte d'Ivoire	-5.0	-4.7	-3.8
	Gambia	-4.0	-4.6	-3.1
	Ghana	-12.8	-13.3	-13.8
	Guinea	-2.3	-3.9	-4.0
	Guinea-Bissau	-5.6	-4.2	-4.1
	Liberia	-3.3	-5.5	-3.5
	Mali	-4.7	-4.4	-3.5
	Niger	-5.2	-4.9	-4.6
	Nigeria	-4.8	-4.5	-4.6
	Senegal	-5.9	-5.5	-4.7
	Sierra Leone	-7.1	-4.4	-4.0
	Togo	-5.8	-6.2	-5.3

Source: African Development Bank
Note: 2021 data are estimates. The terms "most affected countries" and "least affected countries" refer to countries that Germanwatch's Global Climate Risk Index ranked the most and the least affected by climate-related shocks.

Current account balances are projected to narrow. The current account deficit is projected to narrow to 2% of GDP in 2022 and 2023 (Table 11), provoked by an increase in global demand as economic activities continue to normalize. The change in the region's current account balance is expected to be driven by the trade balance and secondary income (e.g., diaspora remittances). As always, performance will depend on countries' economic characteristics. The trade balance of oil-exporting and other resource-intensive economies is expected to improve as commodity prices increase in 2022. If the Ukraine-Russia crisis drags on, however, economies that import oil and food could experience an unfavorable trade balance and larger current account deficits. Except for Burkina Faso (5.5%) and Nigeria (1.0%), all countries in the region are projected to register a current account deficit as a percentage of GDP that exceeds the regional average in 2022. The narrowing current account deficit can be attributed to better performance on the part of Burkina Faso, Nigeria, and Cabo Verde; in the other countries, the current account deficit is expected to widen.

Until now, many countries in the region relied heavily on surpluses in their financial accounts to finance current account deficits. Capital inflows could be adversely impacted by capital reversals due to policy shifts in source countries. Countries with an external position could deplete foreign exchange reserves to cope, while others could resort to borrowing from external sources. In the immediate-to-short term, policy options include diversifying import sources and embarking on export promotion and export diversification exercises; in the medium-to-longer term, countries could pursue structural reforms aimed at diversifying the export base by adding more value and adding to the beneficiation of mineral resources. The African Continental Free Trade Area (AfCFTA) can help.

Table 11 : Current account balance forecasts in West Africa by group and country, 2021–2023 (percentage of GDP)

		2021 (April 2022 estimation)	2022 (April 2022 projection)	2023 (April 2022 projection)
Group	West Africa	-3.5	-2.0	-2.0
	Most affected countries	-3.4	-1.8	-1.7
	Less affected countries	-4.7	-8.2	-7.1
Country	Benin	-3.7	-5.4	-4.6
	Burkina-Faso	5.2	5.5	5.8
	Cabo Verde	-13.1	-10.1	-7.5
	Côte d'Ivoire	-3.8	-4.8	-4.4
	Gambia	-9.3	-14.7	-11.8
	Ghana	-2.1	-2.6	-3.8
	Guinea	-4.0	-11.1	-9.8
	Guinea-Bissau	-3.3	-5.2	-4.1
	Liberia	-17.4	-20.8	-17.5
	Mali	-4.5	-5.0	-4.4
	Niger	-13.6	-14.2	-12.9
	Nigeria	-2.9	0.1	-0.2
	Senegal	-10.4	-13.2	-10.7
	Sierra Leone	-13.9	-16.6	-13.6
	Togo	-5.2	-6.2	-5.9

Source: African Development Bank
Note: 2021 data are estimates. The terms "most affected countries" and "least affected countries" refer to countries that Germanwatch's Global Climate Risk Index ranked the most and the least affected by climate-related shocks.

1.5.2 The macroeconomic outlook faces downside risks

Downside risks to the outlook emanate from several factors:

- A prolonged Russia-Ukraine crisis and sharp rate increases that tighten global financial conditions further: This could narrow external deficit financing opportunities even more, hamper macroeconomic stability, and limit growth.

- The course of the COVID-19 pandemic: Low vaccination rate (less than 15% as at end-October 2021) exposes West Africa to evolutions in the COVID-19 pandemic. The emergence of more virulent variants would weaken West African economies, which have been shown to be extremely vulnerable to global disruptions.

- Weather-related disasters: Most West African economies are exposed to adverse weather-related events that are becoming more frequent because of climate change. Over the past decade, food insecurity in West Africa is rising: the region's agriculture is primarily rain-fed, and more frequent episodes of droughts and floods have been devastating. Poor rainfall lowered crop yields significantly during the 2021–2022 agricultural season, causing the price of locally produced cereals to soar. According to the Food and Agriculture Organization (2022), cereal production fell by 36% in Niger, 10% in Burkina Faso, and 10% in Mali from the five-year average.

- Deteriorating security and political instability: Many West African countries, such as Burkina Faso, Mali, Niger, and Nigeria, are subject to persistent security-related risks that jeopardize their economic prospects. In these countries, armed groups carry out frequent violent attacks that often displace farmers, destroy crops, and rustle cattle. Political uncertainty is higher in the region because of recent coups d'état in Burkina Faso, Guinea, and Mali, and a failed coup d'état in Guinea-Bissau.

- The rising debt burden: Pandemic-induced fiscal stimuli have increased public debt in West Africa, which was already facing a looming debt crisis. Countries in this region mobilize less domestic resources, and higher interest rates and/or more borrowing has made their ratio of debt service costs to revenues high. This is putting their fiscal sustainability at risk and may deprive them of investments needed to drive economic growth.

- Higher risks of social and civil unrest: These risks could result from escalating food and oil prices, particularly in the current harsh economic climate.

Upside risks are as follows:

- Trade opportunities associated with the AfCFTA: The ratification of the AfCFTA Agreement, which will govern the world's largest free trade area, by a large number of countries could boost African economies by removing trade impediments and diversifying exports. Although no trade has yet occurred under the AfCFTA regime, 41 of the 54 countries that signed the agreement have deposited their instruments of ratification with the African Union Commission. All West African countries except Benin, Guinea-Bissau, and Liberia have deposited their instruments of ratification. The AfCFTA will encourage African economies to import from one another while promoting competitiveness and thus decreasing prices, particularly food prices. In the medium-to-long run, once accompanied by adequate infrastructure, including infrastructure for transport and power, the agreement will drive industrialization in the region by expanding existing industries, spawning new industries, and developing economies of scale.

- A faster-than-expected resumption of international financial inflows and tourism: The adverse impacts of COVID-19 were exacerbated in several West African economies by a fall in international capital inflows such as remittances, foreign direct investment, portfolio investments, and official development assistance. A faster-than-expected resumption of these inflows due to the faster vaccination rollout in source countries and stronger global growth would strengthen the region's economic recovery.

CHAPTER 2

WEST AFRICAN ECONOMIES' VULNERABILITY TO CLIMATE CHANGE AND THE IMPERATIVE OF AN ENERGY TRANSITION

KEY MESSAGES

- **Climate-related shocks are becoming an important source of vulnerability for the economies of West Africa.** Increasing temperatures, rising sea levels, changing precipitation patterns, and other extreme weather conditions threaten socioeconomic development. In 2019, heavy rains caused the Niger River to burst its banks and affected more than 210,000 people, killing 57, destroying 16,000 homes, causing crop losses, and damaging hydro- agricultural installations. Floods also recurrently occurred across Nigeria, where they caused casualties and crop losses and damaged infrastructure. Low rainfall in 2021-2022 stunted agricultural production in such countries as Burkina Faso, Mali, and Niger.

- **West Africa's energy sector faces critical challenges regarding energy access, energy security, and the unsustainable use of wood resources.** The ECOWAS region has among the lowest access to electricity rates in the world. West Africa's access was 52.6% in 2019 (83.1% in urban areas and 25.5% in rural areas). The region is confronted with energy vulnerability, volatile fuel prices, and system unreliability. Energy poverty and its consequences for local economies and social development are expected to constitute the region's predominant challenge through 2030.

- **Accelerating West Africa's energy transition while advancing universal access is key.** Clean, indigenous, and affordable renewable energy would give the region the opportunity to move toward low-carbon development and build resilience, thereby achieving the region's economic, social, environmental, and climate-related objectives. Sustainable development and the use of the continent's massive biomass, geothermal, hydropower, solar, and wind power have the potential to rapidly change the region's living conditions.

- **The 15 states that make up West Africa recognize that achieving goals for energy access and energy security require using more renewable energy, using energy more efficiently, and making energy systems more efficient.** The region's significant energy potential includes 17 billion tons of proven oil reserves, 5200 billion m3 of natural gas reserves, and 25,000 MW of hydraulic potential. Despite these vast resources, the region's overall access rate to modern energy services is very low, with biomass accounting for 80% of the region's energy mix in 2021. The heavy use of biomass aggravates deforestation and desertification.

Introduction

Climate-related shocks are becoming an important source of vulnerability for economies around the world. This indicates the need to mitigate and adapt to climate change. In 2021, weather-related shocks hit many regions with adverse consequences. Canada and the United States suffered from intense wildfires related to human-induced climate change. In some Western European countries, such as Germany and Belgium, severe floods inundated towns and provoked landslides. Floods also hit parts of East Africa, Eastern Asia, and South Asia. La Niña, which is characterized by drier-than-normal conditions, led to droughts in late 2020 and early 2021 in Eastern Africa: as a result, Ethiopia, Kenya, and Somalia experienced poor harvests and livestock deaths, and food insecurity increased.

In 2019, heavy rains caused the Niger River to burst its banks and affected more than 210,000 people, killing 57, destroying 16,000 homes, causing crop losses, and damaging hydro-agricultural installations. Floods also recurred across Nigeria, where water levels rose in the Niger River and the Benue River, causing casualties and crop losses and damaging infrastructure. Meanwhile, low rainfall in 2021-2022 stunted agricultural production in such countries as Burkina Faso, Mali, and Niger.

The Economic Community of West African States (ECOWAS), consisting of 15 sovereign countries with a population of 402 million people in 2020,[4] represents about 30% of Africa's population.[5] Together, ECOWAS countries have a landmass of 6,143,000 square km. The region encompasses diverse demographics, socioeconomic groups, and social conditions. Just as the landscape and culture are varied, so are the challenges to overcoming the population's lack of access to sustainable energy.

ECOWAS's significant energy potential includes 17 billion tons of proven oil reserves, 5200 billion m^3 of natural gas reserves, and 25,000 MW of hydraulic potential.[6] Despite these vast resources, the region's overall access rate to modern energy services is very low. Biomass accounted for 80% of the region's energy mix in 2021, despite the large potential of energy from other sources.[2] The ECOWAS region ranks among the lowest in terms of electricity access rate globally, with only about 42% of the total population and 8% of rural residents having access to electricity in 2015.[7,8] The region is confronted with energy vulnerability, fuel price volatility, and system unreliability. Energy poverty and its consequences for local economies and social development are projected to remain the predominant challenge for West Africa through 2030. The situation hinders socioeconomic activities, the provision of basic social services, poverty reduction, and the attainment of the sustainable development goals.

ECOWAS member states recognize that achieving their goals for energy access and energy security requires using more renewable energy, using energy more efficiently, and making energy systems more efficient. In October 2012, ECOWAS's energy ministers crafted regional policies for renewable energy and energy efficiency that were adopted at the 43rd Ordinary Session of the ECOWAS Heads of State and Government in Abuja, Nigeria, from 17 to 18 July 2013.[9]

Electricity shortages in urban areas and the lack of access to modern, affordable, reliable energy services in rural areas are related to economic, social, environmental, and political conditions. However, stakeholders agree that grid, mini-grid, and off-grid technologies could be leveraged to reverse the situation and provide good, sustainable energy services.

West Africa's economies are more and more confronted with the effects of climate change. It is increasingly urgent to mitigate emissions and promote regionally appropriate adaptation measures while striving to meet sustainable development goals.

[4] UN. 2019. World Population Prospects 2019. Department of Economic and Social Affairs Population Dynamics. https://population.un.org/wpp/Graphs/Probabilistic/POP/TOT/914

[5] AfDB, 2020. West Africa Regional Integration Strategy Paper 2020–2025. https://www.afdb.org/en/documents/west-africa-regional-integration-strategy-paper–2020–2025-0

[6] ECOWAS Parliament. 2021. Major energy challenges to be addressed despite enormous potentials in West Africa. https://parl.ecowas.int/major-energy-challenges-to-be-addressed-despite-enormous-potentials-in-west-africa/

[7] World Bank. 2022. Putting Africa on the path to universal electricity access. https://blogs.worldbank.org/energy/putting-africa-path-universal-electricity-access

8 United Nations. 2015. Developing Renewable Energy Sectors and Technologies in West Africa. https://www.un.org/en/chronicle/article/developing-renewable-energy-sectors-and-technologies-west-africa#:~:text=The%20ECOWAS%20region%20ranks%20among,residents%20having%20access%20to%20electricity.

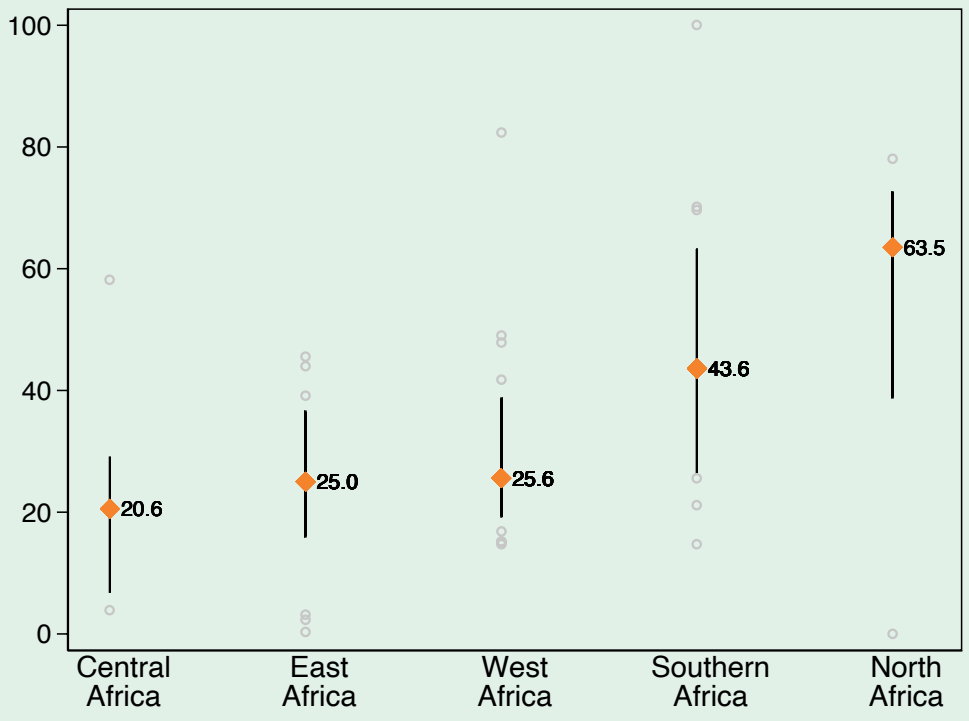
2.1 Climate resilience, readiness, and vulnerability in West Africa

Africa is warming faster than the world as a whole over land and oceans, and West Africa is no exception. According to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), critical global warming levels will likely be reached earlier than mid-century in Africa. The continent and West Africa are, therefore, exceptionally vulnerable to climate variability and climate change, which affect millions of people and make adaptation efforts more pressing as rapid changes in weather patterns erode the productivity of local water and food systems and generate unintended consequences for sustainable development.

African Economic Outlook 2022 calculates Climate Resilience Index scores for Africa. The report shows that in 2010–2019, Africa was the least climate-resilient region in the world. Within Africa, disparities between regions and countries are vast. Of Africa's regions, the most climate-resilient are North Africa (median score of 63.5) and Southern Africa (43.6). West Africa (25.6), East Africa (25.0), and Central Africa (20.6) are the least resilient (Figure 18). At the country level, the four least-resilient countries in West Africa are Niger, Guinea-Bissau, Mali, and Guinea. The most resilient is Cabo Verde, followed by Ghana and Senegal (Figure 19).

Although it contributes only marginally to global warming, Africa bears a disproportionately high share of the consequences of climate change. It is the second-most climate vulnerable region of the world—only South Asia is more vulnerable—and displays the least climate readiness. Its vulnerability stems from low socioeconomic development, with its lack of resources increasing its risk of not meeting sustainable development goals. West Africa is one of the most vulnerable regions on the continent (Figure 20), with a very low level of readiness for adaptation to climate shocks (Figure 21). North Africa and Southern Africa are the least vulnerable, with high readiness, and tend to leverage climate finance and investments. It is therefore imperative that West Africa identify and assess disaster risks, and strengthen collaboration and coordination in this area.

Figure 18 : Climate Resilience Index score by African region, average 2010–2019



Note: The chart shows the median climate resilience index by region with the interquartile range (IQR) over 2010–2019 using principal component analysis. Scatters represent values outside the interquartile range.

Figure 19 : Climate Resilience Index score for West African countries, average 2010–2019

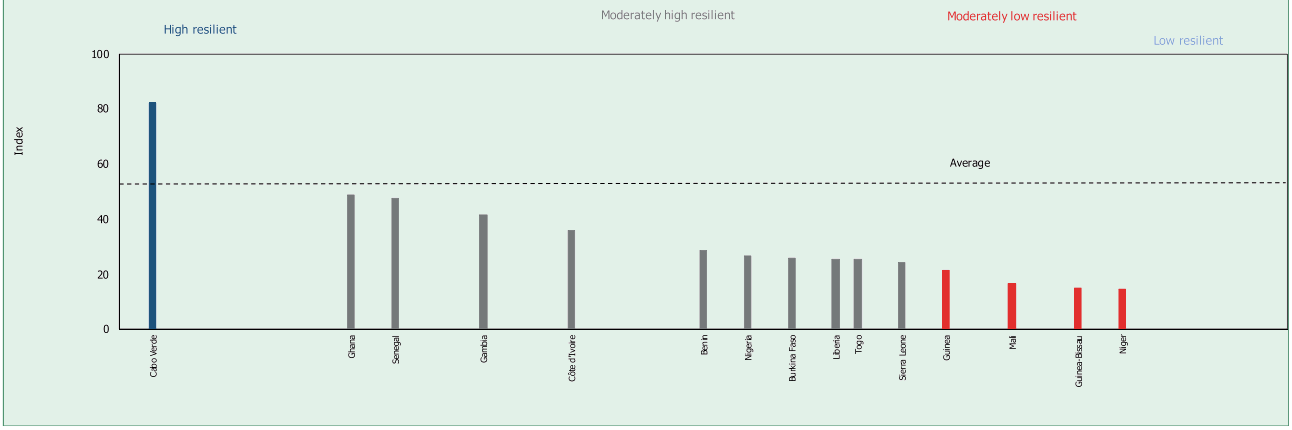


Figure 20 : Climate Vulnerability Index score by African region, average 2010–2019

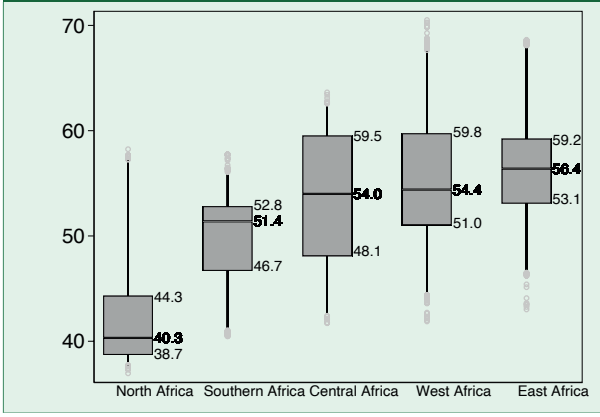
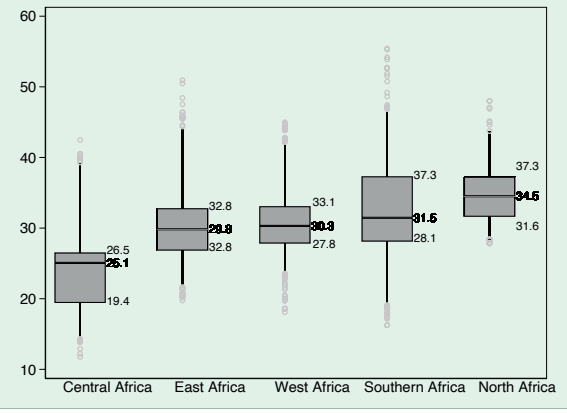


Figure 21 : Climate Readiness Index score by African region, average 2010–2019



Source: AfDB staff computations based on the Notre Dame Global Adaptation Initiative (ND-GAIN) database.

Note: The chart shows the median climate resilience index by region with the interquartile range (IQR) over 2010–2019 using principal component analysis. Scatters represent values outside the interquartile range.

[10] https://library.wmo.int/doc_num.php?explnum_id=10421
[11] https://www.ipcc.ch/site/assets/uploads/2018/02/ar4-wg2-chapter9-1.pdf
[12] https://hess.copernicus.org/articles/22/1095/2018/hess-22-1095–2018.pdf
[13] https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_FinalDraft_FullReport.pdf
[14] Seneviratne et. al., 2018. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change (IPCC). Cambridge

2.2 The socioeconomic impacts of climate change are multiform

According to the 2019 edition of State of the Climate in Africa, increasing temperatures and sea levels, changing precipitation patterns, and more extreme weather conditions threaten socioeconomic development in Africa.[10] In the West Africa region, water resources, fisheries, food security, urban development, trade, tourism, health, and migration are most vulnerable to climate change.[11] In light of the devastating impacts of climate change on diverse socioeconomic sectors, several studies have been conducted to provide early warning systems based on the characteristics of climate events.[12] The socioeconomic impacts of climate change are multidimensional and diverge disproportionally across the region. As part of sub-Saharan Africa, West Africa is characterized by high employment in agriculture (between 55% and 62% of the workforce). Agricultural activity is highly based on rainwater: 95% of cropland is rainfed.[13]

The IPCC warns that climate change will generate alarming consequences for West Africa. A rise in global temperature of between 3°C to 6°C by the end of the century (or earlier) is associated with greater irregularity in rainfall and a delay of the beginning of the rainy season.[14] This section discusses impacts of climate change on various socioeconomic sectors in West Africa.

2.2.1 Climate change is slowing West Africa's economic growth

Compounded by low levels of adaptation, climate change is slowing economic growth considerably in all African countries. African Economic Outlook 2022 estimates that climate change resulted in an average annual loss in GDP-per-capita growth of 5%–15% in Africa over 1986–2015. This is also true for West Africa (Figure 22). The variance in losses stems largely from differences in economic structure and exposure to climate change. For instance, the losses estimated for resource-rich countries, such as Botswana, Equatorial Guinea, and Gabon, and for services- and manufacturing-based economies, such as Mauritius and South Africa, are more modest than in most African countries, whose economies are largely dependent on agriculture, whether measured by value added or share of employment. More concerning for West Africa is that many of the countries severely hurt by climate change were already poor.

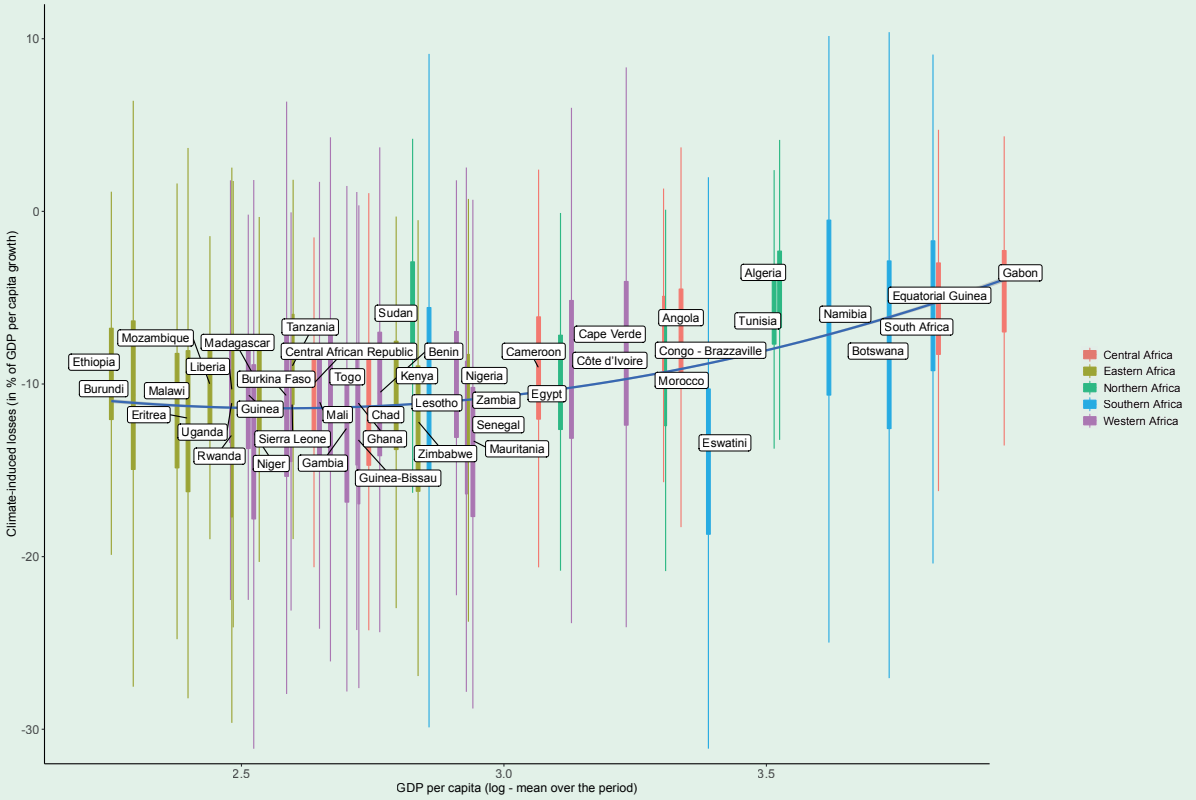
The economic cost of climate change is projected to be much higher in the next few decades, particularly for West Africa. Climate-induced macroeconomic risks for African countries and regions have been estimated under two scenarios: a low-warming scenario in which the emission and concentration pathway aims at limiting the increase of the global mean temperature to 2°C by the end of the century, and a high-warming scenario in which the temperature increases to 5°C.

Figure 23 shows the loss in GDP growth per capita due to climate change in these scenarios for Africa and its regions over 2010–2050. West and East Africa are projected to be the most affected regions in both scenarios, with above 10% median reduction in GDP per capita growth in the high warming scenario by 2050. The effect on North, Southern, and Central Africa will be more modest, with below 10% reduction in projected growth. After 2030, the difference in losses under the two scenarios widens rapidly, particularly in West Africa, where the estimated losses in the high-warming scenario are almost twice as high. In addition to macroeconomic impacts, climate change has significant impacts on socioeconomic outcomes. These include an increased risk of mortality and morbidity, and a high risk of resource-related conflicts, internal displacement, and migration.

For these reasons and others, West Africa needs to build climate resilience. Building climate resilience would produce synergy and mitigate the consequences of climate change. Ways to build climate resilience include adopting climate-smart agricultural practices, using low-cost but effective technologies such as water harvesting and small-scale irrigation techniques, pursuing land and water conservation and management strategies, and practicing minimum or zero tillage agriculture with high net returns to farmers—returns that become even higher when farmers adopt complementary technologies. Building resilience requires transformative changes supported by the public sector.

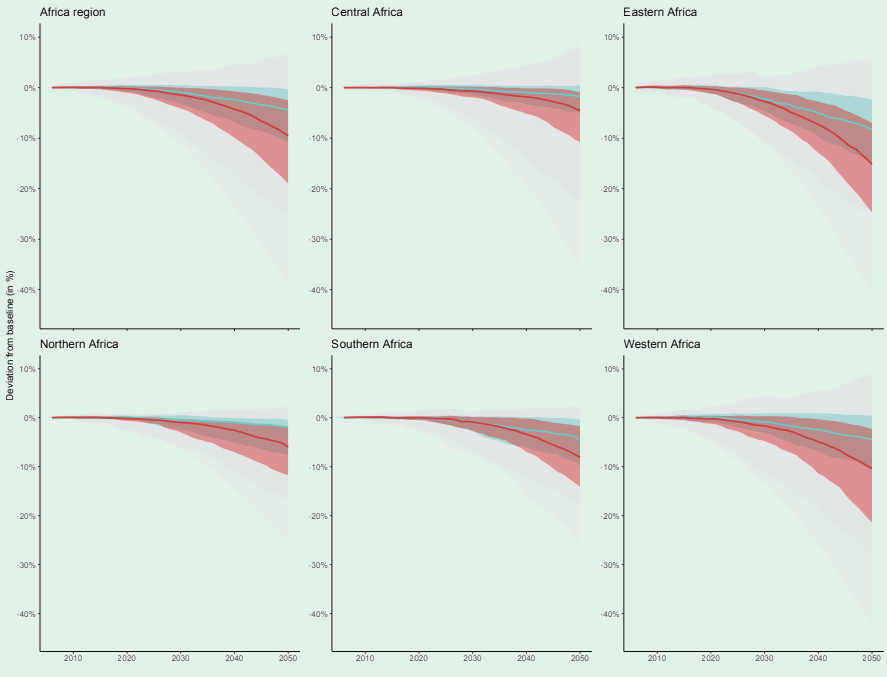
One of the many challenges associated with building climate resilience is to increase access to modern energy. As extreme weather events become more frequent and intense, the installation of residential and workplace climate control systems is important for building climate resilience among households and businesses requiring modern energy. But efforts in this regard are held back by Africa's low modern energy production and consumption. Energy is vital in building resilience in Africa's key productive sectors, including agriculture, where changing patterns in rainfall and temperature threaten output and productivity. In summary, Africa's low level of access to modern energy presents a significant challenge to the quest to build climate resilience, and West Africa is no different.

Figure 22 : Annual climate-induced losses as a percentage of GDP growth per capita, 1986–2015



Source: Baarsch et al. (2020); staff calculations using precipitation and temperature data from NASA

Figure 23 : Estimated losses in GDP per capita growth under low- and high-warming scenarios, 2010–2050



Source: Baarsch et al. (2020)

Note: The red line represents a high-warming scenario (RCP8.5) and the blue line represents a low-warming scenario (RCP2.6). The shaded ribbon represents 66%.

2.2.2 Climate change creates critical challenges for energy security and supply

West Africa's energy sector faces critical challenges regarding energy access, energy security, and the unsustainable use of wood resources. About 60% of the population has no access to the electricity grid (90% of rural dwellers have no access). Over 60% of all energy consumed comes from traditional biomass: this is aggravating deforestation and desertification. The main challenge in the coming years will be to satisfy increasing energy demand without exacerbating social, economic, and environmental problems caused by the changing climate. Climate change consequences such as desertification, drought, flood, food insecurity, and immigration are already visible.[15]

The lack of reliable electricity is a major constraint to sustainable livelihoods and economic growth. With an estimated 50% or more of the region's hydropower potential untapped, investing substantially and cooperating around hydropower could meet the region's entire electricity demand. However, increased evaporation, more extreme heavy rainfall, and reduced river flows in some areas are projected to increase flood damage to dams and turbines, cause reservoir evaporation and siltation, and augment river flow variability, making it difficult to develop hydropower.[16] Variable hydrological conditions will continue to challenge electricity output throughout West Africa. For example, by 2050, the combined effects of climate change and development will reduce hydropower potential in the Volta River Basin by nearly 50%.[17]

West Africa has exceptionally low electricity access rates, particularly outside urban areas and rural centers, and electricity is among the costliest in the world. Access rates range from below 20% in Burkina Faso, Liberia, and Niger, to more than 60% in Senegal and almost 80% in Ghana. In Nigeria, only 60% of the population has electricity: 74 million Nigerians are without. Where electricity exists, access is unreliable and power outages are common. The West African Power Pool is developing power generation and transmission infrastructure, including an integrated regional power market, to make electricity more accessible, reliable, and affordable. The market will link countries with low energy production to the region's main producers: Nigeria, Ghana, and Côte d'Ivoire. Smaller-scale investments target the development of off-grid solar, wind, and micro-hydro solutions around the region.[18]

Much of the energy sector's challenges regard infrastructure, but uncertain precipitation is also a concern. Concerns about reduced river flows are particularly concerning in Liberia, where hydropower accounts for 70% of just 126 MW of installed electrical generation capacity. In Senegal, where trends of reduced rainfall are more certain, hydropower contributes about 10% to the country's electric supply and is highly susceptible to reduced river flows and more evaporation from reservoirs.[19] To minimize the adverse impacts of climate change, hydropower needs to assess climate impacts systematically. Resilient hydropower can play an important role in achieving the sustainable development goals, effecting a clean energy transition, and adapting to climate change.[20]

2.2.3 Climate change threatens access to water

Across West Africa, climate change and population growth threaten access to adequate quantities of water of acceptable quality. Water resources are key for agricultural, industrial, and domestic needs. New solutions that integrate a circular economy approach are expected to address this fact and generate benefits.[21] The impacts of projected climate change on water resources are pessimistic: they predict more frequent extreme events (i.e., flooding and severe drought) that will affect the lives and livelihoods of people in West Africa.[22] With ongoing climate change, water availability's spatial and temporal variability is a challenge for water-dependent sectors such as agriculture, livestock production, energy, and fishing. According to the UN Department of Economic and Social Affairs (2019)[23], the population in West Africa is projected to reach 2.5 billion by 2050. This demographic pressure will raise the demand for water substantially.[24,25] Hydropower and irrigation also raise demand, and they are affected by changes in climate because of evapotranspiration.[26]

But attributing changes in freshwater availability to climate change is difficult. Surface and groundwater hydrology is governed by multiple interacting factors such as land-use change, water withdrawals, and natural climate variability. It is difficult to calculate how climate change in West Africa will affect the quality of water.[27] For instance, the groundwater level responds to rainfall with a delay: its response depends on the local aquifer's physical characteristics.[28] Estimations of climate change impacts on water resources in West Africa are also limited by the significant model uncertainties about the region's future precipitation, according to the IPCC's Fourth Assessment Report. It should be noted that many countries in West Africa have experienced declining water levels in reservoirs in recent years. Less hydropower has been generated and load shedding has occurred (e.g., in Ghana's Akosombo Dam[29]).

[15] https://www.wascal-ne.org/goals.html
[16] McKenzie. 2012. Hydropower could supply Africa's
[17] https://reliefweb.int/sites/reliefweb.int/files/resources/West_Africa_CRP_Final.pdf
[18] RENA. 2013. West African Power Pool: Planning and
[19] McCartney, et al. 2012. The water resource
[20] https://iea.blob.core.windows.net/assets/4878b887-dbc3-470a-bf74-df0304d537e1/ClimateimpactsonAfricanhydropower_CORR.pdf
[21] https://www.iwmi.cgiar.org/Publications/Water_Issue_Briefs/PDF/water_issue_brief_17.pdf
[22] Rameshwaran et al, (2021) : How might climate change affect river flows across West Africa? (springer.com)
[23] UN. 2019. World Population Prospects 2019. Department of Economic and Social Affairs.
[24] https://population.un.org/wpp/Graphs/1_Demographic%20Profiles/Western%20Africa.pdf
[25] https://link.springer.com/article/10.1007/s10113-015-0910-2
[26] https://climateanalytics.org/media/ssa_final_published.pdf
[27] https://www.ipcc.ch/site/assets/uploads/2018/02/ar4-wg2-chapter9-1.pdf
[28] https://www.mdpi.com/2073-4441/8/5/171

Projected changes in river flows are highly spatially variable across the region, and peak flows are projected to decrease by 23%.[30] According to the IPCC's Sixth Assessment Report, the region could face particularly high water risks. The region experiences very high hydrological variability in all water cycle components, with important implications for people and ecosystems. Many countries are challenged by reducing hydropower generation and load shedding due to declining hydrology. Rain-fed agriculture, which is common in the region, is highly vulnerable to floods and droughts. Crop yields are projected to decline by 2050 if large-scale water cycle changes already observed should worsen.[31] In coastal areas, saline intrusion and damage by floods affect people's well-being. The cost of flood damage in coastal zones ranged from $10 million in Togo to $1.2 billion in Côte d'Ivoire, corresponding to 0.2% and 2.9% of those countries' GDP.[32]

2.2.4 Climate variability affects food security

Climate variability and climate change impact food production.[33] More frequent extreme weather events, such as heatwaves, droughts, and floods, undermine the stability of food systems and exacerbate problems of food safety, food price fluctuations, and nutritional security.[34-35] Vulnerability to food insecurity is common across West Africa's drylands, where marginalized groups rely on rain-fed agriculture.[36] In northeastern Nigeria and Niger and in Chad, climate change threatens agriculture.[37] In Mali, drought is the most mentioned climate-related stressor, and households are exposed to various impacts, including erratic rainfall patterns.[38] It has been well established that food insecurity does not depend on climate alone but also on a range of social, economic, and political factors linked to physical factors. Of the factors that influence global food security, however, climate change is becoming the most problematic. It affects food security in all its dimensions: availability, accessibility, and use.[39]

While all of West Africa is projected to experience significant macroeconomic losses because of extreme weather events, the effects of climate change on countries' GDP will vary depending on countries' sensitivity to climate stressors (AfDB, 2019). Furthermore, considering that West Africa comprises coastal areas as well as Sahel countries, the impacts of climate change on food security and economic growth are and will continue to be disproportional. It is therefore important that tailored climate change mitigation and adaptation policies be integrated into the region's agriculture and food security plans. For instance, a 1% increase in agricultural trade could increase inclusive growth by 0.88% to 0.99%.[40]

2.2.5 Climate change is altering the region's fisheries

Marine and coastal resources contribute to the global economy and the economies of countries in West Africa. The marine ecosystem that supports the region's fisheries is under the control of the Canary Current system and the Guinea Current system.[41] Climate change is altering fishery resources over the region, changing both systems. The key drivers of change are fishing pressures, land-based pollution, coastal habitat and biodiversity loss, mangrove destruction, and coastal erosion.[42] Water is being polluted by the drainage and spread of harmful inorganic and organic pollutants from intense precipitation and rising water levels around urbanized and industrialized areas. It is also being polluted by agricultural runoff and marine debris such as plastics. This has adverse effects on fish. The need to develop and implement climate-adaptive approaches is therefore urgent.[43] In Cameroon, Côte d'Ivoire, and Guinea, various initiatives have been developed to meet production needs: these include dam ponds, integrated agri-aquaculture, and cage fish farming.[44]

Studies show that global warming will change species' biogeographical distribution, resulting in a large-scale redistribution of overall catch potential towards the high latitudes to the detriment of the tropics.[45] The projections obtained by ensemble studies from global models predict that the Guinea Current region will suffer a substantial decrease in marine catch potential by 2050.[46] Another study predicted an increase in the catch potential in the Northern and Western Guinea Current sub-areas by 2050. The catch potential will decrease in the Canary Current system and the central and southern Gulf of Guinea as well.[47]

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[29] Kabo-Bah, A. T., Diji, C., Nokoe, K., Mulugetta, Y., Obeng-Ofori, D., & Akpoti, K. (2016). Multiyear rainfall and temperature trends in the Volta river basin and their potential impact on hydropower generation in Ghana. Climate, 4(4), 49.

[30] https://link.springer.com/article/10.1007/s10584-021-03256-0

[31] https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_FinalDraft_Chapter09.pdf

[32] https://documents1.worldbank.org/curated/en/822421552504665834/pdf/The-Cost-of-Coastal-Zone-Degradation-in-West Africa-Benin-Cote-dIvoire-Senegal-and-Togo.pdf

[33] https://archive.ipcc.ch/publications_and_data/ar4/wg2/en/ch9.html

[34] CLIMATE CHANGE AND FOOD SECURITY IN WEST AFRICA

[35] https://pubs.acs.org/doi/pdf/10.1021/es901162d

[36] https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.561.9400&rep=rep1&type=pdf

[37] https://link.springer.com/article/10.1007/s40003-020-00475-2

[38] https://www.tandfonline.com/doi/pdf/10.1080/17565529.2020.1855097

[39] https://www.mdpi.com/2071-1050/14/2/759

[40] https://www.researchgate.net/profile/Badar-Iqbal/publication/352691626_Agricultural_trade_foreign_direct_investment_and_inclusive_growth_in_developing_countries_evidence_from_West_Africa/links/60d88d6f458515d6fbe0dbe5/Agricultural-trade-foreign-direct-investment-and-inclusive-growth-in-developing-countries-evidence-from-West Africa.pdf

[41] https://link.springer.com/article/10.1007/s41976-021-00058-x

[42] https://www.scielo.br/j/ocr/a/QyjPdsnLwBrxyCMf4kLbQ3h/abstract/?lang=en

The Canary Current system, located principally off the Sahara, is the most important stock of European sardine. This system has experienced large fluctuations in abundance and distribution since the mid-1990s. More than 50% of the regional stock was located on the Sahara Bank during some warm episodes.[48] At the same time, round sardinella has declined in the western Gulf of Guinea, where catches have decreased quite steadily since 1999. The stock is now considered over-exploited.[49] It remains, however, difficult to disentangle the contributions of climate change, natural variability, and exploitation to the dynamics of these species during the last decade. In a scenario of a future decrease of upwelling-favorable winds in the equatorward region of the Canary Current system, in terms of both duration and intensity, a decrease in abundance of round sardinella and flat sardinella in Senegal may occur.[50] In addition, a northward shift of upwelling may increase the northward migrations of round sardinella in the summer. In contrast, flat sardinella may stay in Senegalese waters because of sardinella's higher tolerance to environmental fluctuations and less migratory behavior.

2.2.6 Extreme weather events undermine health

Human health has clear links to climate variability, both through direct exposure and less directly. Obviously, extreme climate events such as heatwaves, hurricanes/storms, floods, droughts, and sand dusts affect health negatively. Gradual changes in climate that impact water, food, and air quality also undermine human health around the world. Beyond the physical effects are issues related to mental health. Research has shown that increased numbers of extreme events can leave significant numbers of people with post-traumatic stress disorder-like symptoms. West Africa is experiencing diseases related to climate stressors. The two most common diseases in the region are vector-borne diseases (malaria, mosquito-borne viruses such as dengue and Zika) and diarrheal diseases, HIV, and other infectious diseases, which are emerging and future pandemic threats. Warming temperatures, drought, and precipitation extremes are largely responsible,[51] as are sea surface temperature anomalies, which increase surface air temperatures and precipitation over the region and augment malaria infection rates.[52]

Increased risks of food insecurity, flood- and drought-related mortality and displacement, heat stress, and infectious disease are the most pressing climate-related challenges to human health in West Africa. Food security has a transnational dimension given projected decreases in regional agricultural production and increases in global food prices and price volatility. West Africa is exposed to global food price fluctuations since it imports key staples, including 40% of the region's rice. Rice imports accounting for 70% of rice consumed in Senegal.[53]

Heat stress and associated risks of cardiovascular and respiratory disease are likely to increase due to longer and hotter heat waves and overall warmer temperatures, particularly in the already hot Sahel and among children and the elderly. In West Africa, for instance, the number of very hot days per year has doubled since the 1960s, adding approximately 10 more hot days each decade.[54] High temperatures are already associated with increased mortality in Ghana and Burkina Faso, and heat-related mortality is projected to increase across the region through this century. Evidence also exists of increasing dust during the harmattan in Nigeria and the Sahel: this may be linked to warmer and drier weather and increased evaporation over the Sahara. Air quality that is worsened by dust or increasing wildfires exacerbates cardiovascular and respiratory diseases and has cross-border health implications.[55]

Analyses of daylight work hours show substantial losses in many regions of the world due to excessive heat exposure, and West Africa is among the worst affected regions.[56] Fewer daylight work hours reduces labor productivity, economic output, pay, and family income.

Meningitis occurrence appears to be expanding southward from the Sahel, but areas of endemic and seasonal malaria risk are projected to shrink in places where temperatures will exceed mosquitoes' thermal tolerance, particularly in Sahelian countries, where warming is expected to occur at faster rates.[57]

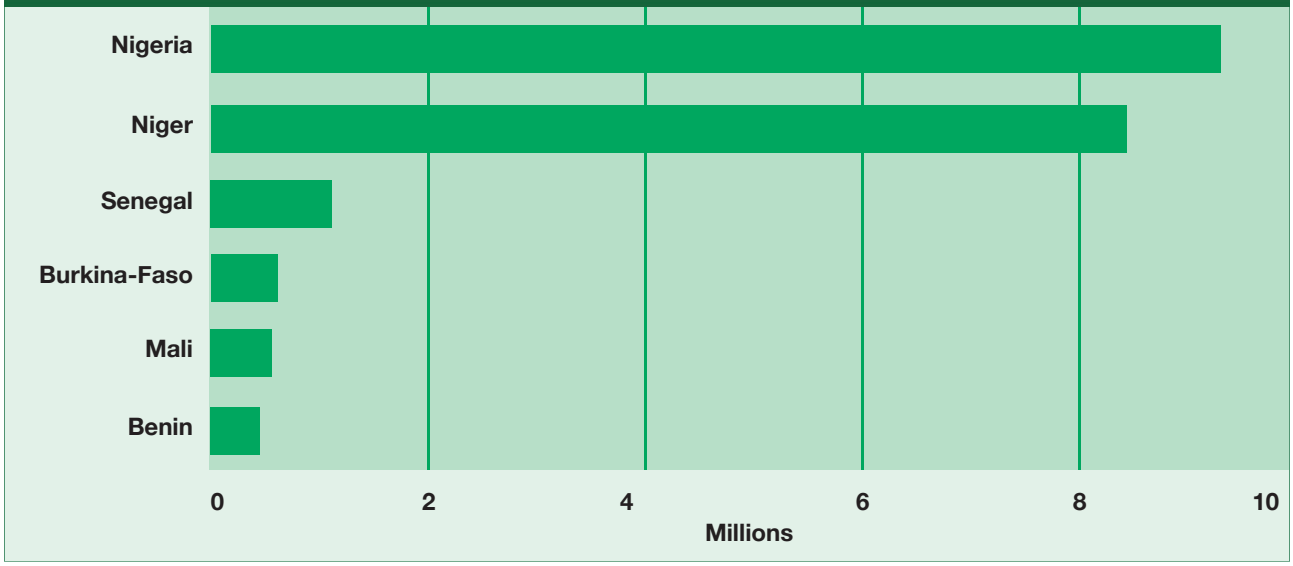
[43] https://onlinelibrary.wiley.com/doi/abs/10.1111/faf.12586
[44] https://bonndoc.ulb.uni-bonn.de/xmlui/handle/20.500.11811/9582
[45] https://academic.oup.com/icb/article/56/1/31/2363254
[46] https://sci-hub.st/10.1111/j.1365-2486.2009.01995.x
[47] https://www.researchgate.net/publication/262987568_Impacts_of_climate_change_on_marine_ecosystem_production_in_societies_dependent_on_fisheries
[48] https://aquadocs.org/handle/1834/9189
[49] https://horizon.documentation.ird.fr/exl-doc/pleins_textes/divers19-10/010076876.pdf
[50] https://onlinelibrary.wiley.com/doi/abs/10.1111/fog.12218
[51] https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_FinalDraft_Chapter09.pdf
[52] https://journals.ametsoc.org/view/journals/wcas/14/1/WCAS-D–20-0160.1.xml
[53] Davis, et al. 2016. Transnational climate change impacts: An entry point to enhanced global cooperation on adaptation?
[54] McSweeney, C., New, M., Lizcano, G. & Lu, X. (2010) The UNDP Climate Change Country Profiles Improving the Accessibility of Observed and Projected Climate Information for Studies of Climate Change in Developing Countries. Bulletin of the American Meteorological Society, 91, 157-166 at http://www.geog.ox.ac.uk/research/climate/projects/undp-cp/
[55] Niang, et al. 2014. Africa. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability; Ochei & Adenola. 2018. Variability of Harmattan Dust Haze Over Northern Nigeria; Ziu, et al. 2017. Global and regional changes in exposure to extreme heat and the relative contributions of climate and population change
[56] KjellstromT, Holmer I, Lemke B. (2009a) Workplace heat stress, health and productivity – an increasing challenge for low and middle income countries during climate change. Global Health Action 2009(on website: www.globalhealthaction.net). DOI 10.3402/gha.v210.2047.
[57] IRIN. 2011. Meningitis- the role of dust; USAID. 2015. West Africa Regional Development Cooperation Strategy; USAID. 2017. Risk expands, but opportunity awaits: Emerging evidence on climate change and health in Africa; USAID. 2018. (Forthcoming). Shifting burdens: Climate change and malaria in Africa.

2.2.7 Climate change affects migration

West Africa has long been known for high mobility. Intraregional mobility is one of the most significant forms of migration in the region—it is mostly facilitated by porous borders and regional policies of the Economic Community of West African States (ECOWAS), including the legal regime of free movement of persons that has been in place since the late 1970s. Trade, pastoralism, the search for a livelihood, and conflicts are the key drivers of such migration. These drivers are highly sensitive to climate change.[58]

Internal migration induced by climate change affects most of the region's countries[59] and can be considered both a challenge and a solution. Internal climate migration in West Africa is not uniform across countries (Figure 24): it depends on how climate factors interact with demographic and socioeconomic factors at the local level. For instance, under a pessimistic emissions scenario, Niger and Nigeria are projected to have the most internal climate migrants by 2050: more than 8 million. In contrast, Benin is projected to have less than 0.5 million.

Figure 24 : Internal climate migrants in selected West African countries projected by 2050 under the pessimistic scenario



Source: Internal Climate Migration in West Africa Countries, 2021[60]

Studies show that climate in-migration hotspots could emerge in areas of high poverty in northern Nigeria (Kano), driven by water availability and crop production trends. The southeastern, southwestern, and coastal states of Nigeria (Lagos, Ogun, and Rivers) could see the emergence of out-migration hotspots, primarily due to sea-level rises compounded by storm surges, water stress, and lower crop yields. In 2018, Nigeria experienced flooding that internally displaced 600,000 people in 12 states. The number of internally displaced people grew from 2,096,000 in 2015 to 2,730,000 persons in 2020.[61] The southern part of Benin, outside the lower elevation areas, could emerge as climate in-migration hotspots, whereas the low-lying areas along the coast could see climate out-migration due to coastal flooding and erosion.[62] All this said, climate migration hotspots in West Africa might not develop if early and concrete adaptive actions on climate and development are taken. These actions could reduce negative impacts and generate local opportunities for jobs and economic growth.

[58] https://www.worldbank.org/en/region/afr/publication/climate-migration-in-africa-how-to-turn-the-tide
[59] https://reliefweb.int/sites/reliefweb.int/files/resources/Full%20Report%20West%20Africa.pdf
[60] https://reliefweb.int/sites/reliefweb.int/files/resources/Full%20Report%20West%20Africa.pdf
[61] https://www.internal-displacement.org/countries/nigeria
[62] Groundswell Africa: Internal Climate Migration in West African Countries (worldbank.org)

2.2.8 Climate change threatens sustainable urban development

Climate change is a major threat to sustainable urban development in Africa. Changes in the frequency, intensity, and duration of climate extremes (droughts, floods, storms, heat waves, sea-level rises, and more) will affect the livelihoods of the urban population—particularly the poor and other vulnerable people who live in slums—and other marginalized settlements.[63] Many cities and residential neighborhoods on the coast of West Africa are particularly vulnerable to sea-level rises and storm surges. The regression of the coastline has already destroyed roads, beaches, and buildings in the last 10 years.[64] For instance, in Cotonou, Benin, the rise in sea level due to climate change has led to the disappearance of roads, drains, pavement, and coconut plantations that were swallowed up by the sea (some shorelines have receded by 400 m).[65] The floods of 2002 ruined 4,000 houses in Bamako, Mali,[66] while in Accra, Ghana, and other urban areas in the northern region of the country, flooding claimed lives and destroyed roads, shops, vehicles, and hundreds of homes in 2008 and the first half of 2009. Sierra Leone experiences heavy rain and landslide events that affect human settlements, health, social conditions, and almost every economic sector in Freetown.[67] The events have caused 1,141 deaths and displaced 12,000 people internally, impacted the urban economy, and damaged the homes of 3,000 people: the economic cost has been estimated at $31.65 million. Flooding in Freetown on 2 August 2019 displaced 5,300 people.[68]

Rising temperatures will also increase the number of hot days and hot nights across the region, with particularly acute impacts in rapidly growing cities. For instance, Nigeria's urban population of more than 80 million will be exposed to more intense urban heat islands, with those living in slums or informal settlements most affected.[69] The conditions will be exacerbated by the growth in the urban population, which already exerts pressure on such services as the urban water supply and urban power, infrastructure, and sanitation systems. Given ongoing global warming, it is clear that the effects of climate change must be factored into West African countries' urban policies and unequivocally address current and emerging urban challenges, especially rapid urbanization, poverty, informality, and safety.

2.2.9 Extreme weather reduces tourism revenues

Tourist arrivals in Africa's international tourism market were estimated at 68 million in 2019, which is quite small compared to global arrivals (1.5 billion) for the same year.[70] In 2019, the total contribution of tourism to Africa's GDP was $168.5 billion, of which sub-Saharan Africa accounted for $107.0 billion. Tourism receipts are low as a percentage of GDP in West Africa (2.1%).[71] Factors contributing to the low rate are health problems, armed conflicts, low tourism infrastructure capacity, and climate change impacts. Drought, extreme heat events, and the degradation of natural reserves have also reduced tourism revenues in Africa. Infrastructure and transport damages related to climate events are curtailing growth opportunities in the region's tourism sector. Climate change could place tourism at risk, particularly in coastal zones and mountain regions. The economic benefits of tourism in West Africa may change with climate change.[72] Today, new tourist centers and cities are planned to be more environmentally friendly and sustainable; however, the plans do not adequately address the severe and radical changes in the local and regional climate being witnessed today.[73] The effects of climate change on tourism change the ecosystems and the natural resources needed to sustain the tourism economy. Climate change impacts that affect tourism include beach erosion, saline intrusion, droughts, flash floods and landslides, coral-reef bleaching, less productive fisheries and agricultural systems, changes in the preferences of tourists, heat waves, and more. Changing climate and weather patterns at tourist destinations and West African countries can significantly affect tourists' comfort and travel decisions. Changing demand patterns and tourist flows impact the tourism businesses and host communities and have knock-on effects on related sectors, such as agriculture, handicrafts, and construction.

Although the impacts of the changing climate on tourism are evident, very few projections of those impacts are available, and even less projections that use scenarios and general circulation model outputs. Modelling climate changes and human behavior, including personal preferences, choices, and other factors, is exceedingly complex.[74]

[63] https://www.academia.edu/download/34632505/chp_10_urban___climate.pdf
[64] https://journals.sagepub.com/doi/pdf/10.1177/0956247807078058
[65] https://journals.sagepub.com/doi/abs/10.1177/0956247807077149
[66] https://www.osti.gov/etdeweb/biblio/22051838
[67] https://documents1.worldbank.org/curatd/en/523671510297364577/ pdf/Sierra-Leone-Rapid-damage-and-loss-assessment-of-August-14th–2017-landslides-and-floods-in-the-western-area.pdf
[68] https://www.internal-displacement.org/countries/sierra-leone
[69] https://reliefweb.int/sites/reliefweb.int/files/resources/West_Africa_CRP_Final.pdf
[70] https://african.business/2019/03/economy/reviving-tourism-in-west-africa/
[71] https://african.business/2019/03/economy/reviving-tourism-in-west-africa/
[72] https://www.researchgate.net/publication/307233977_World_Tourism_Organization
[73] https://www.researchgate.net/publication/269403482_The_Impact_of_Climate_Change_on_Tourism_in_Africa
[74] https://www.researchgate.net/publication/220042209_Climate_Change_2007_Impacts_Adaptation_and_Vulnerability

2.3 West Africa's potential for renewable energy and just energy transition is significant

Africa's energy generation has long been dominated by fossil fuel-based sources, which were made worse by burning bushes for firewood. This system is under pressure from public regulators, global investors, and financial partners, who are calling on the energy sector to acclimatize to a cleaner or greener system. Africa has abundant, diverse, but largely unexploited renewable energy potential (geothermal, hydropower, biomass, marine, solar, and wind) and non-renewable energy sources that may be considered during the transition for boosting development and improving the livelihoods of the continent's population. Major policy shifts in the energy sector and related sectors are needed to provide reliable, affordable, safe, and modern energy services that meet Africa's development needs. The integration of renewable energies, including solar, into the energy mix is already part of the transition in many West African countries, testifying to ongoing efforts to modernize and decarbonize the electricity sector in West Africa. It is nonetheless important to recognize that a just energy transition is a complex and lengthy process that confronts technological, economic, social, cultural, and political challenges. The integration of the regional energy market, the transfer of technologies, and lessons learned will be paramount to the transition's success.

Most West African countries have pledged to integrate renewable energies in their nationally determined contributions, although at varying levels of ambition. Energy generation from renewables is expanding. For example, the recently launched Taiba Ndiaye Wind Project in Senegal will generate 158 MW of additional capacity. In Ghana, the planned Nzema Solar Power Station will be the largest installation in Africa. It is expected to increase Ghana's electricity generation capacity by 6% and allow nearly 100,000 homes to benefit from clean energy. The Desert-to-Power initiative, a flagship program to install 10 GW of solar generation capacity, will provide access to clean energy to over 250 million people in the Sahel and Horn of Africa and will significantly reshape the energy mix and the low-carbon transition in the Sahel over the course of this decade. Globally, we are witnessing a shift in the energy landscape, away from fossil fuels and towards less-polluting energy sources. However, since 2004, a wave of oil and gas discoveries has taken place in Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Senegal, Sierra Leone and Togo. According to Africa Energy Outlook 2014, 30% of global oil and gas discoveries made between 2010 and 2014 were in sub-Saharan Africa. This suggests that even as the share of renewable energy in the mix continues to grow, fossil fuels will continue to be the dominant source of electricity in the years to come.

The long-term efforts of West African countries to increase the share of renewables in the energy mix align with the African Union's Agenda 2063. This suggests that Africa's energy systems will be largely based on renewable energy resources and on infrastructure that integrates centralized systems (electricity grids, hydrogen systems, etc.) and decentralized systems (off-grids, mini-grids, smart grids, distributed power, etc.). The ultimate objective is universal access to affordable, modern, clean energy.

2.3.1 West Africa's energy mix is dominated by fossil fuels

Electricity generation across West Africa still depends heavily on fossil fuels, and hydropower dominates renewables. In 2020, the total install capacity of the West Africa region was estimated at 25,574 MW, of which installed electricity capacity from fossil fuels accounted for 19,399 MW (or 76%). [75]The total renewable installed capacity was estimated at 6,176 MW, of which hydropower accounted for 89.3% (5,512 MW), solar 7.5% (463 MW), bioenergy 1.9% (118 MW), and wind 1.3% (82 MW).

The high share of fossil fuels in the energy mix translates into high generation costs, producing some of the costliest electricity in the world. In 2018, the cost of electricity was estimated to be $0.25 per kilowatt-hour, more than twice the global average.[76] West Africans pay about twice as much for electricity as their neighbors on the continent's eastern side. For those living in the region's fragile states, prices can be as high as $0.40 per kilowatt-hour.[77] Another issue is the low level of per-capita demand in the region. Electricity generation per capita in West Africa was estimated at 187.7 kWh, and the final electricity consumption per capita was 162.1 kWh. These figures are far below the global average per capita consumption of 3,000 kWh in 2017.[78]

The energy supply mix in West African countries varies significantly, as does the demand for power. Nigeria alone accounts for all 60% of total electricity use, followed by Ghana with about 10%. In Nigeria, gas-based power generation dominates, which explains the high share of gas used in the region. Inland countries without access to gas or coal (Burkina Faso and Mali) invest in solar and thermal energy at various levels.

[75] https://africa-energy-portal.org/region/west-africa

[76] World Bank. 2018. Regional Power Trade in West Africa Offers Promise of Affordable, Reliable Electricity. https://www.worldbank.org/en/news/feature/2018/04/20/regional-power-trade-west-africa-offers-promise-affordable-reliable-electricity.

[77] Charles Cormier. 2020. Regional electricity trade, key to unleashing West Africa's power. World Bank. Charles Cormier. https://blogs.worldbank.org/energy/regional-electricity-trade-key-unleashing-west-africas-power#:~:text=West%20Africans%20pay%20about%20twice,as%20%240.40%20per%20kilowatt%2Dhour.

[78] EIA (US Energy information Administration). 2020. Global electricity consumption continues to rise faster than population. https://www.eia.gov/todayinenergy/detail.php?id=44095

2.3.2 Electricity demand and supply are very low

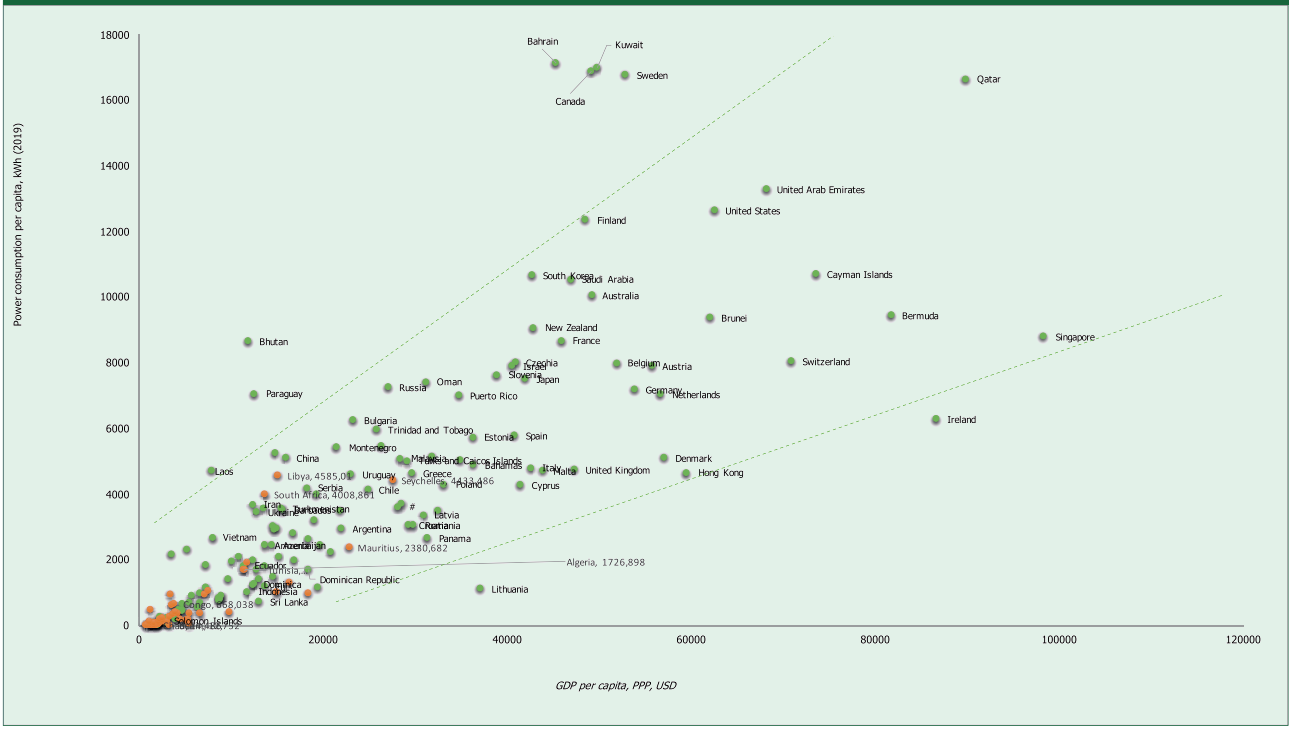
At present, West Africa has very low per-capita electricity use. This situation is likely to change rapidly. It is projected that demand may increase tenfold in the coming two decades as economic activity increases and universal access is achieved.

Modern energy consumption

Beyond playing a critical role in building climate resilience, the consumption of modern energy is vital for industrializing, meeting people's development aspirations, and creating good jobs and prosperity for all. Indeed, there is a strong correlation between GDP per capita and modern energy consumption in the form of electricity across a wide range of countries. Emerging economies such as China and, more recently, India have driven most of the energy growth of the last 15 years, while some high-income countries seem to have peaked on per-capita and total energy demand. But Africa remains the world's least industrialized region, with a very low level of modern energy consumption—this, although modern energy is pivotal to speed and deepen structural transformation (Figure 25).

Per capita electricity consumption in West Africa is among the lowest on the continent (Figure 26). Cabo Verde has the highest level of per-capita modern energy consumption of 900 KWh (Figure 27): even so, this is very low compared to other countries in the world and in the continent. Low levels of electricity consumption are associated with low GDP per capita (adjusted for purchasing power parity).

Figure 25 : Per capita electricity consumption and GDP per capita in the world, 2019



Note: Orange = Africa ; green = the rest of the world.

Figure 26 : Per capita electricity consumption and GDP per capita in Africa, 2019

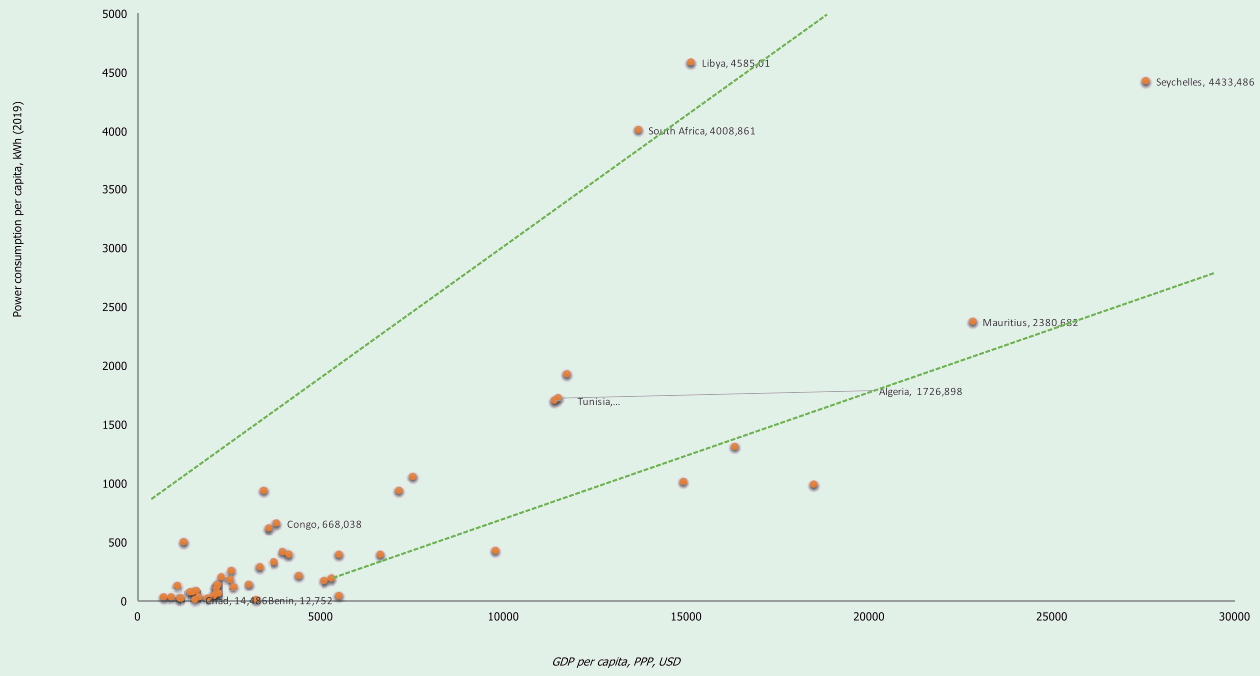
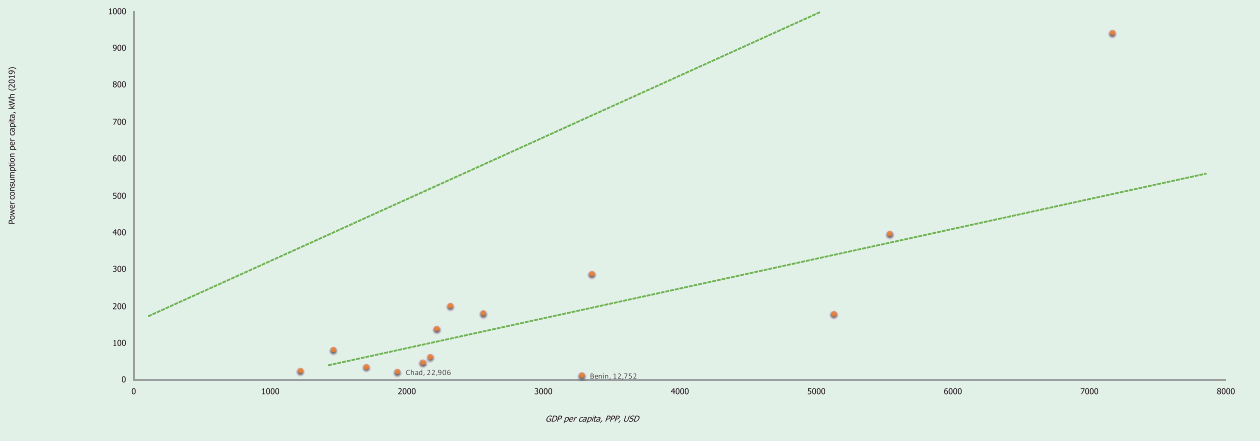


Figure 27 : Per capita electricity consumption and GDP per capita in West Africa, 2019

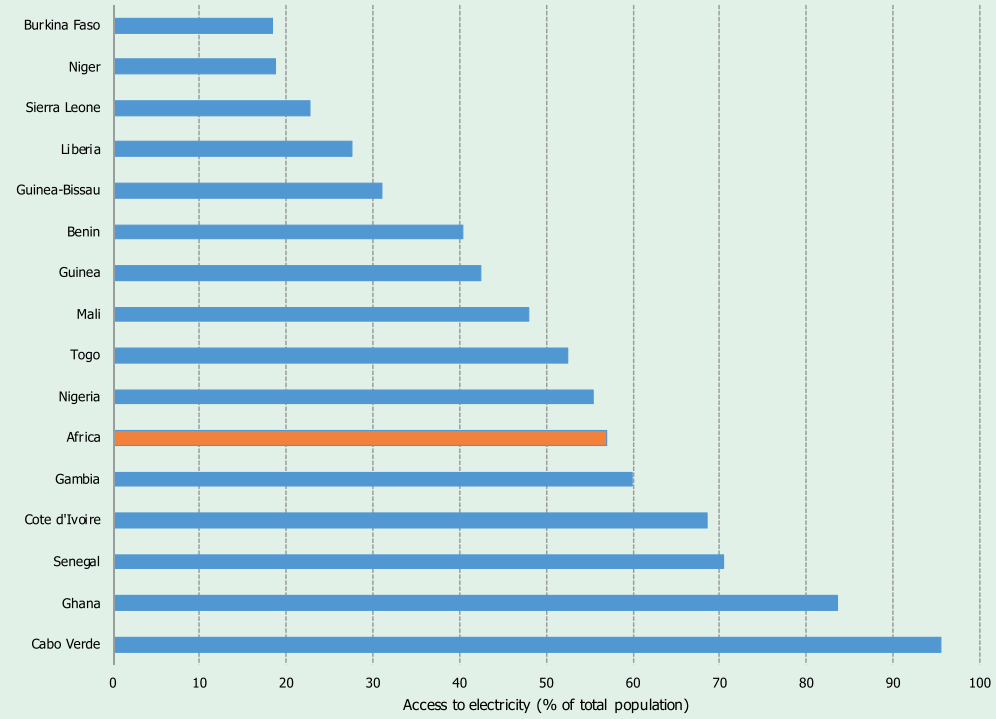


Source: Staff computation from BP's Statistical Review of World Energy and Ember

Access to modern energy

In terms of energy access, half of Africa's population still has no access to electricity. Slightly above 50%—about 600 million people—have access. Africa has the lowest electricity access rate of all global regions—a rate that drops to less than 30% on average in rural areas. In West Africa, 10 of 15 countries are below the African average (Figure 28), and in some countries, less than 20% of the population has access to electricity.

Figure 28 : Electricity access in West Africa, 2019



Source: World Bank

Overall, West Africa's electricity access stood at 52.6% in 2019, with 83.1% access in urban areas and 25.5% in rural areas. More specifically, 74.0% to 94.7% of people have access in Ghana, 18.2% to 66.1% have access in Benin, 47.4% to 95.2% have access in Senegal, and 43.1% to 94.5% have access in Côte d'Ivoire (Table 12). The figures are much smaller in other West African countries. For example, in Liberia, which experienced war in the 2000s, only 27.5% of the population had access to electricity in 2020. In Liberia, access varied from 8.4% in rural areas to 45.2% in urban areas. West Africa has witnessed a significant dearth in power since the middle of 2006 due to low economic growth, the insufficient development of production capacity, and war (Liberia, Sierra Leone).

Table 12 : Access to electricity in West African countries, 2020[79]			
West African Country	**Rural (% of rural population)**	**Urban (% of urban population)**	**Total (% of Population)**
Benin	18.2	66.1	41.4
Burkina-Faso	-	65.8	19.8
Cabo Verde	93.5	94.5	94.2
Côte d'Ivoire	43.1	94.5	69.7
Gambia	31.6	80.6	62.3
Ghana	74	94.7	85.9
Guinea	19.3	88.1	44.7
Guinea-Bissau	15.2	56.3	33.3
Liberia	8.4	45.2	27.5
Mali	16.5	94.1	50.6
Niger	13.4	48.4	19.3
Nigeria	24.6	83.9	55.4
Senegal	47.4	95.2	70.4
Sierra Leone	4.8	54.7	26.2
Togo	24.0	94.1	54.0

Energy Supply

West Africa has significant renewable energy potential. The challenge is how to use this potential to meet future demand for electricity. The region is endowed with rich fossil fuel resources, but this has not helped to increase access. In Nigeria, for example, where massive amounts of oil and gas have been exploited for decades, electricity access is far from universal.

The electricity grid cannot meet demand, and blackouts abound. Load shedding is becoming more prominent, driving consumers towards the large-scale use of costly backup generation. Due to significant under-capacity in electricity generation, countries such as Benin, Burkina Faso, Niger, and Togo import a substantial share of their supply. As of 2020, the total electricity generation in the ECOWAS region was about 74,669.9 GWh, for a total installed capacity of 25,574.4 MW.[80]

In most West African countries, power is often produced from one source. Benin, Burkina Faso, Guinea-Bissau, and Niger produce most of their electricity from diesel-fueled machinery. Ghana, Guinea, and Mali produce most of their electricity from hydropower. In Nigeria, natural gas accounts for 60% of electricity production; in Côte d'Ivoire, it accounts for 67%. Water shortages in reservoirs due to seasonal variations and weather patterns and insufficient electricity trading between West African countries increase the risk of constant power shortages. The lack of interconnected transmission infrastructure and a well-functioning regional power market structure are also at play.

In terms of regional energy initiatives, West Africa counts two important power projects: the West African Power Pool and the West African Gas Pipeline Project. The West African Power Pool was set up in 1999 by ECOWAS to address a feeble substructure for energy transactions, transmission, and distribution among West African countries. A major objective was to connect national grids over 5,000 km to interconnect all of West Africa. The vision was to improve interconnection and energy give-and-take between countries and synchronize regulations and standards in the energy sector.

The West African Gas Pipeline Project aims to set up a 687 km pipeline to use flared gas in Nigeria to feed thermal power stations in Benin, Ghana, and Togo with an initial capacity of 200 million cubic feet per day expandable to 600 million cubic feet per day. It is estimated that the project will cost $635 million. The project is being managed in partnership with Chevron West Africa Gas Pipeline Ltd (36.7%), NNPC (25%), Shell Overseas Holdings Ltd (18%),

[79] World Bank.2022. Data: Access to electricity. https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS

[80] https://africa-energy-portal.org/region/west-africa

Takoradi Power Company Ltd (16.3%), and Bengaz (Benin) and Sotogaz (Togo) (together they hold 2%).

In West Africa, the power supply is projected to grow from 51 TWh in 2010 to 247 TWh in 2030 (a fivefold increase) and 600 TWh in 2050 (a twelvefold increase). This huge increase creates opportunities to deploy renewable energy technologies. The fossil power generation mix in 2030 includes 94 TWh of gas and 18 TWh of coal, the former being largely a low-cost by-product of oil production. This gas supply is limited to countries that produce a large amount of oil. Significant efforts are ongoing to increase the use of this gas, part of which is flared today.

2.3.3 Energy insecurity hinders industrialization and development

Energy insecurity is a major issue. It hampers industrialization and development in West African countries, especially among low-income groups. The region's vast energy resources have not translated into energy security.

Concerns over energy security have recently encouraged the promotion of biofuels and no-carbon energy generation technologies. In its efforts to ensure clean and sustainable energy in the region, ECOWAS established the Centre for Renewable Energy and Energy Efficiency in July 2010, with the objectives of promoting renewable energy and energy efficiency and creating conducive conditions for mitigating climate change and reducing greenhouse gas emissions. In October 2012, ECOWAS became the second regional organization after the European Union to embrace a regional green energy policy. To address the gap in knowledge and information on renewable energy technologies and resources in West Africa, in 2012, ECOWAS created the ECOWAS Observatory for Renewable Energy and Energy Efficiency.

West Africa's electricity systems face challenges caused by the growing gap between predicted demand, existing supply capacity, and limited investment capital. Additionally, energy intensity and electricity losses during generation, transmission, and distribution are very high: this compounds the problem. Power shortages lead to regular blackouts and load shedding and have huge social and economic costs. Increasing fossil fuel import dependency, shortages, and fluctuating fossil fuel prices are major concerns: to resolve them, sources must be diversified. In some countries, more than 90% of electricity is generated by expensive diesel or heavy fuel. As a result, steadily increasing and fluctuating oil prices have had a devastating effect on the economies in the region. Table 12 shows the proportion of national populations that had access to electricity in 2020.

In the ECOWAS region, 19% of the rural population has access, mainly in the major rural centers and in some localities under the powerlines. Some 81% of rural dwellers have no access. In 2009, five countries had a national electricity access rate that exceeded 30%: Cape Verde (87%), Ghana (67%), Nigeria (50%), Côte d'Ivoire (47%), and Senegal (42%). In these countries, 25.1 million urban dwellers and 78.8 million rural residents were without access to electricity in 2009. In the remaining countries, only 18% of the population had access to electricity: 83% lived in urban areas. Of the 82% of people without access, 80% lived in rural areas.

2.3.4 West Africa has substantial potential for renewable energy

The ECOWAS region is blessed with great potential for renewable energy, which, if harnessed, could play an important role in addressing the energy shortage. In the coming years, energy demand will rise as a result of population growth (around 2.5% per year), rapid urbanization, and economic development. This will call for urgent action to exploit the region's tremendous renewable energy resources. The major strategic resources available for electricity generation in West Africa are crude oil, coal, natural gas, and hydropower. Coal is used in very low quantities in the Niger Republic. Some countries already have biomass in their energy mix, while others, like Nigeria and Ghana, plan to incorporate renewable energy sources aside from hydropower.

The region's renewable energy potential is widely distributed and could provide a low-cost and reliable energy supply. Countless opportunities exist for deploying solar PV, wind energy, hydropower, and biomass technologies. Although renewable energy generation in West Africa is currently dominated by hydropower, there is huge potential for solar PV and wind energy in particular to play an important role in the region's energy mix. However, these power sources are governed by the monsoon, which causes seasonal variability. Thus, improving interconnections within the ECOWAS region is essential to realize synergy and harness locally available renewable energy resources as a means of redressing low access and unreliable supply.

In contrast to fossil fuels, renewable energy resources are far more equitably distributed, providing opportunities for all ECOWAS member states to benefit from them. An estimated 23,000 MW of hydroelectric potential is concentrated in five of ECOWAS's 15 member states. Of this, only about 16% has been exploited. According to preliminary estimates, small hydropower potential in the region amounts to around 6,000 MW. There is also good potential for all forms of bioenergy. Considerable wind, tidal, ocean, thermal, and wave energy resources are available in some ECOWAS countries, and the region has vast solar energy potential, with very high radiation averages of 5 to 6 kWh/m2 throughout the year. These resources are generous and well distributed among countries. Wind potential is concentrated in the coastal zones (Cape Verde, Senegal, The Gambia, and possibly Ghana, Mali, and Nigeria). Potential for small hydro is located particularly but not exclusively in the southern part of the region (Côte d'Ivoire, Ghana, Guinea, Guinea-Bissau, Liberia, Togo, and Sierra Leone). Solar resources are abundant in the northern regions (Burkina Faso, Niger, and the northern parts of

[81] Dango, A. M. (2019). A Guide to Sustainable Energy in West Africa. Cambridge Scholars Publishing. https://www.cambridgescholars.com/resources/pdfs/978-1-5275-4298-3-sample.pdf

Ghana and Nigeria). Except for Cape Verde and the Sahelian areas of Mali, Burkina Faso, and Niger, biomass resources are well distributed across the region, with promising potential in the southern region.

Solar resources are especially favorable in the northern desert areas of the ECOWAS region in Mali and Niger and the northeastern part of Nigeria, with a potential of 1,700 kWh/installed kWp/year. The coastal areas of Côte d'Ivoire, Ghana, Liberia, and Nigeria do not benefit to the same extent, with an average potential of 1,200 kWh/installed kWp/ year. The average potential is about 1500 kWh/KWp/year in the other areas.

The region's institutional, regulatory, legal, and tariff structures for renewable energy are largely non-existent or weakly implemented. Of a total of €1.92 billion invested in ECOWAS's energy sector, only 5% has been invested in renewable energy, and independent power producer investment is 3.5%. Except for in Cape Verde, Ghana, and Nigeria, no regulatory authorities deal with renewable energy. Ghana, Guinea, Mali, Liberia, Nigeria, and Senegal have developed detailed renewable energy policies, and Ghana and Senegal passed a renewable energy law. The Gambia validated a draft renewable energy law in December 2012.

Liberia, Mali, and Senegal adopted ambitious renewable energy targets of 30%, 25%, and 15% of installed capacity respectively by 2021, and Ghana and Nigeria targeted 10% by 2020. In 2012, ECOWAS member states endorsed the ECOWAS Renewable Energy Policy (EREP), which aims to increase the share of renewable energy (including large hydro) in the overall electricity mix to 35% by 2020 and 48% by 2030. The share of new renewable energy such as wind, solar, small-scale hydro, and bioelectricity (excluding large hydro) will increase to around 10% by 2020 and 19% by 2030. These targets translate to an additional 2.425 MW of renewable electricity capacity by 2020 and 7.606 MW by 2030.

EREP thus seeks to increase the use of renewable energy sources such as solar, wind, small-scale hydro, and bioenergy for grid electricity supply and access to energy services in rural areas. The EREP scenario will complement other important conventional sources for power production (e.g., large hydro and natural gas). EREP focuses on the electricity sector and considers additional issues regarding the use of heat for domestic energy and the potential production of biofuels. The EREP scenario fully complements the West African Power Pool's power supply strategy and conventional national supplies, both of which contribute to generating bulk power and improving energy access in rural areas. The West African Power Pool aims to integrate national power systems into a single regional electricity market. Multilateral financial institutions like the World Bank and the African Development Bank promote regional integration. It is seen as creating economies of scale, which lower costs in all forms of infrastructure, including power. Renewable energy could become an engine for industrial development and employment and lead ECOWAS member states on the more gender-balanced path to the green economy. EREP will create strong links and synergies with activities envisaged under the ECOWAS Energy Efficiency Policy.

At the regional level, the leading coordinating organization for implementing EREP is the Centre for Renewable Energy and Energy Efficiency. The centre will work closely with its counterpart ECOWAS institutions, the West African Power Pool and the ECOWAS Regional Electricity Regulatory Authority. The Centre for Renewable Energy and Energy Efficiency will coordinate most of its activities in cooperation with focal institutions in the ministries of energy of ECOWAS countries and a network of regional and international research institutions and the business community.

Table 13 indicates the proportion of each type of renewable energy potential per country.

Table 13 : Proportions of types of renewable energy potential by country

Countries	Wind (%)	PV (%)	Small-scale Hydro (%)	Biomass (%)
Benin	10	20	50	20
Burkina-Faso	0	60	30	10
Cabo Verde	90	10	0	0
Côte d'Ivoire	0	10	50	40
Gambia	60	30	0	10
Ghana	25	35	30	10
Guinea	0	20	50	30
Guinea-Bissau	0	20	40	40
Liberia	0	10	50	40
Mali	10	30	30	30
Niger	30	50	0	20
Nigeria	10	30	30	30
Senegal	70	10	0	20
Sierra Leone	0	10	60	30
Togo	0	20	50	30

Source: Centre for Renewable Energy and Energy Efficiency

Note: The sum of the potential per country is 100%. 0% indicates that resources are not available or are not economically feasible.

2.3.5 Energy efficiency is low and electricity losses are high

Energy efficiency improvements are among the most cost-effective solutions for offsetting rising energy costs, countering an unpredictable and uncertain energy supply, and meeting the growing demand for energy services in ECOWAS member states. Currently, the region's continued reliance on aging and inefficient equipment (often acquired second-hand), combined with the inefficient use of traditional biomass, lowers efficiency. Technical and non-technical losses in the region's grid networks are a major barrier to further development of the energy sector. National rates of electricity loss vary by country and range from 15% to 50%. Although network losses have decreased over time, 36% of electricity was lost in the ECOWAS region in 2018 (26,207 GWh was lost). The Regulatory Indicators for Sustainable Energy scores for energy efficiency, published in 2020 by the World Bank, place most member states in the red zone, suggesting that their policy frameworks are not conducive to their scaling up the adoption and application of energy efficiency measures.

ECOWAS Heads of State have prioritized energy efficiency as an essential tool for meeting the region's energy supply challenge. They formalized their commitment with the 2013 adoption of the ECOWAS Energy Efficiency Policy. The policy prioritizes cooking, lighting, buildings, and electricity distribution as high-impact opportunities for improving efficiency and outlines targets and priority measures to reduce energy use and increase productivity with national energy efficiency action plans in each member state.

The transition to energy-efficient, clean cookstoves and cleaner cooking fuels is another critical component of the EREP. The use of advanced cookstoves can mitigate many of the negative health, environmental, and social impacts associated with the use of traditional biomass. In recent years, projects in the ECOWAS region have demonstrated many benefits of using energy-efficient stoves. These include cost, time, and fuel savings; easier and faster cooking; less smoke and fewer negative health impacts from indoor air pollution; and the reduced occurrence and risk of fires and burns. With a rapidly growing population, urban expansion, and projected economic growth, buildings' contribution to energy demand across Africa is expected to rise. Energy efficiency improvements in buildings typically fall into two major categories: improving construction and deploying advanced equipment that better uses energy. ECOWAS's ministers of energy adopted a regional directive on energy efficiency in buildings in 2016 to improve energy

efficiency in new buildings. In addition, some member countries (Benin, Côte d'Ivoire, Ghana, Senegal, etc.) are implementing domestic programs to improve energy efficiency in existing buildings.

2.3.6 West Africans pay more for electricity

The West Africa region's energy sector is plagued by unreliable, extremely expensive power supplies, low rates of electricity access, and an inability to recover the exorbitantly high cost of producing electricity. Only 50% of the population has access to electricity, and even then, the supply is unreliable. Power supplies record an average of 44 hours of outages per month and are among the most expensive globally, with prices averaging about $0.20 per kilowatt-hour. West Africans pay about twice as much for electricity as their neighbors on the eastern side of the continent, and for those living in the region's fragile states, prices can be as high as $0.40 per kilowatt-hour.

Despite the steep prices, public utilities in West Africa struggle to recover the cost of producing electricity. This is because of high generation costs due to small-scale generation, expensive imported fuel, and rampant operational inefficiencies. Power generation costs are about 40% above what could be achieved with more efficient technologies, and distribution utilities only recover revenue on 60% to 70% of the electricity they deliver.

Many small countries have been forced to rely on expensive, inefficient, and dirty small-scale oil-fired and diesel generation. Meanwhile, their neighbors are well-endowed with hydropower, natural gas, and solar resources that cannot be developed because of the limited size of domestic markets.

The economic benefits of a regional power market have been estimated at $665 million per year, and the reduction in power outages at the regional level would be equivalent to the entire electricity consumption of Togo. The average cost of electricity generation in the region would fall by one-third, and the electricity cost differential across countries would narrow markedly.

Although all countries in the region would benefit from a regional market, energy-constrained countries may benefit more. Through increased reliance on imports, these countries would enjoy substantial reductions in power generation costs of at least 20% resulting in annual financial savings worth between 1% to 3.5% of GDP. These savings could be invested in other sectors, such as healthcare and education. Currently, 4,000 km of transmission lines are under development. Their imminent completion will allow electrons to flow all the way from Abuja in Nigeria to Dakar in Senegal, opening up vast opportunities for every country along the way.

But realizing the gains from a regional power market requires more than infrastructure. While physical infrastructure is an indispensable foundation, concerted policy and institutional reforms are needed for infrastructure to realize its potential. In West Africa, barriers prevent countries from trusting trade. Exporting countries need to be sure that they will be paid promptly for electricity sales, and importing countries need to be able to rely on delivery when they need it. As in any trade, a clear mechanism to secure and enforce contracts is needed. This mechanism does not yet exist.

Technical solutions are being adopted in many cases. From a regional perspective, ECOWAS's electricity institutions play an important role in creating an integrated power market by developing an overarching legal, regulatory, and operational framework for efficient trade in the region. These institutions include the West African Power Pool, which is in charge of promoting regional infrastructure and coordinating power exchanges among its members, and the ECOWAS Regional Electricity Regulatory Authority, which is responsible for developing and enforcing the regulatory framework that enables efficient regional trade. But while a regional approach is essential, it is not enough. Achieving regional trade goals also rests on correcting deficiencies at the national level.

2.3.7 Infrastructure, institutions, and subsidies are key to growing the power sector

To tap into the immense potential for growth in the power sector, governments of the region need to design power policies that address three elements:

- The upgrade and maintenance of existing power infrastructure
- The periodic institutional reform of utilities and service providers
- Better subsidy policies and practices that reduce the annual cost of filling infrastructure gaps (this requires utilities to be financially sound, so that the subsidies can be progressively removed)

Investment in off-grid renewable energy is an attractive option for investors in countries where most of the population either has no access to the grid or cannot afford a connection. Off-grid solar energy can provide access to lighting and, in some cases, mini renewable-based electricity generators. Furthermore, to encourage local sourcing and reduce costs, West African countries could venture into producing manufacturing materials and components for power generation plants and distribution lines. More indigenous companies should be encouraged to venture into the power project construction, operation, and maintenance stream.

The role of the private sector in addressing the region's power deficit is crucial. Given the increasing electricity demand and the lack of financial resources, more public -private partnerships should be encouraged. To reach the level of investment required in the sector, however, investment conditions for electricity access-related projects must be improved. This can be achieved by clarifying investment frameworks, ensuring market transparency, and encouraging consultations over the pace of grid extension in West Africa. Closer cooperation should also be built between investment promotion agencies to enhance access to information on investment opportunities in the region.

2.3.8 West Africa has a vast amount of carbon credits

One of the most important aspects of global climate commitments is to limit temperature increases to 1.5°C. In climate finance negotiations, an important issue is attributing the amount of carbon that countries emitted in the past and allocating the remaining carbon budget. The global consensus seems to be that by limiting future emissions and setting commitments equitably, including commitments for finance, countries can quantify their "common but differentiated responsibilities" for historical climate damage. The monetary amount associated with this responsibility is referred to as carbon debt or carbon credit.

According to the IPCC, since 1850, humans have released around 2,400 gigatons of carbon dioxide equivalent ($GtCO_2eq$) into the atmosphere. The remaining carbon budget estimated from the start of 2020, with a 67% chance of limiting temperature increases to the 1.5°C target by 2050, is only 400 $GtCO_2eq$. Almost all carbon emissions have come from industrialized countries. For example, the carbon footprint of a country such as Burkina Faso on a per capita basis was only 0.19 tCO_2 in 2020. In the United States and China, the carbon footprint was 14.34 tCO_2 and 7.41 tCO_2, respectively.

To meet the net-zero emissions target by 2050, it is important to allocate the remaining carbon budget set out by the IPCC in a way that meets the global commitment to be equitable and fair. However, there is no universally agreed carbon allocation framework that accounts for or offers a just balance between countries' historical responsibilities and other countries' development needs. After considering several approaches in the literature, African Economic Outlook 2022 adopted a pragmatic approach of the "contraction and convergence" framework (Meyer, 1999). This approach proposes a two-phased future emission rights allocation that balances environmental effectiveness, equity, national capacity and ability, political feasibility, economic efficiency, and technical requirements.

To quantify amounts of carbon debt and credit, we used the 2020 average international energy market carbon price of $31 per ton and the average social cost of carbon of $70 per ton suggested by the High Commission on Carbon Prices. We also used the suggested 2% per year discount rate for historical and future emissions.[82] We deducted the 2 tCO_2 eq per-capita per year equal share from actual annual per-capita emissions before computing the per-capita carbon debts and credits.

Figure A.1 shows the discounted cumulative per-capita carbon debts and credits for different Africa regions at a discounted international average carbon price of $31 per ton for three cut-off years: 1850, 1970, and 1990. The estimates vary widely depending on historical per-capita emission levels: emerging and developing regions have carbon credits, but almost all the developed regions, including China, have large carbon debts. Africa's estimated per-capita carbon credits are $1,050–$1,570: this are the amounts that an average person in these regions is owed. The estimated carbon credit at the international average carbon market price for West Africa is $851 billion, with a lower bound of $822 billion and an upper bound of $884 billion. On a per-capita basis, the estimated carbon credit averages $1,835, with lower and upper bounds of $1,623 and $2,307.

Market prices are, however, distorted on the global commons—as are carbon emissions—due to inherent market failures. To measure the true extent of cumulative damage to the climate, we used the discounted average social cost of carbon, and find that cumulative per-capita social carbon debts and credits are more than double the amount calculated using market prices (Figure A.2). The estimate shows that Africa has a total carbon credit averaging $4.64 trillion, a credit that considers historical, current, and future shares of carbon emissions. Paid annually over 2022–2050, this comes to about $165.8 billion a year. The amount of carbon credit that the continent is owed is, therefore, almost 10 times as much as the global climate finance that it received, which was around $18.3 billion annually in 2016–2019.

For West Africa, the estimated total carbon credit uses the discounted social cost of carbon of $1,827–$1,964 billion, averaging $1,892 billion. On a per-capita basis, the estimated carbon debt using the discounted social cost of carbon for West Africa is $4,079. Paid annually over 2022–2050, West Africa should receive an estimated $67.6 billion per year in climate change compensation under the "common but differentiated responsibilities" principle that accounts for historical climate damage.

[82] https://carbonpricingdashboard.worldbank.org; https://www.carbonpricingleadership.org/report-of-the-highlevel-commission-on-carbon-prices; Mitchell et al., 2021.

Figure 29 : Cumulative carbon emission debt

Source: Centre for Renewable Energy and Energy Efficiency

CHAPTER 3

IMPROVING CLIMATE RESILIENCE AND ACCELERATING THE JUST ENERGY TRANSITION AND FINANCING MECHANISMS IN WEST AFRICA

KEY MESSAGES

- **Although strategies for the long-term transition to renewables exist, many countries focus on addressing immediate needs. This sometimes puts renewables on the back burner.** The frequency, intensity, and consequences of weather shocks incite governments to take short-term measures to the detriment of more impactful long-term ones.

- **To respond adequately to climate change, West Africa needs an estimated $399.32 billion in financing over 2020–2030. Annually, this comes to about $36.3 billion.** Assuming that West Africa countries continue to receive the same average annual amount of climate finance over 2016–2020 ($4.97 billion per year), the annual financing gap is $31.3 billion.

- **The region is already carrying heavy debt, and the recent pandemic has undermined many countries' fiscal strength. This limits their ability to invest in climate-smart projects.** The provision of more concessional resources through instruments such as the Green Baseload program and other programs of the Bank's Sustainable Energy Fund for Africa can accelerate the transition to green energy. The falling cost of renewable energy technologies is another opportunity for African countries to leapfrog.

- **Fiscal stress and financial needs call for more innovative financing instruments and creative implementation strategies.** New financing and more operational efficiency are crucial for the power sector to be sustainable in the long term. By coordinating renewable projects nationally and regionally, West African governments could optimize energy plans and prevent renewable projects from fragmenting into inefficient clusters decoupled from national and regional electricity grids.

Introduction

West African countries need to explore ways to guarantee a cleaner future and make use of the region's vast potential for renewable energy to become net exporters of clean energy. The region's potential is enough to meet unmet power demand and achieve universal access to electricity while helping the region to transition to a low-carbon growth path.

In July 2013, the Authority of Heads of State and Government of ECOWAS adopted the ECOWAS Renewable Energy Policy (EREP) to increase the share of renewable energy in the region's overall electricity mix to 48% in 2030. While this is an important step towards building an enabling environment for governments and private sector, a huge gap in energy access in the region remains.

According to the International Energy Agency, as of 2020, approximately 47% of sub-Saharan Africans did not have access to energy, particularly electricity. In line with the implementation with EREP, however, West African countries have made strong efforts to enhance electricity security, even during the COVID-19 pandemic. These efforts buttress the point that the economic development of the countries in the region should go hand-in-hand with green growth and an accelerated transition to renewable energies. They align with the African Union's Agenda 2063 to transform energy development in Africa, meet the sustainable development goals, and respect the Paris Agreement on climate change. The efforts will also promote access to affordable clean energy for households and businesses in West Africa.

3.1 Moving towards low-carbon development and more resilience

Clean, indigenous, and affordable renewable energy offers West African countries opportunities to achieve their economic, social, environmental, and climate objectives. Sustainable development and the use of the region's massive biomass, geothermal, hydropower, solar, and wind power could change current realities rapidly. This implies that as countries increase their energy generation capacity, it is critical that they look at flexible commercial and technical solutions that incorporate a mix of thermal and renewable resources. This transition and the progressive inclusion of renewable energies in the energy mix cannot be achieved without a deliberate and aggressive push to decentralize power in the region. For some of the poorest areas in the region, where grid extensions are not cost-effective, access to electricity can only be achieved by installing micro- and mini-grids powered by renewables such as solar, wind, and mini-hydropower plants. Building climate resilience at the country levels implies continuing to invest in grids. Although strategies for the long-term transition to renewables exist, many countries remain focused on addressing immediate needs. This sometimes puts renewables on the back burner. Accelerating West Africa's energy transition while advancing universal electricity access is therefore key. The increased provision of concessional resources through instruments such as the Green Baseload program and other programs of the Bank's Sustainable Energy Fund for Africa can accelerate the transition. The falling cost of renewable energy technologies is an opportunity for African countries to leapfrog. More flexibility in the power system will be important to integrating higher shares of renewables.

It will also be important to scale up national and regional utility-scale renewable energy generation capacity. By 2030, West Africa's energy generation deficit will be about 200 GW. This makes increasing generation capacity a priority. Given high storage costs, natural gas will continue to be needed as a transition fuel. According to the International Energy Agency, decentralized solutions such as mini-grids and solar home systems will account for over half of new electricity access by 2030.

Finally, it is essential to boost the sustainability of sector and power utilities and enhance energy efficiency. Utilities' financial and operational efficiency is crucial for the long-term sustainability of the power sector in West Africa.

3.2 Climate finance needs, inflows, and gaps

3.2.1 Climate finance needs

To respond adequately to climate change, West Africa needs an estimated $399.32 billion in financing over 2020–2030 (Figure 30). Annually, this comes to about $36.3 billion.

Adaptation costs are estimated at $46.64 billion, or 11.43%, of West Africa's total needs. These costs are likely underestimated because of a lack of data and the technical expertise to estimate the true cost of adaptation measures, control for the uncertainty of future carbon emissions, and calculate how these might influence adaptation needs. In addition, other social, economic, and political circumstances might influence the determination of needs for adaptation, such as rapid social and political changing conditions at the local level.

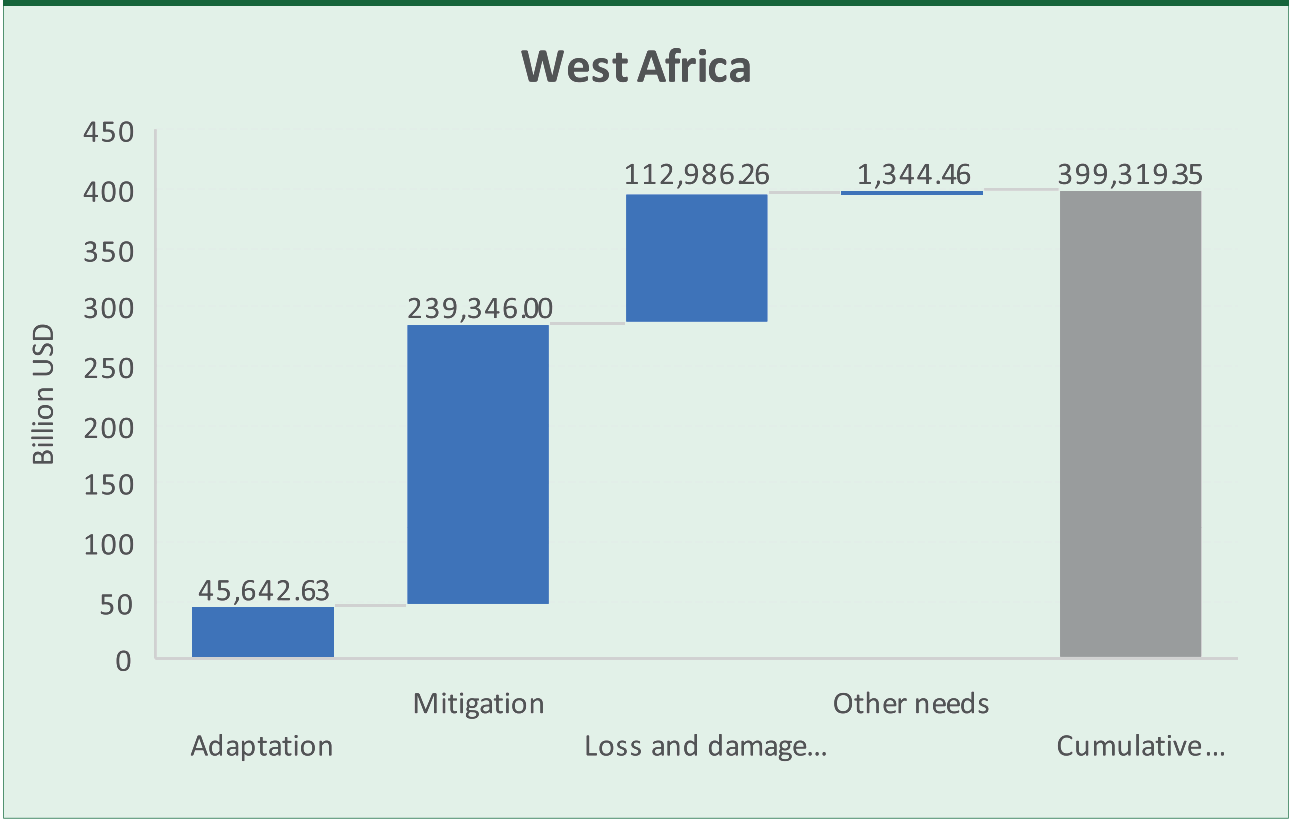
Mitigation accounts for 59.94% of the estimated needs in 2020–2030: this equates to $239.346 billion. Losses and damage costs due to climate change are projected at $112.99 billion, or 28.29% of West Africa's total needs.

[83] IRENA. West Africa Clean Energy Corridor https://www.irena.org/cleanenergycorridors/West Africa-Clean-Energy-Corridor

[84] IRENA. SCALING UP RENEWABLE ENERGY DEPLOYMENT IN AFRICA DETAILED OVERVIEW OF IRENA'S ENGAGEMENT AND IMPACT.2020. https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Feb/IRENA_Africa_Impact_Report_2020.pdf?la=en&hash=B1AD828DFD77D6430B93185EC90A0D1B72D452CC

[85] https://opecfund.org/news/the-path-to-africa-s-energy-transition

Figure 30 : West African countries' estimated climate financing needs, 2020–2030

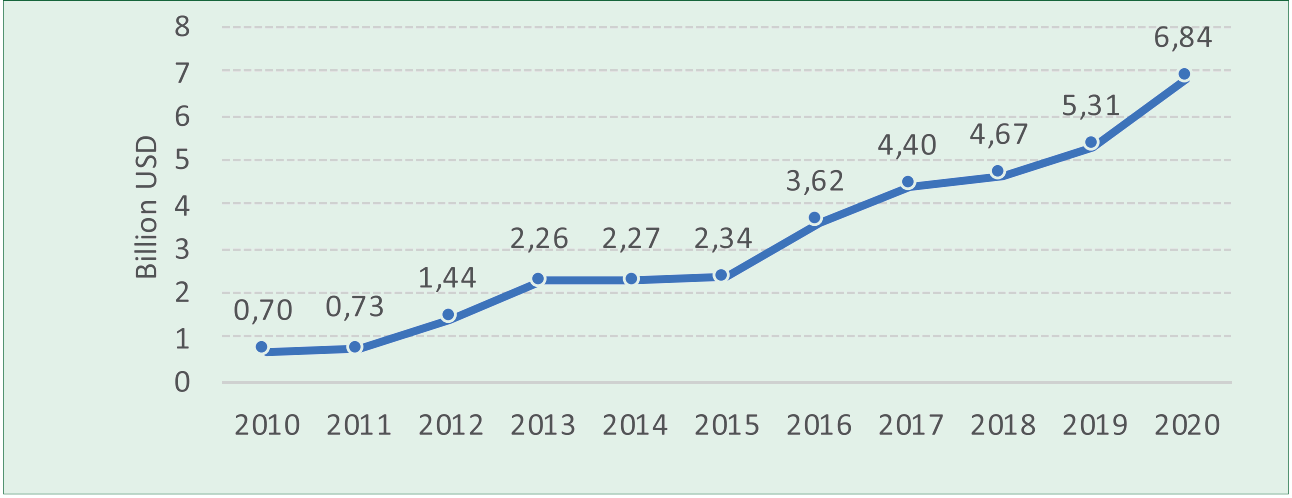


Source: Staff computations based on AEO (2022), Africa NDC Hub, Integral Consult, and OECD data.

3.2.2. Climate finance inflows

Over 2010–2020, West Africa received $34.59 billion in climate finance from developed countries, an average of $3.5 billion per year (Figure 31). Over 2010–2015, the country received $9.75 billion of climate finance ($1.95 billion per year), compared to $24.84 billion for 2016–2020 ($4.97 billion per year).

Figure 31 : Total climate finance inflows, 2010–2020

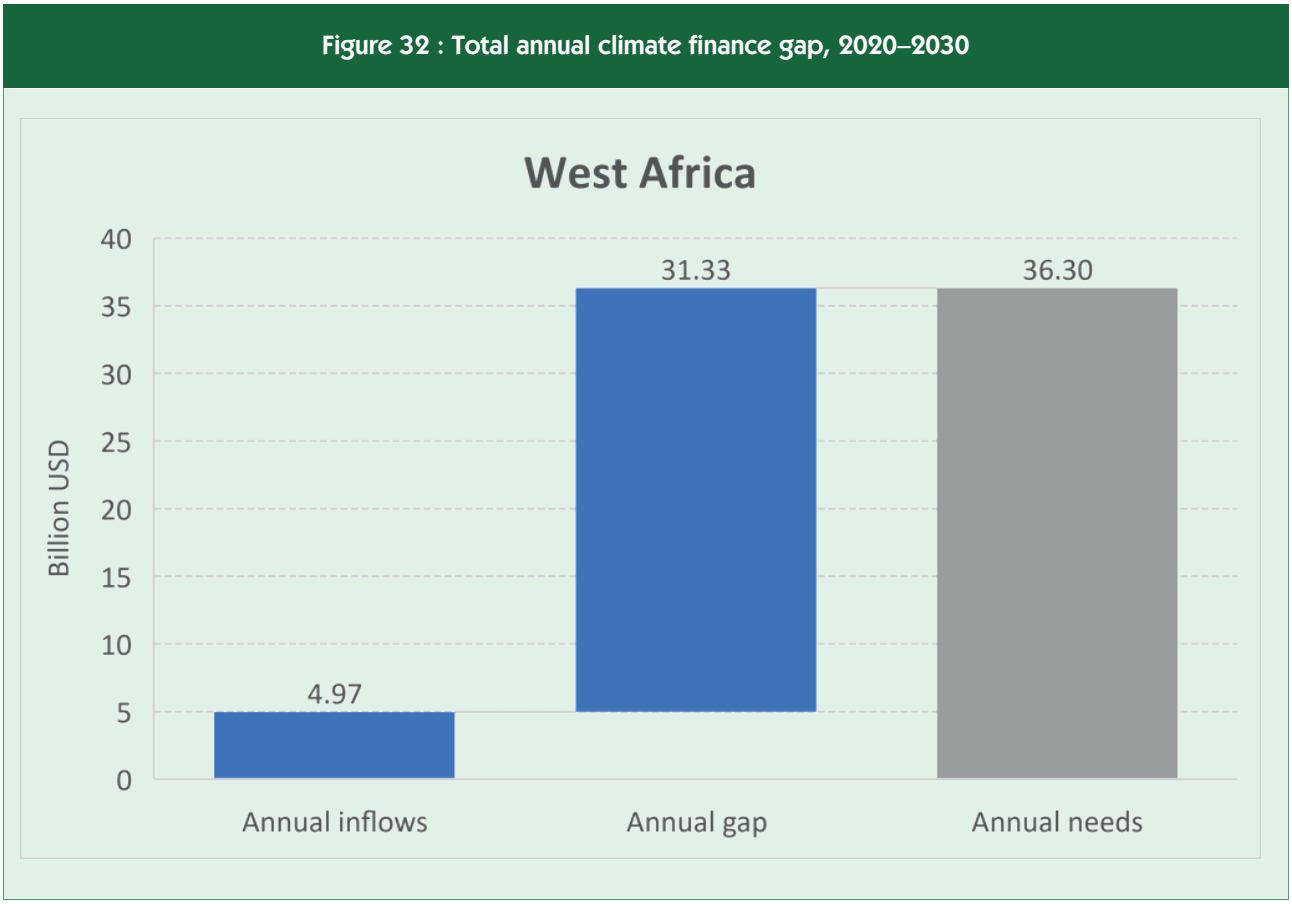


Source: Staff computations based on AEO (2022), Africa NDC Hub, Integral Consult, and OECD data

3.2.3. The climate finance gap

Assuming that West Africa countries continue to receive the same average annual amount of climate finance as over 2016–2020 ($4.97 billion per year), the annual financing gap is $34.96 billion (Figure 32). This gap greatly limits West African countries' ability to build climate resilience.

Figure 32 : Total annual climate finance gap, 2020–2030



Staff computations based on AEO (2022), Africa NDC Hub, Integral Consult and OECD data.

Note: We assume that West Africa countries continue to receive inflows averaging $4.97 billion per year.

3.3. Tapping into innovative financing instruments to support a just energy transition in West Africa

Access to finance is fundamental to building climate resilience in the sectors in the region. However, the region is already carrying large debts, and the impact of the recent pandemic has undermined many countries' fiscal strength. The fiscal stress calls for innovative financing.

3.3.1 Blended finance

According to African Economic Outlook 2022, blended finance, i.e., the use of catalytic capital from public or philanthropic sources to increase private investment, would help West African countries to leverage the private sector and close the climate finance gap. In 2018, the International Finance Corporation, in partnership with the Government of Canada, established the Blended Climate Finance Program to catalyze private sector financing for resilient infrastructure, climate-smart agriculture, and renewable energy. The program provides concessional financing at below-market rates or lenient grace periods for private-sector-led projects, especially in the poorest and most vulnerable countries. Most ECOWAS member states are eligible to access resources under this program.

One example of a blended finance initiative is the West African Initiative for Climate-Smart Agriculture, led by the ECOWAS Commission. This initiative builds climate resilience among smallholder farmers. It provides financial and technical support to promote the adoption of climate-smart agriculture and increases local financial institutions' capacity for climate-smart lending.[87]

[86] International Finance Corporation. 2020. IFC-Canada Blended Climate Finance Program 2019 Implementation Progress Report. BlendedFinance_Canada_vREDACTED_4.pdf (ifc.org)

[87] Global Innovation Lab for Climate Finance, 2019. https://1fwcdz28pkwoeejuhatobka0-wpengine.netdna-ssl.com/wp-content/uploads/2019/03/WAICSA-v16_18092019-_Final.pdf

[88] Patel, Sejal; United Nations. Economic Commission for Africa; United Nations. Economic Commission for Africa (2021-10). Innovative financing for Africa: harnessing debt for climate and nature. Addis Ababa: © UN. ECA. https://hdl.handle.net/10855/46517

[89]

3.3.2. Climate-linked performance bonds

Climate-linked performance bonds are a form of bond whose repayment terms improve if the debtor continues to support agreed climate objectives in their country. Instead of operating under a "use of proceeds" model, this bond allows general use: that is, the funds are not ringfenced for environmental activities, and governments are free to allocate the money in whatever way they consider most conducive to achieving the climate objectives to which they committed under the bond agreement. This approach fosters ownership by the debtor country. General-purpose debt financing linked to climate key performance indicators will help address the financial challenges in the region. For example, very indebted countries could adopt debt-for-climate conversions or swaps. In contrast, countries with good market access and countries that are less debt-distressed could adopt general-purpose performance bonds for climate change. Countries with a stronger debt sustainability position could choose voluntary refinancing, raise new loans or performance bonds, use those bonds to prepay existing debt, and channel the remaining funds towards climate mitigation and adaptation goals

Although private investors are showing more and more interest in sustainability-linked bonds that align with the Paris Agreement, only 0.4% of bonds issued in Africa by 2018 were linked to sustainability. Benin was the first to issue a sustainable development goal-linked bond of €500 million, and Ghana is in the process of an issuance of up to $2 billion.

Green bonds are another financial instrument important to high-return or low-risk projects, such as project in green energy. For example, Kenya increased electricity access from 40% to 70% in five years primarily by using small, off-grid solar-powered energy plants. In countries with high-risk premia, like the countries in West Africa, better debt management is key for green bonds to succeed. It is also important to improve information access by setting up environmental information disclosure methods and harmonizing green finance standards across the region.

3.3.3. External public financing

External public financing is a viable instrument that countries in the region can pursue to mobilize the resources they need to respond to climate and economic issues. Climate-focused trust funds and development partners such as the African Development Bank, the Green Climate Fund, the World Bank, the Global Environmental Facility, and the United Nations are external funders into which the West Africa region should tap. These institutions can provide grant financing for adaptation and mitigation projects and catalyze climate innovation and private-sector participation in climate-based projects.

3.3.4. Insurance and carbon credits

As financial markets in ECOWAS become more sophisticated and risk premia decline, other financing options may emerge. These could help the government, firms, and households invest in resilient homes and good sanitation, access safe drinking water, and empower themselves through education and health care. Insurance products could be immensely helpful in building resilience, although their use in sub-Saharan Africa is presently low. Overly restrictive regulations barring investments in climate-resilient infrastructure projects should be relaxed. There is also a need to institute a legal framework that provides room to transfer climate risk at affordable and sustainable premiums. Another potential source of financing is carbon or environmental credits, depending on how they evolve on international markets. These credits would incentivize environmental protection and climate action.

[90] Patel, Sejal; United Nations. Economic Commission for Africa; United Nations. Economic Commission for Africa (2021-10). Innovative financing for Africa: harnessing debt for climate and nature. Addis Ababa: © UN. ECA. https://hdl.handle.net/10855/46517

CHAPTER 4

CONCLUSION AND PRINCIPAL POLICY RECOMMENDATIONS

West Africa is among the most vulnerable regions to climate change in the world. In recent decades, many economies in the region were severely affected by extreme weather shocks due to their limited ability to cope and adapt. Among other things, West Africa's primary dependence on rain-fed agriculture has meant that extreme weather events induce large drops in agricultural production. This exacerbates food insecurity.

The COVID-19 pandemic shed light on the extreme vulnerability of West Africa's economy. This vulnerability is a factor of the region's reliance on commodity exports, its import of essential foodstuffs, and its dependence on external financing such as remittances. To mitigate the adverse economic consequences of the COVID-19 pandemic, governments in West Africa implemented fiscal stimuli that aggravated fiscal deficits and complicated the resolution of indebtedness and external imbalances. The region has been fragilized further by the global disruption caused by Russia's invasion of Ukraine. This war, which is inflating food and energy prices, is affecting West African economies by deteriorating their terms of trade.

The principal policy recommendations are as follows:

In the short term

- Guaranteeing food security at a time of rising prices: Rising food prices, combined with increased fuel prices and higher transport costs, will hit the most vulnerable people the hardest. This will aggravate extreme poverty. While sovereign debt should be kept sustainable, it is imperative to support the most vulnerable households with government subsidies and transfers.

In the medium term

- Ensuring debt sustainability : The COVID-19 pandemic increased sovereign debt in West African countries, leading to high debt servicing costs and jeopardizing economic recovery. While the priority should be to support the recovery, mitigate the impact of rising prices on vulnerable groups, and invest in infrastructure—including climate-resilient infrastructure—keeping debt sustainable calls for governments to increase revenues and progressively reduce expenditures. In this regard, efforts are needed to improve tax collection through strong compliance and enforcement. There is scope to strengthen taxes that are still low, such as property taxes and environment-related taxes.

- Improving agricultural productivity and developing agro-industry : The COVID-19 pandemic and the ongoing disruption caused by the Russia-Ukraine conflict have underscored the need to develop agriculture in West Africa. Most countries in the region are net food importers, even as a large part of their populations work in agriculture and have abundant and fertile lands. To make the agriculture sector more productive, governments should encourage modern farming techniques, such as mechanization, irrigation systems, and improved seeds. Increasing agricultural productivity also requires building resilience to climate shocks by investing in climate-smart agriculture. Farmers should primarily focus on crops that can be produced efficiently given the local soil, land capacity, and weather. Smallholder farmers should be offered better access to inputs (improved seeds, fertilizers, herbicides, and weedicides), finance, and advisory services. At the same time, economies should develop agro-industry that can process agricultural products locally, reducing post-harvest losses for perishable agro-commodities that are important to the region. Agricultural processing also requires accelerating and intensifying the electrification of rural areas.

In the long term

- Investing in the development of regional and cross-border infrastructure to better seize the opportunities offered by the AfCFTA : Although the AfCFTA became active on 1 January 2021, no trade has yet taken place under the new regime. Important progress has nonetheless been achieved, including ratification by 76% of the 54 signatories and agreement on the rules of origin for 87.7% of product lines. To capitalize on the full potential of the AfCFTA, West African countries should invest in regional and cross-border infrastructure projects that facilitate cross-border trade and the free movement of persons.

- Promoting resilience to climate change: Promoting green growth means applying regulatory instruments and policy frameworks that are conducive to developing and adopting technologies that address climate challenges. West African countries should especially integrate climate change aspects into infrastructure planning and designs, and improve their emergency response and preparedness for natural disasters. Fuel subsidy policies and practices could save a substantial percentage of the annual costs of filling infrastructure gaps.

- Accelerating West Africa's energy transition while advancing universal electricity access is key: Clean, indigenous, and affordable renewable energy solutions offer the region the opportunity to move toward low-carbon development and build resilience, thereby achieving its economic, social, environmental, and climate objectives. Sustainable development and exploitation of the continent's massive biomass, geothermal, hydropower, solar, and wind power have the potential to change the region's current realities rapidly.

- Tapping into innovative financing instruments: Investing in climate-resilient infrastructure in key sectors such as agriculture reduces the impact of climate shocks and provides a foundation for sustainable economic growth. But the region is already carrying large debts, and the pandemic has undermined fiscal strength in many countries. The fiscal stress calls for more innovative financing instruments.

ANNEX

Benin's installed electricity capacity increased from 0.09 million kilowatts in 2000 to 0.43 million kilowatts in 2019, growth of 11% per year. Together, Benin and Togo have hydropower capacity of 65 MW. The country's power utility, Société Béninoise d'Énergie Électrique (the Benin Electric Power Company), faces significant operational and commercial issues. The enabling environment for independent power producers is insufficient, and the off-grid sector is embryonic.

Burkina Faso's strategy so far has been to import electricity from Côte d'Ivoire and Ghana. Installed production capacity in 2018 stood at 300 MW, of which 253 MW came from fuel, 32 MW from hydropower, and 33 MW from solar. The access to electricity rate was 19% in 2020: 1.5% in rural areas and 65.8% in urban areas.

Cabo Verde had electricity capacity and generation of 176 MW in 2020. Some 80% came from fossil fuels (141 MW) and 20% (35 MW) from renewables (16% from wind and 4% from solar). In 2020, the country's electricity access rate was 94.2%.

According to the World Bank, in **Côte d'Ivoire**, as of 2020, 69.7% of the population had access to electricity: 94.5% of urban dwellers and 43.1% of rural residents. Renewable energy represented 70.8% of all energy consumed; renewable energy (mostly hydropower) accounted for 23.9% of all electricity outputs. Per capita electricity consumption was 280.8 kWh. The main sources of electricity are hydropower, oil, gas, and biomass, which account for 70% of all energy consumed. As of 2020, Côte d'Ivoire had an installed capacity of 2,179 MW, roughly 60% of which was generated by thermal and the remainder by hydropower. The government has a renewable energy target of 16% of the energy mix by 2030. This target excludes large hydroelectricity.

The Gambia has a total installed electricity capacity of 105 MW. In 2020, it generated approximately 40 MW; excess demand was 50 MW. Non-renewables account for 97% (102 MW) of energy and renewables account for 3% (3 MW), of which 1 MW came from wind and 2 MW from solar.

Ghana has over 5,300 MW of installed generation capacity, but changing hydrological conditions, inadequate fuel supplies, and inadequate infrastructure mean that availability rarely exceeds 2,400 MW. Disaggregated installed capacities are 1,580 MW for hydropower, 2,070 MW for natural gas, 63 MW for liquid gas, 335 MW for diesel, 700 MW for crude oil, and 400 MW for heavy fuel oil. Currently, Ghana has installed solar capacity of 63 MW.

Electricity coverage in **Guinea** was 44.7% in 2020. Hydropower generation of 368.1 MW was connected to the grid, 202.2 MW came from fuel-generated machinery, 2 MW came from rural electrification, and 7% came from clean energy devices. Installed capacity reached 566 MW: this includes power furnished by the Kaleta hydropower dam. Guinea's electricity sector faces several challenges, such as dilapidated infrastructure, high technical losses, high commercial losses, and poor financial performance.

Guinea-Bissau had an electricity access rate of 33.3% in 2020. The total installed capacity was 29 MW, of which 1 MW came from solar. Authorities are targeting 100% access to electricity by 2030, of which 70 MW (75% of all power demand) will come from renewable energy.

Liberia's electricity access rate was 27.5% in 2020 and its total generation capacity was 138 MW, of which 64% came from hydropower. Liberia imports electricity from Côte d'Ivoire to supply 36,000 people. Authorities target an access rate of 70% in the capital, Monrovia, and 35% in the countryside by 2030.

Although **Mali** is endowed with plentiful solar and hydro potential, it only has about 700 MW of installed capacity to serve around 18 million people. Mali imports 50 MW from Côte d'Ivoire and produces approximately 90 MW off-grid. The price of electricity is high (it averages $0.17/kWh). In 2020, the access rate was 50.6%, with a connection rate of 94.1% in urban areas and 16.5% in rural areas.

Niger has one of the lowest consumptions of electricity in the world. In 2020, only 19.3% of Nigeriens had access to the grid (48.4% of urban dwellers and 13.4% of rural residents). Those with a connection suffer from frequent brownouts and blackouts. There is a strong case for off-grid lighting and energy solutions, since population density is extremely low—less than half the African average. The country had an installed capacity of 318 MW in 2019, of which 27 MW came from renewable energy.

In 2020, **Nigeria** had a national electrification rate of 55.4%. It targets 90% by 2030. The rural electrification rate was 24.6% in 2020 against a target of 85% by 2030. As one of the largest economies on the continent, Nigeria has substantial installed generation capacity: more than 13.5 GW. Given the country's peak demand of 8.25 GW, Nigeria should be able to generate enough energy to meet national demand. Yet in 2019, available capacity amounted to only 3.7 GW.

As of 2020, **Senegal** had around 965 MW of total installed electricity capacity, 26% of which was renewable (5% from wind, 3% from bioenergy, and 18% from solar PV). The actual access rate was 70.4%, with 47.4% of people in rural areas and 95.2% of people in urban areas having access. Currently, 1.1 million households have no access to electricity in Senegal.

[91] https://www.usaid.gov/sites/default/files/documents/1860/Burkina_Faso_-_November_2018_Fact_Sheet.pdf

[92] https://www.irena.org/IRENADocuments/Statistical_Profiles/Africa/Cabo%20Verde_Africa_RE_SP.pdf

[93] https://www.trade.gov/country-commercial-guides/cote-di-voire-energy#:~:text=As%20of%202020%2C%20C%C3%B4te%20d,percent%20generated%20by%20hydroelectric%20dams.

The current electricity supply in **Sierra Leone** is challenged by generation capacity and seasonal variations and is distributed on inadequate and aging transmission and distribution networks. As of 2019, installed electricity generation capacity was 113 MW. This comprised 75 MW of hydropower, 4 MW of solar, and 34 MW of bioenergy. The nation's electrification rate was 26.2%: 54.7% in urban areas and 4.8% in rural areas.

In 2020, **Togo**'s total production capacity was 245 MW: 172 MW from fuel sources, 67 MW from hydropower, and 6 MW from solar. Togo imports about 19.94% of its electricity from Nigeria and Ghana. The electricity access rate was 54.0% (94.1% in urban areas and 24.0% in rural areas). In 2017, with the support of the International Finance Corporation, the government started to promote rural electrification by doing business with off-grid private companies, which are installing 800,000 solar home systems over five years (500,000 systems by Power Africa BBOX and 300,000 by Green Light Planet). Authorities target 100% access by 2030.

[94] https://www.irena.org/IRENADocuments/Statistical_Profiles/Africa/Gambia_Africa_RE_SP.pdf
[95] https://www.usaid.gov/powerafrica/ghana#:~:text=Ghana%20currently%20has%20over%205%2C300,fuel%20supplies%20and%20dilapidated%20infrastructure.
[96] https://www.irena.org/IRENADocuments/Statistical_Profiles/Africa/Guinea-Bissau_Africa_RE_SP.pdf
[97] https://www.usaid.gov/powerafrica/liberia
[98] https://www.trade.gov/country-commercial-guides/mali-energy
[99] https://www.privacyshield.gov/article?id=Mali-Energy#:~:text=Although%20Mali%20is%20endowed%20with,MW%20of%20off%2Dgrid%20production.
[100] https://www.lightingafrica.org/country/niger/#:~:text=Niger%20has%20one%20of%20the,from%20frequent%20brownouts%20and%20blackouts.
[101] https://www.get-invest.eu/market-information/nigeria/energy-sector/
[102] https://www.irena.org/IRENADocuments/Statistical_Profiles/Africa/Senegal_Africa_RE_SP.pdf
[103] https://energycatalyst.ukri.org/wp-content/uploads/2020/12/Country-guide-Sierra-Leone.pdf
[104] https://www.irena.org/IRENADocuments/Statistical_Profiles/Africa/Togo_Africa_RE_SP.pdf

REFERENCES

African Development Bank. 2021. West Africa Economic Outlook 2021: Debt Dynamics: The Path to Post-COVID Recovery. Abidjan.

Avdiu, B., Meyer, M. 2021. "How COVID19 changed the path of remittances in The Gambia," World Bank Africa Can End Poverty blog https://blogs.worldbank.org/africacan/how-covid19-changed-path-remittances-gambia.

David, A. C. 2011. How do international financial flows to developing countries respond to natural disasters? Global Economy Journal, 11(4), 1850243.

Food and Agriculture Organization. 2022. West and Central Africa: Market situation in 2021 and 2022 outlooks.

International Labour Organization. 2021. ILO Monitor: COVID-19 and the World of Work, Eighth Edition. Geneva.

International Monetary Fund. 2021. World Economic Outlook, October 2021: Recovery During a Pandemic: Health Concerns, Supply Disruptions, and Price Pressures. Washington, DC.

International Monetary Fund. 2022. World Economic Outlook April 2022: War Sets Back the Global Recovery. Washington, DC.

Global Knowledge Partnership on Migration and Development. 2020. Inward Remittances Flows.

McDermott, T. K., Barry, F., Tol, R. S. 2014. "Disasters and development: natural disasters, credit constraints, and economic growth." Oxford Economic Papers, 66(3), 750-773.

Organisation for Economic Co-operation and Development and Food and Agriculture Organization. 2020. OECD-FAO Agricultural Outlook 2020–2029. FAO, Rome/OECD Publishing. Paris. https://doi.org/10.1787/1112c23b-en.

Raddatz, C. 2007. "Are external shocks responsible for the instability of output in low-income countries?" Journal of Development Economics, 84(1), 155-187.

Ratha, D., De, S., Kim, E. J., Plaza, S., Seshan, G., Yameogo, N. D., 2021. Migration and Development. Brief 35: Resilience: COVID-19 Crisis through a migration lens. KNOMAD-World Bank. Washington, DC.

World Bank. 2022. "Debt Service Suspension Initiative." Washington, D.C. https://www.worldbank.org/en/topic/debt/brief/covid-19-debt-service-suspension-initiative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