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CHAD
COUNTRY ECONOMIC MEMORANDUM

Boosting Growth and Reducing Vulnerability

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Contents

List of Figures

List of Tables

List of Boxes

Acronyms

AGER	Road Agency, *Agence d'entretien routier*
Bbl	Barrel of crude oil
BTS	Radio base stations
CAR	Central African Republic
CC	Concession regime
CCDR	Country Climate and Development Report
CEM	Country Economic Memorandum
CEMAC	Economic and Monetary Community of Central Africa, *Communauté Économique et Monétaire de l'Afrique Centrale*
DFS	Digital financial services
FCV	Fragility, conflict, and violence
FDI	Foreign-direct investment
FOC	Foreign oil company
FONAP	National Professional Training Fund
ILO	International Labor Organization
IMF	International Monetary Fund
INSEED	National Institute of Statistics, Economic and Demographic Studies
MFMod	Macroeconomic and fiscal model
NDP	National Development Plan
NOPB	Non-oil primary balance
OECD	Organization for Economic Co-operation and Development
ONAPE	National Office for the Promotion of Employment
PPP	Public-private partnership
PSC	Production sharing contract
PSC	Production sharing contract
RMF	Road Maintenance Fund
SOE	State-owned enterprise
SSA	Sub-Saharan Africa
SSS	Standalone solar systems
TFP	Total factor productivity
TVET	Technical and vocational education and training

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Abstract

Chad faces complex and often interlinked challenges that have contributed to its economic fragility while slowing down or undermining inclusive growth. This Country Economic Memorandum (CEM) identifies several key factors including insecurity; overreliance on oil revenue and the failure to use those revenues to bolster broad-based growth; climate change and variability; weak public financial management and business environment; and limited physical and human capital as the country's main growth constraints. Insecurity within Chad and in neighboring countries has recently increased, making it a significant driver of short-run growth volatility.

The CEM elaborates on several policy options to enhance economic inclusion and strengthen natural resource governance, which could contribute towards addressing some of the drivers of insecurity and promote inter-communal reconciliation. As oil production is projected to sharply decline, reforms are needed to improve the oil revenue management framework by strengthening the oil revenue management mechanism, which will include establishing a general fund designed to house the non-budgeted surplus, divided into stabilization and investment components, and with clear utilization rules and procedures that promote more productive and effective utilization through the budget. Moreover, there is an urgent need to diversify the economy away from oil. Improving agriculture productivity, supporting light agro-processing, and services, specifically the digital economy, will be instrumental.

Chad's infrastructure network increasingly lags that of peers and is characterized by regional inequalities and limited access. Infrastructure services are twice as expensive as elsewhere in Africa, reflecting inefficiencies and the lack of competition. A large share of infrastructure is domestically financed, with the central government budget being the main driver of infrastructure investment, although development partners provide significant support in critical areas. The CEM estimates that the cost of addressing the country's infrastructure needs by 2030 would be more than 50 percent of 2021 GDP. Even if major potential efficiency gains are achieved and domestic revenue can be increased from their current low levels, Chad would still face important infrastructure funding gaps that would need to be financed by innovative and non-traditional financing sources and mechanisms. The adoption of institutional, regulatory, and administrative reforms will be key to promote such private investment in economic infrastructure.

Meanwhile, Chad's formal unemployment rate has been increasing, adding to the majority informal and often poorly utilized labor, and the failure to address it raises significant economic and social risks. Most of the workforce is employed in the low value-added informal sector, and low-skilled and poorly educated workers make up most of the labor force. The labor market tends to demand more unskilled labor, although there is a trend toward more skilled labor, particularly in the formal sector. The country remains ill-prepared to produce relevant skills for the job market, which is not competitive. Private sector development is the main engine for job creation and labor mobility. The CEM proposes some options for the use of some of the oil revenues to invest in developing relevant skills to leverage economic transformation, with the aim to accelerate job creation and increase labor mobility. To spur the formal jobs market, some labor market regulation may also be needed to strengthen competition among firms for skilled labor.

The prospect of a significant decline in oil production, solid population growth, and growing climate change challenges imply that even a successful implementation of proposed structural reforms would only lead Chad to achieve low-middle-income status by 2045.

Executive Summary

Growth Dynamics and Drivers

Chad's economic growth has been volatile and largely depended on the oil sector, climate shocks, and the level of insecurity rather than structural long-term economic factors. The oil sector represents around 85 percent of the country's total exports, and oil accounts for an average of 56 percent of total fiscal revenues, indicating lack of economic diversification. Oil price and production volatility and subsequent oil revenue volatility have rendered fiscal revenues highly unpredictable. Various weaknesses in oil revenue management have also led public spending, especially public investment, to be very pro-cyclical in relation to oil prices, undermining sustainable, resilient and broad-based economic growth.

In the last two decades, episodes of strong growth have followed a significant increase in oil prices or the end of a major conflict. By contrast, recessions have coincided with a sharp reduction in oil prices, an episode of conflict, or insufficient rain at the beginning of the agricultural session. The growth expansions of 2001–05 (GDP growth averaging 14.5 percent), 2007–10 (5.8 percent), 2012–15 (6.5 percent), and 2018–19 (2.2 percent) were all led by strong oil revenues and social stability. Meanwhile, the periods of economic contraction in 2006, 2011, 2016–17, and 2020–21 were led by either a sharp drop in oil prices, major conflicts, drought, or the COVID-19 pandemic.

There has been a significant rise in conflicts and violence involving various groups during the last decade. Each major conflict episode disrupted economic activities, led to a growth contraction, or resulted in a recession. Conflicts in neighboring Sudan, Central African Republic (CAR), and Libya have increased the availability of weapons as well as soldiers/mercenaries, and the Sahel and Boko Haram militants have exacerbated insecurity. Regarding internal factors, Chad's low population density (13 people/km2) and the state's limited presence in remote areas have provided a propitious environment for festering insecurity in these areas, keeping them in a protracted state of fragility. Fragility and insecurity, combined with weak governance, undermine Chad's human development performance, and contributed to its ranking of 190 out of 191 countries on the Human Development Index in 2021.

Low productivity, combined with weak human and physical capital accumulation, constrained the country's GDP growth potential to an average of 3.7 percent in 2010–22, 0.7 percent in per capita

terms. Between 1960 and 2019, total factor productivity (TFP) accounted for only 16 percent of GDP growth. Although it improved in 2015–21, TFP has remained too low to kick-start the economy's structural transformation aimed at transforming Chad into a middle-income country. Chad's market efficiency has been hampered by practices that limit competition, and limited investment has reduced access to key economic infrastructure, making the country among the worst performers in terms of physical capital accumulation across low-income countries. In addition, low human capital and inefficient labor markets have hampered the development of the labor force. Low-skilled and less educated workers make up most of the labor force and are trapped in low-productivity sectors. Low labor force quality and lack of sectoral reallocation have constrained total productivity.

Climate shocks are also a source of low productivity, that is likely to worsen over the long-term. Chad is among the world's most vulnerable countries to climate change.[1] Insufficient rain during the agricultural season and frequent flooding have often had a heavy impact on yearly agricultural production. Given the contribution of agriculture to growth in Chad, volatile agricultural growth leads to overall growth volatility. In the future, large economic losses are expected due to climate change, and substantial adaptation interventions are needed to reduce negative impacts on growth and poverty reduction. According to the G5 Sahel Country Climate Development Report, Chad's GDP would by 2050 be reduced by 4.2 percent under wet and optimistic climate scenarios and 10.5 percent under dry and pessimistic climate scenarios *if* there is no adaptation.

Management of Oil Revenue

Chad's oil revenue management remains poor and complex, which presents numerous challenges related to oil prices and production volatility. The country has developed its oil sector under difficult conditions, including extremely low levels of human and physical capital, civil war, absence of basic infrastructure in oil-producing regions, and its landlocked status. After almost twenty years of oil exploitation, the government share in oil production was 60 percent in 2019, slightly below the average of Africa' main net-oil exporting countries. Chad's oil sector remains an enclave with few connections to the non-oil economy. Moreover, PFM and other budget weaknesses inhibit the transmission of resources to invest productivity in the non-oil economy. Meanwhile, Chad's oil sector is a major contributor to the country's carbon emissions. The sector still carries gas flaring and is failing to properly manage and produced water management.

The management of oil revenues can be improved by implementing new revenue mechanisms. There are different levels of intervention through which oil revenue management could be improved, including from the government expenditure and revenue sides. In the past, there have been different attempts to create an oil revenue management mechanism in Chad, with different degree of success. The country's current revenue stabilization mechanism incorporates various inflow and outflow rules, which, by design, provide a buffer against revenue fluctuations above a certain threshold.

Economic Infrastructure

Investing in infrastructure is instrumental to accelerate Chad's economic growth, as functioning and accessible infrastructure is necessary for sustainable economic development. The country needs to particularly increase its access to physical capital. In addition to its effect on growth, infrastructure contributes to human development, and its

[1] According to several global indices, including the Notre Dame Global Adaptation Initiative (ND-GAIN) Country Index, which summarizes a country's vulnerability to climate change in combination with its readiness to improve resilience. Countries are ranked from 1 (low risk) to 182 (high risk), and Chad is ranked 182.

absence or inadequacy impacts business development. Hence, priority should also be given to infrastructure that would support delivery of basic services to the poor or those living in underserved areas.

However, Chad's network density, supply, quality, and accessibility of infrastructure is low. Despite the relatively recent and short-lived investment boom, Chad has a relatively low capital stock relative to other comparable countries.[2] Chronic lack of investments in energy sector assets has kept the country at the very bottom of rankings of energy access for decades. The access rate is estimated at about 8 percent nationally, ranging from 40 percent in urban areas to a mere 2 percent in rural areas. More broadly, the country's landlocked status, sparsely populated territory, and dispersed regional centers result in a high cost of basic transport infrastructure and services. Despite recent government efforts to reduce the cost of digital connectivity and rolling out digital infrastructure, the digital sector in Chad is nascent, with significant gaps in access to quality digital services and infrastructure.[3] The uneven geographical distribution of the backbone road network is commensurate with the distribution of both the population and economic activities.

The cost of infrastructure is also very high, reducing the country's attractiveness and competitiveness. Chad's electricity sector is underdeveloped and inefficient, leading to high consumer electricity prices that are subsidized from the public sector general budget. High costs and delays make the Douala-N'Djamena transit corridor (all of Chad's international non-oil exports go through Douala) one of the least efficient in Sub-Saharan Africa (SSA). The high cost of deploying and operating radio base stations (BTS), the relatively high price of wholesale Internet bandwidth, and low purchasing power are all factors that make broadband services unaffordable for the average Chadian. Moreover, inadequate controls have resulted in rapid road deterioration, and challenges in service affordability and broadband capacity are due to competition issues, limited availability of international capacity, and poor data infrastructure.

There are several infrastructure gaps that need to be addressed in Chad. The public capital stock was quasi-stationary between 1960 and 2000 due to a very low level of investment, before growing rapidly between 2000 and 2012, corresponding with oil sector boom. The country's level of public investment has historically been below the average of the Economic and Monetary Community of Central Africa (*Communauté Économique et Monétaire de l'Afrique Centrale*, CEMAC) and SSA, as its fiscal policy has been more oriented toward recurrent than capital expenditure. Aware of the country's infrastructure challenges, the government's National Development Plan (NDP) 2017–21, included provisions to improve Chad's infrastructure. However, one of the major challenges concerns the effective mobilization of resources devoted to investment.

Skills and Labor Mobility across Sectors

The bulk of the workforce is employed in low value-added and low-productivity sectors. Low-skilled and less educated workers make up most of the labor force and are trapped in the least productive sectors. The volume of the overall workforce continues to increase, but labor force participation slightly declined to 60 percent in 2018, which is comparable to that of countries like Burkina Faso, Côte d'Ivoire, and Sierra Leone. The agriculture sector is the main sector of employment in Chad, and agricultural and livestock jobs dominate in rural areas, while services jobs (mostly informal self-employment) dominate in urban areas. Women workers are predominantly employed by households (55.1 percent). While the private sector dominates the labor market, the public sector absorbs more high-skilled workers.

[2] The boom was stopped by the sharp decline in oil prices in 2015.

[3] Many of the foundational building blocks needed to propel digital transformation at scale are still underdeveloped or missing.

Unemployment declined significantly from 2003 to 2018 and has become an urban phenomenon. Invisible underemployment has increasingly affected workers aged 15–44. Working in the services and industry sectors increases the likelihood of earning a higher income, regardless of gender or level of education. Meanwhile, women remain less represented in the formal job market, with a gender wage gap estimated at 47 percent in 2018.

Mobility is driven by education and capital accumulation. Labor mobility is lower in the agriculture sector than in the industry and services sectors, regardless of workers' age and gender, although skilled workers tend to be primarily employed in services, where earnings are higher and working conditions are more favorable. Nevertheless, the agriculture sector is the only sector with the ability to absorb labor market fluctuations.

Chad spends very little on education, technical and vocational education and training (TVET), and skills development. With a large share of school-aged youth out of school, the skills profile of the Chadian labor force is not likely to improve in the medium term. An estimated 1.9 million youth aged 12–24 (two-thirds) is out of school, an indication that the challenges related to inadequate skills have their origin in the school system. Chad's education system is disconnected from the country's economic needs. Its education spending is among the lowest in SSA, and most education funding goes to primary and secondary education. Access to TVET is extremely limited, especially in rural areas. Aging infrastructure and the absence or obsolescence of technical and teaching equipment make the problem worse. TVET programs are ill-suited to meet the needs of the labor market, while its linkages with other forms of education and training remain weak.

Policy Options

Chad could become a low-middle-income country by 2045 if the country implements the full set of reforms recommended in this CEM. Assuming that all CEM reforms are implemented, Chad's per capita GDP growth is projected to average 0.2 percent in 2025–29, 3.2 percent in 2030–39 and 5.2 percent in 2040–49. Chad' net national income (GNI) per capita would reach, the current official threshold of low-middle-income status only reach by 2045. By contrast, failure to implement the proposed reforms would be costly, as Chad would remain a low-income country even by 2050, with no meaningful improvement in the quality of life of its population and no significant poverty reduction.

This CEM recommends that the authorities consider:[4]

- **Developing a social contract around more inclusive, broad-based growth.** Despite the uncertainty surrounding the current political transition, the country's transitional authorities and international partners could use this as an opportunity to engage in constructive policy dialogue on how to create a more inclusive growth and development model. In turn, this could lead to the beginning of a new social contract that could improve social cohesion. Specifically, the government could move forward on the decentralization process to strengthen local governance and improve the public sector administration by establishing a transparent and efficient budgeting process.
- **Adapting and strengthening Chad's resilience to climate change.** Chad needs to make significant adaptation investments and take actions to make growth more sustainable and resilient. Relevant actions are needed in five specific areas: institutions, climate financing and risk mitigation, energy, landscapes, and cities. In addition, Chad needs to strengthen resilience to climate change effects on agriculture, livestock, and flooding. It needs to incorporate disaster and climate-related risk considerations in the public investment system.

[4] A detailed policy recommendation matrix is available at the end of Chapter 5.

- **Adopting an adequate oil revenue management framework that is consistent with CEMAC's fiscal rule to ensure Chad gains more from its oil sector.** The country should invest more of the rents from nonrenewable resources in its citizens to acquire the needed skills and improve their capacity. An adequate framework to transparently manage oil revenue should be designed and implemented, and it should include a macroeconomic stabilization component and infrastructure component. There should be transparent, and clear utilization rules and procedures that promote more productive and effective utilization through the budget. Chad should also consider options to mitigate its carbon emission from the oil industry.
- **Improving the efficacy and efficiency of public investment management and procurement to reduce the infrastructure gap.** In 2020, Chad adopted a new institutional framework for public investment management, but its operationalization faces major challenges.[5] Despite support from technical and financial partners, the quality of national practices for preparing projects financed from own resources remains very low. The country's vast infrastructure needs, and limited resources require the prioritization of projects based on objective criteria to optimize public investment. The monitoring and evaluation of public investment projects is not rigorous enough to ensure optimal management that anticipates problems and ensures that outstanding projects are implemented. In the transport sector, the low-quality road infrastructure network and its high maintenance needs are a huge challenge for Chad and have a high economic cost.
- **Exploring direct private sector participation in infrastructure to attract the funding and skills necessary to enhance infrastructure assets and strengthen economic diversification.** To date, reforms to allow the private sector to participate in some key infrastructure areas such as ICT, electricity, and transportation have had limited success. The development of public-private partnerships will require the adoption of relevant regulations and extensive technical assistance to strengthen the ability of the private sector to invest in and manage infrastructure assets in the non-oil sectors. It is crucial to finalize the operationalization of the PPP support system in accordance with Ordinance n°006/PR/2017 on the PPP legal regime.
- **Enhancing the governance, transparency, accountability, and regulatory framework of state-owned enterprises (SOEs) to improve their performance.** Overall governance, transparency, and accountability in the electricity sector should be enhanced while strengthening the performance and financial viability of SNE. In addition, the regulatory ICT framework should be revised, including extending board membership to non-government officials with relevant technical, economic, or legal skills. SOEs such the Sotel Tchad should also be better managed, and there should be a virtual [internet] landing point that allows operators with capital holdings in companies be responsible for managing common infrastructure.
- **Developing relevant skills to leverage economic diversification and transformation, with the aim to accelerate job creation and increase labor mobility.** Economic diversification and transformation are key to sustainably creating better jobs at scale. However, an inadequate business climate, high taxes, and lack of investment are holding back the demand for labor. The country should reduce learning poverty by building a strong human capital and skills base, which would require strengthening the relevance and quality of Chad's skills development system. The government should improve and

[5] The COVID-19 pandemic, institutional and security crises, and other factors related to the control of the planning process explain the poor performance in following up on the planning of infrastructure projects.

extend vocational training in key growth sectors such as ICT while improving the governance of the education and skills system. In addition, it should promote links with the private sector by establishing partnership agreements between TVET institutions and industry and supporting skills development to address the needs of unemployed youth, including school graduates and school leavers, through internship and entrepreneurship training.

CHAPTER 1

Chad's Growth Dynamic: Growth Drivers and Constraints

Abstract. *Chad is a country with complex and interlinked challenges that have contributed to its fragility while constraining its growth efforts. The main identified growth constraints include insecurity, climate shocks, overreliance on oil revenue, weak public finance management and business environment, and limited physical and human capital. Chad would benefit from addressing these constraints, mainly by limiting the impact of conflict on growth, improving productivity through better public finance management, adapting to climate change, and creating a more favorable business environment.*

1.1. Introduction

Chad is one of the world's largest landlocked countries and is characterized by harsh bioclimatic conditions and low population density. The country covers a vast territory (it is the fifth-largest country in Africa) organized into 23 provinces and 107 departments, within 3 bioclimatic zones. The Saharan zone, covering 47 percent of the surface of Chad, represents the entire northern part of the country. This zone suffers from unfavorable Saharan weather conditions. The Sahelian zone in the middle of the country (covering 43 percent of the territory and 51 percent of the population) has a Saharo-Sahelian climate. The third bioclimatic zone, the Sudanian zone in the south (representing 10 percent of the territory and 47 percent of the population), has increasing humidity and vegetation moving southwards (Agriculture Report 2022). Overall, harsh bioclimatic conditions in over half of Chad's territory have greatly exacerbated the already difficult living conditions of the population in these areas.

Chad suffers from chronic instability, political turmoil, and sporadic armed rebellions. Violence in Chad has a strong cross-border and regional component, but it also originates in deep-rooted structural causes such as non-inclusive governance, elite capture, and intercommunal tensions. The state's limited presence in remote areas has provided a propitious environment for festering insecurity, keeping some areas in a protracted state of fragility. The country has also provided strong military support to the fight against terrorism in the Sahel and Lake Chad Basin region, and it is regarded as a contributor to regional security.

Fragility and insecurity, combined with weak governance, undermine Chad's human development performance. Chad ranked 190th out of 191 countries on the Human Development Index in 2021. With a score of 0.3, Chad ranks last out of 157 countries on the World Bank Human Capital Index (HCI). On average, Chadian children spend no more than five years in school by age 18. Chad's adult literacy rate (22 percent) is far lower than the average of Sub-Saharan Africa (SSA), low-income countries (LICs), and fragile and conflict-affected countries. Chad also has one of the highest maternal mortality rates in Central Africa, with 1,140 deaths for every 100,000 live births, and it remains the least electrified country in the world.

Chad's economic growth has been largely depended on the oil sector, climate shocks, and the level of security rather than structural long-term factors. The oil sector represents around 85 percent of the country's total exports, and oil revenue accounts for 56 percent of total revenue. Chad's non-oil economy relies principally on rain-fed agriculture, including livestock (about 25 percent of GDP) and services (about 40 percent of GDP), with the demand for services being driven mostly by government oil revenues.

The oil sector key position in Chad's economy has posed a significant downside risk to debt sustainability. A large share of the country's debt service is collateralized to oil production and threatens the viability of debt, and Chad's dependence on external aid has been increasing in recent years. The public debt portfolio is made up of domestic and external outstanding debt totaling CFAF 1,592.1 billion (54.4 percent of outstanding public debt) and CFAF 1,335.4 billion (45.6 percent), respectively, as of end-2021. In 2021, the public debt to GDP ratio stood at 52.1 percent, while domestic debt and external debt represented 23.9 and 28.2 percent of GDP, respectively.[6] The share of commercial debt (mostly oil-backed loans to the mining company Glencore), which was virtually non-existent in 2008, increased rapidly following the 2014 crisis, reaching 33 percent in 2021. Despite the November 11, 2022, agreement with Glencore in the G20 Common Framework for Chad's debt restructuring, the debt service to revenue ratio is expected to breach its threshold in 2022–23, before falling significantly below the 14 percent threshold from 2024 onward.[7]

Poor oil revenue management has constrained Chad's fiscal space; while oil revenue volatility has limited public investment. In the absence of an efficient oil management system that is resilient to shocks, oil price volatility has created bottlenecks to Chad's fiscal management and sustainability. Moreover, public spending, especially public investment, has been procyclical in oil prices, thereby undermining sustainable and resilient economic growth. Meanwhile, budget allocation has increasingly been dominated by current and security spending, at the expenses of investment, particularly in key sectors such as infrastructure and human capital which have relied on external financing.

Chad's GDP growth has fluctuated significantly throughout the country's history, and its five growth phases between 2000 and 2021 were led by episodes of oil price fluctuations, drought, and insecurity.[8] The onset of oil production in 2003–05 boosted considerably the country's GDP growth, which peaked at 33.6 percent in 2004, but a decade of conflict and drought that followed disrupted the growth trend (Figure 1-1). The 2015–16 oil price crisis marked the third growth phase, and the economy went into recession for the first time after more than two decades

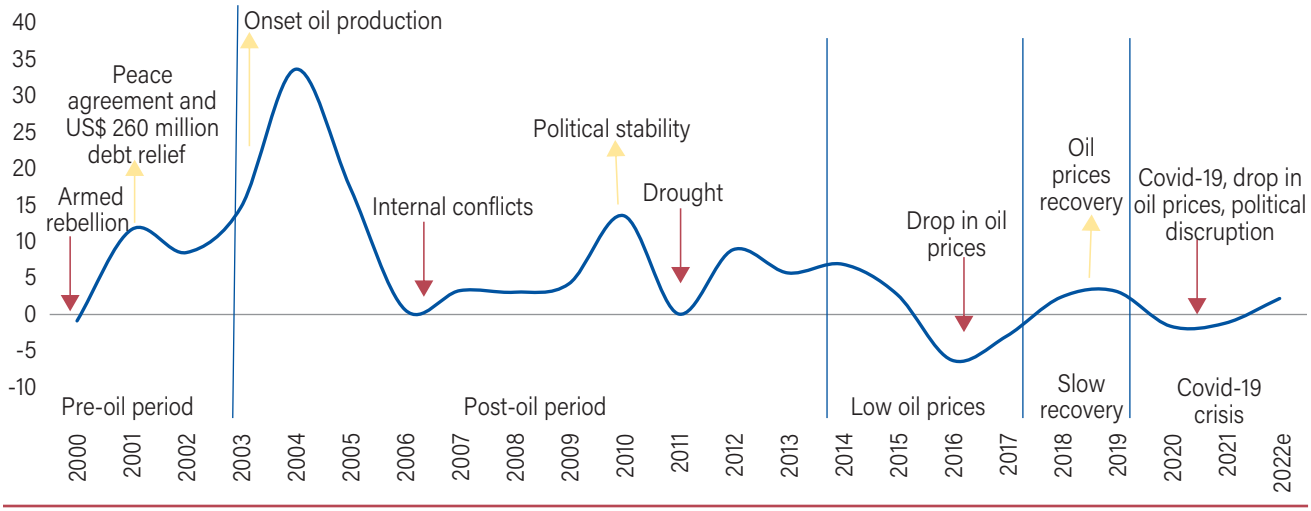
[6] A DEMPA exercise was completed in May 2021 during the CEM analysis, and its recommendations are being implemented to improve debt transparency.

[7] Chad is the first country to successfully complete the G20 Common Framework, although due to the high oil prices that led to the absence of a financing gap to file, the country's debt net present value was not modified. Only a reprofiling on debt service in 2024 was decided. In addition, the creditors committed to reconvene promptly to support the country if any financing gap reappears in 2022–24 and to reassess the country's debt situation by the end of 2024 to cover the period 2025–27.

[8] Determined in a 2018 growth study.

Figure 1-1

Chad – Real GDP Growth Cycles, 2000–2022 (in percent)



Source: Macro Poverty Outlook.

Box 1-1

Oil Sector Performance and Economic Growth

With oil exports constituting around 85 percent of total exports and oil revenue accounting for 56 percent of total revenue in 2022, Chad's diversification efforts remain limited, with very little investment in other economic sectors with high potential. The country's economy suffers from a high dependency on the highly volatile oil market, which makes it highly vulnerable to shocks. Meanwhile, Chad has not been able to tap into sectors with high economic potential such as agriculture and livestock, whose value chains are underdeveloped. Agriculture, mostly focused on subsistence, employs around 80 percent of Chad's workforce. Livestock is Chad's most important non-oil sector and a major income source. Both the agriculture and livestock sectors are characterized by very low productivity and lack of strong value chains, which prevents them from creating quality jobs and generating sufficient income for stakeholders. Therefore, strengthening economic diversification to enlarge the fiscal base and develop the rest of the economy remains one of Chad's main policy challenges (Tchana-Tchana et al. 2022).

Chad's oil revenue management remains poor and complex, which presents numerous challenges related to oil prices and production volatility. The country has used its substantial oil revenues to boost procyclical spending, particularly during periods of high oil prices. In the absence of a functional fiscal rule or stabilization fund, no fiscal buffers were available when oil prices plunged in the second half of 2014, which led the country into a deep and prolonged recession. It was only in November 2019 that the government adopted a revenue-smoothing mechanism to mitigate the adverse effects of oil price volatility through a stabilization fund. The fund is designed to function as an effective counter-cyclical or less pro-cyclical policy tool. It features a 'saving rule,' which the government uses to save parts of its oil revenues during periods of high oil prices, and a 'spending rule,' which the government uses to spend during difficult periods. The fund was used by the government during the COVID-19 crisis to mitigate the effects of a reduction in oil revenue. As of end-2021, the balance of the stabilization fund was CFAF 0, which points to the need to improve the fund's mechanism to avoid a depletion of funds. The stabilization fund's mechanism and management could be improved to strengthen Chad's resilience to shocks. Moreover, the country could use recovering oil markets as an opportunity to build up an effective buffer for future crises.

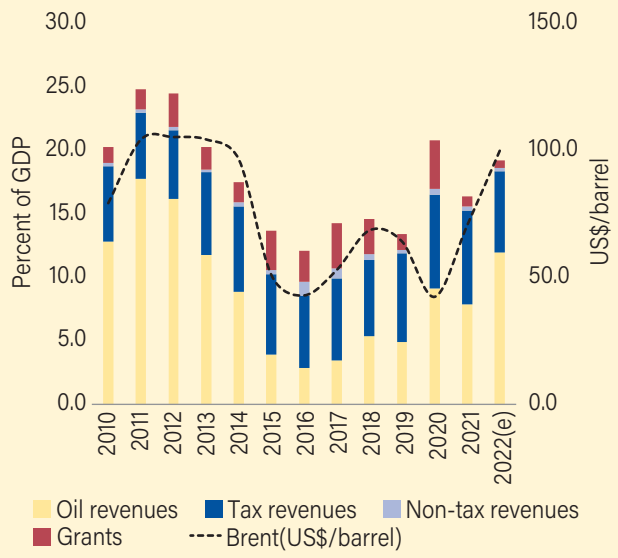
(continued on next page)

Box 1-1

Oil Sector Performance and Economic Growth *(continued)*

Figure 1-2

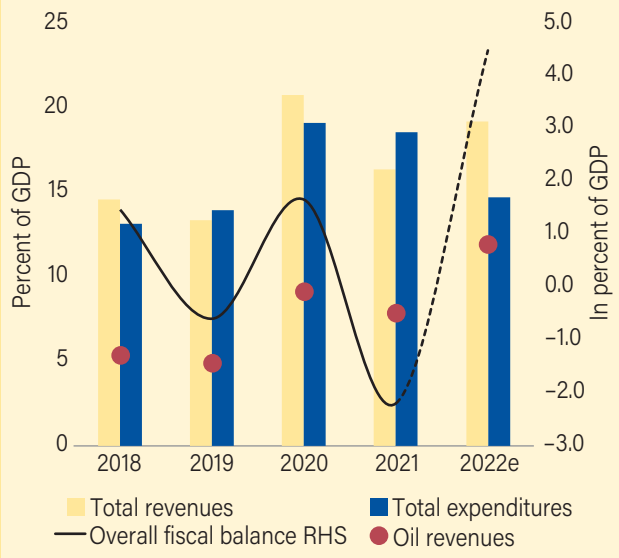
Chad – Total Revenue Decomposition, 2010–22



Source: Chadian authorities and World Bank staff estimates.

Figure 1-3

Chad – Fiscal Balance, Expenditures, and Revenues, 2018–22



Source: Chadian authorities and World Bank staff estimates.

Source: Authors.

of highly volatile but sustained growth, with economic growth contracting by 6.3 percent (9.2 percent per capita) in 2016. The 2018 recovery in the oil market drove the upward trend during the last growth phase, with economic growth averaging 2.8 percent in 2018 and 2019, but it was disrupted by the COVID-19 health crisis, leading to another recession in 2020.

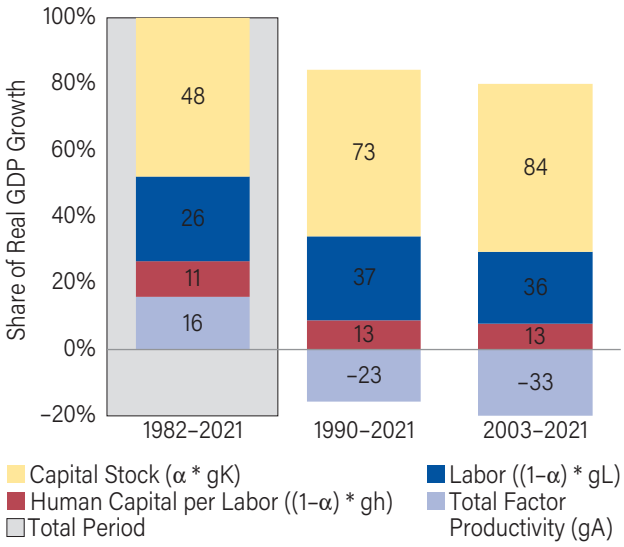
1.2. An Analytical Framework to Identify Long-Term Growth Drivers and Constraints

This Country Economic Memorandum's (CEM) analytical framework builds on a simple aggregate production function that includes human capital. Output (Y) growth depends on the accumulation of physical capital (K), labor (L), human capital (h), and the Solow residual reflecting total factor productivity (TFP) (A). This growth-accounting framework allows for a decomposition of economic growth based on resources (production factors) allocated to the production process, with productivity often viewed as a resource that can be developed in its own right.

1.2.1. *Growth Determinants*

On the demand side, exports have quickly become the main contributor to growth. Between 2000 and 2002, total consumption and investment were the main contributors to growth, contributing an average of 23.65 and 26.16 percent, respectively, while net exports had a negative average contribution to growth of 77.27 percent (Figure 1-4). Since 2003, the main growth contributors changed significantly. Indeed, with the growing importance of the oil sector, the economy

Figure 1-4
Solow Growth Decomposition



Source: Macro Poverty Outlook.

has quickly become dependent on oil exports, with net exports contributing an average of 8.07 percent to growth in 2003–2022, at the expense of total consumption and investment, whose contribution turned negative (–0.60 and –2.01 percent, respectively) in the same period (Chad Economic Update 2021).[9] This shows that gains from oil exports have not been accompanied by an adequate structural change that would have benefited domestic consumption and capital investment. Chad's main growth drivers have been different to those of its structural peers[10] (South Sudan and the Democratic Republic of Congo), despite exports being the main driver of growth in all these countries.

On the supply side, agriculture has slowly evolved to become the main growth contributor in recent years, while the contribution of TFP to growth has been volatile. The services and industry sectors were the main growth contributors during the first half of the 2010s (averaging 2.9 and 1.2 percent, respectively), benefiting from high oil sector performance. The successive crises (i.e., the 2015–16 oil price crisis and the COVID-19 pandemic) that impacted global oil prices in 2015–20 had a considerable effect on the growth contribution of the services and industry sectors (which dropped to an average of –1.2 and 0.3 percent, respectively). Meanwhile, agriculture became the main contributor to growth over the same period, contributing a mere 0.7 percent of GDP.

Between 2003 and 2021, TFP had a negative contribution (–0.33 percent) to GDP growth, as a significant increase in the capital stock did not yield its full potential. Nevertheless, as oil revenue fell in 2015–19, the growth contribution of TFP turned positive (0.43 percent) as the economy found a better way to transform these resources into production. The contribution of labor and human capital per labor to growth was 0.32 and 0.08 percent, respectively, during this period, which could be partially explained by the low availability of local skills, as a combination of growth in the quantity and quality of labor would be required to trigger a structural transformation that would lead to productivity growth (Figure 1-4).

Between 2015 and 2019, private investment was the primary source of capital formation (18.42 percent of GDP) in Chad, similar to in peer countries. (Figure 1-6). With the oil exploitation boom in Chad, public investment as a share of GDP has dropped by more than half (from 12.5 percent in 2003 to 5.3 percent in 2019), increasing the importance of private investment in capital formation (PER 2019).[11] This has been partly due to the government not reinvesting enough oil revenues (its main source of revenue) in public infrastructure, resulting in inadequate investment in critical infrastructure

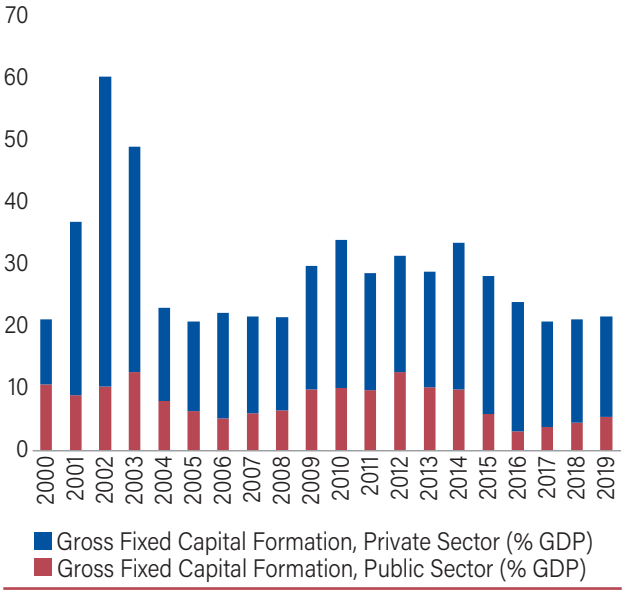
[9] The World Bank. 2021. Chad 2021 Economic Update Recovering from Shocks: Improving Macro-Fiscal Sustainability to Rebuild Better. June 2021.

[10] Countries in SSA that had a GDP per capita, GDP growth, population, and oil rents in percent of GDP of ±30 percent of Chad's respective values in 2015–2019

[11] "Kitzmuller, Markus; Kassim, Olanrewaju. 2019. *Chad Public Expenditure Analysis: Fiscal Space for Productive Social Sectors Expenditure*. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/34616 License: CC BY 3.0 IGO."

Figure 1-5

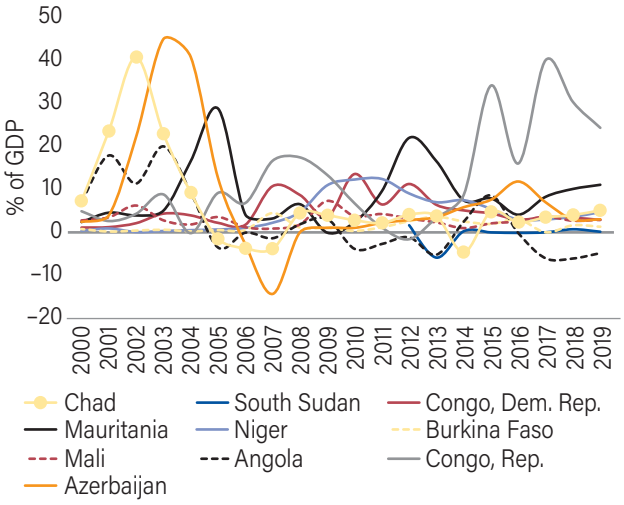
Gross Fixed Capital Investment, 2000–19



Source: Macro Poverty Outlook.

Figure 1-6

Chad vs. Comparators: FDI Inflows, 2000–19



Source: Macro Poverty Outlook.
Note: Comparators countries are those that had similar economic characteristics as Chad in 2000–19 based on selected structural indicators.

such as roads, electricity, schools, hospitals, and telecommunications, which are essential for growth and productivity.

Meanwhile, Chad's net foreign direct investment (FDI) inflows have been cyclical and tied to oil market trends, with a value as a share of GDP below 10 percent since 2004. (Figure 1-7). The contribution of FDI to development has been limited to capital formation in Chad. It has not benefited from foreign technical know-how (as evidenced by low TFP growth), higher skills, or better employment. This may be explained by the over-polarization of FDI in the oil industry, limiting spillover to other sectors. Moreover, Chad has experienced a downward trajectory in its gross domestic savings as a share of GDP, which has constrained domestic capital formation.

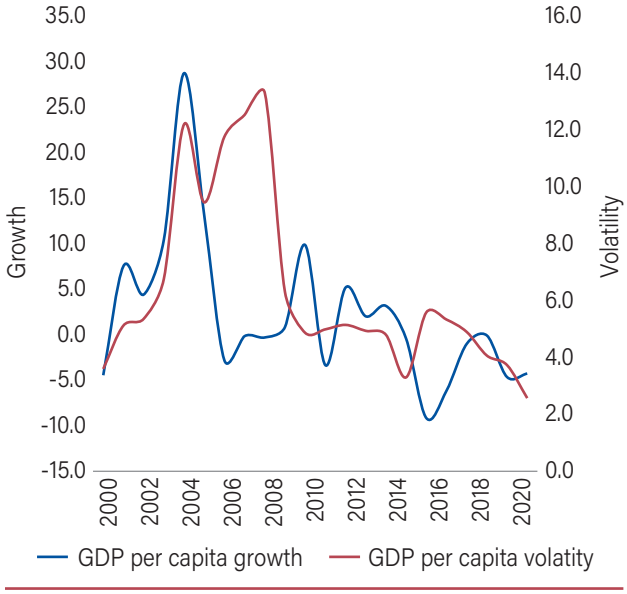
1.2.2. *Growth Volatility*

Chad's high growth volatility[12] has limited overall growth performance, except during periods of high oil revenue, which have been marked by a positive correlation between growth and growth volatility. Figure 1-8 depicts Chad's GDP per capita growth trend in 2000–21 and the 5-year window standard deviation of GDP per capita growth (as a proxy to volatility) over the same period. There were two notable peaks of GDP per capita volatility between 2003 and 2009. GDP per capita growth increased from 4.4 percent in 2002—at the onset of oil production—to 28.7 percent in 2004, followed by a sharp decline in GDP per capita growth, which turned negative before reaching a moderate rate of 0.8 percent in 2009 (which in turn was the result of an eruption of conflict). This succession of events manifested in a relatively short timeframe and led to large fluctuations in GDP per capita growth. Chad slowly regained political stability in 2010, which translated into a recovery of GDP per capita growth while growth volatility decreased. The inverse relationship between GDP

[12] Economic volatility is traditionally measured by the standard deviation of the distribution of a variable around its mean or a trend. Here, the standard deviation of the growth rate of GDP per-capita as a proxy to volatility is used (Ramsey and Ramsey 2015).

Figure 1-7

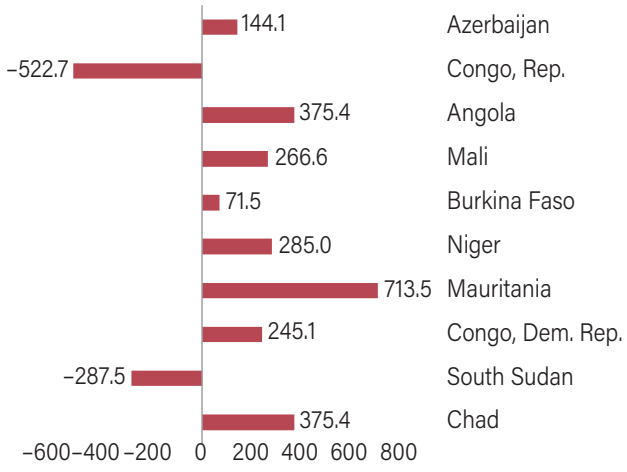
Growth Trend and Volatility, 2000–21



Source: Macro Poverty Outlook.

Figure 1-8

Chad vs. Comparators: Volatility of per capita Growth (% of trend 2000–21)



Source: Macro Poverty Outlook.
Note: The values represent the coefficient of variation (standard deviation over the mean) of GDP per capita growth in percentage, for the period 2000-21.

per capita growth and GDP per capita growth volatility was sustained during the subsequent years (2011–2020).

Chad's growth volatility is one of the highest among peer countries. Between 2000 and 2021, the standard deviation of GDP per capita growth was 3.8 times the average per capita growth (Figure 1-8). This shows that Chad's GDP per capita growth has been highly dispersed. Chad's level of growth volatility is higher than that of other peer countries, with the exception of Angola, which had similar volatility, and Mauritania and the Republic of Congo, where the standard deviation of GDP per capita were respectively 7.1 and 5.2 times their average GDP per capita growth.

1.2.3. *Growth Constraints*

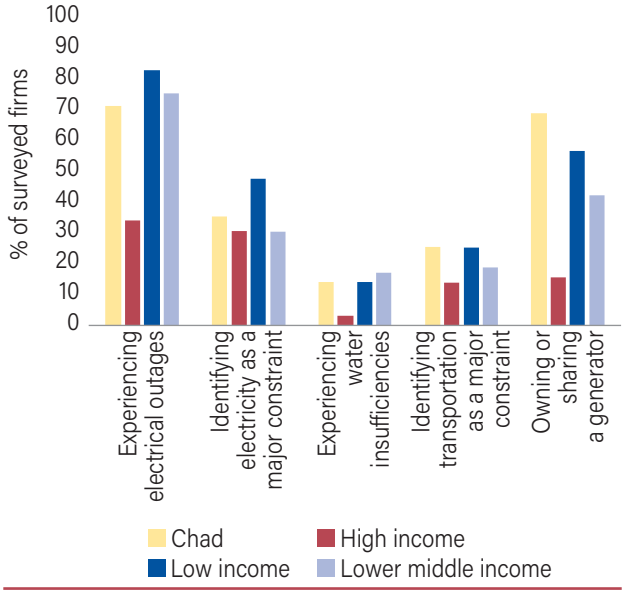
1.2.3.1. Productivity Constraints

Between 1960 and 2019, TFP accounted for only 16 percent of GDP growth.. This was mainly due to TFP's negative contribution to GDP growth between 2004 and 2015 during the commodity super cycle. During this period, an increase in capital spending did not have a proportional increase in growth. The country's poor spending efficiency, macroeconomic management, and business environment contributed to its low TFP productivity. Specifically, agriculture productivity is low, highlighting the prevalence of subsistence agriculture in the country. According to the 2022 SCD, a combination of factors reduces productivity in the agriculture sector. These include: (i) the risky and variable production environment; (ii) a lack of effective public investment, extension services, and post-basic skills, which are associated with the limited uptake of new technologies; (iii) a lack of improved water and land management, which hampers efforts to increase yields and reduce climate-related risks; (iv) a lack of up- and downstream value-chain integration; (v) limited connectivity to local and international markets; and (vi) insecure land tenure.

Public finance, administration, and regulation requires significant improvement to attract more private investment. The country's high tax rates, poor tax administration, and corruption are among

Figure 1-9

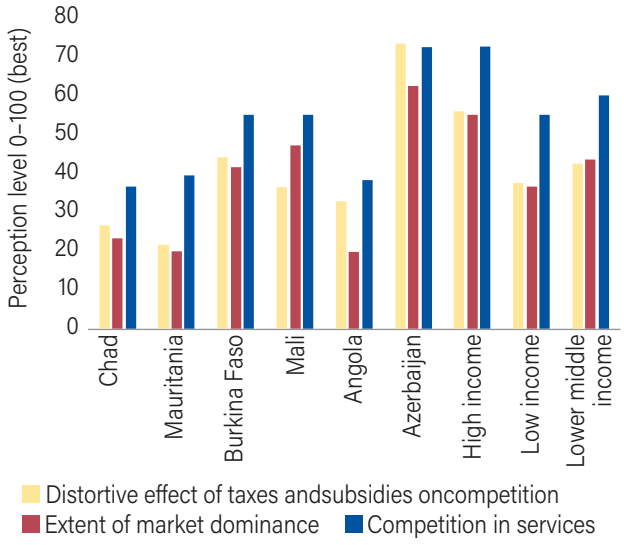
Gross Fixed Capital Investment, 2000–19



Source: World Bank Enterprise Survey 2018.

Figure 1-10

Chad vs. Comparators: Competition Perceptions



Source: World Economic Forum 2019.

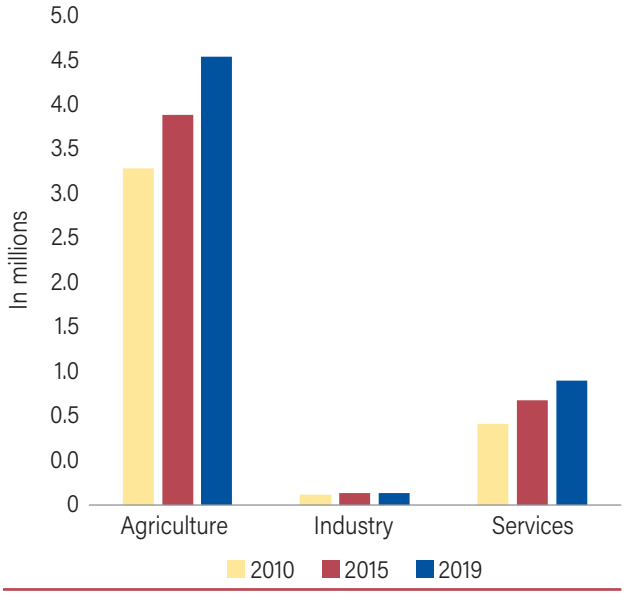
the main barriers to doing business in Chad. The government's liquidity crunch is leading to the accumulation of arrears and low credit to the private sector as banks finance government needs. The business regulatory system is a major bottleneck to business entry. Also, Chad has higher rates of firms that face tax obstacles than other low-income countries, and it takes more days to obtain key business licenses in Chad. Given this context, businesses may choose to remain in the informal sector to avoid the country's cumbersome tax system.

Chad's market efficiency is hampered by anti-competitive practices. The country's businesses perceive the tax system as a major constraint on competition, followed by market dominance and competition in services (Figure 1-11). Chad is also one of the worst performers in terms of governance among low-income countries. In 2021, the country's Corruption Perceptions Index score was 20, below the low-income country average of 25. This has a negative impact on the business environment, domestic and external investment, and productivity while limiting fiscal space.

1.2.3.2. Constraints on the Physical Capital Stock: Lack of Infrastructure Limits Investment

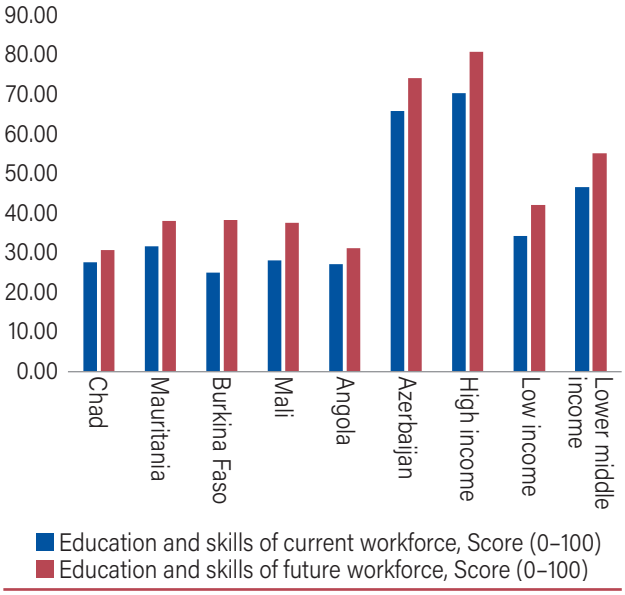
Access to key economic infrastructure in Chad is limited and among the lowest in low-income countries. It is challenging to access electricity, roads, ICT, water, and transport services in Chad, particularly for firms operating in the country. The lack of private investment in the energy sector and the high cost of diesel-based electricity generation by the national utility company SNE, combined with poor governance of the sector, are the main reasons for Chad's low electrification rate. Only 11 percent of the population has access to electricity—among the lowest in the world—and 80 percent of the demand is concentrated in the capital city N'Djamena. Moreover, only 55 percent of the poor population has access to water from an improved source, 9 percent from pipes, and 46 percent from boreholes, while access to ICT is below the average of low-income countries, hampering efforts to increase efficiency. The country's internet penetration rate (6.5 percent in 2019) has increased little in recent years, internet coverage has

Figure 1-11
Employment by Sector



Source: World Bank Enterprise Survey 2018.

Figure 1-12
Skills and Education of Workforce by Country



Source: World Economic Forum 2019.

stagnated over the past year at a level below one of its regional peers, and mobile coverage remains weak.

1.2.3.3. Constraints on Human Capital: Inefficient Labor Markets and Lack of Relevant Skills Hamper the Development of the Labor Force

The bulk of Chad's workforce is employed in sectors with low value added and low productivity. A growing number of workers have been employed in agriculture over the past decade (from 3.4 million in 2010 to 4.5 million in 2019), representing around 77 percent of the total workforce (Figure 1-12). However, the agriculture sector is characterized by informality and subsistence, resulting in it being the sector with the lowest per capita value added at around US$1,285 in 2019, much lower than US$2,393 and US$11,363 in the services and industry sectors, respectively. Stagnating productivity may be due to a misallocation of resources between sectors. Industry, the sector with the highest productivity, only employs 1.9 percent of the labor force, while services, the second most productive sector, employs 21.2 percent of all workers.

Low-skilled and less educated workers make up the majority of the labor force and are trapped in the least productive sectors. In 2019, Chad's education and skill of workforce score was 27.4, lower than the low-income country average of 34.2. Furthermore, its Human Capital Index was among the lowest in the world at 0.3 in 2018. The country's low performance is due to inadequate education and adverse health outcomes, including malnutrition, which has an impact on future learning potential.[13] The low level of skills is also explained by the lack of vocational training and basic education.

While labor growth contributed to overall economic growth in 2015–19, the low quality of the labor force and lack of sectoral reallocation constrain productivity growth. With an average annual rate of 3.4 percent, labor growth was higher than the growth of the capital stock (0.84 percent) and TFP

[13] In 2021, an estimated 31 percent of children under five had height-for-age values two standard deviations below the median for the international reference population aged 0–59 months (stunting). *https://data.worldbank.org/indicator/SH.STA.STNT.ZS?locations=TD*.

(–3.04 percent) between 2015 and 2020. This implies that the growing stock of labor has been a determinant of growth in Chad. However, the low quality of the labor force and lack of sectoral reallocation remain significant constraints on productivity growth. Also, weak investment in the private sector has contributed to decreasing employment growth in recent years and lower labor productivity. Ultimately, progress in accelerating employment growth in the services sector did not translate into productivity growth between 2015 and 2020.

Chad's weak human and physical capital is mainly due to limited public investment. Low levels of public investment in education, health, and essential infrastructure have constrained development in key sectors. The country's education system suffers from challenges in both access and quality, resulting in low enrollment, attendance, and completion rates. In addition, health outcomes remain generally poor, reflecting limited access to quality health care. Chad has just 0.4 doctors per 10,000 people, far below the World Health Organization (WHO) standard of 1 doctor per 10,000 people, which is exacerbated by a lack of correlation between human resources and population distributions.[14] Moreover, the lack of adequate physical infrastructure, along with the poor national trade network and limited access to regional markets, impedes the development businesses in Chad. Beyond the quality of the education and health systems, infrastructure in these sectors is limited or obsolete, reflecting weak public investment. The share of education, health, and infrastructure in total public expenditure averaged 13.5, 7.3, and 7.4 percent, respectively, in 2017–21.

1.2.3.4. Conflict, Violence, and Climate Change

Conflict and Violence

There has been a significant rise in conflict and violence due to the actions of various groups during the last decade. These groups include state security forces, violent extremist groups, communal militias, and unidentified armed groups. Violence in Chad has a strong spatial component. First, in the Lake Chad region, there has since 2015 been a continuous rise in attacks due to violent extremist organizations, such as Boko Haram, which has led to many civilian casualties. In 2021, one-third of conflict incidents occurred in the Lake Chad region (Figure 1-14). There has also been an increase in conflicts over natural resources, mainly gold, in the Tibesti region as well as an increasing number of conflicts between herders and farmers in the Ouaddaï, Salamat, Sila, and Tandjilé, which have been exacerbated by climate change.

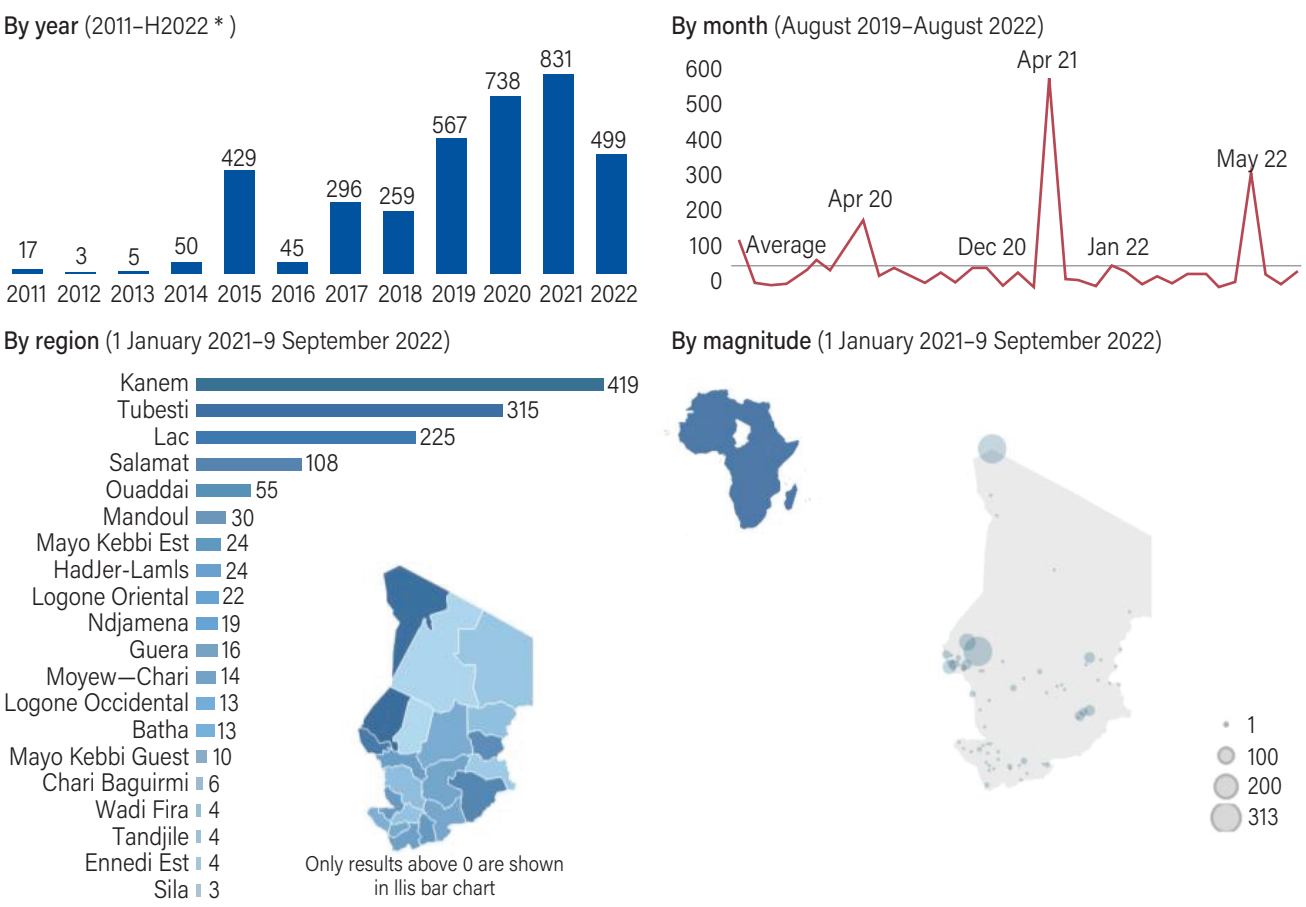
Increasing security threats have hampered efforts to ensure sociopolitical and business environment stability. Chad has been at the center of various security and political challenges that have either originated inside or outside the country. Due to the passing of President Idriss Deby in 2020, the country is going through a risky and costly political transition. After a not fully inclusive national dialogue that ended on September 30, 2022, the transition was prolonged for an additional 18 months. A successful transition could put the country on a better development path, but a failed political dialogue could derail the projected economic recovery. Moreover, regional insecurity and instability, particularly insurgencies in Lake Chad and Sahel countries, exacerbates Chad's dire social and economic situation. The country hosts hundreds of thousands of refugees from Sudan, Cameroon, and CAR, following intercommunity conflicts in these countries.

These conflicts have slowly slipped out of control of the state, whose institutional presence in the affected regions and rural areas has been scant. The absence of state control has also favored fraudulent practices and activities at the borders led by rebel groups. Despite their limited presence in remote places, state forces have been involved in combat with rebel groups to limit their violent activities and raids on villages along the borders. However, border management issues related to trafficking and migratory flows worsened during the COVID-19 crisis.

[14] Chad's poverty assessment 2022.

Figure 1-13

Reported Fatalities in Chad by Year, Month, Region, and Magnitude



Data source: ACLED (as of 9 September 2022).
Disclaimer: Fatality data should be viewed as indicative rather than definitive. *** 1 January 2022 — 9 September 2022**. Please note contradictions with earlier publications regarding fatalities figures are due to updates with regards to the ACLED data.

Source: World Bank using ACLED, September 9, 2022.

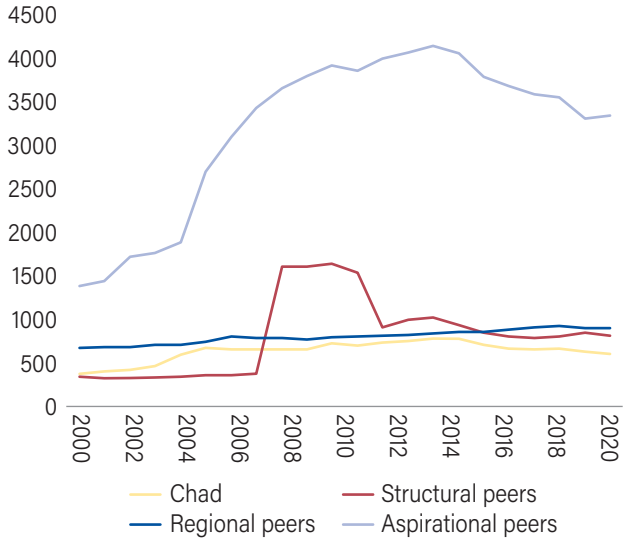
Impact of Conflicts on Economic Growth and Poverty Reduction in Chad

Insecurity has seriously undermined Chad's efforts to remain on a growth trajectory and benefit from its growth potential in periods of high oil prices. Fragility and insecurity have constantly constrained important growth drivers such as trade and investment. Growth dropped significantly or was relatively weaker during periods of conflict, despite higher oil prices. For instance, while growth sharply dropped from 17.33 percent in 2005 to 0.65 percent in 2006 (a year when internal conflicts erupted), averaging 2.3 percent in 2006–08, total government revenues as a percent of GDP rose from 11.4 percent in 2005 to 22.4 percent in 2008, one of the highest levels in Chad's history. In fact, during periods of conflict, the country's booming oil revenues have been diverted toward military and security expenditure at the expenses of productive investments in key sectors such as health, education, and infrastructure.

Chad's fragility challenges are reflected in its limited progress on reducing poverty

Figure 1-14

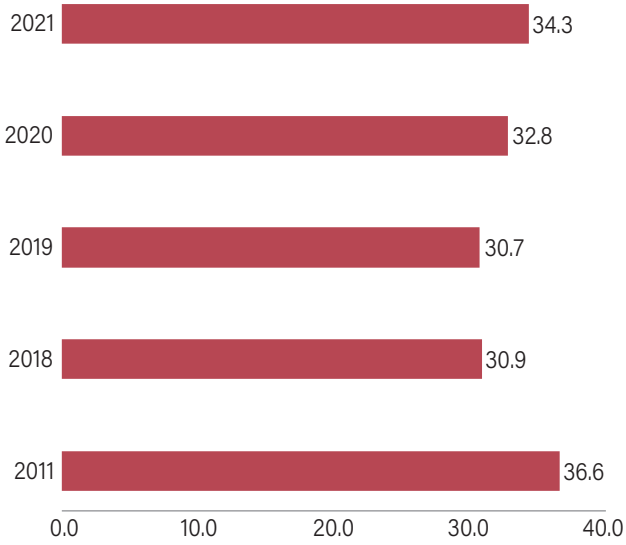
Real GDP per capita: Chad vs. Peers, 2000–2020 (constant 2015 $US)



Source: WDI, authors' calculation.

Figure 1-15

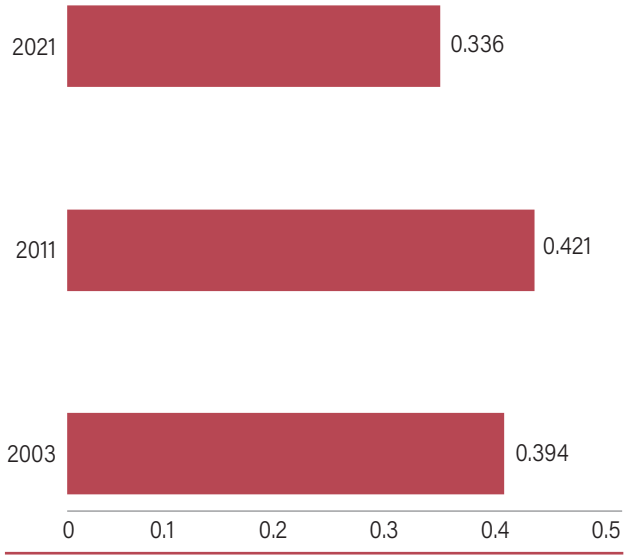
Extreme Poverty Rate (US$2.15/day per capita, 2017 PPP)



Source: World Bank staff calculation based on data from MPO.

Figure 1-16

Gini Index



Source: World Bank staff calculation based on data from MPO.

and inequality, which has also been significantly delayed by various security and economic shocks. The country's extreme poverty rate (US$2.15/ day per capita, 2017 PPP) was estimated at 34.3 percent in 2021 (Figure 1-16: Extreme Poverty Rate (US$2.15/day per capita, 2017 PPP)). While this represents a decline of 2 percentage points compared to 2011 (36.6 percent), the number of people living in extreme poverty increased from 4.5 million in 2011 to 5.8 million in 2021. As a result, the number of extreme poor has increased by 29 percent over the past 10 years, exacerbated by volatile GDP growth and a fast-growing population (3.1 percent, on average, over the past 10 years).

While the population has been shrinking, there has been no decline in poverty, which has been affected by oil shocks and the COVID-19 pandemic. The declining trend in population growth (from 3.9 percent to 3.0 percent between 2002 and 2019) has not been met with adequate structural policies for harnessing the benefits of a demographic transition. The different oil shocks that have hit the economy have greatly impacted poverty rates over the past decades. Since the 2015–16 oil price crisis, the number of poor increased steadily from 4.5 million people in 2011 to 4.9 million in 2019. In 2020, the COVID-19 crisis impacted the livelihoods of poor and

vulnerable households, with 76 percent of households reported a loss in their total household income, according to data from high-frequency phone surveys in 2021. As a result, the extreme poverty rate (US$2.15/day per capita, 2017 PPP) rose from 30.7 percent in 2019 to 34.3 percent in 2021, translating into to an increase in the number of the extreme poor by almost 1 million people.

Poverty has been prevalent in conflict-affected areas bordering CAR, Sudan, and Cameroon. Security restrictions in these areas have a negative impact on household livelihoods, increasing the number of poor and vulnerable. The Mandoul and Logone Oriental regions, which border CAR, are home to 8 and 9 percent of the poor population, respectively. In comparison, the regions of Mayo-Kebbi Est and Mayo-Kebbi Ouest are home to a combined 17 percent of the country's poor. These regions also host thousands of refugees for whom the national poverty rate is around 80 percent (Chad 2021 poverty assessment). All these mounting challenges facing Chad are particularly worrisome given the low coverage of social protection programs, which limits the support available to the poorest households.

Climate Change Is One of The Most Important Long-Term External Constraints in Chad

Chad is among the most vulnerable countries in the world to the risks of climate change (G5 Sahel CCDR). Ongoing climate change contributes to: (i) desertification; (ii) the degradation of forests, soil, and natural habitats; (iii) the loss of biodiversity; (iv) the depletion of water tables; and (v) the silting of oases. Climate change is also contributing to more frequent episodes of drought and flooding. Unfavorable weather conditions have hampered agricultural production, leading to food insecurity in 2021, and the country could face the same challenges in 2022. Chad's agriculture depends heavily on the weather. Like any Sahel country, the main weather characteristics include a short rainy season and water scarcity. For example, Chad experienced poor distribution of rain during the 2021 rainy season and unprecedented floods in 2022, hampering agricultural production and its contribution to growth. The government declared a food emergency in June 2022 due to the severe food insecurity that is currently affecting the country.

The frequency and impact of flood events has intensified in recent years, and more attention is needed to ensure the sustainability of future development prospects. Deadly floods have been reported on average once every 2.5 years over the last decade, with 358 deaths attributed to 22 flood events since 1981.[15] Annual flood events have affected an increasing proportion of the population since 2019. In 2019, floods affected over 100,000 people after overflow of the Logone River and Lake Maga.[16] In 2020, over 190,000 people were affected by heavy floods across Chad.[17] More recently, floods in 2021 and 2022 affected over 1.3 million people, equivalent to 7.3 percent of the population.[18] Importantly, while droughts mainly affect agricultural output and rural household's welfare, floods damage physical assets and infrastructure across sectors, generating significant economic activity disruptions and negative spillovers that affect the productivity of the capital stock beyond the assets directly impacted.

Large economic losses are expected from climate change in Chad, and substantial adaptation interventions are needed to reduce negative impacts on growth and poverty reduction. Significant GDP losses are expected from the combined effects of six impact channels (rainfed crop yields, livestock yields, heat-labor productivity, human

[15] This number corresponds exclusively to deaths reported in an international disaster database. The actual number of deaths in this period is likely to be higher, as disaster statistics are often incomplete.; Centre for Research on the Epidemiology of Disasters (2022). EM-DAT: The International Disaster Database.

[16] United Nations Office for the Coordination of Humanitarian Affairs (OCHA) (2019). *Cameroon / Chad: Floods - Oct 2019*.

[17] International Federation of Red Cross and Red Crescent Societies (IFRC) (2021). *Final Report Chad: Floods in N'Djamena DREF n. MDRTD018*.

[18] Centre for Research on the Epidemiology of Disasters (2022).

Box 1-2

Root Causes of Fragility, Conflict, and Violence

There are five core drivers of FCV in Chad. First, hyper-centralized, fractured, and non-inclusive governance, which reduces democratic and political space, impedes government effectiveness in the delivery of basic social services and fuels rebellions. Second, regional imbalances, with limited public spending outside of N'Djamena, and the exclusion of youth and women from public life weaken state legitimacy and heighten divisions between groups. Third, elite capture, poor governance, and low local participation in the oil sector have negatively impacted social and human capital investments and resulted in grievances. Fourth, dysfunction in the security sector, which creates tensions with the public, and a weak justice sector, which is not optimally independent from the executive branch, prevent the effective mitigation and resolution of conflicts, particularly between communities. Finally, intercommunal tensions are exacerbated by increasing natural resource scarcity and climate change. Due to the lack of land governance and access to justice, these tensions have slowly crystallized along identity and ethnic lines, which makes them more complex to resolve.

There are several external factors that significantly heighten the country's fragility. The main external factors are: (i) regional conflict spillovers and forced displacement; (ii) geopolitical influence; (iii) the activities of transnational criminal groups; and (iv) climate change.[a] Chad is a landlocked country surrounded by instability along its borders. Armed conflicts and protracted instability in Sudan, Libya, CAR, Nigeria, and Cameroon periodically spill over into Chadian territory, creating episodes of forced displacement. These conflict zones along Chad's borders also host armed rebel groups, which use them as their rear bases. Moreover, the various groups that have competed for power throughout Chad's history have resorted to external actors for support. For its part, Chad has benefited from substantial military support, resulting in the country emerging as a strong military power in the region.

Chad's porous borders have favored the development of transborder criminal markets for, in particular, arms, drugs, and migrant trafficking.[b] The trafficking of migrants increased dramatically in 2011 with the fall of Muammar Gaddafi in Libya, with parts of the Libyan war arsenal ending up in the hands of Boko Haram. Chad has not made much effort to improve its resilience to climate change, despite it being one of the most vulnerable countries in the world to climate risks. Chad's households are highly dependent on agriculture and livestock for their livelihoods, which makes them extremely vulnerable to climate change. Furthermore, limited access to resources such as land and water has exacerbated conflicts between farmers and pastoralists.

Poor accessibility between and within districts has created a disconnect between these areas and the country's main cities while heightening feelings of exclusion. Chad's vast territory and poor infrastructure have compounded the exclusion of communities, particularly in remote areas, limiting their access to basic administrative and security services, resulting in widespread insecurity. This has created feelings of resentment and exclusion among the population, leading to public mistrust of the state, and made the population vulnerable to rebel and opposition groups' propaganda. Moreover, the discovery of natural resources such as oil and gold in the southern and northern parts of Chad, respectively, have accentuated regional imbalances and feelings of discontent among the people, who have yet to see any benefit from the exploitation of these resources.

Rich reserves in extractive resources have been a major source of socioeconomic and political challenges while creating persistent pressure and conflict among elites and communities. Chad is highly dependent on oil[c] revenue, which has been poorly managed. It has historically been captured by elites—small groups of people within the ruling class—to consolidate their economic and political power. Elite capture of oil resources and competition within clans have spurred conflicts and armed rebellions. In addition, an inequitable distribution of oil revenues, with limited social and human capital investments, has resulted in feelings of injustice and inequality as well as grievances. The discovery of gold mines in 2012 created additional challenges and sources of fragility. Unlike the oil

(continued on next page)

Box 1-2

Root Causes of Fragility, Conflict, and Violence *(continued)*

sector, which belongs to a formal industry, gold exploitation is characterized by artisanal and small-scale mining. Massive rushes of artisanal gold miners, mainly from Chad's eastern and central regions, have fueled deadly clashes among gold miners and with local communities. These frequent clashes generate episodes of internal displacement of local populations. The lack of regulation of artisanal and small-scale mining also leads to environmental pollution and exposes miners to the risk of physical abuse, human trafficking, and smuggling. The lack of transparency and equitable distribution of oil and other natural resource rents has added to existing grievances.

Chad has been ruled by an elite coalition that has applied a highly centralized form of military, economic, judicial, and political power. This has limited democratic and political space and made room for different forms of abusive practices. It has also limited transparency in the management of the country's resources, resulting in poor public financial management. This hyper-centralized and unstable governance has fueled rebellions and grievances by weakening the social contract and reducing the effectiveness and delivery of basic social services, particularly in peripheral regions.

Source: RRA, 2021.
[a] RRA 2021.
[b] OCI 2019.
[c] Chad has the 10th largest oil reserves on the continent estimated at 1.5 billion barrels (UNECA, 2016).

health productivity, flooding damages, and damages to roads and bridges) that have been modeled from the G5 Sahel Country Climate and Development Report (CCDR) (Box *1-3*). The impact on economic output varies significantly by sector and climate scenario. The negative impacts increase over time and are higher under the dry and pessimistic climate scenarios, where all channels yield negative impacts, with the largest coming from lower labor productivity due to heat stress, followed by lower livestock yields and lower rainfed crop yields. GDP losses are higher under the low-growth scenario than under the medium- and higher-growth scenarios, as there is little or no structural transformation, and the economy continues to be dominated by the traditional agriculture sector (which is subject to larger negative shocks). These estimates are likely to underestimate the impact of climate change on GDP because (i) not all impact channels are included, and (ii) they do not include the magnifying effects of climate-induced increases in conflicts, ecosystem shifts, and migration.

Climate shocks are likely to have a large adverse impact on poverty reduction in Chad. Based on estimates of economic losses from climate shocks related to the six impact channels, Chad's poverty rate will by 2050 increase relative to the medium-growth baseline by 3.3 percentage points (pp) under the wet and optimistic scenarios and 10.6 pp under the dry and pessimistic climate scenarios, which translates to an additional 3.34 million people falling into poverty. Climate change will have a heterogeneous spatial effect in the Sahel, with higher poverty impacts in rural areas, including in some of the most vulnerable border communities in Chad. Given the large negative impact of climate change on poverty and the challenge to fully adapt to climate-related shocks, it will be critical to expand adaptive safety nets and other poverty reduction programs.

1.3. Policy Recommendations

1.3.1. *Reducing the Impact of Conflict on Growth*

Chad could benefit from strengthening natural resource governance and inter-communal

Box 1-3

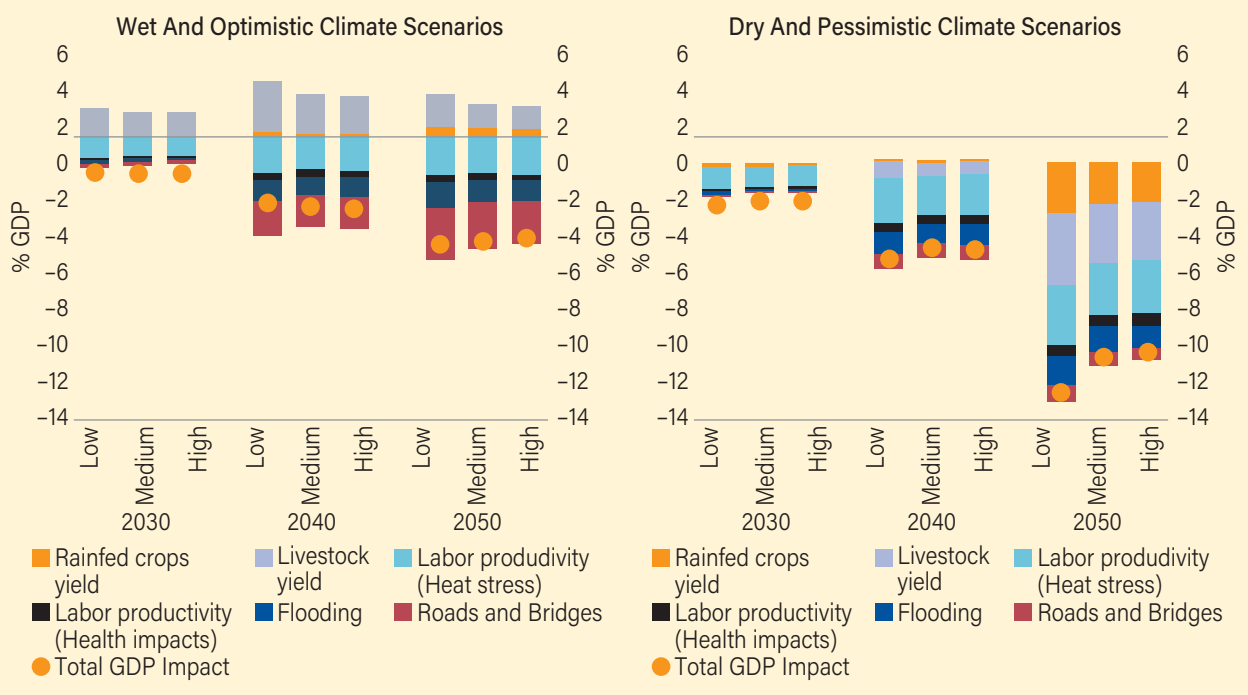
Macro-Modelling Framework for the Impact of Climate Change on Growth and Poverty

The macro-modeling of the G5 Sahel CCDR focuses on analyzing the economic and poverty impact of climate change and adaptation policies rather than modeling mitigation policies because of the severity of climate risks in Chad and the Sahel region. The modeling uses different climate scenarios, given climate uncertainty, and three growth and development baseline scenarios for each of the G5 Sahel countries, as the relative and absolute size of the economic impact will depend on the structure and income level of the economy. Each growth baseline scenario—low-growth, medium-growth, and higher-growth—is categorized by the average annual GDP per capita growth over the next 30 years (2021–2050) and by a set of assumptions on the components of growth, the speed of structural transformation, and the development narrative.

There are six identified channels through which climate change could impact growth: (i) rainfed crop yields, which will be affected by changes in rainfall patterns, increasing evaporative (water) demands, and extreme heat as temperatures rise; (ii) heat and labor productivity, as higher temperatures in the Sahel will lead to more heat stress, reducing the productivity of outdoor labor; (iii) heat-related human health shocks, as higher temperatures, in addition to causing direct labor productivity losses from heat stress, can indirectly reduce labor productivity through increased morbidity and mortality due to disease (e.g., malaria, dengue, diarrhea, and respiratory and cardiovascular heat-related diseases); (iv) livestock yields, as climate change will affect livestock yields and revenues because of reduced availability of pastures to graze and greater heat stress on animals from temperature and precipitation changes; (v) inland flooding events that damage infrastructure and physical capital, which in turn negatively affects economic activities; and (vi) roads and bridges, as changes in precipitation, temperature, and flooding can cause damages to roads and bridges, which in turn increase annual maintenance costs for these infrastructure assets and create delays for passengers.

Figure 1-17

Annual GDP Loss (% deviation from the baseline) from Six Impact Channels, with No Adaptation



Source: G5 Sahel CCDR 2022.

reconciliation. This would help mitigate intercommunal tensions that are exacerbated by increasing natural resource scarcity and climate change, and it would help channeling natural resource revenue toward productive investment. The authorities could do this by: (i) developing a national land and natural resource policy to ensure effective, sustainable, and equitable use of land and natural resources, with the aim to enhance social development and accelerate economic growth; and (ii) securing transhumance routes and strengthening the capacities of traditional and local bodies to better manage or prevent conflicts related to land and natural resources.

Despite the uncertainty attached to the current political transition, Chad's transitional authorities and international partners could use this period as an opportunity to engage in a constructive policy dialogue aimed at creating a more inclusive growth and development model for the country. Chad could leverage the finalization of the National Development Plan (NDP) and the valuable insights gained from the national inclusive dialogue and the new Country Engagement Note to bring all its partners together and formulate an approach to address the structural causes behind FCV in Chad and build the foundation for a sustainable peace. The authorities could: (i) fully implement the political program of the transitional government and develop the key priority areas identified during the 24-month transition before the elections scheduled for end-2024; (ii) move forward on the decentralization process to strengthen local governance; (iii) prioritize the fight against corruption and impunity; (iv) improve public sector administration by establishing a transparent and efficient budgeting process; and (v) support and strengthen the role of civil society in holding the government accountable.

1.3.2. *Strengthening Climate Resilience*

In the context of climate change, Chad needs to make significant adaptation investments and take measures to make growth more sustainable and resilient. The G5 Sahel CCDR provides key policy recommendations around five specific areas: institutions, climate financing and risk mitigation, energy, landscapes, and cities. The recommendations most relevant for Chad include: (i) build the institutional foundations that are essential for both development and effective climate action, especially planning and monitoring of budgetary processes, managing land governance, and strengthening social protection systems; (ii) improve access to finance for resilience by leveraging digital financial services (DFS) and using regional risk pooling solutions for social safety nets; (iii) increase access to finance, including through climate insurance and risk mitigation products, and support the resilience of microfinance institutions, particularly in conflict-affected areas, to ensure wide outreach in rural areas; (iv) adopt systems for transparent monitoring of and decision-making for national budget allocations related to priority climate actions and strengthen anti-corruption initiatives; (v) leverage new private sector financing and develop the capacity, regulations, and institutions to support the preparation of projects and programs that can access global public climate funds and benefit from revenues potentially available in carbon markets; and (vi) adopt national electrification plans that scale up the development of least-cost renewable energy projects and the transmission lines needed to deliver electricity equitably.

In addition, Chad needs to strengthen resilience to climate change effects on agriculture, livestock and floods by: (i) increasing the share of irrigated land and enhancing the use of water resources; (ii) enforcing a risk-informed urban and territorial planning and building code; (iii) building institutional and financial capacity of local governments to support implementation and enforcement; and (iv) incorporating disaster and climate-related risk considerations in the public investment system.

Chad has enormous potential for renewable energy such as solar power generation. Its global horizontal irradiation is 5.8 kWh per m^2 per day in the south and 6.8 kWh per m^2 per day in the north.

Hydropower also represents an important source of renewable power, with numerous water basins and lakes with hydropower potential such as Lake Chad. Solar photovoltaic and wind power are rapidly increasing, but still represent less than 5 percent of generated electricity. The continuous decline in prices of solar and battery storage technologies represents a unique opportunity to develop these resources as part of the least-cost energy mix. Developing renewable energy sources could help address the climate impact of fossil fuel, the fiscal volatility of fuel usage for power generation, and rising costs of power production.

CHAPTER 2

Obtaining More from the Oil Sector to Increase Chad's Growth Potential

Abstract. *Chad's economy is heavily dependent on oil revenue, but oil production is projected to decline, and oil revenue management remains poor. There is room to improve the current oil stabilization mechanism. A new fiscal rule could establish a general fund designed to house the non-budgeted surplus, which is the difference between budgeted oil taxation and oil taxation generated from oil sales. This would help to guarantee budgetary sustainability and limit additional debt accumulation, thereby ensuring the stabilization of the national economy in the short and medium term. Assets from the general fund could be invested in judicious investments to generate additional wealth. Chad should also consider options to mitigate its carbon emissions from the oil industry.*

2.1. Oil Revenue Context

Harnessing the petroleum sector for fiscal stability remains a priority for Chad's long-term development strategy. Over the past two decades, oil revenue has been a major driver of Chad's economy, representing an average of 85 percent of total exports and 40 percent of total government revenue.

Procyclical fiscal policy and the absence of a consistent approach to oil revenue management have left Chad vulnerable to volatility and exogenous shocks. Many resource-rich economies have used resource revenues to boost procyclical spending, particularly during an oil price boom. Chad has been no exception. Past attempts at managing oil revenue helped to increase transparency in fiscal policy but were overall insufficient to achieve a fiscal stabilization function. The first oil revenue management mechanism was established at the outset of the Chad-Cameroon pipeline project. It was designed to cushion against oil price volatility and support inter-generational equity (Box 2.1). By design, it only covered direct oil revenue (royalty and pipeline dividends). This arrangement was modified over the years: in 2006 to dispense of the inter-generational function, in 2007 to include indirect revenue from resource rent and corporate income taxes, and in 2014 to dispense of the stabilization function, making the mechanism a transparency tool only. Therefore, no fiscal buffers were in place to cushion the effect

Box 2-1
Oil Revenue Management in Chad

An oil revenue management law (Law 001/PR/1999) was designed at the outset of the Chad-Cameroon pipeline project. The independent *Collège de Contrôle et Surveillance des Revenus Petroliers* was tasked with monitoring expenditures financed by oil revenues. The mechanism was built around expected direct oil revenue, namely royalties from the sale of oil, and dividends from the government's participation in the two transportation companies (TOTCO and COTCO) that own and manage the Chad-Cameroon pipeline. In 2007, indirect oil revenue from resource rent and corporate rent taxes were added to the scope of application of the oil revenue management law, and the role of the *Collège de Contrôle et Surveillance des Revenus Petroliers* was expanded accordingly. In 2014, triggered by the tightening fiscal space, a new revenue management law was promulgated (Law 002/PR/2014). However, without a stabilization or saving function, Law 002 simply became an earmarking mechanism to channel oil revenue to a list of priority sectors. Unexpected oil revenue shortfalls following the oil price shock in 2015 led Chad into a severe fiscal and economic crisis, including illiquidity, debt distress, and severe recession.

Source: Second programmatic economic recovery and resilience development policy grant (P168606).

of revenue shortfalls triggered by the 2015 oil price shock. The government had no choice but to absorb the full extent of the shock through large expenditure cuts and arrears accumulation. The resulting recession and shortfall in revenues put severe strains on public finances, ultimately rendering the government illiquid and public debt unsustainable. These budgetary problems were exacerbated by the tense security situation, resulting in instability and an increased influx of refugees, and the severe drought, resulting in food insecurity.

To strengthen the government's fiscal policy tools, an oil revenue management mechanism incorporating a stabilization function was reestablished in 2019. Law 0040/PR/2019 on the Smoothing of Petroleum Prices and Production, which incorporates the new oil revenue management mechanism, was enacted on November 27, 2019. Its key policy objectives were to set aside oil revenues to cushion the fiscal impact of unexpected oil revenue shortfalls. It features a 'saving rule,' in which the government saves parts of its oil revenues during periods of high oil prices, a 'spending rule,' in which the government uses savings when actual oil revenue falls short of budgeted oil revenues by 10 percent or more, and a formula for estimating oil revenue for budget purposes (Box 5.2). Although the stabilization mechanism contributed to cushioning the effects of oil revenue shortfalls triggered by the sudden onset of the COVID-19 pandemic, it was not designed to insure against a major domestic and global economic crisis. The government is currently implementing this mechanism in this regard; it replenished the Fund by CFAF 10 billion in 2022 thanks to increasing in an oil price increase.

2.2. Leveraging the Petroleum Sector for Fiscal Sustainability

Chad has developed its oil sector under particularly difficult conditions: extremely low levels of human and physical capital, civil war, absence of basic infrastructure in oil-producing regions, and its landlocked status. Oil was first discovered in Chad in the 1970s, and in 1988 the government granted a 30-year concession to a consortium of several companies led by Esso. Construction of the country's oil infrastructure began in the 2000s, and production and exports began in 2003. As a result, Chad's GDP per capita jumped from US$220 in 2002 to US$1,024 in 2003. Its GDP per capita was

Box 2-2
The 2019 Oil Revenue Stabilization Mechanism

The Government of Chad has established an oil revenue management mechanism with the following objectives: (i) setting aside oil revenues to cushion the fiscal impact of unexpected oil revenue shortfalls; and (ii) insuring against the risk of unexpected oil revenue shortfalls beyond 10 percent of budgeted oil revenues. Based on historic oil prices, such shortfalls roughly correspond to oil price reductions greater than US$5/bbl (ceteris paribus), an event that occurs with an estimated probability of 19 percent. About half of all oil price reductions historically have been greater than US$5/bbl.

The mechanism consists of a stabilization fund with a (i) saving rule, (ii) spending rule, and (iii) formula for estimating oil revenue in the budget:

a. Stabilization Mechanism: Saving Rule (inflows)
   - An annual amount of CFAF10 billion shall be paid into the Stabilization Fund through quarterly payments.
   - In addition, if actual exceed budgeted petroleum revenues, 20 percent of this difference would be paid into the fund up to a maximum of CFAF 10billion. *Therefore, the minimum inflow per year is CFAF 10 billion and the maximum is CFAF 20 billion.*
   - The maximum balance of the fund is capped at CFAD 40 billion. *In absence of withdrawals, the fund will reach full capacity over a period of minimum 2 years and maximum 4 years.*
   - The maximum balance of the fund can be increased after 2 years of implementation by the Minister of Finance and Budget.

b. Stabilization Mechanism: Spending Rule (outflows)
   - Withdrawals from the fund occur automatically when actual oil revenues fall short of budgeted oil revenues by 10 percent or more.
   - Oil revenue shortfalls up to 10 percent of budgeted oil revenues will be accommodated through an expenditure adjustment.
   - Any shortfall beyond 10 percent of budgeted oil revenues will be compensated subject to availability of resources in the fund.
   - The fund may only be used to finance expenditure budgeted in a given fiscal year. It may not be utilized for the satisfaction of any sovereign or commercial debt of the government, and no legal or beneficial interest in the fund may be created.

c. Criteria for Estimating Oil Revenue in the Budget:
   - Budgeted oil revenue is estimated using conservative assumptions: Oil prices will be at least an estimated US$3/barrel below the price of crude oil published in the World Economic Outlook by the International Monetary Fund. The volume of production will be set at least 10 percent below the production volumes estimated by petroleum companies operating in Chad.

Source: Second programmatic economic recovery and resilience development policy grant (P168606).

US$743 in 2022, well above other low-income countries (although still far from the Sub-Saharan African [SSA] average).

Many factors affect Chad's ability to leverage the benefits derived from the exploitation of petroleum resources. Some of these factors are exogenous such as oil prices and the cost of equipment and materials, while others are internal such as efficiency gains, attractiveness to investors, and good governance. The petroleum sector could be used to reduce Chad's exposure to price and production-related shocks, as well as to lay the basis for a more

diversified economy, which in turn would increase resilience in the face of exogenous shocks and economic cycles, create productive jobs, and lay the foundation for sustainable and inclusive growth. A recent study carried out by the World Bank suggests that a clear sector policy, competent and well-funded institutions, and effective oversight processes are critical priorities to achieve these outcomes.[19]

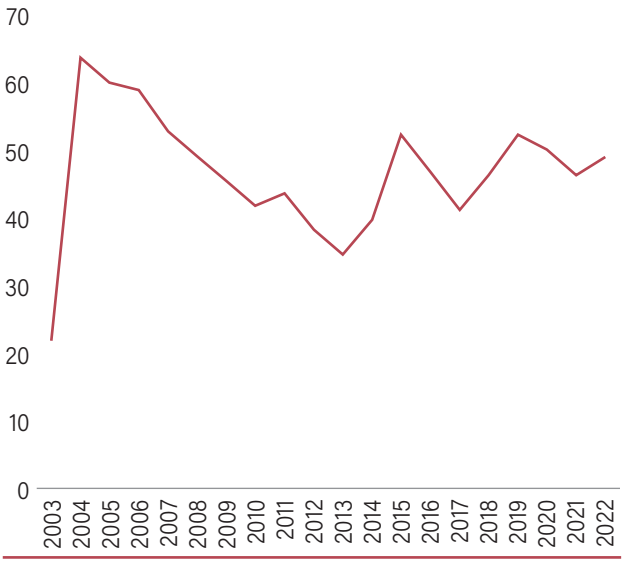
2.2.1. *Overview of the Petroleum Sector*

Prospectivity and Production

Chad proven petroleum system is modest, with a large basinal area for further exploration, but its resources are difficult to fully exploit. According to industry experts, Chad may hold around 10 billion barrels of crude oil (bbls) that is potentially recoverable and 20 trillion cubic feet of potentially recoverable gas in yet-to-find conventional resources, which suggests that further discoveries should be possible. In addition, about half of original proved reserves of 1.5 billion bbls have reportedly been produced from the production licenses in the Doba basin,[20] and undeveloped but discovered oil in place is estimated at 475 million bbls of oil equivalent, of which about 160 million bbls of oil equivalent could be considered as contingent resources.[21] However, investor appetite to explore these basins remains modest (major oil producers such as Esso have pulled out of Chad's oil production), given the distance from infrastructure, security risks, and commercialization challenges.

Since the start of production in 2003, oil output has been steadily declining (Figure 2-1). Chad currently produces around 92,000 bbls per day, produced by three operators: the recently created Chad Petroleum Company (SPT),[22] CNPCI, and Perenco. Production reached an all-time high in 2004, with over 200,000 bbls per day, but it was short-lived. All production is located within the three sedimentary basins of southern Chad: Doba, Doseo, and Bongor. The fields associated with the Doba concession have been declining steadily, and now represent only a small portion of total production. Production from fields that have come onstream since 2014 has not been sufficient to efficiently utilize the Chad-Cameroon pipeline, which has a capacity of 250,000 bbls per day.

Figure 2-1
Chad's Oil Production in Millions of Barrels per Year



Source: Chad's authorities.

A broad range of investors usually results in more sustainable sector development. Companies with acreage in Chad include major multinationals and small independent companies that hold petroleum rights under more recent production sharing contracts (PSCs). While large companies have the financial capacity to undertake all and any

[19] Chad Petroleum Sector Diagnostic Report, Energy and Extractives Global Practice 2019.

[20] Actual available proven reserves could be substantially less than reported as Chad's data on proven reserves do not always account for the entire oil already produced.

[21] Contingent resources are volumes that, while discovered, have not yet been shown to be commercial, possibly reflecting insufficient expected production volumes, lack of infrastructure, and/or other factors such as low oil prices.

[22] SPT is a state-owned enterprise created in April 2023 to manage Exxon's participating interests in the Doba concessions, Chad-Cameroun pipeline, and FSO. The measure was taken by the government after a contested transfer of interest from Exxon to Savannah Energy.

operations required to identify and produce hydrocarbons, they tend to manage their projects following a global portfolio logic, which at times might result in prioritizing projects outside of Chad. On the other hand, smaller players tend be dynamic and less burdened by bureaucracy. These companies are usually upstream focused. Some companies specialize in exploration to sell all or a part of their interests once a promising target is identified, while others specialize in tail-end production. Independent companies are keenly focused on their acreage because it is all or a substantial part of their portfolio. However, they usually lack the financial capacity to execute all phases of their projects. In addition, the government's March 2023 decision to stop the ownership transfer of oil assets from Exxon Mobil to a smaller oil producing company (Savannah Energy) by the nationalization of these assets highlights the challenges around using small oil production companies. The participation of a broader range of companies could lead to more consistent development of Chad's oil sector.

Contractual Framework for Petroleum Operations

Petroleum activities in Chad are carried out under concession agreements or the more recent PSCs. In the oil and gas sector, exploration, development, and production rights in a particular area or block are granted by host governments to investors by means of concessions, PSCs, or service and risk service contracts. In Chad, all exploration and production rights issued since 2007 have been through PSCs. In both concessionary and contractual systems, the investor assumes all risks and costs associated with the exploration, development, and production of hydrocarbons, and it receives compensation adequate to the risk. In general terms, the higher the risk of investment activities in a country, the higher the portion of the rent received by the investor. The fundamental difference between concessionary and contractual systems relates to the ownership of the natural resources, which affects the rights and obligations of the parties and their ability to dispose of these rights. Under a concessionary system, the title to hydrocarbons passes to the investor at the wellhead, while under a contractual system the investor acquires the ownership of its production share only at the delivery point. The key features of concessionary and PSC systems and their application in Chad are summarized in Table 2-1.

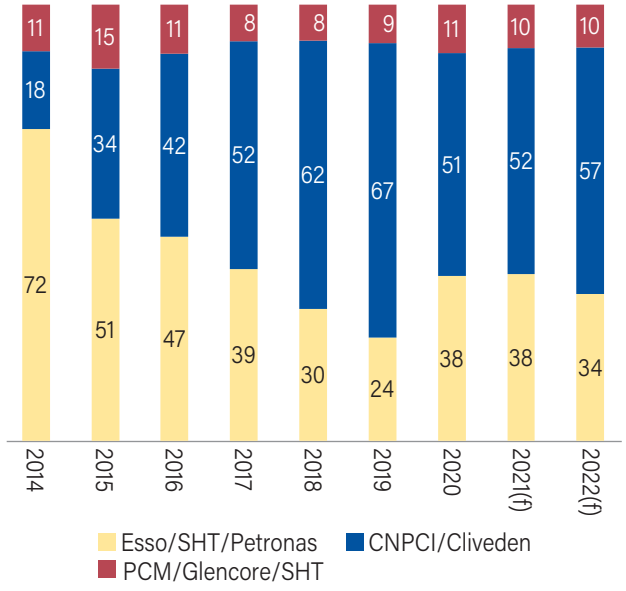
Table 2-1

Concessionary and Contractual Systems: Practices in Chad

Topic	Concessionary System	PSC System	Practice in Chad
Ownership of nation's resources	The nation and/or the state in federal systems	The nation and/or the state in federal systems	State
Title transfer point	At wellhead	At export point	As per standard practice in the respective systems
Company's entitlement	Gross production less royalties	Cost of oil/gas plus profit oil/gas	As per standard practice in the respective systems
Ownership of facilities	Investor	State	State once amortized
Management and control	Typically, less host government control	Most direct host government control and participation	Similar level of control and participation in both systems
Government participation	Less likely	More likely	The national oil company participates in both systems

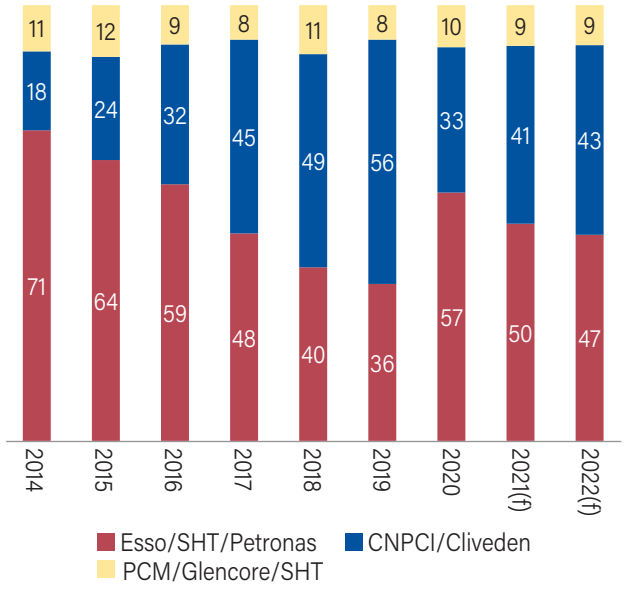
Source: Petroleum Sector Diagnostic Study, World Bank, 2019, and Fiscal Systems for Hydrocarbons, World Bank, 2007.

Figure 2-2
Oil Prodution by Oil Company, 2010–22 (%)



Source: World Bank calculations using ITIE Chad 2022 data.

Figure 2-3
Oil Exports by Oil Company, 2014–22 (%)



Source: World Bank calculations using ITIE Chad 2022 data.

2.2.2. *Chad's Petroleum Operators*

International oil companies play an important role in the exploration, production, and refining of crude oil in Chad. Before the creation of SPT, Exxon was the operator of the Doba fields' consortium, the first of Chad's oil producing assets. Production from these fields has been steadily declining since 2005. The original consortium included Exxon (40 percent), Chevron (25 percent), and Petronas (35 percent). Chevron sold its participating interests to the Société des Hydrocarbures du Tchad (SHT) in 2014 and Petronas in 2022. In 2022, Exxon transferred its interest to Savannah Energy, a small independent company that focuses on mature oil fields. However, the transfer was contested by the Government of Chad, on procedural and technical grounds, and the assets were nationalized in April 2023. Another consortium led by CNPCI is currently the leading oil producer in the country. CNPC also holds a 60 percent interest in the SRN refinery, which receives crude oil from Block H.[23] Petro Chad Mangara, a wholly owned subsidiary of Perenco, operates the Badila and Mangara fields in southern Chad (previously operated by Glencore), and it has recently started producing natural gas-generated power at the Moundou Power Station. OPIC Africa is the operator of a small oil field—the Oryx—whose production peaked in 2022.

In addition to international companies, Chad's national oil company (SHT) is important

[23] CNPCI has the right to supply the refinery with crude oil by withdrawing from Block H or any other oil fields held by CNPCI and/or its affiliates in Chad. The state has pledged to provide sufficient crude oil, including in-kind royalties and its share of oil profits, to SRN for it to process and generate electricity, which in turn is supplied to SNE (in excess of SRN's operational requirement), fuel, and by-products to the state. In accordance with the memorandum of understanding signed on January 7, 2018, between the state, SHT, CNPCIC, Cliveden, and SRN, the state and SHT undertake to sell during the period from January 1, 2018, until December 31, 2023, between 3.8 and 4.3 million barrels at the national refinery (SRN) at a fixed price (46.85 dollars). The equivalent of the sales is allocated to the payment of transport costs and the purchase of refined products to produce electricity, and the remaining amount goes to the Treasury.

Table 2-2

Chad Fiscal Parameters by Contract – Producing Concession Arrangements

Concession	Doba			Permit H	
Ownership	SPT (optr, 40 percent), SHT (60 percent)			CNPC International (100 percent)	
Convention	1988		2004	Phase 1	Phase 2
Fields	Nya, Moundouli	Komé, Miandoum, Bolobo	Maikeri, Timbré	Ronier, Mimosa (sold to NRC refinery)	Na, Oryx
Government Royalty	12.5 percent oil, 5 percent gas		14.25 percent oil	0 percent	13.5 percent oil
Statistical Royalty	1.0 percent		1.5 percent	na	na
Corporate Tax	50 percent	60 to 65 percent	50 to 65 percent		40 to 50 percent

Source: Adapted from Petroleum Sector Diagnostics 2019.

for the development of the country's oil sector and ensuring the government's share of oil production. SHT's objectives are: (i) the exploration, research, development, production, and transportation by pipeline of liquid and gaseous hydrocarbons; (ii) the refining, transportation, storage, and distribution of finished products; and (iii) the marketing of hydrocarbons and finished products.

2.2.3. *The Fiscal Regime for Petroleum Operations*

The fiscal regime for oil and gas operations in Chad is intertwined with the type of contractual arrangement: concessionary (also called tax and royalty) and production sharing contacts. Petroleum activities are subject to a great variety of tax instruments. These include taxes that apply to all sectors of the economy and taxes that are specific to the oil industry. In addition, there are non-tax forms of rent collection such as surface fees, bonuses, and production sharing. Special provisions are often included in petroleum fiscal regimes to modify the timing or magnitude of revenue appropriations. These provisions are normally intended as incentives designed to attract investors, accommodate unique attributes of a petroleum asset, or influence the choices of investors toward specific public policy goals. The Treasury is the main body responsible for collecting and managing taxes paid to the central government. The main features of these two types of regimes are summarized in Annex Table B-1, while Table 2-2 shows the key fiscal parameters by contract.

Chad's government take is comparable to that of countries with similar geological and investment conditions. Figures 2-4 and 2-5 compare Chad with other established producers. The World Bank (2019) assessed the relative efficiency of existing fiscal terms in capturing economic rent under different scenarios and included concessionary systems, even if this type of arrangement is no longer available for new companies entering the country. It revealed that the efficiency of concession and PSC arrangements was comparable at different price and cost levels, with concessions slightly more regressive than PSCs, and PSCs providing a slightly lower government take.[24] Under the PSC, the government

[24] While concession's R-Factors and corporate tax rates compare to those used in the PSC and for Profit (Tax) Oil sharing, the corporate tax is deemed to come out of the tax oil share. Moreover, under a PSC regime, SHT participation is carried (i.e., all exploration costs are paid for by the contractor and only repaid by SHT (in equity proportion) if a discovery is made and developed).

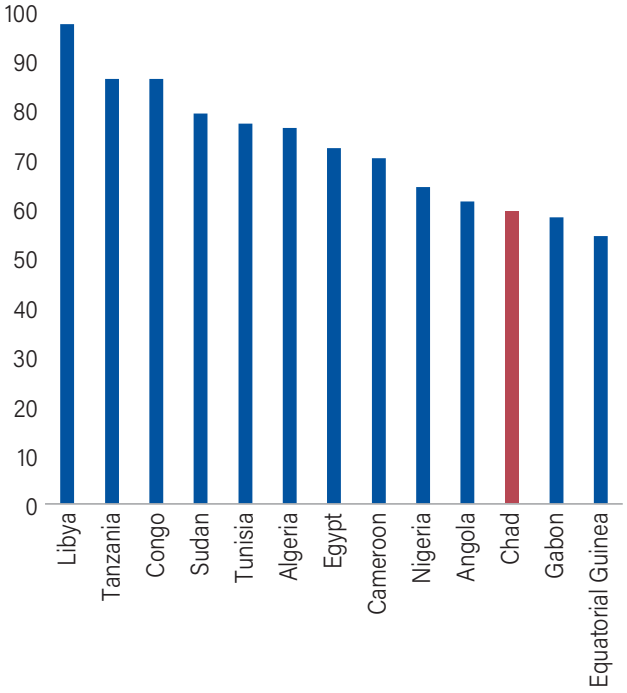
Box 2-3
Legal Regimes in the Oil Sector

Chad's oil sector is marked by the cohabitation of two legal regimes. The first is the concession regime (CC), which is applicable to companies established before 2007 and is governed by Ordinance n°007/PC/TP/MH of February 3, 1962, and Law n°001/PR/1999 of January 11, 1999, on the management of oil revenues, as amended by Law n°002/PR/06 of January 11, 2006. This regime is designed as a hydrocarbon exploitation concession agreement granted by the state to a consortium for a specific commercial field in the contractual zone. The parties mutually agree on the perimeter of the concession before it is granted. The government cedes control of the oil field to the consortium in exchange for the payment of a production royalty (usually paid in-kind) in addition to the corporate income tax.

The second legal regime is the PSC regime that has been applicable to companies since 2007. This is governed by Law n°006/PR/2007 of May 2, 2007, relating to hydrocarbons; the implementing decree of the Petroleum Code n°796/PR/PM/MPE/2010 setting out the terms and conditions of application of Law n°006/PR/2007; and Ordinance n°001/PR/2010 amending Law n°006/PR/2007 and approving the standard PSC. The regime is designed as an agreement between the operator of a given block and the government (or its agent), under which the former assumes the expenses and risks associated with the exploration and exploitation of the resource in return for future production. The PSC regime recognizes that the legal ownership of natural resources remains with the government.

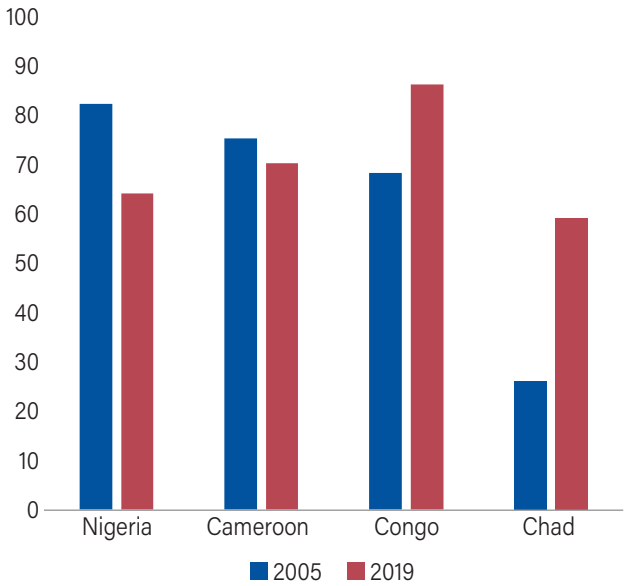
Source: Authors.

Figure 2-4
Main African Oil Producers as of 2021 – Government Take (%)



Source: World Bank 2019, Chad Petroleum sector diagnostic report.

Figure 2-5
Evolution of Government Take (%) of Chad and Its West and Central Africa Neighbor 2005–2019



Source : (1) 2005 data are from Leenhardt B « fiscalité pétrolière au sud du sahara : la répartition des rentes » De Boeck Supérieur « Afrique contemporaine » 2005/4 n216| pages 65 to 86. (2) 2019 data are from World Bank 2019 « Chad Petroleum sector diagnostic report).

take [25] ranges from 60 to 70 percent in Chad, which is similar to that in Cameroon, Nigeria, and Angola, but below the regional average. The sustainable level of a government take at any point in time is a function of the geology and the size and productivity of a field; the historic success rate of operations; the costs of operation in the country (or in a basin/area of the country where there is variability); the price of oil and gas; the attendant enthusiasm of both oil and gas companies and the financial sector to invest in oil and gas projects; the ease or complexity of undertaking operations in a country; and the alternatives for oil and gas companies. Therefore, the optimum level of the government take will vary over time, making it important to adopt flexible fiscal regimes similar to those applicable in Chad.

Even under efficient laws and fiscal regulation, difference of interpretation or tax gaming will occur if little to no oversight is exercised by the competent authorities. Although both PSCs and concession agreements grant the state the right to audit petroleum operations, this is seldom done. Capacity and funding constraints are often cited as impediments to carry out audits. Customarily, the state's audit rights would extend back 5 years, making it imperative for governments to carry out timely audits to ensure their right to protect the state's interests. A risk assessment should guide what to audit, which ideally requires the design of a risk strategy for auditing enterprises. A comprehensive integrity system requires multiple types of audits, including physical, price, cost, and compliance audits. Combined with field-level economic modeling, regular audits are essential to ensure that revenue from oil and gas activities is mobilized in accordance with the applicable legal and contractual framework.

2.2.4. *Mitigating the Climate Impact of Chad's Oil Sector*

Chad's oil sector is a major contributor to the country's carbon emissions. The authorities could mitigate these emissions it by adopting reforms to reduce the environmental footprint of the oil and gas sector, including regulating gas flaring and methane emissions, waste management, and produced water management. The government should also explore creating a strategy to transition out of fossil fuels to avoid stranded assets. According to the World Bank (2020), there are opportunities to leverage the oil and gas sector such as: (i) exploiting advanced data management (e.g., identifying a new business segment to integrate sustainable development variables in the oil and gas sector); (ii) repurposing water used in the oil production process; and (iii) using existing petroleum infrastructure for other strategic industries.

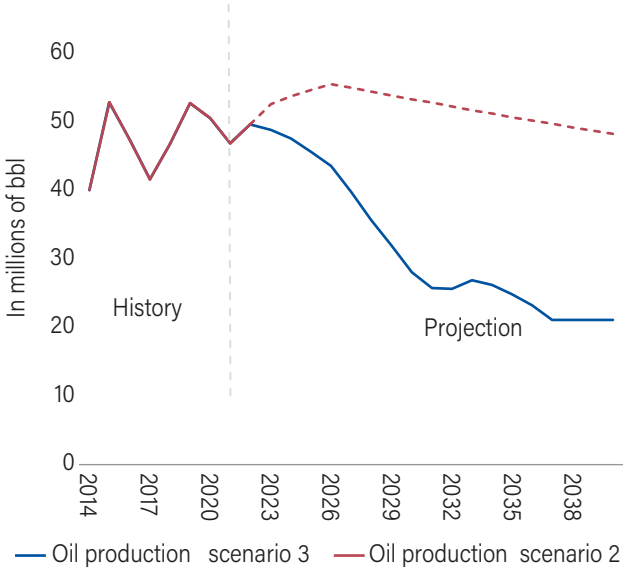
The government should work with oil and water companies as well with local communities to identify ways to use produced water (a byproduct of oil and gas production) for irrigation to increase agricultural productivity. Leveraging oil sector-related investments through shared-use could help narrow the gap in public infrastructure funding. Moreover, Chad could exploit natural gas and renewable energy to promote low-carbon electricity generation as part of its strategic objective to increase access to electricity and promote climate-smart growth.

2.3. Options for Improved Oil Revenue Management

The country's high dependency on the oil sector and the absence of an adequate oil revenue management mechanism have left the country vulnerable to oil price volatility and exogenous commodity price shocks. The design of adequate fiscal rules is crucial to obtain concrete, sustainable, and efficient benefits from the oil sector in a context of gradually declining oil production.

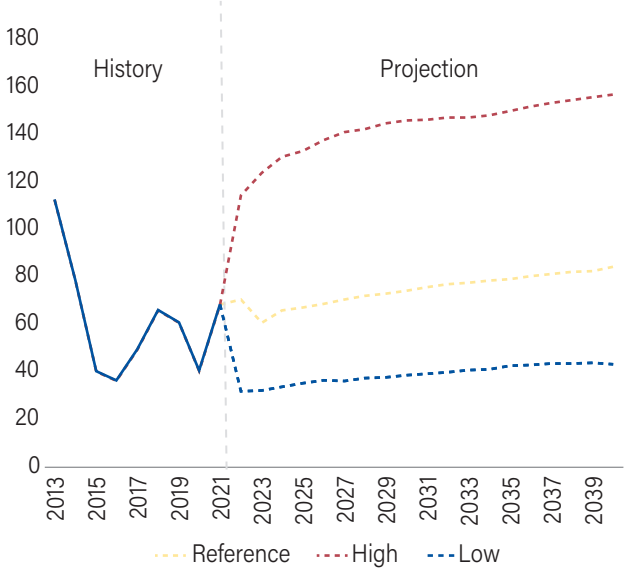
[25] Government take is the government's royalty, special petroleum taxes, profit oil, and corporation taxes as well as bonuses, rentals, and other charges levied on a contract. Its definition (at least in comparing percentages between countries) usually excludes customs duties, VAT, and employments costs and levies where these apply. However, these sources of revenue are often not negligible. The state take includes the government take and revenues from direct participation by the national oil company (SHT in Chad).

Figure 2-6
Oil Production and Exports Forecast, 2014–2040



Source: National authorities and IMF; World Bank for projections.

Figure 2-7
Oil Price Forecast, 2013–2039



Source: U.S. Energy Information Administration; World Bank for projections.

There are different levels of intervention through which oil revenue management could be improved, including from the government expenditure and revenue sides. From the expenditure side, the government could constrain public expenditures to prevent overspending of oil revenues on non-productive expenditures. The idea would be to convert depletable resources into long-term non-oil capital capable of generating revenues after the resource is depleted. A second option would be to focus on the revenue side and work on disconnecting total revenue and the oil cycle, leaving enough fiscal space for the allocation of expenditures. This could be done by creating an oil stabilization or savings fund to accumulate oil revenues during upturns to ensure there are adequate fiscal resources available during downturns. Regardless, the authorities need to adopt relevant good governance practices to reduce the risk of elite capture of oil rent.

There have been various attempts to create an efficient oil revenue management mechanism in Chad, but all have had limited success (Box 2.1 and Box 2.2). There is room to improve the current oil stabilization mechanism, which was developed in 2018–19 with World Bank support under the programmatic economic recovery and resilience Development Policy Financing series. It was created when oil prices were recovering following the 2015 oil price shocks, which had led to a fiscal deficit and severe economic recession in Chad. The key objective was to increase transparency.

The country's current stabilization mechanism has limitations. The fund was designed to cushion fall in real revenue compared to budgeted revenue in excess of 10 percent, which had a 15 percent cumulative probability of occurring based on the data series up to 2018. As a result, the size of the fund was set at CFAF 10 billion per year, with a maximum of CFAF 20 billion, which is very small compared to the type of shocks that impacted Chad's oil revenues in the past. For example, shocks in 2014 and 2020 resulted in a fall of oil revenues by about CFAF 400 billion and CFAF 180 billion, respectively. At its maximum, the fund is unable to cover even 20 percent of the country's needs. Moreover, budgeted

oil revenue is estimated using at least US$3/bbl below the price for crude oil published in the World Economic Outlook, and the volume of production is set as at least 10 percent below the production volumes estimated by petroleum companies operating in Chad. However, since 2015, oil prices have followed a different trajectory than what is used by the fund. Lastly, a stabilization fund cannot consider long-term investment needs to increase a country's growth potential.

2.3.1. *Oil Market Context and Assumptions and Fiscal Management*

This CEM focuses on interventions on the revenue side and uses a simulation model to evaluate the impact on Chad's economy of an improved oil revenue management mechanism under alternative oil price and production trajectories. To identify and calibrate an adequate and effective oil revenue management mechanism, the simulation is based on the World Bank's macroeconomic and fiscal model (MFMod) standalone for Chad, incorporating the main economic dimensions and core assumptions of MFMod.[26] The model covers the performance of the Chadian economy between 1990 and 2021, and it includes projections covering the period 2022–40.

The projections are formulated around three common assumptions related to the oil sector and based on three general assumptions. There are two oil production assumptions. First, the baseline, which consists of producers' oil production projections, assumes no new fields will be discovered and exploited, resulting in a sharp decline in oil production. Second, a 1 percent reflecting a new wave of exploration and development investment.[27] Oil taxation rates are assumed constant during the projection period. There are three International Energy Agency scenarios for oil price projections: reference, low, and high. Moreover, this CEM assumes two distribution scenarios: Markov switching and Random walk (see Annex B-1 for details). To transform prices into nominal quantities, the model assumes a US inflation rate of 2 percent per year, assuming that inflation will be, on average, at its target in 2022–2040.

There are additional assumptions to ease the modeling. Tax rates and non-tax revenues as share of GDP are constant during the projection period, which means that government revenues are determined by fluctuations in the tax base. Nominal interest rates on government debt are also constant, which means that interest payments depend on the outstanding public debt. Nominal wages increase at a rate that ensures a constant real public wage.

The model assesses the behavior of the economy by the impact of an oil revenue management mechanism on public expenditures, given that the objective of the fiscal rule is to increase fiscal space. Chad's expenditures are classified into two categories: inelastic and elastic expenditures.[28] Inelastic expenditures include wages and compensations as well as interest payments, and these expenditures occur regardless of the level of actual revenues. Elastic expenditures include goods and services, transfers, and capital expenditures, and they are adjusted based on changes in disposable revenues (i.e., revenues after subtracting inelastic expenditures).

2.3.2. *A New Oil Management Mechanism*

The proposed oil revenue management mechanism involves establishing a fund[29] designed to

[26] TFP: 1.12 percent; working age population: 3.62 percent; inflation: 3 percent; and real global growth of Chad's business partners (weighted average): 3.91 percent.

[27] This scenario is consistent with the average oil production decline in CEMAC countries (Cameroon, Republic of Congo, and Gabon) over the last 20 years.

[28] Campagne et al. 2020.

[29] The Revenue Regulation Fund is a domestic stabilization fund outside the budget that belongs to the Treasury and is fed by the surplus value of oil taxes. It is replenished and expressed in local currency and housed at the central bank and governed by the Ministry of Finance. The fund aims to guarantees a certain level of public expenditures relative to public revenue forecasts that depend on volatile oil prices. The aim is to ensure the stability of the economy and public finances.

house the non-budgeted surplus. The non-budgeted surplus is the difference between budgeted oil taxation and oil taxation that is generated from oil sales. The fund would be used when oil prices fall below the budgetary reference price. This will provide adequate fiscal space to counter market deficiencies, help guarantee budgetary sustainability, limit additional debt accumulation, and thus ensure the stabilization of the national economy in the short and medium term. Assets from the fund can be invested in judicious investments to generate additional wealth.

There are both revenue and expenditure gains from adopting such an oil revenue management mechanism. On the revenue side, there could be fiscal gains if oil prices are higher than forecasted in the budget and if there are any other revenues related to the operation of the fund (e.g., interest rates).[30] On the expenditure side, outflows could be driven by the regularization of the expenditure and budget balance set by the annual budget and public debt.

This CEM sets the fiscal rule based on data and information from the International Monetary Fund (IMF) Extended Credit Facility program. The fiscal rule is consistent with the current CEMAC convergence criterion on the non-oil fiscal balance. Specifically, the non-oil primary balance (NOPB), defined as the difference between (i) total government revenue (excluding grants, oil revenue, and exceptional receipts) and (ii) primary expenditure on a commitment basis (which is defined as total government expenditure minus interest payments on domestic and external debt and foreign-financed capital expenditure), equals –5 percent of GDP.

For this scenario, elastic expenditures depend on "anticipated disposable revenue," $Rev_t^{dispo}(P_t^{ant})$, which is based on the "anticipated oil price", P_t^{ant}. The anticipated oil price would be the EIA reference regime. if ($P_t^{ant} < P_t$ P_t is the realized price of oil), then the government saves the extra revenue in a fund with a remuneration of 2/100 a year. A fraction of the fund will go to an oil price stabilization mechanism up to the upper bound of the fund. This value is calibrated to cover a revenue reduction of an oil price reduction of 25 percent. The fund will reach its upper limit after N years of good prices, N being 3, 5, or 7. If $P_t^{ant} > P_t$, then the government could use past savings from the fund to cover the extra spending or, if the fund dries up, the deficit will be debt-financed.

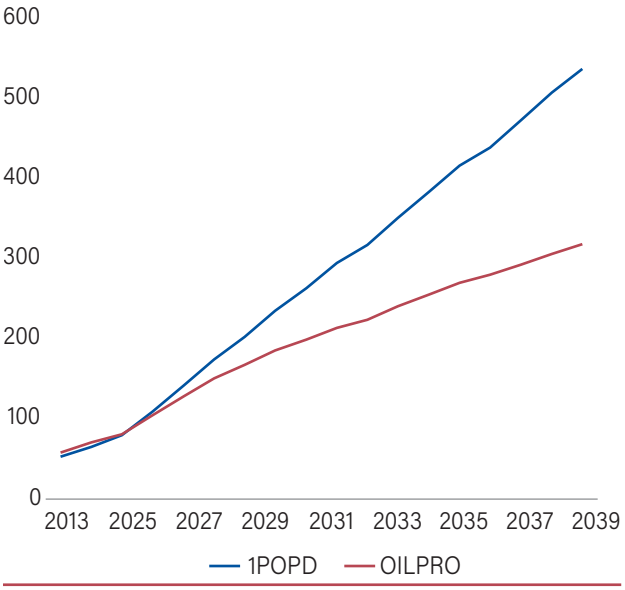
Size of the Funds

The size of the funds depends significantly on the path of oil production and oil price dynamics. Under the baseline oil production scenario, and assuming that oil prices will follow the Markov switching process (described in Annex B), the government could accumulate up to CFAF 316 billion in the funds by 2040 (Figure 2-8). The amount is lower (about FCFA 196 billion) in case the oil price follows a random walk. Under a better oil production scenario (oil production slightly decline by 1 percent starting in 2026) and if oil prices follows the Markov switching process, the government could accumulate up to CFAF 540 billion in the funds by 2040 (Figure 2-8). The amount is lower (about FCFA 280 billion) in case the oil price follows a random walk.

The size of the stabilization fund will decline over time as oil production decline. Under both oil production assumptions, the stabilization fund should contain about CFAF 143 billion at maturity in 2023–30 to smooth out budgeted spending under a 33 percent oil price shock that lasts for 18 months (i.e., two consecutive fiscal years). If the government wants to fully fund the stabilization fund over three years, it will have to save an average of CFAF 48 billion each year to replenish the fund. For a 5-year replenishment plan, the government would need to save about CFAF 29 billion a year (Figure 2-10). Under the assumption that a major shock arrives every 5 years, the level of savings in the 3- and 5-year scenarios would fully cover the shock. It is important that the central bank provides a fair interest rate to remunerate the fund. In the baseline scenario with a sharp decline in oil

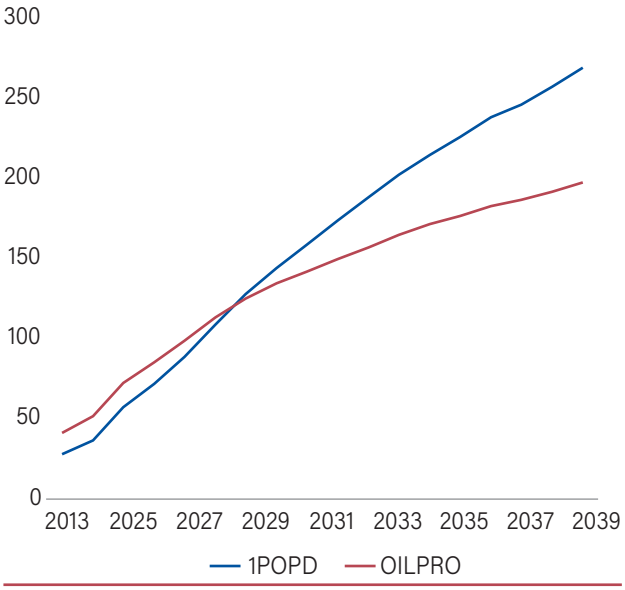
[30] These revenues could cover fluctuations in production and prices.

Figure 2-8
Fund Accumulation, 2022–40 Markov (CFAF Billion)



Source: Authors.
Note: (1) 1POPD means 1 percent decline and (2) OILPRO means oil producers scenarios.

Figure 2-9
Fund Accumulation, 2022–40 Random Walk (CFAF Billion)



Source: Authors.
Note: (1) 1POPD means 1 percent decline and (2) OILPRO means oil producers scenarios.

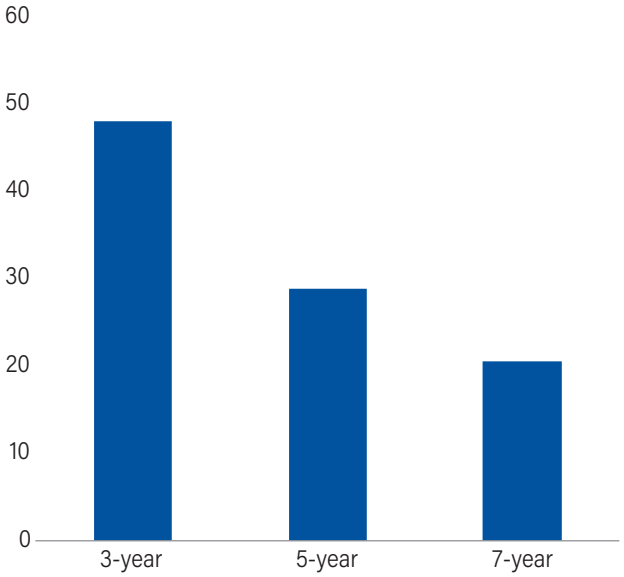
production, the size of the stabilization fund will be almost insignificant by 2040, as the share of oil revenue in total revenue could be less than 12 percent. The infrastructure fund, as a residual, will accumulate more slowly. Under baseline oil production, there will be no significant accumulation in the infrastructure fund under any price dynamic scenario in the next 10 years. In case the decline in oil production is less severe and the oil price follows an MS dynamic, an average of about CFAF 200 billion will be available in the infrastructure fund for about a decade (Figure 2-11 and Figure 2-12).

Economic Indicators under the Fiscal Rule and Savings Plan

Under the proposed fiscal management arrangement, Chad's economic variables are less volatile, while its non-oil GDP growth potential is relatively higher. Under the 3-year replenishment plan, the economy is less volatile; however, the country's non-oil GDP growth potential is lower than under the 5-year scenario. Under the 7-year replenishment plan, the economy is more volatile, but the impact on GDP growth is limited compared to under the 5-year scenario. The saving mechanism scenario generates some gains in terms of potential non-oil GDP growth up to 2024 under the baseline oil production scenario and up to 2039 under the alternative scenario. In fact, the difference in GDP growth between the three scenarios and the baseline scenario is at maximum about 0.46 points of a percentage in favor of the 5-year fiscal rule scenarios under the alternative scenario.

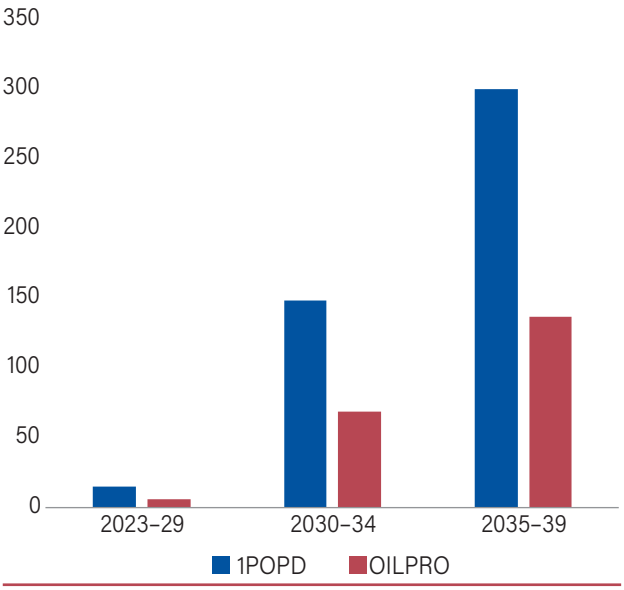
The difference in non-oil GDP growth between the proposed fiscal rule scenarios and the current fiscal rule is mainly driven by more elastic expenditure in absolute terms, resulting in higher capital investments from the imposed fiscal rule. Indeed, elastic expenditure adjusts to the anticipated oil price, which is the reference regime oil price. This is possible since the saving mechanism reduces procyclicality and ensures more available resources for elastic spending, including public

Figure 2-10
Level of Replenishment during a Good Year



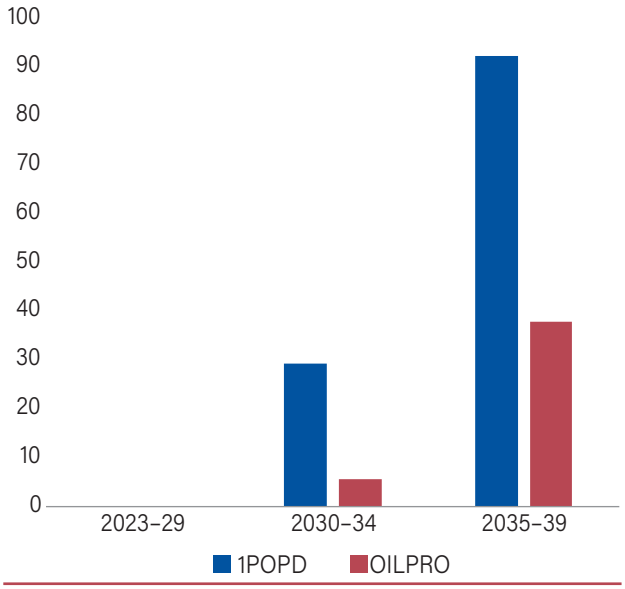
Source: Authors.

Figure 2-11
Average Available Funds in the Infrastructure Fund, 2022–40, Markov



Source: Authors.

Figure 2-12
Average Available Funds in the Infrastructure Fund, 2022–40, Random Walk



Source: Authors.

spending on investment through the infrastructure fund. As soon as the mechanism is functional, elastic spending will be higher than under the current fiscal rule.

The saving mechanism also has other benefits. It ensures greater macroeconomic stability by smoothing public spending and reduces the volatility of private investment. With the saving mechanism, debt accumulation is lower, even during periods of negative shocks, and the current account balance and inflation are more stable.

2.4. Policy Recommendations

2.4.1. *Reforming the Oil Taxation Policy to Increase the Government Share of Oil Production*

Ensure all new contracts are under the PSC regime and take steps to pursue joint venture and service contracts in the coming years. Taxation via the CC regime is generally regressive due to the balance of royalties, which taxes production irrespective

of the profitability of the project, while the PSC regime is progressive because its taxation depends more directly on the profitability of the project. Under the PSC regime, oil is owned by the state, which brings in a foreign oil company (FOC) to explore and, in case of commercial discovery, develop the resource. The FOC operates at its own risk and receives a specified share of production as reward. Thus, the main difference between the PSC and CC regime is the ownership of the mineral resource. While all crude oil produced belongs to the FOC under the CC regime, it is owned by the host government under PSAs, and the share of production allocated to the FOC can be regarded as payment or compensation for the risk taken and services rendered. In addition, companies under a CC regime do not pay a tax on oil profits, which reduces government revenues.

Invest in human capital through professional and academic training to develop a pool of knowledge around hydrocarbons and renewable energy. The government needs to develop the skills necessary to assume the responsibility of certain technical services that are required in the oil industry to ensure the operation and sustainability of oilfield assets. These services are currently outsourced to third-party contractors, who perform them for a prescribed fee under an agreement known as an oil and gas service contract.

Adopt good governance and business-friendly reforms to attract more private investment and increase competition in the oil sector. Political uncertainty and insecurity are listed as the top obstacles to business development in Chad, followed by low electricity access, high tax rates, weak tax administration, and corruption. There are still significant efforts to be made to improve governance, as Chad has been and continues to be one of the worst performers on governance indicators among low-income countries. In addition, the authorities need to improve transparency and accountability in the oil sector (e.g., by continuing to comply with EITIE rules and perform annual audits of oil sector financial reports) to reduce the likelihood of elite capture. Finally, it is critical to improve the transparency and accountability in the oil sector specifically in the Ndjamena refinery to improve it efficiency, given that its oil subsidies mechanism from the current refinery remains blurry.

2.4.2. *Adjusting the Oil Fund to Reduce Procyclical Spending*

Adopt and implement a mechanism to save oil windfall, with the aim to ensure adequate management of oil revenue. The saving mechanism should be a general fund that receives oil revenue surpluses according to the non-oil primary balance fiscal rule anchored in the IMF Extended Credit Facility program and consistent with the CEMAC fiscal rules. As such, it will contribute to improve debt sustainability. Specific rules should be set for how the fund should be managed to be more productive and in which circumstances the government can use the accumulated funds.

Given Chad's declining oil revenues, the saving mechanism should aim to both stabilize the economy and ensure better execution of investment projects. A stabilization fund's sole objective is to smooth government spending. It is only used when oil prices go below a threshold consistent with budgeted spending determined under a fiscal rule. Chad's savings fund should be used to invest in mature productive assets, preferably in basic economic infrastructure such as energy, ICT, and roads and transportation. Resources should be allocated to the stabilization fund according to an accumulation rule, while the investment/infrastructure fund would be the residual. The stabilization fund should adopt a rate of accumulation that allows for the effective stabilization of revenues, depending on the oil production profile and the level of risk that the government wants to cover. The mechanism should be revised every five years to reflect the state of oil reserves and production.

The stabilization and infrastructure funds should be productive and manage to improve the

long-term well-being of the population. The stabilization fund should be kept liquid, while the investment fund could be less liquid to yield more revenue. The oil fund can lose purchasing power due to inflation and sometime due to currency depreciation. Chad's stabilization fund could be saved (as is currently the case) in an escrow account at the BEAC. The government is encouraged to negotiate a fair interest rate for this type of account.[31] Regarding the investment fund, the Treasury could create a mechanism to ensure an adequate interest payment while waiting for the available resource, which could be achieved by developing an asset management policy framework. Moreover, the government should ensure that appropriate governance mechanisms are in place so that that the fund is appropriately managed. The country's supervision agencies and Parliament need to exercise their relevant oversight and monitoring functions to ensure the fund is not mismanaged.

[31] The issue of remunerating the Government Saving Fund by the BEAC was topical in 2011–14 during the last oil boom, as countries such as the Republic of Congo wanted more interest payments for their funds.

CHAPTER 3

Investment in Economic Infrastructure

Abstract: *This chapter focuses on Chad's roads, ICT, and energy infrastructure. The country's infrastructure networks increasingly lag behind those of other peers and aspirational countries and are characterized by regional inequality and limited access. Moreover, its infrastructure services are twice as expensive as elsewhere in Africa, reflecting inefficiencies and lack of competition. A large share of Chad's infrastructure is domestically financed, with the central government budget being the main driver of infrastructure investment. The cost of addressing the country's infrastructure needs by 2030 is projected to more than 50 percent of GDP over the next decade. Even if major potential efficiency gains are captured, Chad would still face an important infrastructure funding gap that needs to be financed by innovative and non-traditional financing sources and mechanisms. The adoption of institutional, regulatory, and administrative reforms will be key to promote investment in economic infrastructure that is well adapted to climate change.*

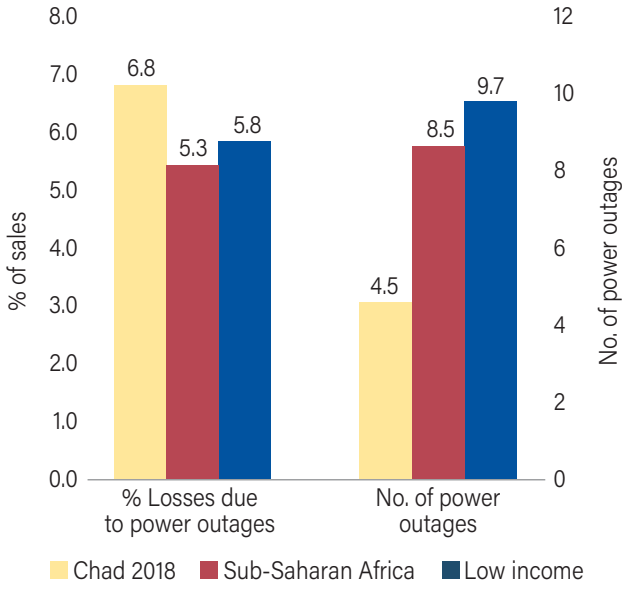
3.1. Investing in Infrastructure Is Instrumental to Chad's Growth

Well-functioning and accessible infrastructure is vital for sustainable economic development. Infrastructure investments have two main types of effects on economic growth: (i) short-term effects related to the construction sector, which have a multiplier effect on the entire economy; and (ii) long-term effects linked to the improvement of productivity and competitiveness (lower cost of service, time savings, increased access to markets, etc.). In addition, because of its many positive externalities, infrastructure affects all sectors of the economy through intermediate consumption: effects on household income, employment, business productivity, and private sector investment. For example, Aschauer (1989a) shows a strong link between aggregate output in the private sector and public infrastructure capital (greater impact than private investment). These impacts are linked not only to increased growth but also to possible spatial restructuring (mobility).

Investment in infrastructure can drive growth through capital accumulation and structural transformation. This is especially the case with Chad, a landlock country with high cost of transport, limited

Figure 3-1

Constraints to Private Sector Development and Losses due to Insufficient Provision of Electricity, 2018



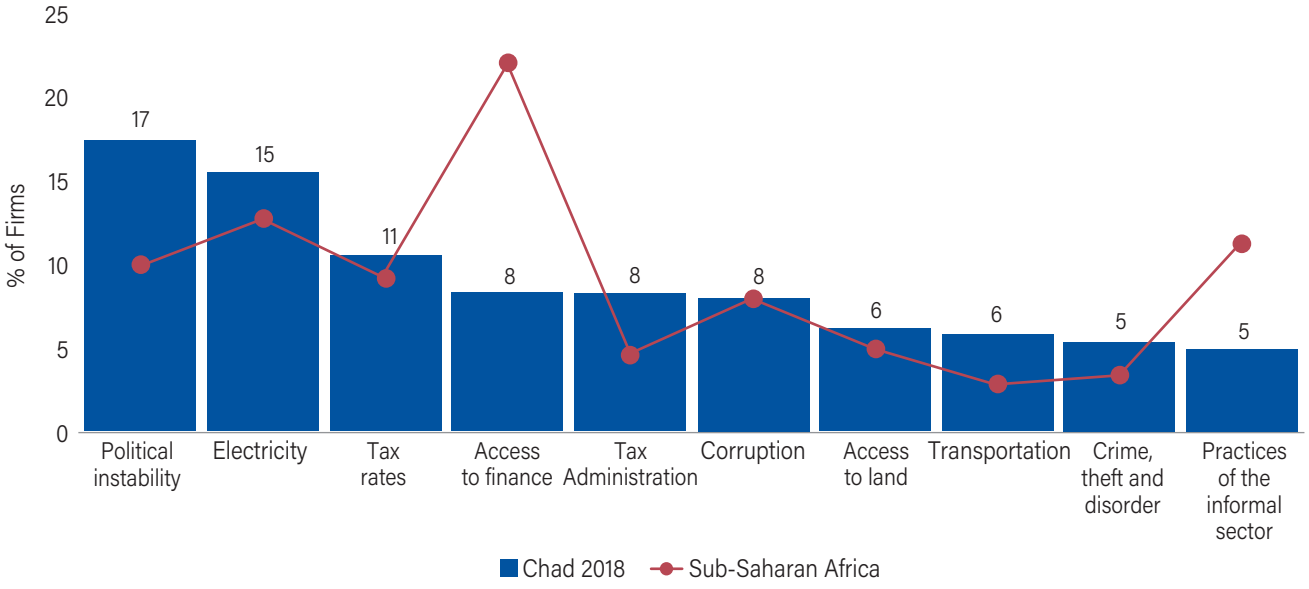
Source: World Bank 2018.

transport connections between regions, and limited rural accessibility. Structural transformation remains essential to sustainable and shared growth that reduces poverty through its ability to generate higher incomes on a sustainable basis. Indeed, this process implies an improvement in productivity in all sectors and the transfer of resources from low-productivity sectors to those with higher returns. This transformation is only possible if the most promising sectors are constantly innovating and modernizing. Thus, infrastructure, because of the externalities it generates, allows for the improvement of productivity and competitiveness in all sectors, encourages industrialization and the establishment of value chains, and gradually leads to greater revenue creation (World Bank 2022c).[32] According to a study from Lebrand (2022) using a spatial general equilibrium model and covering three countries around Lake Chad (Chad, Cameroon, and Nigeria), the combination of access to paved roads, electricity, and the internet increases employment in the services sector and shifts labor from agriculture to services. For Chad, the 28 percent increase in electricity

[32] Improving Infrastructure is one the three pathways highlighted by the 2022 Chad SCD.

Figure 3-2

Constraints to Private Sector Development, 2018



Source: World Bank 2018.

Table 3-1
Infrastructure Development Index

		2016	2017	2018	2019	2020	Ranking 2020
Composite infrastructure index	Chad	7.24	7.52	7.24	7.52	7.84	51
	Ivory Coast	21.96	23.28	21.96	23.28	24.18	21
	Botswana	35.63	36.61	36.79	36.96	37.50	10
	Africa	27.129	27.75	28.44	28.99	29.63	
Electricity index	Chad	0.18	0.14	0.29	0.28	0.27	53
	Ivory Coast	6.08	6.25	6.22	6.64	6.74	19
	Botswana	1.4	17.59	21.52	20.7	20.56	9
Transport index	Chad	1.13	1.27	1.26	1.14	1.13	53
	Ivory Coast	6.60	7.1	6.66	6.25	6.16	27
	Botswana	24.26	22.52	22.29	24.65	25.76	5
ICT index	Chad	2.82	4.42	5.38	6.25	6.9	51
	Ivory Coast	6.96	13.57	20.63	25.43	28.93	11
	Botswana	14.67	23.59	30.62	31.49	30.9	9

Source: AfDB.

productivity, combined with the rehabilitation of the rail and road corridor in Chad and Cameroon, could led to an increase of 0.3 to 0.8 percentage points of GDP.

Lack or inadequacy of infrastructure affects business productivity in Chad. The 2018 World Bank enterprise survey shows that efficiencies/inefficiencies in the provision of transportation, electricity, water supply, and telecommunications infrastructure affect private sector operations. Insufficient and limited access to infrastructure increases costs, disrupts production, reduces profitability, and results in important losses. Also, limited access to electricity and transport infrastructure is among the top ten constraints to private sector development in Chad (Figure 3-1).

3.2. Infrastructure Sector Diagnostic

3.2.1. *Chad's Infrastructure Challenges*

The network density, supply, quality, and accessibility of infrastructure in Chad remains low compared to other African countries. According to the Africa Development Bank' Africa Infrastructure Development Index,[33] Chad ranked 51st out of 54 countries in Africa in 2020, with an overall score of 7.8 out of 100, below the average of continental Africa (29.6) and far below aspirational countries like Cote d'Ivoire (24.2) and Botswana (37.5). The evolution of the country's performance has remained stagnant over the last five years, led by the index related to energy supply and accessibility.

Despite the relatively recent and short-lived investment boom, Chad's capital stock is low relative to other comparable countries. As a share of GDP, public capital declined substantially from 107 percent in 1990 to 40 percent in 2006. This decline is explained by low dynamism of public investment

[33] The Africa Infrastructure Development Index, based on four major components (transport, electricity, ICT and water & sanitation) and disaggregated into 9 indicators that have a direct or indirect impact on productivity and economic growth, provides consolidated and comparative information on the status and progress of infrastructure development in African countries.

compared to economic growth. The capital stock currently stands at 62 percent of GDP in Chad, lower than the average of 110 percent for developing countries, 117 percent for SSA, and 181 percent for CEMAC countries. The level of public capital stock per capita is also extremely low at an estimated US$646, much lower than US$800 for Niger, US$1050 for Burkina Faso, and US$1,500 for Cameroon.

Chronic lack of investments in energy sector assets kept Chad at the very bottom in terms of energy access for decades. Despite the endowment of fossil fuels and excellent solar resources, Chad has the lowest electricity access rates in the world after South Sudan at only 11 percent at end-2020 (IEA 2022), with significant disparities between urban (40 percent) and rural (2 percent) areas. In a country with a population exceeding 16 million people and population growth of more than 3 percent per year, the existing power system of only about 150MW consists of city-based isolated power systems that are not interconnected. By far, the biggest system is serving the capital city of N'Djamena, and it accounts for 90 percent of electricity sales of the national power utility SNE, even though the system covers only about one-third of N'Djamena. N'Djamena's power system currently has only about 130 MW of installed capacity, and all thermal using polluting hydrocarbons result in power generation costs exceeding US$0.2/kWh (to which distribution and supply costs also need to be added). However, the current available capacity is considerably lower at about 90 MW in the capital city N'Djamena and only 10 MW in secondary cities where the national utility company SNE operates mini grids, which falls short of meeting current demand by a large margin. The significant discrepancy between installed and available capacity is driven largely by poor maintenance of power plants, lack of new investment in grid infrastructure, and poor planning. Due to severe power shortages, most of the areas that have access to the electricity grid face frequent interruptions in the power supply, and some areas are left without electricity for days.

The cost of basic transport infrastructure and services is high due to Chad's landlocked geographical location, its sparse population density, and limited adaptation to climate change. The 2018 Logistics Performance Index ranks Chad 140th out of 160 countries. The total length of its road infrastructure network is 40,000 km, including 25,000 km of priority network, which consists of 7,475 km of trunk roads (3,145 km of permanent roads, with 2,369 km paved) and 17,525 km of regional seasonal dirt roads linking intermediate localities. There is also approximately 15,000 km of local feeder roads. Chad relies on international corridors for its import/export transport, 80 percent of which transit through the Port of Douala in Cameroon, located 1,700 km away from N'Djamena. Domestically, underinvestment in quality transport infrastructure and maintenance and adequate services has resulted in poor local and regional connectivity, including rural accessibility. This is aggravated by climate change, which poses numerous threats to already limited paved and unpaved road access, with risk of ponding, erosion, collapse, and washout in the central and southern parts of the country as well as obstructions by moving sand dunes in the north.

The country's digital sector is nascent, with significant gaps in access to quality digital connectivity. In 2022, Only 9.1 percent of Chad's population has a mobile broadband subscription, much lower than 34 percent in SSA. Fixed broadband penetration in Chad is very low, and access to digital services for businesses remains limited, as the country ranks among the worst performers in terms of e-commerce development. Chad also has limited access to international connectivity capacity, and international internet bandwidth capacity per user is among the lowest in the world at 1.4 kbps, lower than an average of 34 kbps in SSA and 21 kbps in low-income countries. Private investment in the digital economy has stalled, with average annual capital expenditure in mobile networks dropping by 6 percent over the past five years.

Internal Distribution of Infrastructure

Lack of electricity access is even more acute outside of the capital of N'Djamena. Only a dozen

secondary cities have mini-grids, and these only cover a fifth of their population. More than half of installed generation capacity across these secondary cities is out of service, supply is not reliable, and daily interruption is the norm. In rural areas, where three-fourths of the country's population reside, there are no power systems. Only better-off households can afford the prohibitively high cost of electricity from individual diesel generators, whose cost often exceeds US$0.5/kWh. Most of the population face acute and chronic energy deprivation and are forced to use expensive and often polluting solutions—such as dry-cell battery flashlights, candles, and kerosene lamps—to get some form of lighting, and they incur additional costs when charging their phones in often remote locations.

The uneven geographical distribution of the backbone road network is commensurate with the distribution of both the population and economic activities. Chad's average road density of 20.5 km / 1,000 km^2 varies greatly among climatic zones, with 6.4 km / 1,000 km^2 in the Saharan zone, 28.5 km in the Sahelian zone, and 43.7 km in the Sudanian zone. The country's level of road density places it among the lowest ranked worldwide, above only CAR and Somalia. Using the 2019 UMD global land cover/land use map and the 2017 International Food Policy Research Institute MapSPAM dataset, the value of Chad's cropland with a travel time of less than 1 hour to the nearest city is estimated at a mere US$21 million, or 1.3 percent of the country's total cropland value, and land with a travel time of 3 hours is estimated at US$189 million, or 11.0 percent. The lack of all-season regional and local feeder roads hampers access for production farms to collection/conditioning/transformation facilities or to wholesale markets, as well as for the rural populations to access basic public facilities and services (schools, hospitals, local markets, etc.) (hahbani et al. 2022 in Chad CEM Volume – Background papers). This constrains local economic growth and potential synergies between regions, and it weakens the prospects for human capital development.

In Chad, last-mile digital infrastructure is not spatially distributed in terms of regions' economic potential. Some regions that are relatively densely populated experience a gap in the provision of digital connectivity and access. The regions of Logone Oriental, which represents 7.1 percent of the population, and Mayo-Kebbi Est, which represents 7 percent of population,[34] are respectively the second and third most populous regions (after the capital region N'Djamena, which has 9.6 percent of population), and they have respectively 5.8 percent and 4 percent of the deployed telecom pylons (compared to N'Djamena's 18 percent).[35] Disparities in the availability of digital connectivity and access seem to be accentuated in the southern regions along the border with CAR compared to the rest of the country.

Infrastructure Costs and Tariffs by Sector

Chad's electricity sector is underdeveloped and inefficient, leading to high costs paid by electricity consumers and the government through subsidies. The current variable electricity tariff ranges between 13 and 20 USc/kWh,[36] with the lower tariff paid on the first 150 kWh consumed each month by residential customers and medium-voltage customers who benefit from the preferential tariff (*tariff préférentiel*). There is also a fixed monthly charge per subscribed capacity that is paid by medium-voltage customers. The overall weighted average headline tariff stands at around 20 USc/kWh, of which the national utility only collects about 78 percent from end customers. While the electricity tariff is relatively high by regional standards, it is significantly below the national utility's (SNE) average supply costs. This tariff revenue shortfall is largely financed by the government's in-kind subsidies (diesel fuel) to SNE, which currently represent around 50 percent of SNE's overall revenues. Apart from the sector relying

[34] *https://www.inseed.td/index.php/thematiques/statistique-demographique/population.*

[35] https://arcep.td/rapports.

[36] Foreign exchange rate used: 612 CFAF/USD.

Table 3-2

Mobile Data and Voice High-Consumption Basket, 2018–2021

Mobile data and Voice High-Consumption Basket (140 min + 70 SMS + 2 GB) Price in US dollars	2018	2019	2020	2021
Mali	25.77	31.17	11.93	12.87
Burkina Faso	35.09	35.09	12.72	13.53
Niger	16.2	17.99	17.28	18.38
Botswana	14.1	14.1	3.1	3.1
Cameroon	22.4	22.4	11.9	11.1
Ivory Coast	7.5	7.5	8.3	6.9
Rwanda	19.9	19.9	17.7	11.1
Chad	41.88	32.39	33.6	22.06

Source: ITU ICT Price Basket.

on expensive thermal generation, the significant gap between costs and tariff revenues is driven by factors such as fraud, lack of metering of some customers' consumption, deficient metering and illegal connections, and non-payments by some customers (World Bank 2018). Combined technical and non-technical losses stand at over 35 percent, with collections at only about 78 percent. As connection to the national grid is strongly correlated with wealth, the subsidies provided to the sector[37] are regressive, paid by all taxpayers, while only about 11 percent of Chad's population currently have access to electricity (IEA 2022).

High costs and delays make the Douala-N'Djamena transit corridor one of the least efficient in SSA. The cost of international trade is very high for Chad, even in comparison to other landlocked countries. This is largely due to an inefficient market organization and cumbersome procedures. Shipping a container from Doula or Lagos to N'Djamena can take four to six weeks and cost up to €4,600 (World Bank, 2021). As a result, basic products can be 30 percent more expensive in N'Djamena than in neighboring Cameroonian cities. While Kigali is located approximately the same distance from the sea as N'Djamena, its trade costs are 30 percent lower due to the more efficient transport corridors in East Africa.

The high cost of deploying and operating radio base stations (BTS), the relatively high price of wholesale Internet bandwidth, and low purchasing power are all factors that make broadband services unaffordable for the average Chadian. Even though the price of a 1Gb internet package in Chad dropped from CFAF 12,000 in 2017 to CFAF 1,200 in 2019, the average cost of the 1 GB mobile data is still high (43.07 percent of the monthly GNI per capita) in Chad compared to the average of SSA (6.31 percent of the monthly GNI per capita).

Other Challenges and Constraints

There are also other constraints that contribute to the high cost of electricity and low level of access. These constraints include: (i) electricity generation infrastructure reliant on the use of diesel and, to a lesser extent, heavy fuel oil; (ii) obsolete and inadequate transmission and distribution infrastructure that results in a high level of technical losses; (iii) operational and commercial inefficiencies, resulting in a very low rate of tariff payments

[37] The electricity consumption of the public sector is largely not billed or paid for, and therefore a considerable share of this subsidy is effectively paying for the consumption of the public sector and related entities.

that has effectively bankrupted the national utility (SNE), which in turn has limited the ability to undertake necessary investments and assume contingent liabilities inherent in PPAs and/or guarantees provided to IPPs; and (iv) limited private investment in the sector (and a failure to convert proposals into projects) due to weak negotiating capacity, inefficient and unpredictable decision-making, an inadequate regulatory framework, deficient technical capacity, a lack of standard contractual documents, the weak financial position of SNE, and political interference in regulatory decisions.

Absence/dysfunctional road maintenance, inadequate controls, and illegal taxation have led to the rapid deterioration of road conditions. Chad's road maintenance quality is poor due to lack of budgeted resources. Efficient implementation of axle-weight control is hindered by: (i) high transport costs, which make overloading a sensible strategy to reduce costs; (ii) widespread bribery or illegal taxation by security officers and other shareholders; (iii) inappropriate weighbridge equipment; and (iv) inappropriate overload control operations. Axle-weight enforcement remains, however, essential especially along the Chad-Cameroon corridor, as US$1 invested in axle-load control translates into US$20 of savings in road user costs and road maintenance and rehabilitation costs (Martinez et al 2018; Pinard 2010). Lack of transparency in the process of allocating transit freight to road freight carriers is a major constraint to the development of a viable and competitive road transport industry in Chad. The role of land transport freight offices is important in explaining the country's high transport costs, and they discourage new investments in the trucking industry.

Unaffordable services and limited broadband capacity result in competition issues, limited international capacity, and poor data infrastructure. Service affordability challenges principally stem from market dominance in the upstream of the broadband value chain and limited competition intensity in the retail market due to a de-facto duopoly. The first-to-middle mile of the broadband value chain, including the Central African Backbone connecting the country to the submarine cable via Cameroon, is controlled exclusively by the state-owned incumbent Sotel Chad. Currently, the country hosts no independent data center, but the government has expanded the national backbone via Sudan and through the Sahara with Niger, and it has constructed a national data center under a PPP model. High fees—in the form of sector-specific taxes, fees, and fines—are other barriers to private sector investment. High customs duties for telecommunication equipment and long processing times complicate infrastructure upgrades. Security issues and challenging geographical features also hamper access and private sector investments.

3.2.2. *Infrastructures Needs and Gaps*

Meeting Chad's infrastructure needs demands substantial infrastructure investment and a maintenance program. Chad's infrastructure needs are higher than those of aspirational peers in almost every sector. Whether measured in generating capacity, electricity consumption, road density, or mobile and internet accessibility, the country delivers only a fraction of the services found elsewhere in Africa. To address these infrastructure challenges, the country should: (i) develop additional new power generation capacity to reach an access rate of 53 percent by 2030, as projected by the National Emergency Electricity Plan; (ii) raise household electrification rates by at least 50 percentage points; (iii) complete the intraregional fiber-optic backbone network; (iv) extend mobile voice and broadband internet coverage to the entire population; (v) interconnect ports and border crossing stations to N'Djamena and secondary cities with a quality road network; (vi) increase rural accessibility by expanding all-season road access to the country's high-value agricultural land and rural populations; and (vii) unlock the potential of fragile areas (e.g., around Lake Chad) to increase resilience to insecurity, conflict, and fragility. Given the size of the

country, investing in major corridors and areas of economic/ social potential is critical for Chad's long-term socioeconomic development.

Addressing Chad's infrastructure needs could cost about 50 percent of GDP over the next decade. According to the World Bank Chad Energy Access Scale Up Project, an estimated US$3.2 billion (30 percent of GDP) is needed for Chad to reach an access rate of 53 percent by 2030. Investment in other infrastructure such as roads, ICT, and water and sanitation is estimated at a minimum of US$2 billion, which includes the overall cost to build new infrastructure, refurbish dilapidated assets, and operate and maintain all existing and new installations. There is a need to sequence investments to ensure the entire country is covered based on the government's priority to expand access to energy and strengthen the road corridor to improve competitiveness.

3.3. Infrastructure Expenditures and Their Efficiency

3.3.1. *Infrastructure Expenditures*

Chad's level of public investment has historically been below the average of CEMAC and SSA due to its fiscal policy being more oriented toward recurrent than capital expenditure. Over the period 1990–2019, Chad's public investment rate was 5.2 percent, below the average of 7.0 percent for CEMAC, developing countries, and SSA.[38] This period can be divided into three phases. Between 1990 and 2000, the country's public investment rate was 3.2 percent, much lower than the average of 7.3 percent for developing countries. The period 2000–14, which was relatively prosperous for Chad, barely brought the level of investment back to the average of SSA. This period is linked to the growth phase of the extractive sector, which marked a turning point for the country's economic policies, as the investment rate reached 7.4 percent, slightly higher than the average of developing countries (7.37 percent) and SSA (7.1 percent). However, Chad's investment rate has been less than 3 percent of GDP since 2015. Capital expenditure represented less than one-quarter of total public expenditure over the period 2014–19, which remains relatively low in relation to comparable countries (TAUSSIG et al. 2022). Nevertheless, this share is expected to increase to over 30 percent by 2024, according to the 2022–24 macroeconomic framework.[39]

Aware of the country's infrastructure challenges, the authorities developed the NDP 2017–21, but the effective mobilization of investment resources remains one of Chad's major challenges. The NDP comprises two infrastructure development-oriented axes (development of a diversified and competitive economy and improvement of the quality of life of the Chadian population). Initially, these two axes represented more than 86 percent of the estimated cost of the NDP. However, budgetary programming and implementation constraints, as well as the consideration of other needs, have significantly modified the priorities of the NDP. While improving the quality of life accounted for 49 percent of the NDP, expenditure related to this axis from internal and external resources represented only 34 percent of total expenditure. While capital expenditure should account for 37 percent of the state budget, it represented only 29 percent. The authorities also need to address domestically financed budget execution, as the execution rate was only 15 percent in 2020.

3.3.2. *Efficacy and Efficiency of Resource Allocation and Procurement*

In 2020, Chad put in place a new institutional framework for public investment management, but its operationalization faces major challenges. Two presidential decrees were adopted in 2020 to establish a unified framework for public investment management. The first aims to set up a central

[38] IMF data, public investment (nominal, % of GDP).

[39] Technical report on the macroeconomic and budgetary framework, Ministry of Finance and Budget – Chad.

structure (CONAGIP)[40] in charge of public investment management, while the second decree[41] aims to define the management cycle of public investment projects by specifying its various stages as well as the roles and responsibilities of public investment actors at each stage. The deployment of this new institutional framework coincided with various health, institutional, and security crises. These crises allowed for neither the establishment of all the necessary prerequisites for the effective operationalization of CONAGIP nor an optimal appropriation of the management cycle by project owners.

While the health, institutional, and security crises can partly explain the poor performance related to the planning process, there are also other factors related to the control of the process. First, the articulation of sectoral policies was not optimal, with the absence of program-based budgeting and results-based management. Second, almost all the projects included in the NDP were not subjected to a rigorous preparation process to determine their potential impact in terms of economic and social profitability and to anticipate risks. Third, the initial macro budgetary assumptions on which expenditure was estimated and projected were too ambitious. Fourth, the noninvolvement of local authorities in the preparation of the NDP and the failure to define a logical framework to ensure results reflect the principle of theory of change resulted in a low impact of the priority actions. Finally, there was no rigorous monitoring and evaluation framework.

Despite support from technical and financial partners, Chad's ability to properly prepare projects financed from own resources remains very low. The few projects that are subject to feasibility studies are limited to technical studies that consider neither the dimensions of social and economic profitability nor the environmental and gender impact, and they do not anticipate the various risks projects are exposed in Chad. The project management cycle maturation guide includes general guidelines that frame the preparation process without detailing the various methods and tools that make it possible to ensure quality preliminary studies. In this context, several projects financed from own resources are at a standstill and others are on hold with significant time and cost overruns.

Chad's infrastructure needs and limited resources require a prioritization of projects based on objective criteria to optimize public investments. The project selection process provided for in the institutional framework and the prioritization guide developed with World Bank support are not yet operational. Regarding the validation of project preparation, despite an experimentation of maturation conferences with sectoral ministries, the mechanism of maturation visa is not yet effective. In terms of project selection, the prioritization guide has not been officially adopted; the selection criteria have not been determined; and a computerized support system to assist in the application of the selection process has not yet been set up.

The use of public-private partnerships (PPPs) is neither sufficiently regulated nor practiced. Although legal and regulatory texts[42] exist to govern the financing of public investment projects within the framework of a PPP, and despite the identification of a few potential projects, no project has benefited from this financing modality. The absence of a PPP strategy, the slow operationalization of the PPP management structure (national PPP unit), lack of public resources, the weak state guarantee mechanism, the lack of mastery of the legal and budgetary modalities of the PPP financial package, and the low quality of project preparation are all factors that hinder the development of PPPs in Chad.

[40] Decree 2020/PR/2020 on the creation of the National Commission for Public Investment Management, whose main mission is to: (i) validate the preparation of projects with a maturation visa; (ii) constitute a project bank; (iii) select projects based on a rigorous method and objective criteria; and (iv) draw up the three-year public investment plan and carry out the budgetary programming of public investment projects.

[41] Decree 2021/PR/MFB/2020 on the management cycle of public investment projects.

[42] Ordinance No. 06/PR/2017 on the legal regime for public-private partnerships in the Republic of Chad, Decree No. 1154/PR/MMDICSP/2019 setting out the terms and conditions for its application.

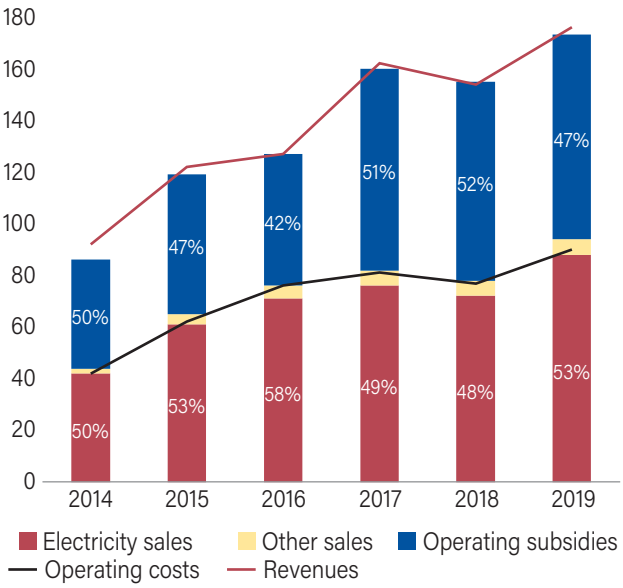
The monitoring and evaluation of public investment projects is not rigorous enough to ensure optimal management that anticipates problems and ensures the implementation of outstanding projects. Although the institutional framework includes and emphasizes the importance of measures for the physical and financial monitoring of projects in the project management cycle, the monitoring system for public investments projects remains rudimentary in practice. In addition, projects are not subject to ex-post evaluations to capitalize on lessons learned and ensure the effectiveness of the country's public investment policy.

How much more can be done within the existing resource envelope through efficiency gains?

In the power sector, with revenues well below supply costs and a structural reliance on central budget transfers, SNE faces chronic cash shortages and is unable to properly maintain its assets, let alone expand electricity access. (Figure 3-5). SNE's chronic loss-making operations prevent it from providing reliable electricity services, expanding access, and attracting private capital for power generation. The company increasingly relies on support from the government in the form of in-kind subsidies (fuel to power stations), which impose a considerable burden on the state budget. In-kind transfers from the state budget to SNE totaled US$84 million in 2019, representing 0.8 percent of Chad's GDP, higher than 0.3 percent and 0.5 percent of GDP in 2014 and 2015, respectively. Public entities and several categories of customers have been released (often implicitly) from the obligation to pay for electricity. This, together with deficient commercial practices, strips SNE of cash and causes the accumulation of payables and receivables, which now exceed SNE's annual revenue. As a result, SNE has not been able to properly maintain its assets, let alone invest in access expansion. The persistent loss-making operations of SNE also negatively affect private sector appetite to invest in power generation, as SNE is not seen as a credible off-taker.

In the transport sector, the country's low-quality road network has massive maintenance needs, which represents a huge challenge for the country and will involve a high economic cost. The average cost of maintaining roads in Chad is US$55K/km for rural roads and US$400K/km for paved roads, while the cost of constructing news roads is US$1 million/km. It is more profitable for the country to maintain existing roads and avoid the high cost of building new roads. Unfortunately, resource allocations to maintenance remain insufficient. The budget for maintaining the road network is estimated at US$85 million/year and the available budget is about US$30 million/year in 2022, a sharp improvement from previous years thanks to a recent gradual percentage increase in the levy on petroleum products for the Road Management Fund.

Figure 3-3
SNE's Cost-Revenue Gap, 2014–19, (in millions of US$)



Source: Word Bank analysis based on SNE data.

3.4. Policy Recommendation to Reduce Infrastructure Gap

Adequate prioritization and planning are paramount to maximize the economic and social

benefits of new investment in infrastructure. This, however, would require optimizing and strengthening the current institutional and regulatory framework in coordination with the private sector, civil society, professionals in the sector, and the public, at least in the form of regular consultations and participation in the monitoring and evaluation of programs. The goals is to prioritize investments based on certain social and economic criteria, including their impact on the environment.

Private Sector Participation in Energy, ICT, and Digital Infrastructure

Private sector-led investments in off-grid electrification can play an important role in accelerating electricity access in Chad, with a focus on green energy. In the past, it was virtually impossible to increase electricity access rapidly and sustainably without addressing basic issues concerning sector institutions, policies, and regulations. These issues still need to be addressed to increase grid-based access and improve the regional power trade, but private sector-led off-grid electrification options, including mini-grids and standalone solar systems (SSS), which have seen a rapid deployment in the past decade worldwide and in Africa in particular, offer an excellent opportunity to boost electricity access. This despite lingering systemic issues facing Chad's power sector.

The government needs to develop a regulatory framework for mini-grids to establish service and technical requirements, a transparent tariff methodology, and policies concerning the potential replacement of mini-grids with the country's main electricity grid. SSS are also an integral part of Chad's least-cost electrification strategy, and they need to be deployed for productive uses, medical centers, schools, and households in rural areas where grid or mini-grid electrification is not foreseen in the next few years. To ensure the sustainability of SSS, the government needs to implement and enforce VeraSol quality standards for solar home systems and industry standards for SSS to be used in both the private and public sector. In addition, to attract private capital and make access affordable and investments sustainable, the government needs to mobilize, with the help of international financial institutions, funds to subsidize the cost of mini-grids, SSS, and solar home systems when affordability is an issue.

The liberalization of telecommunications, initiated in 1998, has enabled some Chadians to leverage the transformative potential of digital technology, although most face barriers, often invisible, to participate in the digital economy. The main supply-side constraints relate to the high cost of international connectivity and national IP transit, as well as limited availability of the frequency spectrum. Due to the geographic position of the country, as well as its size and population density, it costs more to bring quality international connectivity to end-users in Chad than in coastal and densely populated countries. Last-mile digital infrastructure is not spatially distributed in accordance with the economic potential of the regions

To increase private sector participation in ICT and DFS infrastructure, regional and national regulatory reforms are needed. For instance, while there is a law on payment services, there is a lack of clear legal category for fintech companies as a specific category of providers. Also, there is no agent banking regulation, which hampers service delivery in rural areas. Finally, the lack of appropriate identification procedures, absence of regulations on alternative financing platforms (e.g., crowdfunding and online fundraising), and incomplete consumer protection and electronic transactions frameworks for DFS are additional factors that limit the development of DFS. Taxation in the telecommunications sector does not stimulate the market and makes services unaffordable (including taxation on 3G+ compatible smart devices such as smartphones, tablets, and computers). Limited digital literacy and skills remain critically low in Chad, while training programs are generally limited to nonexistent, with limited pathways to participation in the digital economy.

To accelerate growth in the telecommunications sector, the authorities should remove the

regulator from the supervision of the Ministry of Posts and Digital Economy (Ministère des Postes et de l'Économie Numérique, MPNTIC) and appoint non-government officials, chosen for their technical, economic, or legal skills, to its board. This would involve instituting technological neutrality and considering the economic potential of the country when determining the costs related to the use of frequencies. The authorities should also take inspiration from international best practices, remove all taxes that hinder consumption, and restructure and privatize Sotel Tchad. Moreover, Chad should build a virtual landing point and allow operators to hold capital in the company responsible for managing common ICT infrastructure.

Improving SOE Performance in Energy and ICT

To encourage private sector participation in electricity generation, the authorities must address key technical and operational inefficiencies and the lack of creditworthiness of SNE. The World Bank's Chad Country Private Sector Diagnostic (2022) outlines specific policy actions to improve the public management of the power sector. In addition to improving the existing system, Chad has the potential for solar and wind energy, which has only begun to be exploited. The relative abundance of renewable energy sources in Chad, combined with the various ultimate and proximate factors that currently increase electricity costs and constrain electricity access, suggests that off-grid technologies powered by renewable sources—such as solar mini-grids and SSS—represent the least expensive and most feasible means of increasing electricity access to a large share of the currently unelectrified population over the short to medium term (World Bank 2021). World Bank analysis indicates that dozens of towns and secondary cities have electricity demand in excess of 1MW and can potentially accommodate relatively large mini-grids.

The government needs to enhance governance, transparency, and accountability in the electricity sector. This could be achieved by: (i) finalizing the legal status of SNE and transferring power sector assets to SNE's balance sheet, which is critical to enable private sector participation in financing new power generation capacity; (ii) signing a performance contract with SNE to delineate its respective roles and responsibilities, which would enhance transparency in the sector, improve SNE's operational, commercial and financial performance, and ensure an adequate enabling environment from the government's side; (iii) developing a tariff framework by creating a revenue setting methodology for SNE, which would allow the utility to recover its costs, and pressuring SNE to become operationally and commercially more efficient; and (iv) approving a law that strengthens the financial and administrative autonomy of the newly created electricity regulatory authority, ARSE.

The authorities also need to strengthen the performance and financial viability of SNE. To achieve a financially viable SNE, the government could: (i) implement a revenue protection program to help SNE secure the billing and collection of electricity payments, thereby reducing (initially) commercial losses from the largest customers; (ii) adopt a payment mechanism to compensate SNE for losses from the non-payment of electricity from customers protected from disconnection by the state; and (iii) reduce power generation costs by procuring power generation capacity following a competitive procurement process (instead of the current practice of unsolicited proposals that take time to materialize and typically increase SNE's costs). New power generation should tap into renewable and climate-friendly sources such as solar power, which is abundant in Chad.

The government has assets in two out of the four major companies in the Chadian ICT market: Sotel Tchad (fixed and mobile) and SudaTchad (rental of national and international transmission capacity). Sotel Tchad, an incumbent operator holding a global license (fixed and mobile) created in 1998, was the result of the merger of the International Telecommunications Company of Chad and the

telecom branch of the National Office of Posts and Telecommunications of Chad. It is currently fully owned by the government, even if it wants to sell 60 percent of its capital to private shareholders, which has been laid out in the government's Digital and Postal Development Strategic Plan 2020–2030. SudaTchad, an infrastructure operator managing the south and east backbones of the national fiber optic network, was the result of a PPP concluded in 2018 between the Government of Chad, Chadian private investors, and a Sudanese engineering company, holding respectively 10, 45, and 45 percent of the company's shares. It has a concession for the operation of fiber optic infrastructure.

Improving Road Maintenance and Physical Connectivity to Neighboring Countries

Maintenance management can be strengthened to improve physical connectivity and realize efficiency gains. Road maintenance, including programming, procurement, and implementation, is currently outsourced to the Road Agency (*Agence d'entretien routier*, AGER)—a public-private company (66/33 percent public/private ownership). AGER was created in 1999 but became operational only in 2011. Road maintenance is entirely funded with resources from the second-generation Road Fund created in 2000, which currently provides CFAF 20 billion each year, representing only 40 percent of the estimated annual budget required for the proper maintenance of 7,500 km of the priority road network. With the available budget, AGER carries out optimized maintenance (under constraint) programming, prioritizing paved roads (CFAF 15 billion) and the permanent dirt road networks (CFAF 5 billion). An estimated CFA F130 billion is required to clear the rehabilitation backlog and years of under-maintenance in Chad (World Bank 2022a). For rural road maintenance, it is essential to set up a reliable and sustainable maintenance system that is part of the decentralization process to tap into efficiency gains.

In the context of limited resources and climate change, the authorities should increase road infrastructure accessibility and adaptability to climate shocks. Rural transport is a priority in Chad, as most of the poor (78 percent) live in rural areas that are also important agricultural zones. The design and implementation of new roads or the maintenance of old roads should systematically consider the adaptability of infrastructure to climate shocks.

Efforts to improve physical connectivity to neighboring countries should be combined with key reforms to facilitate trade and the movement of goods and people. The project aimed at upgrading the Chad-Cameroon Corridor is a great example of an initiative to increase regional trade and improve the movement of both people and goods. The Trans Saharan corridor is another important gateway that would connect Chad to Niger and countries further up north such as Algeria and Tunisia. These corridors not only facilitate regional connectivity for Chad but also support local accessibility to other regions and economic centers, particularly in the north and around the Lake Tchad where accessibility is the lowest.

Improving the Governance and Management of Investment Projects

There are seven key reforms to improve the governance and management of investment projects, according to TAUSSIG et al. (Chad CEM Volume II—Background Papers 2022). The financial cost of these reforms is insignificant and can easily be covered by the government budget or technical assistance from donors. The seven reforms are:

1. **Developing a mechanism to manage backlogged projects and prioritize new projects.** The government could adopt an institutional and operational mechanism to manage backlogged projects and support the management and completion of outstanding projects that are at a standstill mainly due to lack of funding.
2. **Providing a framework for PPPs to diversify the sources of project financing.** The government could achieve this objective by finalizing the operationalization of the PPP support system in

accordance with Ordinance n°006/PR/2017 on the PPP legal regime. It could then update the inventory of projects that could be financed as PPPs and support the preparation of the most promising ones based on a legal, financial, and technical assessment.

3. **Consolidating the institutional framework for public investment governance.** This involves validating the practical guides with the appropriate texts; defining the notion of a public investment project and, if necessary, adapt existing thresholds; developing, validating, and supporting a roadmap for public investment management reforms; and consolidating the institutional framework (review of existing decrees and new texts, if necessary).
4. **Institutionalizing socioeconomic assessments and cost-benefit analyses (CBAs).** The authorities should consider developing a guide on how to conduct cost-benefit analyses that consider the specificities of developing countries. Moreover, they should develop the skills of the administration in the management and supervision of the ACA and integrate a tool to assist in the completion of a CBA.
5. **Integrating all steps of the project management cycle in a collaborative digital environment.** This would involve carrying out a technical diagnosis of the Project Bank at the level of the Budget Directorate and the possible interactions with the Aid Management Platform at the level of the ministry in charge of planning. It would also involve developing a master plan for public investment management, integrating existing mechanisms, and proposing a new mechanism for managing investments, if necessary, and developing a digital application to help prioritize investment projects.
6. **Consolidating budget management for public investment projects.** The government should define an envelope to fund new capital projects and consolidate timelines for ongoing projects. It should also use the dedicated guide to pursue budget programming based on the AE/CP model, and there is a need to assess the recurring loads and maintenance needs of existing infrastructure.
7. **Consolidating the capacities of project leaders in the management of public investment projects.** The government could develop a training plan that integrates all stages of public investment management in accordance with the stages of the project management cycle laid out in the 2020–2021 decree. The authorities could also develop training modules and train a group of trainers on public investment management within CONAGIP. Various training courses could be offered in partnership with public agencies, universities (e.g., University of Ndjamena), and others.

CHAPTER 4

Job Creation and Mobility across Sectors

Abstract: *Chad's formal unemployment and underemployment rates are increasing, and the failure to address them raises significant economic and social risks. Most of the workforce is employed in the low value-added informal sector, and low-skilled and poorly educated workers make up most of the labor force. The labor market tends to demand more unskilled labor, although there is a trend toward more skilled labor. The country remains ill-prepared to produce relevant skills for the job market, and the labor market is not competitive, as it is dominated by a few artisanal companies and formal firms that control wages. Private sector development is the main engine for job creation and labor mobility. Chad should invest in developing relevant skills to leverage economic transformation, with the aim to accelerate job creation and increase labor mobility.*

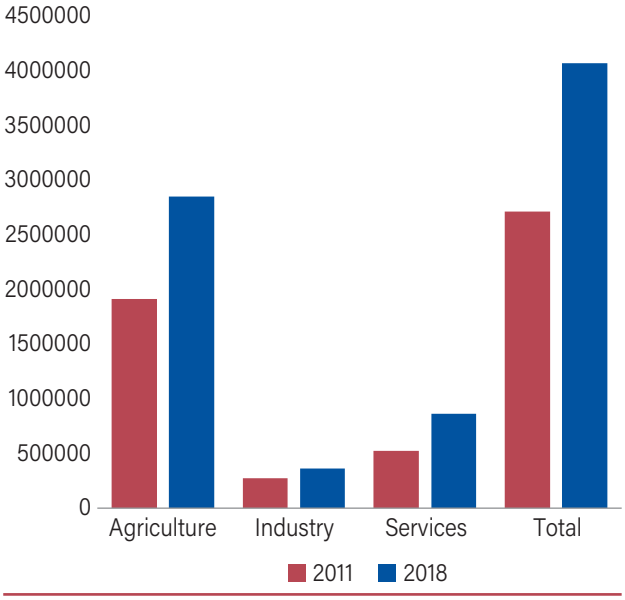
4.1. Labor Market: Trends and Dynamic

The bulk of Chad's workforce is employed in low value-added sectors with low productivity. The number of workers employed in agriculture increased over the past decade from 1.9 million in 2011 to 2.8 million in 2018, constituting around 76 percent of the total workforce (Figure 4-1).[43] However, the agriculture sector is highly characterized by informality and subsistence farming. It is the sector with the lowest per capita value added, at about US$1,285 in 2019, much lower than US$2,393 for services and US$11,363 for industry. However, industry, the highest-productivity sector, only employs 1.9 percent of the labor force, in part because oil (the main industry) is capital intensive, while 21.2 percent of the labor force is employed in services.

Most of the country's workforce is low-skilled, poorly educated, and trapped in low-productivity sectors. In 2019, Chad's education and skill of workforce score was 27.4, lower than the low-income country average of 34.2. Furthermore, Chad's Human Capital Index of 0.3 in 2018 was among the lowest in the world, which means that children born in Chad can expect to achieve only 30 percent of their lifetime productive potential by age 18. This is due to

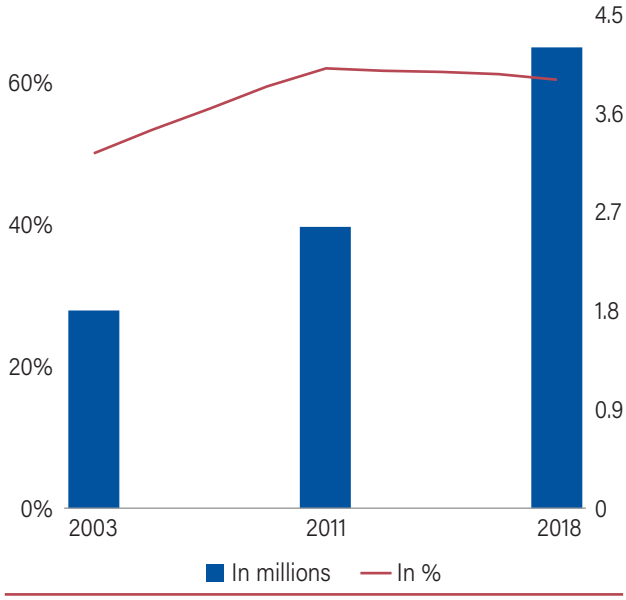
[43] Although the most recent employment data used in the chapter are from 2019, they remain relevant, as small-sample mobile phone surveys conducted in 2021 and the Covid-19 pandemic tend to confirm the 2019 survey findings.

Figure 4-1
Employment by Sector, 2011 and 2018



Source: Ecosit 2011 & 2018.

Figure 4-2
Total Labor Force Participation, Age 15–64



Source: ECOSIT 3 & 4.

inadequate education and adverse health outcomes. The low level of skills is also explained by the lack of vocational training, as there are only five technical or vocational schools in the entire country.

4.1.1. *Labor Supply*

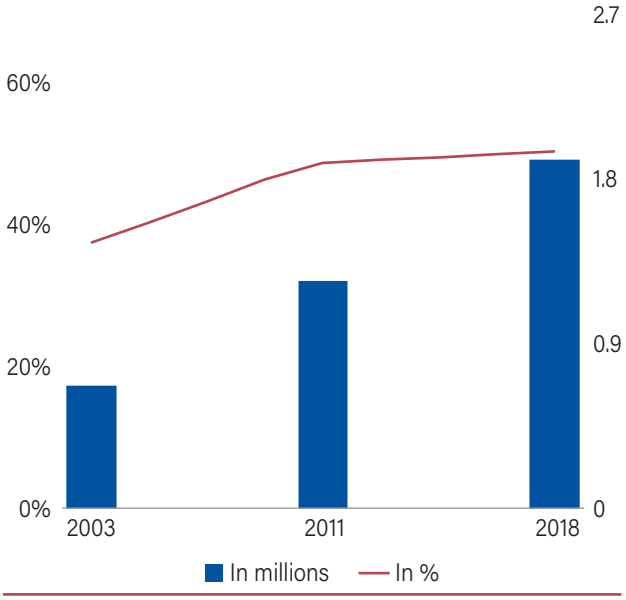
Chad's population has grown by an average of 3 percent annually since 2012 and totaled 16.2 million in 2020, although the pace of urbanization remains low.[44] The natural increase in the population was positive in 2021, as the number of births exceeded the number of deaths by 0.52 million, although the population only increased by a mere 26 thousand due to external migration. The urbanization rate nearly doubled from a low base of 10.5 percent in 2003 to 18.4 percent in 2011, before reaching 24.4 percent in 2018. Still, Chad remains one of the least urbanized countries in the world.

The size of the overall workforce continues to increase, but labor force participation slightly declined recently. The workforce more than doubled from 1.78 million in 2003 to more than 4.14 million in 2018 (Figure 4-2). The labor force participation rate increased from 42 percent in 2003 to 62 percent in 2011, before it decreased slightly to 60 percent in 2018. Female participation is relatively low compared to the average, but it follows the same trend: faster growth in the absolute numbers but low in terms of growth rate (Figure 4-3).

Chad's low labor force participation is comparable to that of countries like Burkina Faso, Côte d'Ivoire, and Sierra Leone, but lower than that of other countries like Niger, Malawi, and Liberia. Among people aged 15–64, the labor force participation rate is 59.4 percent in Chad, higher than 54.2 percent in Burkina Faso, but lower than 76.0 and 75.3 percent in Niger and Malawi, respectively (Figure 4-4). This is also reflected in Chad's low employment ratio among all age groups, particularly for the growing group of young people aged 15–24. In fact, around 59 percent of the working age population was employed in 2018, higher than 41 and 54 percent in 2003 and 2011, respectively. For the youth, the employment rate is relatively low: while it increased from 37 percent in 2003

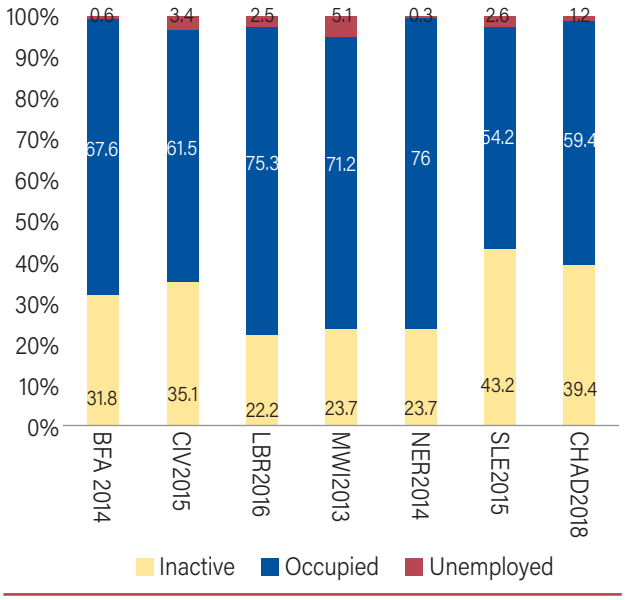
[44] National Institute for Statistics, Economic and Demographic Studies (INSEED).

Figure 4-3
Female Labor Force Participation, Age 15–64



Source: ECOSIT 3 & 4.

Figure 4-4
Labor Force Participation by Country, 15–64

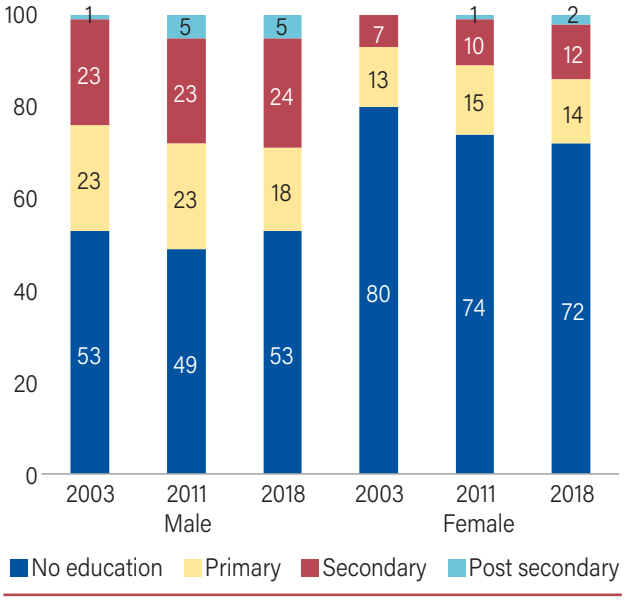


Source: International Labour Organization data.

to 48 percent in 2011, it fell by 10 percentage points to 38 percent in 2018 (Souag et al. 2022).

The country's overall level of education remains low. ECOSIT data for 2003, 2011, and 2018 indicate that more than half of Chadians are uneducated (Figure 4-5). Despite government efforts, women are more likely to be poorly educated than men in both urban and rural areas. Nevertheless, younger people (aged 15–24) tend to be more educated than the older generations. The large share of Chad's population with no education or only a primary education is similar to that in Niger, Malawi, and Burkina Faso, but higher than in Liberia and Sierra Leone (Figure 4-6). Finally, the labor force in urban areas is more educated than its rural counterpart: only 9 percent of the rural labor force had obtained a secondary education and a very small share had obtained a post-secondary education in 2018.[45]

Figure 4-5
Highest Level of Education Completed, Age 15–64



Source: ECOSIT 3 & 4.

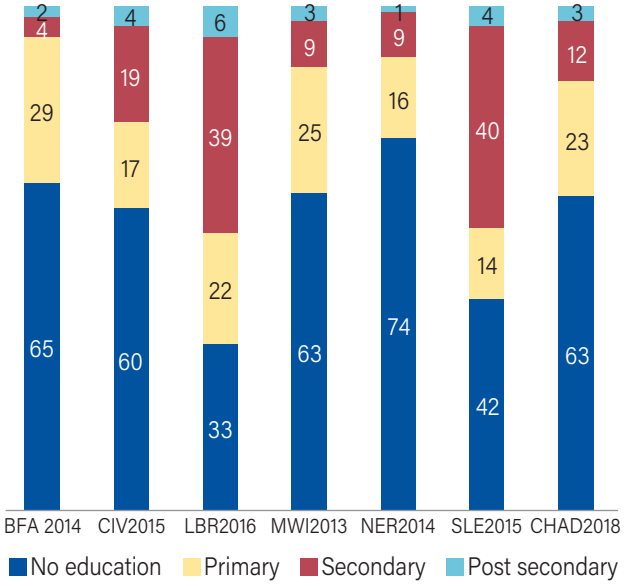
4.1.2. *Labor Demand*

Total employment and the number of workers across all employment groups have consistently

[45] Between 2011 and 2018, the structure of the urban population by age remained relatively stable, with a dominance of the 30–49 age group (around 50 percent), although in rural areas there was a decline in the share of the 15–29 age group in favor of the 30–39 age group.

Figure 4-6

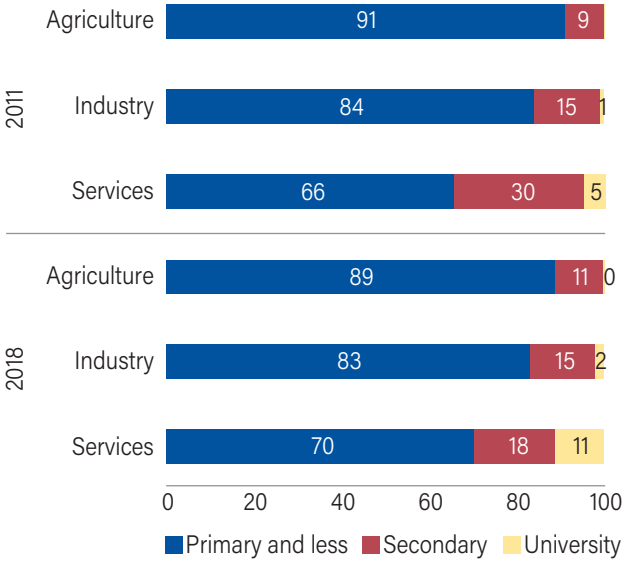
Highest Level of Education Completed by Country, Age 15–64



Source: ECOSIT 3 & 4.

Figure 4-7

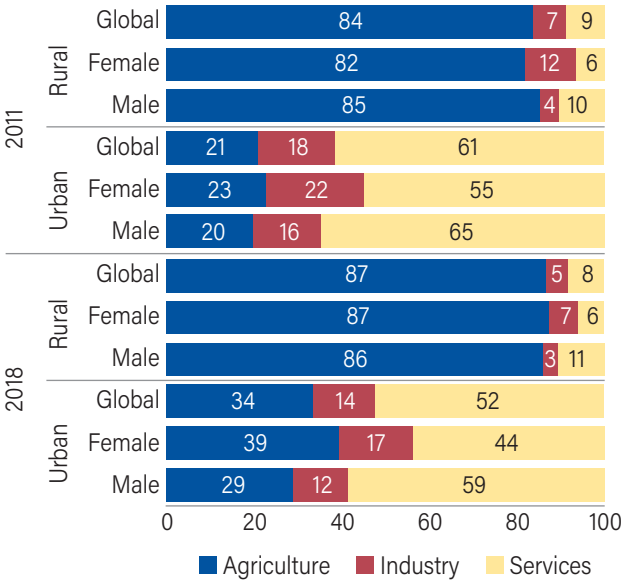
Employment by Industry and Education, 2011 and 2018



Source: ECOSIT 3 & 4.

Figure 4-8

Employment by Industry, Place of Residence, and Gender, 2011 and 2018



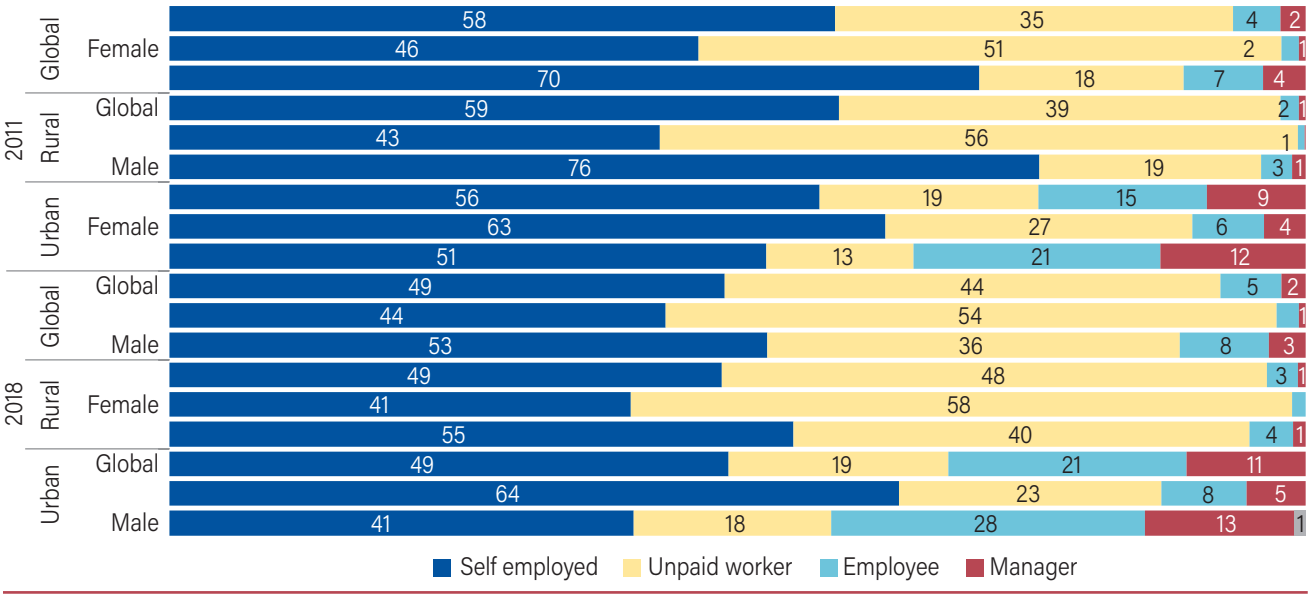
Source: ECOSIT 3 & 4.

grown, with agriculture being the main sector of employment. In 2018, the employed population aged 15 and above was estimated at 4.06 million, of which 2.33 million (55.1 percent) were men and 1.9 million (44.9 percent) were women (Figure 4-8). During this period, there was a transition of workers from agricultural self-employment to non-agricultural self-employment, and non-agricultural employment increased both in terms of wage jobs and self-employment. More than 75 percent of all jobs were in agriculture in both 2011 and 2018 (Figure 4-7). The country's high dependence on agricultural employment is due to: (i) Chad being an agropastoral-rural country; (ii) rural jobs representing 76 percent of all jobs; (iii) the agriculture sector representing about 50 percent of the country's GDP; (iv) most agricultural jobs being relatively low-skilled; and (v) the agriculture sector being favorable for the mobilization of family labor.

Agricultural and livestock jobs dominate in rural areas, while services jobs dominate in urban areas, and most employment in Chad is informal self-employment. The agriculture/livestock sector employs more than 80 percent of the population, while the services sector employs more than

Figure 4-9

Employment by Socio-Professional Category, Place of Residence, and Gender, 2011 and 2018



Source: ECOSIT 3 & 4.

60 percent of the urban population. Self-employment is the most common type of employment, and agricultural self-employment increased from 49 percent in 2011 to 58 percent in 2018 (Figure 4-9). The increase in family workers (i.e., unpaid workers), especially women in rural areas, also boosted agricultural activity. Agricultural self-employed and family workers constitute almost the totality of employment in rural areas. In urban areas, there are also workers and managers, but they are less important than self-employed and family employment categories, demonstrating the failure of Chad's economy to generate other employment opportunities besides farming.

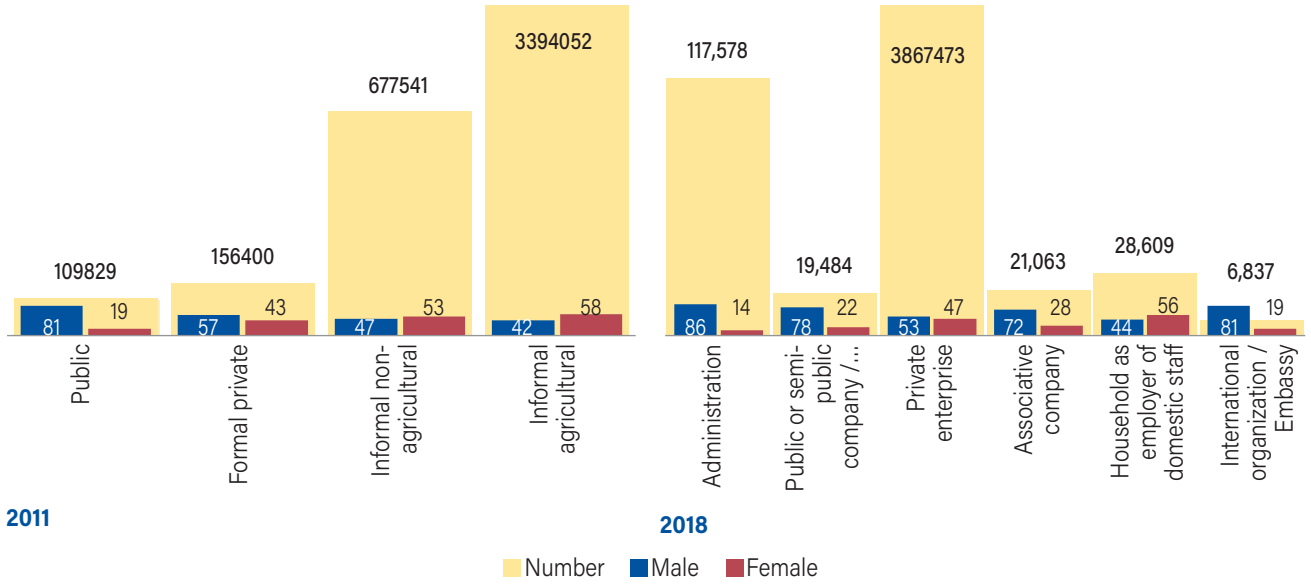
Women constitute half of Chad's working population, but many have low-productivity jobs and earn less than men. Only 50 percent of women participate in the labor force, much lower than 73 percent of men. Moreover, women are less likely to join the formal labor force and work for pay, and they do not have access to the same work opportunities as men. Even when they do, they are more likely to work part-time or in the informal sector. Time-use constraints for women, including the burden of domestic chores, also play a role in constraining their ability to work. As a result, there are substantial gender gaps in earnings and productivity, which in turn decrease women's bargaining power and voice as well as their ability to negotiate their productive work (Ngatia et al. 2020).

While the private sector dominates the labor market, the public sector absorbs more high-skilled workers. In 2018, there were more than 3.8 million jobs in the private sector, representing 95.2 percent of all jobs, while public sector jobs constituted less than 5 percent (Figure 4-10).[46] The public administration offers only 117,578 jobs, representing 2.9 percent of all jobs. The public sector has a much higher proportion of high-skilled jobs than the private sector, with public sector employees having an average of 10.4 years of education in 2018,[47] much higher than the average of 2.2 years for workers in

[46] The 'other' employment category includes jobs at, for example, international organizations.

[47] Employees in the public administration had an average of 9.3 years of education in 2018.

Figure 4-10
Employment by Institutional Sector, 2011 and 2018



Source: ECOSIT 3 & 4.
Note: The categories in 2011 and 2018 were not the same because the questions in ECOSIT 3 (2011) and ECOSIT 4 (2018) surveys were different.

the informal private sector. This is because the private sector is mostly informal and low-level jobs.

4.1.3. *Unemployment, Underemployment, and Wages*[48]

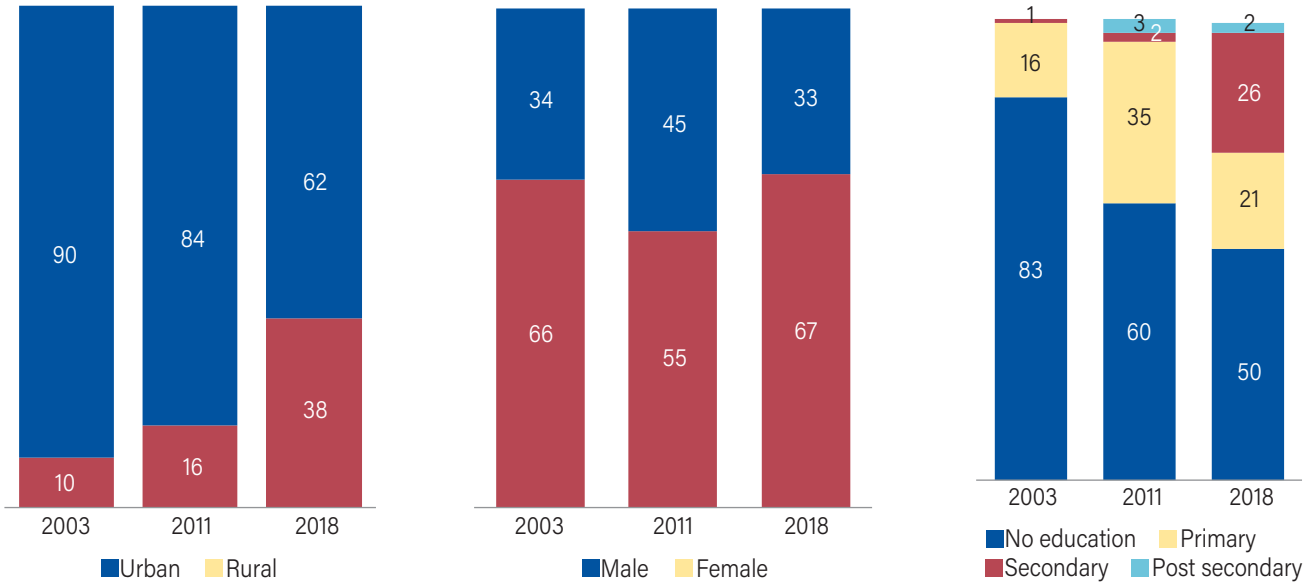
Unemployment has declined significantly in the past two decades and has become an urban phenomenon. Chad's unemployment rate, as defined by the International Labour Organization, fell by more than 16 percentage points from 18.2 percent in 2003 to 2.0 percent in 2018.[49] The unemployment rate for women dropped significantly by more than 14 percentage points, from 15.5 percent to 1.5 percent in the same period (from 20 percent to 2.3 percent for men), and the same downward trend is observed for youth unemployment (15–29 years). Unemployment affects more urban than rural households. In 2018, the unemployment rate was an estimated 5 percent in urban areas (down from 7 percent in 2011), higher than 1 percent in rural areas (down from 5 percent in 2011) (Figure 4-11 and Figure 4-12). While the share of unemployment increased in urban areas between 2003 and 2018, it remains low in comparison to other West and Central African countries. Unemployment also affects more men than women due to the low participation of women in the labor market, and young people are especially vulnerable to unemployment. Data indicate high unemployment among people aged 15–29. Moreover, people with little to no education face high unemployment, and they are less likely to get a job than people with advanced degrees due to the high share of uneducated people in Chad. However, since

[48] Chad, like many countries, uses two definitions of unemployment statistics: (i) the criteria established by the International Labour Organization; and (ii) the so-called extended definition established by the national statistical agency. The International Labour Organization unemployment rate and the extended unemployment rate are the two most used indicators for statistical measurement of unemployment.

[49] In addition to improving Chad's economy, the implementation of several insertion and support programs, including the Support Program for Graduates without Experience, Self-Employment Program, the Agricultural Credit, may have helped reduce the unemployment rate.

Figure 4-11

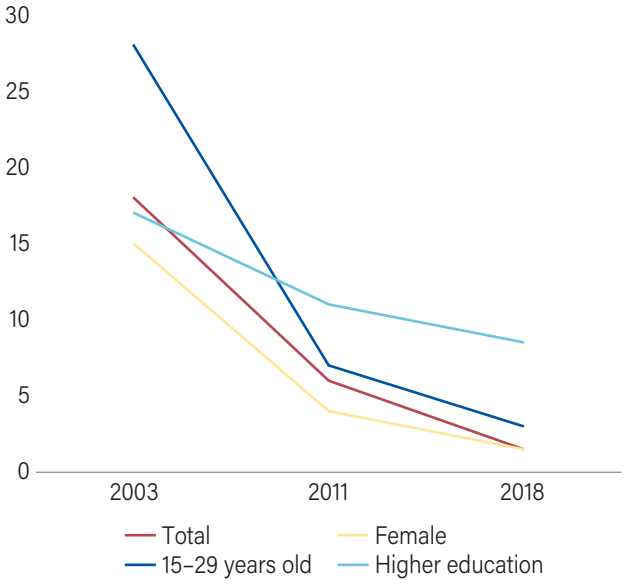
Unemployment by Level of Education, Place of Residence, and Gender



Source: ECOSIT 3 & 4.

Figure 4-12

Unemployment Rate (%), 2003–18



Source : INSEED, ECOSIT 3 & 4.

2011, there has been an increase in the share of unemployed people with secondary education degrees.

Invisible underemployment affects especially younger workers.[50] In 2011, people living in rural areas, women, and the poorly educated were more likely to be underemployed than their urban, male, and more educated counterparts. In 2018, the situation had reversed. More educated people had become more likely to be underemployed, indicating a skills mismatch. Regardless of the area of residence, invisible underemployment affects especially domestic household staff (more than 73 percent) and workers at associative enterprises (more than 56 percent). Increasing underemployment reduced the average working hours per week from 34 in 2011 to 33 hours in 2018.

Working in the services and industry sectors increases the likelihood of higher income,

[50] People who work shorter hours, earn less income, or do not use their skills as much as they would like to or could are in a situation known as underemployment (ILO 1998). Invisible underemployment occurs when employed workers earn less than the minimum wage (CFAF 60,000/month), while visible underemployment occurs when workers work less than 35 hours per week.

Table 4-1

Monthly Primary Employment Wage by Gender and Sector in Chad, 2013 and 2018–19 (in thousand of CFAF)

	Female		Male		Relative (%)	
Sector of activity	2011	2019	2011	2019	2011	2019
Agriculture	16.3	5.8	32.8	29.9	49.8	19.4
Breeding/Fishing	17.6	—	39.7	37.5	44.4	—
Mining	10.0	65.0	245.1	67.8	4.1	95.9
Other industries	19.2	39.9	60.5	67.6	31.7	59.0
Construction	70.5	88.3	80.1	91.5	88.0	96.6
Trade	32.8	21.4	58.0	61.0	56.6	35.1
Restaurant/Hotel	32.0	48.3	52.5	82.8	61.0	58.3
Transport/Communication	0.0	211.7		119.5		177.1
Education/Health		116.7		132.1		88.3
Personal services		26.9		70.7		38.1
Other services	108.7	121.1	102.8	177.6	105.7	68.2
Total	28.6	75.8	66.0	121.3	43.3	62.5

Source: ECOSIT 3 & 4.

regardless of gender, but the gender gap remained significant. Total wages increased significantly from 2011 to 2018 for both men and women (tripled for women and doubled for men), reducing the gender gap from 62.5 percent to a still high of 43.3 percent. While services and industries have experienced an increase in wages, this has not been the case for agriculture, breeding, and mining, which has seen a sharp decline in the already low wage both for women and men, and the gender gap has increased in agriculture. In terms of the wage rate of the employed population, which is a good indicator of the degree of formalization of labor relations, Chad's wage rate was estimated at 7.9 percent in 2018, down from 8.7 percent in 2011 and 7.3 percent in 2003. Wages tend to be higher in urban areas and in the capital o' N'Djamena.

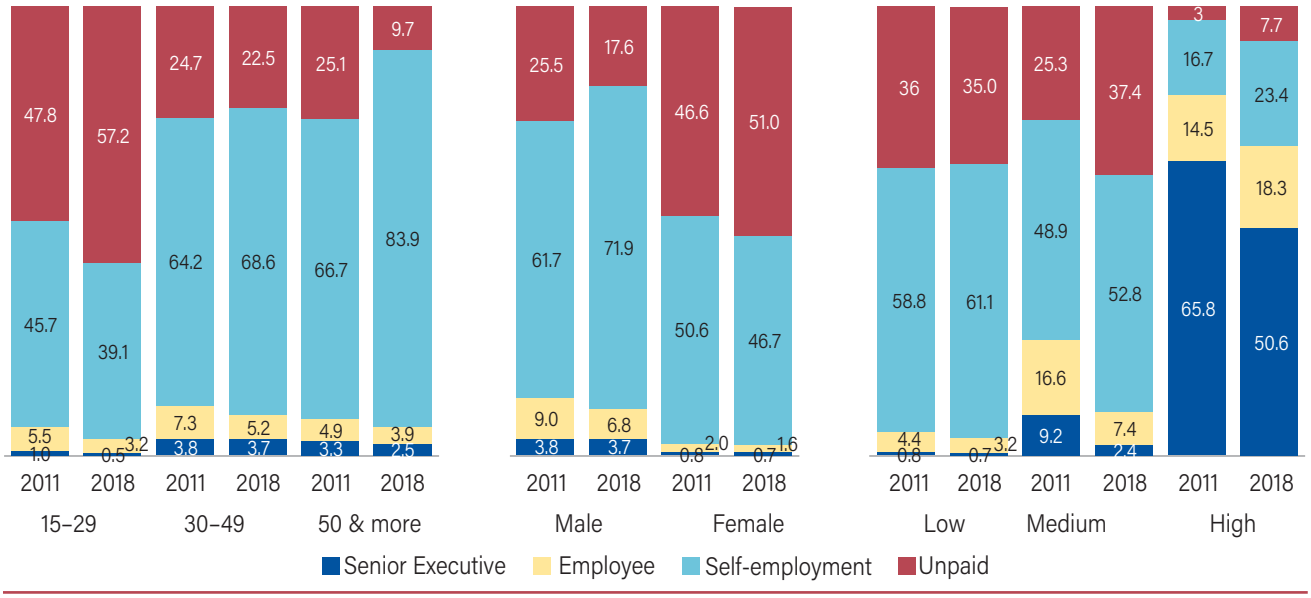
4.1.4. *Labor Mobility*

Labor mobility in Chad is driven by education and capital accumulation. Chadians tend to start their careers working unpaid jobs, especially in agriculture, and many try to improve their employment status through education or the accumulation of capital. This can be done by, for example, pursuing jobs in industry or services. The industrial and services sectors have higher labor mobility than the agriculture sector, regardless of age and gender (except for highly educated people). Skilled employees tend to be primarily employed in the services sector, followed by the industry sector, as earnings are higher and working conditions are more favorable (e.g., professional jobs, permanent contracts, and the presence of medium and large-sized enterprises). Workers who transition from industry or services to agriculture have either lost their jobs or have returned to improve their employment status (from an employee or unpaid worker in industry or services to self-employment in agriculture) (Figure 4-13).

The agriculture sector is the only sector able to absorb fluctuations in the labor market and accommodate labor market adjustments. The

Figure 4-13

Labor Mobility by Employment Status and Industry, 2011 and 2018



Source: ECOSIT 3 & 4.

industry and services sectors do not create enough jobs, and their intervention in the labor market is very limited due to the Chadian economy's inability to create highly productive jobs and develop more productive sectors. This is a supply-side problem, and diversification efforts should focus on promoting services and industry jobs and generate more formal employment. This could involve accelerating industrialization and integrating industrial processes for food products to generate value addition that can benefit the whole economy. However, the quality of Chad's labor force remains a significant constraint to diversification.

4.2. Focus on Labor Market Skills

4.2.1. *Skills of the Employed Labor Force*

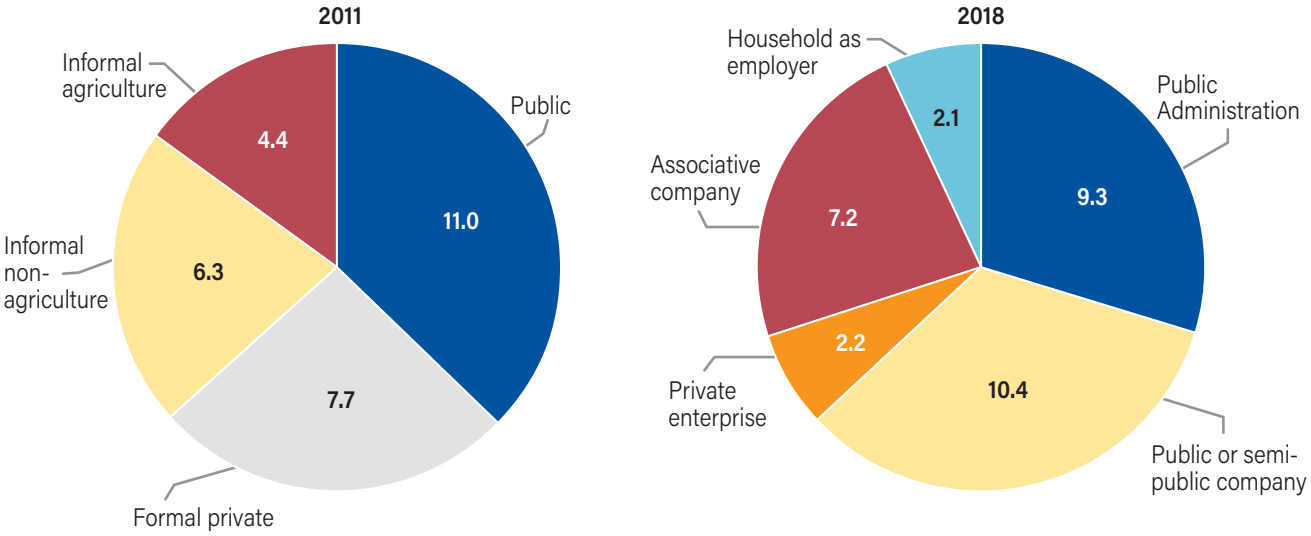
Chad's most common types of jobs rely on manual skills, and relatively few jobs require cognitive skills.[51] Managers, technical workers, and associate professionals require more cognitive skills than workers involved in food processing, construction and building trades, and agriculture that require more manual skills. Public sector jobs have the highest cognitive skills demands and the lowest manual skills demands. All three broad work sectors—agricultural, public non-agricultural, and private non-agricultural—emphasize routine cognitive skills such as performing calculations.

Workers with low educational attainment are concentrated in jobs that require manual skills, but many Chadians with higher education degrees also hold manual or physically demanding jobs. While there is a difference in the intensity of routine manual skills—mostly physical labor—required for many jobs held by Chadians with high educational attainment compared to workers with little or no education, the difference is not great (Figure 4-14).

[51] The analysis is not based on actual skills but rather a mapping of Chad' labor market onto an 'expected skills' grid, where each job held by each person in the ECOSIT survey (weighted) is assessed in terms of the degree to which certain kinds of skills are expected to be necessary for that job.

Figure 4-14

Number of Successful Years of Study by Institutional Sector, 2011 and 2018



Source: ECOSIT 3 & 4.
Note: The categories in 2011 and 2018 are not the same because the questions in ECOSIT 3 (2011) and ECOSIT 4 (2018) surveys are different.

The skill demands on men and women are surprisingly similar, given the differences in earnings. Men are more likely than women to hold jobs that require slightly more analytical and interpersonal skills, but the difference is very small, and they are more likely to hold jobs that involve routine manual tasks. The distribution of expected skills is also remarkably consistent across the three age cohorts, which is yet another reminder of the rigidity of Chad's labor market (Figure 4-14). Younger workers in the country are not more likely than their older counterparts to take jobs that are cognitively more demanding, and the types of manual jobs of old and young workers have been identical in terms of the skills required.

4.2.2. *Skills of the Labor Supply*

With a large share of students out of school, the skills profile of the Chadian labor force is not likely to improve in the medium term. The reasons for the country's skills gap can be traced back to the estimated 1.9 million youth aged 12–24 who are out of school, of whom 1.4 million have never set foot in a school and another 500,000 dropped out after enrolling in primary school (Inoue, di Gropello, Taylor & Gresham 2015). Only about 800,000 youth, or one-third of the youth in this age group, are enrolled in school, making Chad one of the countries with the worst educational outcomes in the region. Out of 31 regional countries for which data are available, with nearly 54 percent of the youth out of school, Chad ranks the third worst, following Mali and Burkina Faso. While the share of out-of-school youth has declined, dropout rates in the country increased between 2003 and 2011, suggesting that while the youth are now more likely to be enrolled, they are not necessarily more likely to complete school. The quality and availability of schooling, as well as demand-side constraints such as the cost of attending school, plays a large role in the decision to drop out.

Education does not always lift Chadians out of poverty, especially in rural areas. Rural households whose head has completed primary education suffer from higher-than-average poverty, and household consumption is insensitive to primary education. This is due to the low quality of education and

its irrelevance to the job market. For traditional farmers, education adds little to the knowledge passed from parents to children, as reading does not improve their economic outcomes. By contrast, rural households with a household head with secondary and vocational education and diplomas, who work in the wage sector, have significantly higher levels of consumption. This suggests that returns to some forms of specialized technical education may be high, at least in certain contexts, and that improving the education of agricultural wage workers (e.g., through a combination of post-basic cognitive, non-cognitive, and technical skills) could improve productivity and earnings in the agriculture sector.[52]

4.2.3. *Developing Skills*

The country's Human Capital Index (HCI) has remained low during the last decade. The HCI for Chad went from 0.29 in 2019 to 0.30 in 2020. Despite this small increase, Chad's HCI is lower than the average for SSA and low-income countries.[53] This means that children born in Chad today will be 30 percent as productive when they grow up as they could have been had they enjoyed complete education and full health. This is driven largely by the low probability of survival to age 5 (88 per 100 children born), high levels of stunting (40 percent of children), and poor enrollment and quality of education. For example, a child in Chad can be expected to complete only 5.3 years of school by the age of 18. Factoring in what is actually learned, this is the equivalent to only 2.8 years of schooling. An additional reduction in years of schooling is expected given school closures during the COVID-19 pandemic.[54]

Learning poverty (LP) is very high at 94 percent, meaning that very few children (1 in 20) can read and understand a simple age-appropriate text at age 10. This level of LP is 8.3 and 3.6 percentage points worse than the average of SSA and low-income countries, respectively. According to the Program for the Analysis of Education Systems' international learning outcomes survey conducted in 2019, only 22.2 percent and 11.5 percent of students at the end of primary school reach the minimum competency threshold in reading and mathematics, respectively. In addition, according to ECOSIT 2019, roughly half of all children of primary school age, equivalent to approximately 1.5 million children, are not in primary school. According to the 2021/2022 education yearbook, the primary and secondary completion rates are less than 47 percent and 21 percent, respectively. Girls dropout of school across education levels is especially at the primary and junior secondary level high. Two-thirds of the population is under the age of 25, and 77 percent of people live in rural areas. Therefore, instead of being the norm, primary education completion has become a rare outcome for many children, especially girls.

A lack of foundational skills limits Chadians' chances to access higher education, get better jobs, and escape the vicious cycle of poverty. According to ECOSIT-IV, the average wage of a worker with a general secondary education is 1.6 times that of a worker with a primary education. Those with a technical secondary education have an average wage 2 times higher than those with a primary education, and the coefficient increases to 3 for higher education. Interestingly, an additional year of education increases the average wage by 7 percent for men and 13 percent for women. The proportion of poor and very poor households decreases as the level of education rises: if the absence of education and incomplete primary education lead to 43 percent of the population being poor or very poor, this share

[52] Examples of technical skills that could support productivity gains are animal health, land and crop management, and the use of techniques for more intensive farming (including small-scale irrigation).

[53] World Bank Human Capital Project Report 2020.

[54] After the first confirmed case of COVID-19 on March 20, 2020, all schools were temporarily closed and resumed only in September 2020. Grades 6, 9, and 12 were the exception, as they resumed at the end of June 2020. Approximately 69,576 teachers and 3 million learners were affected (2.4 million students in primary, 500,000 in secondary, and 40,000 in higher education).

slowly decreases to 7 percent with higher education (22 percent with secondary education, including technical education). Finally, education affects the behavior of women aged 15–49 in terms of fertility (fewer children with more education) and maternal health (more deliveries attended by qualified personnel).

Although TVET and skills development efforts are critical for improving the stock of skilled workers and preparing them market relevant jobs, the subsector has suffered from numerous challenges:

a. **TVET enrollment is low, and access is limited for Chadians living in rural areas as well as women in rural and urban areas.** TVET centers have extremely low absorptive capacity despite demand, and they do not make use of efficiency measures in scheduling and shifting to maximize space and enrollment. Enrollment in TVET represents only 1.5 percent of total enrollment at the secondary level. The primary sector (agriculture, forestry, and fishing) is the greatest source of employment in Chad, but there are few opportunities to train for jobs in this sector in the country's training institutions. While only 3 percent of TVET programs focus on the primary economic sectors, jobs in these sectors account for three-quarters of all jobs in Chad. Additionally, most TVET and training opportunities are concentrated in the capital (approximately 35 percent). Various sector ministries offer other types of training, but their reach remains limited. An estimated 70–80 percent of the country's young people, especially in rural areas, are excluded from TVET. According to ECOSIT surveys, the estimated demand for vocational training is 53,000 students per year, and there are 77,000 apprentices supported by informal entities annually, but the total capacity of the country's TVET programs, including training programs (training funded by schools and FONAP), is less than one-third of total apprentices.

b. **Training programs are not relevant and of low quality**. The key factors driving low quality are: (a) program offerings do not appear to be driven by employment offerings and do not result in required skills for employment; (b) equipment is outdated or nonexistent, and hands-on application is often not possible; and (c) poorly trained trainers and staff as well as outdated heavily theoretical curricula diminish the quality of training to students. TVET programs, both formal and informal, are ill-suited to meet the needs of the labor market. TVET institutions work in isolation and are disconnected from the labor market. The bulk of training programs ignore the needs of the agriculture sector, where labor demand is the greatest. The curricula used in TVET programs rarely consider the needs of the labor market, training programs remain rigid and narrow, and they rarely offer incentives for entrepreneurship and self-employment—the main sources of employment in the country. TVET courses are also poorly suited to the needs of young women, as vocational training for women is limited to stereotypical areas such as hairdressing and sewing.[55] As a result, TVET graduates remain without jobs while employers complain about lack of skilled workers.

c. **Private sector involvement is limited**. Representatives of the private sector are not involved in the development of TVET training programs, and linkages to industry remain weak. Furthermore, there is little focus on skills development in the areas of entrepreneurship and self-employment, even though these remain the main sources of employment. Professionals have little involvement in curriculum development or identifying sector needs, and there is no legal framework for their involvement. Similarly, the relationship between universities and businesses is limited, despite the existence of vocational courses in schools. Collaborations between higher education institutions and corporations are limited to the energy sector. The disconnect

[55] The SWEDD project has broken this trend by offering training in areas such as mechanics, but more efforts are needed.

between TVET entities and the private sector also manifests itself in TVET programs' inability to improve teacher quality. Teachers at TVET institutions often lack the relevant experience and education, or their knowledge is purely theoretical. There is no feedback form the business sector on the types of qualifications or experience teachers should have to be able train students in technical and vocational fields.

d. **Chad spends relatively little on education, and spending is not equitably distributed among the population**. Representing less than 10 percent of total government spending, Chad's education spending is among the lowest in SSA. Although most education funding goes to primary and secondary education, 41 percent of current expenditure in primary education is still financed by families. In addition, 10 percent of the most educated youth benefit from 48 percent of public education resources, while 40 percent of youth have never been to school and do not benefit from any public resources. TVET receives less than 1 percent of government spending on education, much lower than the African average of about 5 percent (Foko, Tiyab & Husson 2012). Technical and vocational training outside the Ministry of Education receives funding from multiple sources, but little coordination exists among these groups. The second biggest source of TVET funding is the National Professional Training Fund (FONAP), which operates under the Ministry of Planning and is funded through a 1.2 percent payroll tax imposed on every private (and formally registered) business in Chad.[56] The Ministry of Public Service, Employment and Dialogue funds employment and training programs through The National Office for the Promotion of Employment (ONAPE) and indirectly through the National Social Security Fund. ONAPE funds various entrepreneurial programs using dedicated revenues from fees related to a work permit foreign workers must have to work in Chad. Another important source of funding for employment programs is the National Youth Support Fund under the Ministry of Culture, Youth and Sports.

e. **TVET institutions have limited autonomy**. Currently, Chad's TVET institutions are controlled directly by the Ministry of Vocational Training, which retains the power to, among other things, recruit and post staff in training institutions. TVET institutions do not operate as distinct legal entities, and they do not have a board of directors (or similar entity) to facilitate private sector participation. Budgets are primarily allocated based on previous allocations and do not consider the objectives and performance of training institutions. The rigid allocation of public resources generally does not provide necessary incentives to foster innovation.

f. **The linkages between TVET and other forms of education and training remain weak.** TVET institutions are disconnected from other forms of formal education. In theory, graduates of technical and vocational schools can pursue post-secondary education at any institution that accepted them. In practice, the TVET system lacks harmonious standards for the various types and levels of training, certification, and quality assurance, which reduces the opportunity for graduates to continue their post-secondary education. A divide exists between TVET and initial training and continuing education, with limited complementary between them, which means that graduates of vocational training programs cannot pursue additional technical education. There are no continuing education options under the Ministry of Education. There is also a disconnect between

[56] FONAP was established in 1993 to provide financial support to businesses and public and private providers of vocational training that submit training plans that meet priority guidelines set by the National Committee for Education and Training in conjunction with employment. The Ministry of Planning provides technical supervision, and the Ministry of Finance provides financial supervision for the fund. A committee called Conseil de Gestion Tripartite that is composed of representatives of the government, workers, and employers makes funding decisions.

formal TVET schools and on-the-job apprenticeship programs, as formal TVET schools do not cater to the needs of skilled trades, and on-the-job apprenticeship programs offer only a small range of qualifications.

g. **Chad's workforce development strategies remain out-of-step with the needs of the labor market**. The Observatory of Education, Training, and Employment, the entity in charge of compiling labor market and TVET data, is extremely weak. Moreover, the government does not conduct surveys or study specific topics in education and training, and it does not perform any type of needs analysis. Private operator data are rarely exploited by the regulatory authorities, and there is no integrated and centralized system to capture, store, and study information provided by operators. There is little collaboration between FONAP and other planning agencies, even though FONAP can share information on the types of training businesses request.

4.3. Labor Market Structure

4.3.1. *Labor Market Organization*

Chad's labor market is governed by several decrees and regulations. These includes the law on the labor code; decree on child, women, and pregnant women's labor; decree determining the terms and conditions of application of working hours; and the decree raising the guaranteed interprofessional minimum wage and the guaranteed agricultural minimum wage. The main laws are Law No. 38/PR/96 of December 11, 1996, on the Labor Code and the General Collective Agreement of 2002, which deals with work, wages, allowances, social security, job security, family responsibilities, health, sick leave, and maternity. In terms of collective agreements, several general agreements have been concluded between unions and employers, the latest of which dates to 2002. This general collective agreement was drawn up to regulate labor relations between employers and workers and supersedes all existing agreements. In addition, there are special agreements in some sectors such as oil. In December 2012, an agreement applicable to contractual agents in public services was concluded between the government and unions.

Several authorities (ministries, observatories, offices, etc.) are involved in the labor market and the management of Chad's active employment policy. No less than seven ministerial departments and four institutions (two national funds, one national office, and one observatory) are directly or indirectly involved in policies related to employment. The Ministry of Public Service, Employment and Social Dialogue monitors the national employment policy and manages recruitment to the public service and the negotiation mechanism (labor rights, social security, etc.); the Ministry of Agriculture and Irrigation oversees the integration of young farmers, breeders, and craftsmen; and the Ministry of Justice manages labor disputes, etc.

ONAPE manages the active labor market policy. It was created in 1992 and placed under the supervision of the ministry in charge of labor (currently the Ministry of the Civil Service, Employment and Social Dialogue). Its mission is to promote employment and combat unemployment, manage job placements, retrain and promote the mobility of the workforce, and deal with adjustments related to job demands and offers.

The government has also created other agencies to promote job creation. FONAP, created in 1993 provides financial support to companies and public and private vocational training institutions that have submitted training plans that meet the priorities set by the National Committee for Education and Training in connection with Employment. The National Youth Support Fund, created in 2010 and located under the ministry in charge of youth, supports initiatives of young entrepreneurs that can contribute to their economic and professional integration. The Observatory of Education, Training and Employment, created in 1993, aims to: (i) centralize,

process, and analyze data on education, training, and employment; (ii) realize the interface between labor market fluctuations and education and training programs; and (iii) create and disseminate two directories (one of the trainings offers and the other of the jobs resulting from the promotion actions). In terms of labor market intermediation, there are two institutions that play a major role in the placement of job seekers: the National Office for the Promotion of Employment facilitates placement for public jobs, and the Private Placement Bureaus focuses on private job placement.

Chad's unions and employers play an important role in organizing the labor market. They participate in collective bargaining to determine employment and working conditions and to organize collective relations between employers and workers. The National Council of Chadian Employers (CNPT), the only employer organization, has over 50 employers. It serves as an intermediary between the authorities and employers and business owners. The CNPT participates in collective bargaining with representatives of labor organizations and conducts studies on general economic and social issues in Chad. Workers, for their part, have organized themselves into various unions, including the Chadian Syndical Union; Free Confederation of Workers of Tchad; Confederation of Chadian workers; Independent Confederation Syndical in Chad; and Chadian Syndical Confederation.

4.3.2. *National Employment and Wage Policy*

There is a need to update and validate the National Employment and Vocational Training Policy. There has been no significant policy action to improve employment and vocational training since 2002 (when the employment policy declaration was adopted). In 2014, Chad created its first official National Employment and Vocational and Technical Training Policy document,[57] which aims to: (i) develop human capital: (ii) increase the supply of skilled labor; (iii) improve the business climate; (iv) organize the informal sector and promote small and medium-sized enterprises/SMIs; and (v) improve labor market governance and access to information. However, after more than seven years of policy validation, the assigned objectives have not been achieved.

Within the framework of implementing public employment policies, several programs have been designed to promote employment and the professional integration of the youth. The programs initiated and implemented by ONAPE are the Self-Employment Program, Agricultural Credit Program, Support Program for Graduates without Experience, and the Job Search Techniques Workshops. The Self-Employment Program aims to encourage self-employment by granting interest-free micro-credits, ranging from CFAF 0.5 to 3 million over a maximum repayment period of three years. In 2018, 1,400 projects were financed, and 3,900 jobs were created. Meanwhile, the Agricultural Credit Program is intended to create public jobs in rural areas, and 130,000 jobs were created in 2018. The Support Program for Graduates without Experience is a pre-employment internship program that promotes the integration of young graduates without professional experience who are looking for their first job. Between 2012 and 2018, more than 3,500 young graduates were placed in companies. The Job Search Techniques Workshops are preparatory, educational, and introductory sessions on techniques for finding an internship or a job. Within the framework of the National Youth Support Fund, the program aims to support the initiatives of young promoters in their economic and professional integration.

4.4. Reforms to Boost Job Creation and Mobility

Economic transformation is key to sustainably creating better jobs at scale. Economic transformation

[57] The objective of the national employment policy is to increase decent employment opportunities by focusing on the cross-cutting nature of employment, which encompasses all macro and sectoral policies.

involves shifting people and resources from lower- to higher-productivity activities within and across sectors, firms, and farms; from rural to urban areas; and from self- to wage employment. A shift to higher-productivity activities can allow people to raise their incomes as they earn higher returns on their labor and other assets. Without accelerating economic transformation, the potential to create more and better jobs is limited. At the early stages, shifting Chad's employment from agriculture to industry and services is the main determinant of productivity growth.

Chad needs to promote economic diversification and sectors with a strategic advantage to create more and better jobs such as agriculture.[58] According to 2022 SCD, the authorities should consider : i) encouraging private sector participation in key agricultural input markets and supporting climate-smart agricultural practices; ii) ensuring sustained productivity growth in agriculture through technological innovation; iii) formulating a national land policy to increase agricultural productivity; iv) adopting sector-specific policies to incentivize private investment;[59] v) ensuring the livestock reform agenda focuses on policies that protect the supply chain, from production sites to trade corridors, border crossings, and destination markets; iv) supporting light manufacturing, mainly the leather, cotton, and milk industries, to diversity the economy.

The inadequate business climate, high taxes, and lack of investment are holding back the demand for labor. High tax rates, an inefficient tax administration, and corruption are among the top obstacles to private sector development in Chad. The business regulatory system is a major bottleneck to business entry, and Chad has a higher rate of firms facing tax obstacles than other low-income countries. Given these conditions, many businesses choose to remain in the informal sector. As the informal sector accounts for about 98 percent of employment, employment programs should support informal enterprises to enter the formal sector. The government could streamline the administrative process to register companies and promote a business-friendly environment, anchoring it in the CEMAC reform agenda.[60] This could increase the share of formal jobs in the private sector, increase the potential of education and skills development, and expand the middle class. Given the important gender gap, women entrepreneur in the informal sector should be offered business training, including on psychosocial skills, business development, and management. Targeting lines of credit to female-owned businesses could also be considered (Ngatia et al. 2020).

To develop the labor-intensive formal sector, the authorities need to leverage the country's natural assets, increase market contestability, and improve labor market regulations. The agricultural and livestock value chains could be a good avenue for economic diversification through agro processing. The government could develop a knowledge pole around certain agro-industries to expand formal job creation. To improve labor mobility, an increase in firm competition should be matched with regulations that favor labor market competition. Chad's labor market regulations need to be reviewed, as they all (labor code, collective agreements, etc.) date back more than 20 years and require updating. The country lags much of the world in international integration, competition, and antimonopoly policies. The lack of economic contestability is limiting investments in technology, exacerbating the region's low equilibrium outcomes, and increasing the likelihood that many groups, especially youth and women, will be excluded from the workforce. Beyond improving the contestability of services and goods markets, policies

[58] With the technical support of the Economic Commission for Africa (ECA), the Government has drawn up its Master Plan for Industrialization and Economic Diversification (PDIDE). It would therefore be important to kickstart its implementation, by emphasizing, in a first phase, the development of infrastructures to support industry and by enhancing the supply of energy.

[59] The adoption of reforms to promote private investment should consist, on the one hand, in updating the investment charter to make the Chad destination attractive and, on the other hand, in adopting the charter for small and medium-sized enterprises.

[60] CEMAC 2021.

need to increase social inclusion by ensuring workers operate in a dynamic labor market that provides them with flexibility and social protection.

The authorities need to reduce LP to build a strong human capital and skills base. Without literacy and numeracy foundational skills, Chadian children and youth will be unable to contribute fully to their own livelihoods and to their families, communities, and country. Cutting LP requires improving literacy and reducing the number of out-of-school children. This would mean transforming the teaching profession, boosting student readiness to learn, providing learning resources and educational technology tools, teaching in a language that children understand and at the right level, and improving learning assessments. Reducing the number of out-of-school children and increasing girls' education require both demand- and supply-side policies that, along with a strong partnership with private education providers such as non-governmental organizations, churches, and communities, introduce mechanisms targeting the poor and vulnerable population.

Chad needs to strengthen the relevance and quality of its skills development system through formal TVET and higher education as well as informal and nonformal training. This would not only benefit the population but also provide the country with a wide range of competent workers to fill jobs across the economy. To do this, the government should : (i) improve and extend vocational training in key growth sectors, including ICT, while improving the governance of the education and training system and promoting links with the private sector through the establishment of partnership agreements between TVET institutions and industry; (ii) provide more autonomy to TVET institutions while enhancing their accountability through performance-based contracts with the government; (iii) support skills development to address the needs of unemployed youth, including school graduates and school leavers, through internship and entrepreneurship training; (iv) improve the rigor of institutional and program accreditation; (v) strengthen data collection, analysis, and access to information; and (vi) strengthen support services to help people better transition to the labor market. To meet market needs, the authorities should harness expertise already existing in the informal sector and encourage greater private sector involvement in training programs by providing fiscal incentives and facilitating administrative processes for investors.

The authorities also need to improve the link between remuneration and productivity to strengthen human capital development and reduce the skill gap. This cannot, however, be done without connecting remuneration levels to productivity levels. Chad has a statutory type of remuneration: a very marginal part of remuneration is linked to productivity and work results. The basic salary makes up a large part of remuneration, and it is determined by a professional classification of the employing organization, the seniority of the worker, amount of overtime worked, or the working conditions. An in-depth reform to link a significant share of remuneration to productivity would increase people's incentives to work, increase the return of education/human capital on investment, and allow companies to increase the workforce to extend their market size.

Finally, Chad should strengthen its labor market information system to support job creation and mobility. This would require the government to strengthen: (i) the legal basis for the National Institute of Statistics, Economic and Demographic Studies (INSEED) to monitor jobs and skills statistics; (ii) the financial, human, material, and technical capacity of INSEED to collect, analyze, and disseminate information on employment and the labor market; and (iii) coordination and partnerships between the authorities involved in the labor market information system and enhance administrative sources to centralize and clarify all labor market information.

CHAPTER 5

Impact of Policy Reforms on Chad's Economy and Development

Abstract: *Due to a significant decline in oil production, solid population growth, and growing climate change challenges, Chad could become a low-middle-income country only by 2045, if the country implements the full set of reforms recommended in this CEM. Assuming that all CEM reforms are implemented. However, failure to reforms would be costly, as the country would remain a low-income country even by 2050, with no meaningful improvement in the quality of life of its population.*

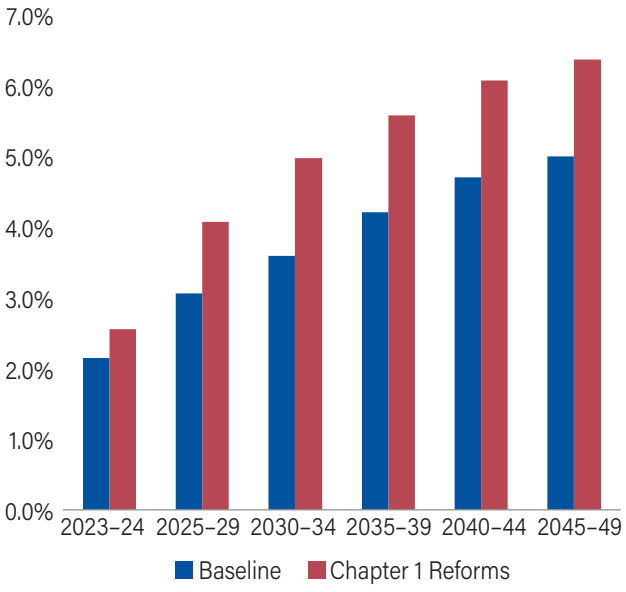
5.1. Impact on Non-oil GDP Growth

This chapter examines Chad's growth prospects, assuming that the proposed reforms have been implemented. Simulations are based on the World Bank's structural CC-MFMod model. The baseline scenario is the G5 Sahel CCDR medium growth scenario.

Reforms introduced in Chapter 1 affect GDP through an increase in the capital stock and TFP. Policies that reduce the likelihood of conflicts would decrease the depreciation rate of capital, free up additional resources that could be used to increase public investment, and improve the investment climate as the government eases its heavy control on economic activities. Assuming these reforms reduce the likelihood an episode of insecurity by 50 percent, the depreciation rate of capital would be reduced by about 0.4 percentage points (ppts) over the next 15 years, starting in 2025. Moreover, given that defense spending has increased by an average of about 67 percent per year in 2000–22, such a significant reduction of the likelihood of a major episode of insecurity would (assuming that almost all unplanned spending replaces investment spending) increase public investment by an average of about 1 percent per year starting in 2025. Meanwhile, better public financial management and investment climate could improve the efficiency of public investment. All these policies would support an improvement of TFP from negative growth to gradually increasing by about 1.2 percent relative to the baseline by 2026. Under these assumptions, potential non-oil GDP growth would increase by about 1 ppt in 2025–29 and up to 1.5 ppts in 2030–39. The main contributor to growth would be labor in 2025–29, TFP in 2030–34, and the capital stock in 2035–59.

Figure 5-1

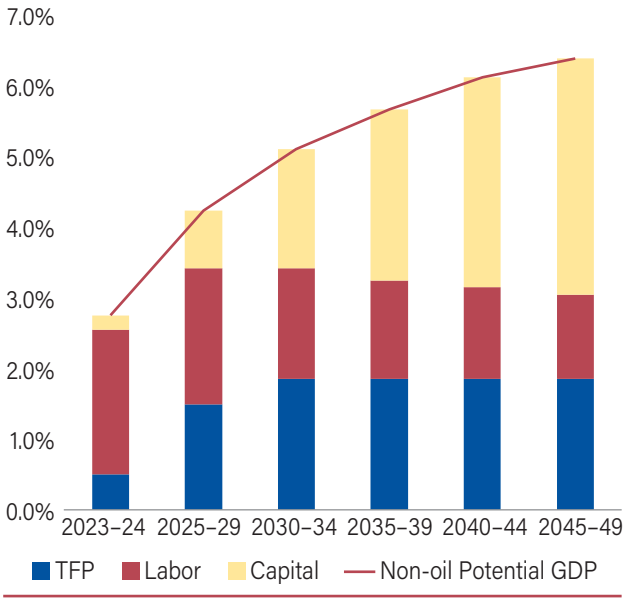
Chapter 1 Reforms: Non-Oil Potential GDP (average annual growth), 2022–49



Source: Authors using CC-MFMod Model.

Figure 5-2

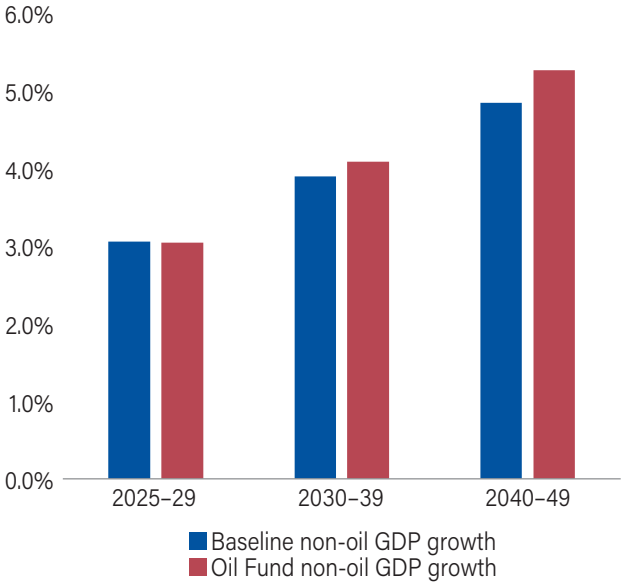
Chapter 1 Reforms: Contribution to Non-Oil Potential GDP Growth 2022–2049.



Source: Authors using CC-MFMod Model.

Figure 5-3

Chad's Oil Fund Reform: Contribution to Potential Non-Oil GDP Growth, 2022–2049



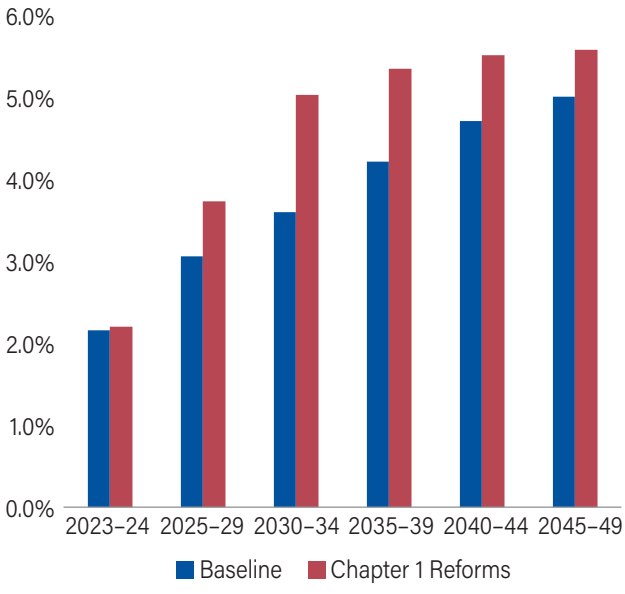
Source: Authors using CC-MFMod Model.

Reforms introduced in Chapter 2 would slightly affect GDP and sustain public investment. Better management of the oil sector would increase public revenue that could be used for investment, while the saving mechanism would allow for a steady, albeit modest, increase in investment. Under these assumptions, potential non-oil GDP growth would remain unchanged in 2025–29, before increasing slightly by 0.2 ppts in 2030–39.

Reforms introduced in Chapter 3 would improve the quality of economic infrastructure. Their impact is based on assumptions related to: (i) public investment, ii) private investment, and iii) productivity. With the support of development partners, Chad could significantly increase public investment in the next five years (by 10 ppts from the baseline), with public investment growth averaging 15 percent in 2023–30, before decelerating to an average of 6 percent as donor support fade but the government remains commitment to improving economic infrastructure. Greater public investment and policy reforms to increase private infrastructure funding are expected to increase private investment by about 2 ppts from the baseline in 2023–29 and 1 ppt

Figure 5-4

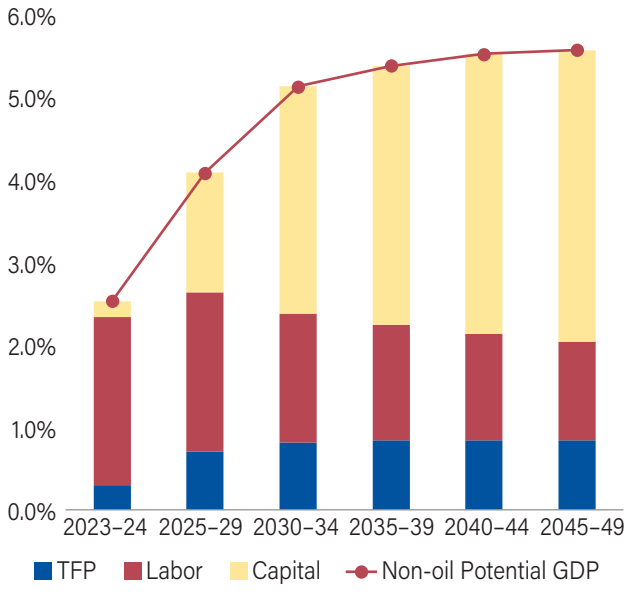
Chapter 3 Reforms: Non-Oil Potential GDP (average annual growth) 2022–2049



Source: Authors using CC-MFMod Model.

Figure 5-5

Chapter 3 Reforms: Contribution to Potential Non-Oil GDP Growth, 2022–2049



Source: Authors using CC-MFMod Model.

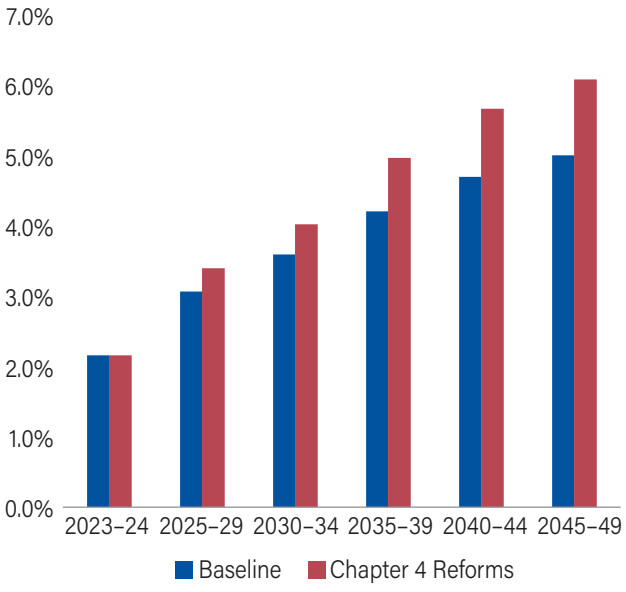
thereafter. Also, better maintenance of roads should reduce capita stock depreciation by 0.2 ppts. Better governance and management of public investment would improve economic efficiency, which in turn would improve TFP from the baseline by 0.5 ppts. Under these assumptions, potential non-oil GDP growth would increase by about 0.7 ppts in 2025–29 and up to 1.8 ppts in 2030–39 relative to the baseline. The main contributor to growth will be the stock of labor in 2025–29, representing about 40 percent of growth, while capital will account for about 50 percent of non-oil GDP growth in 2030–34.

Finally, reforms introduced in Chapter 4 would improve labor market mobility and the skills of the workforce. These are based on assumptions related to labor participation and productivity. Reforms in the labor market, including increasing women's participation in the workforce, would lead to a gradual rise in labor participation of about 4 ppts over the next 15 years, before leveling out at a certain point due to a cap on labor participation. Unemployment in Chad is, however, already low at less than 3 percent. Meanwhile, reforms to increase workers' skills in relevant sectors would also reduce underemployment and ultimately total productivity up to 0.5 ppts from the baseline by 2035. Under these assumptions, potential non-oil GDP growth will increase by about 0.2 ppts in 2025–29 and up to 0.6 ppts in 2030–39 relative to the baseline. The main contributor to growth will be the stock of labor in 2025–29, representing about 40 percent of growth, while capital will account for about 50 percent of non-oil GDP growth in 2030–34.

Implementing the reforms laid out in each of the four chapters could accelerate Chad's economic growth despite a sharp decline in oil production. The proposed reforms in this CEM would gradually increase the capital stock due to solid and sustained public investment and more robust private sector investment aimed at reducing the infrastructure gap. The reforms would also improve human capital and labor market participation, and many reforms would lead to a sharp increase in productivity. Under the stated assumptions, potential non-oil GDP growth

Figure 5-6

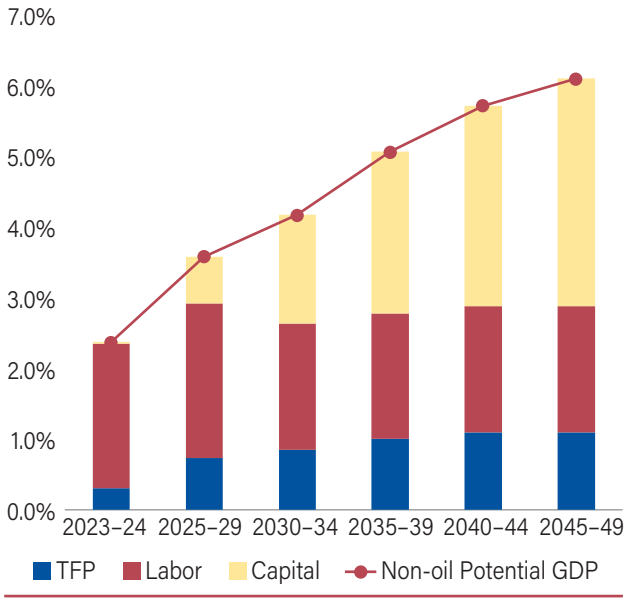
Chapter 4 Reforms: Potential Non-Oil GDP (average annual growth), 2022–2049



Source: Authors using CC-MFMod Model.

Figure 5-7

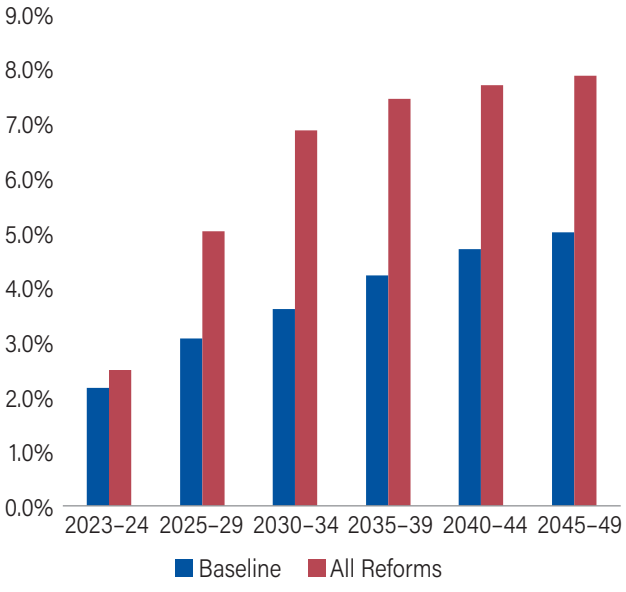
Chapter 4 Reforms: Contribution to Potential Non-Oil GDP Growth, 2022–2049



Source: Authors using CC-MFMod Model.

Figure 5-8

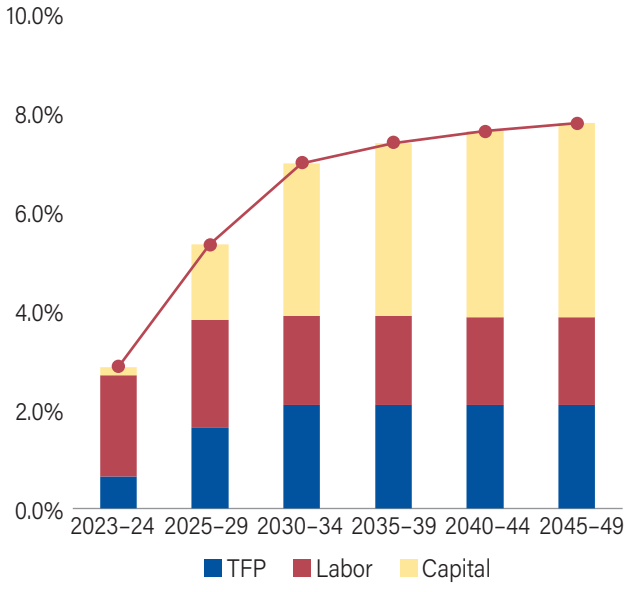
Potential Non-Oil GDP (average annual growth), 2022–2049



Source: Authors using CC-MFMod Model.

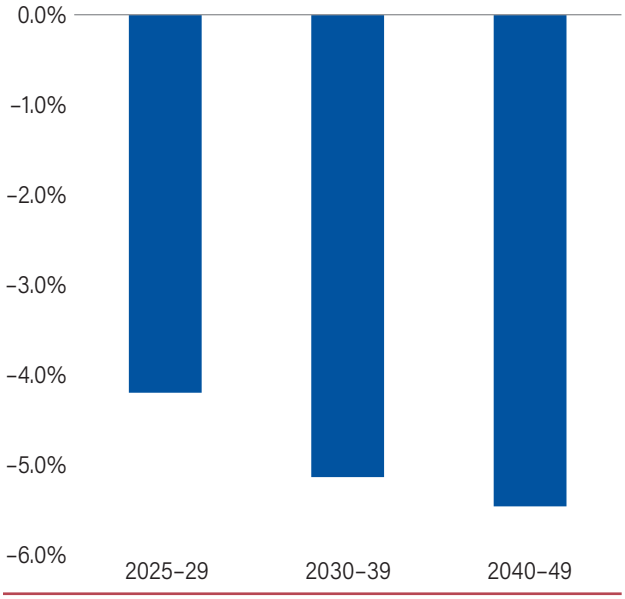
Figure 5-9

Contribution to Potential Non-Oil GDP Growth, 2022–2049



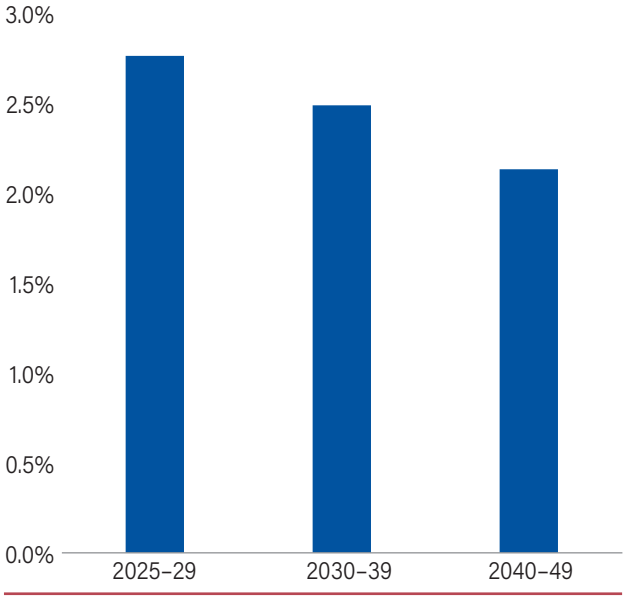
Source: Authors using CC-MFMod Model.

Figure 5-10
Average Oil GDP Growth, 2025–2049



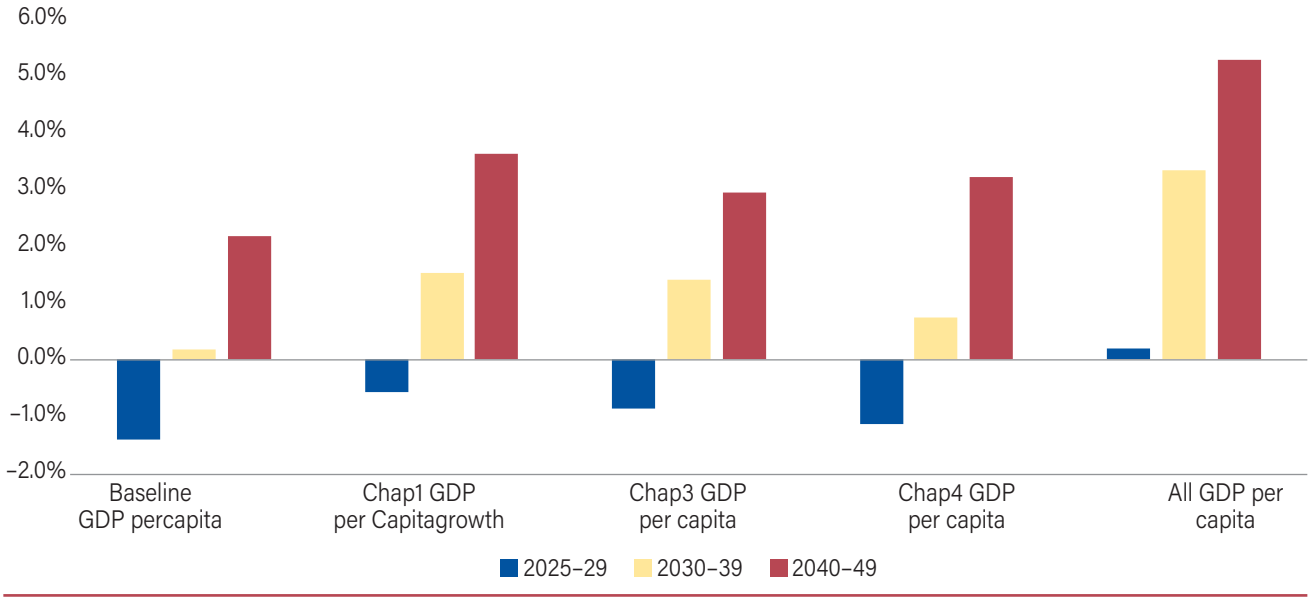
Source: Simulations with CC-MFMod Model. using oil production data from oil producing companies.

Figure 5-11
Average Population Growth, 2025–2049



Source: UN Population.

Figure 5-12
Average GDP Capital Growth, 2025–2049



Source: Authors using CC-MFMod Model.

will increase by about 2.0 ppts in 2025–29 and up to 3.3 ppts in 2030–39 relative to the baseline. The main contributor to growth would be the stock of labor in 2025–29, representing about 55 percent of growth, while capital would account for about 50 percent of non-oil GDP growth in 2030–34, and the growth contribution of TFP would average 30 percent in 2030–39.

5.2. Impact on Development Prospects

Efforts to significantly improve well-being in Chad through an increase in non-oil GDP per capita are hampered by declining oil production and a negative demographic dividend. Oil GDP is projected to decline by more than 6 percent, on average, in 2024–2049, reducing the share of oil GDP in total GDP from about 20 percent in 2022 to less than 5 percent in 2040 under the baseline scenario. Negative oil GDP growth significantly reduces total GDP growth under every reform scenario. Moreover, with a population growth rate of about 2.7 percent in 2024–2039, the demographic dividend is expected to remain weak.

As a result, GDP per capita growth is projected to be negative in 2025–29 under any partial reform scenario. If the full set of reforms is implemented, GDP per capita growth would be barely positive during the same period. Nevertheless, in 2030–39, GDP per capita growth would range from 0.7 percent (if only skills and labor market reforms are implemented) to 1.3 percent (if only reforms to close infrastructure gaps are implemented or if only reforms to reduce conflicts and improve public financial management and the business environment are implemented), depending on which reforms are adopted. With the implementation of all reforms, Chad would post a solid 3.2 percent of GDP per capita growth in 2030–39. With GDP per capita estimated at US$720 in 2022, under the assumption that the full set of reforms are implemented, Chad's GDP per capita would increase to about US$1,063 by 2040, an improvement, but Chad would still fall short of low-middle-income status. Since Chad has negative net national income, this level of estimated GDP per capita would translate into a GNI per capita lower than US$1,036, the current official threshold of low-middle-income status. Chad would not reach low-middle-income status until 2045. Therefore, failure to implement the proposed reforms would be costly, as Chad would remain a low-income country even by 2050, with no meaningful improvement in the quality of life of its population and no significant poverty reduction.

Table 5-1
GDP Indicators, 2025–2049

	2022	2030	2040	2050
Baseline	720	644	669	832
Chap 1 reforms	720	701	813	1158
Chap 3 reforms	720	685	799	1064
Chap 4 reforms	720	671	737	1010
Full set of reforms	720	754	1063	1764

Source: Authors using CC-MFMod Model.

5.3. Policy Recommendation Matrix

Table 5-2
Policy Recommendation Matrix

Objective	Policy Action	Entities responsible	Timing of the Reform
Reducing the impact of conflict on growth			
Strengthen natural resource governance and inter-communal reconciliation.	Developing a national land and natural resource policy to ensure effective, sustainable, and equitable use of land and natural resources to enhance social development and accelerate economic growth.	Ministry of Land	24-month transition period
	Securing transhumance routes and strengthening the capacities of traditional and local bodies to manage and prevent conflicts related to land and natural resources.	Ministries of Livestock, Agriculture, and interior	
Create a more inclusive growth and development model.	Fully implementing the political program of the transitional government to develop the key priority areas identified during the 24-month transition before the elections scheduled for end-2024	Chad Government	24-month transition period
	Moving forward on the decentralization process to strengthen local governance	Ministry of interior	
	Prioritizing the fight against corruption and impunity.	Chad Government	
	Improving the public sector administration by establishing a transparent and efficient budgeting process.	Chad Government	
	Supporting and strengthening the accountability role of civil society.	Chad Government	
Strengthening climate resilience			
Adapt to climate change	Improving access to finance for resilience by leveraging digital financial services and using regional risk pooling solutions for social safety nets.	Government of Chad	Medium-term (by 2030)
	Increasing access to finance, including climate insurance and risk mitigation products, and supporting the resilience of microfinance institutions, particularly in conflict-affected areas, to ensure wide outreach in rural areas.	Ministry of finance	
	Adopting systems for the transparent monitoring of decision-making related to national budget allocations for priority climate actions and strengthening anti-corruption initiatives.	Ministry of finance	
	Developing the capacity, regulations, and institutions to support the preparation of projects and programs that can access climate finance and benefit from revenues potentially available in carbon markets and leveraging new private sector financing.	Government of Chad	
	Increasing the share of irrigated land and enhancing the use of water resources for strengthening agriculture and livestock resilience to climate change.	Government of Chad	
	Enforcing a risk-informed urban and territorial planning and building code.	Government of Chad	
	Building institutional and financial capacity of local governments to support implementation and enforcement.	Government of Chad	

(continued on next page)

Table 5-2

Policy Recommendation Matrix *(continued)*

Objective	Policy Action	Entities responsible	Timing of the Reform
	Incorporating disaster and climate-related risk considerations in the public investment system.	Government of Chad	
	Adopting national electrification plans that scale up the development of least-cost renewable energy projects and the transmission lines needed to deliver electricity equitably.	Ministry of Energy	2025
Gaining more from the oil sector			
Increasing government oil revenues	Continue to have new oil exploitation contracts under the PSC regime and take steps to advance joint venture and service contracts.	Ministry of Energy	Short term
	Invest in human capital through professional and academic training to develop a real pool of knowledge around hydrocarbon and renewable energy.	Ministry of Education and Professional Training	Medium-term (by 2030)
	Adopt business-friendly reforms to attract more private investment and increase competition in the oil sector	Office of the Prime Minister and the Ministry of Economy	
Enhancing oil revenue management	Procyclical fiscal management Set up a saving mechanism that should both stabilize the economy and better execute investment projects.	Ministry of Finance	24-month transition period
Improving the long-term well-being of the population	Keep the stabilization fund liquid, while the investment fund could be less liquid but should yield more revenue.	Ministry of Finance	No timeline
	Regulate gas flaring and methane emissions, improve oil refinery for domestic market.	Ministry of hydrocarbon	Short and medium to long term
	Continue compliance with EITIE rules, perform annual audits of oil sector financial reports, and strengthen parliament oversight of the sector	Ministry of Finance	Short term
Improving Access to Energy			
Enhancing governance, transparency, and accountability in the electricity sector	Finalize the legal status of SNE and transfer power sector assets to SNE's balance sheet.	Ministry of Hydrocarbons and Energy	2024
	Sign a performance contract with SNE to delineate its respective roles and responsibilities.	Ministry of Hydrocarbons and Energy	2024
Strengthening the performance and financial viability of SNE	Develop and adopt a cost- recovery tariff framework, starting with a methodology for SNE.	SNE	24-month transition period
	Implement a revenue protection program to help SNE secure the collection of electricity payments and adopt a payment mechanism to compensate SNE's losses	Ministry of Hydrocarbons and Energy	2024
Improving ICT infrastructure			
Reforming for a more market-friendly regulatory environment	Remove the regulator from the supervision of the MPNTIC and appoint to the board non-government members chosen for their technical, economic, or legal skills.	Chad Government	2024
	Institute the technological neutrality	MPNTIC	2024

(continued on next page)

Table 5-2

Policy Recommendation Matrix *(continued)*

Objective	Policy Action	Entities responsible	Timing of the Reform
Improving Road and transport infrastructure			
Strengthening road maintenance fund and road asset management	Undertake an audit of the RMP to identify additional sources for funding and actions to improve transparency such as for example by putting in place digital tolling systems and integrated modern collection of trade revenues and revenues from transport services on the main international road corridor.	Ministry of Transport and Road Safety	2024
	Put in place appropriate prioritization tools for rural road investments and segregate funds for rural road rehabilitation.	Ministry of Infrastructure	2025
	Establish a rural transport fund for community road maintenance as a window in the RMF and define a minimum share of resources allocated for the periodic maintenance of dirt roads.	Ministry of Transport and Road Safety; Ministry of Finance	2024
Strengthening governance and management of investment projects			
Developing a mechanism to select and manage projects	Initiate the institutional and operational mechanism for identified backlogged projects and support the management and resolution of outstanding projects.	Ministry of Finance; Ministry of Infrastructure	2024
	Adopt a guide on cost-benefit analysis adapted to the specificities of developing countries.	Ministry of Finance; Ministry of Infrastructure	2023
Diversifying the sources of project financing	Finalize the operationalization of the PPP support system in accordance with Ordinance n°006/PR/2017 on the PPP legal regime.	Ministry of Finance	2023
Improving the quality of human Capital			
Improving the access to and quality of learning	Strengthening the quality and availability of primary education (including remedial education).	Chad Government	Medium to long term
	Increase the share of government spending on education.	Chad Government	Short to medium term
Improving labor market regulations	Design productive social safety nets, including economic inclusion services.	Ministry of Finance and Budget	2025
	Provide social insurance for workers in the informal sector through fiscal incentives.	Ministry of Public Service, Employment and Social Dialogue	2025
Improving the quality of training institutions	Revise training programs in collaboration with the private sector and invest in key growth sectors with high economic and employment potentiality	Ministry of Vocational training and Trades	2024
Promoting equality of opportunity, especially among young and female workers.	Implement appropriate youth employment programs modeled on global best practices and adapt them to local challenges.	Ministry of Public Service, Employment and Social Dialogue	Medium-term (by 2030)
	Promote evidence-based programming through a culture of monitoring, evaluation, and learning.	Ministry of Youth, Sport, and Entrepreneurship Promotion	
Improving the access to and quality of learning	Strengthening the quality and availability of primary education (including remedial education).	Ministry of Education	Medium to long term

(continued on next page)

Table 5-2

Policy Recommendation Matrix *(continued)*

Objective	Policy Action	Entities responsible	Timing of the Reform
Strengthening labor market institutions			
Promoting self-employment and strengthening the labor market information system.	Simplify procedures and centralize registration of new enterprises.	Ministry of Public Service, Employment and Social Dialogue	Medium to long term
	Strengthen data collection, analysis, and access to information.	National Institute for Statistics, Economics and Demographic Studies	Medium to long term
Improving PFM and the business environment to improve productivity			
Promote the formalizing of the economy and attractive taxation	Incentivizing business owners to move from the informal to the formal sector with attractive taxation systems or tax incentives.	Ministries of agriculture and of livestock	Over the next 5 years.
	Implement reforms (e.g., streamlining administrative processes, strengthening the rule of law, modernizing the tax administration, and facilitating access to finance) to render the business environment more friendly to the formal private sector while attracting more investment.	Ministries of finance and of Economy	

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Annex A: Chad Peers

Table A-1
Chad Peers

Group	Definition	Selection criteria	Selected countries
Regional peers	Countries Groups in the same region and income level as Chad	Neighboring countries in Sub-Saharan Africa	Sahel G5, Low-income Countries.
Structural peers	Countries that have similar economic characteristics as Chad in 2015–2019 based on selected structural indicators.	Countries in SSA that had a GDP per capita, GDP growth, population, oil rents in percent of GDP of +/–30 percent of Chad respective values in 2015–2019	Democratic Republic of Congo, South Sudan
Aspirational peers	Oil exporting countries that are classified as Lower to Upper- Middle-Income Country between 2015–2019	Oil exporting Lower to Upper- Middle-Income Country between 2015–2019	Angola, Republic of Congo and Azerbaijan

Annex B: Oil Management

Table B-1

Fiscal Structure of Concessionary and PSC Type Regimes

Basic components	Three components: royalty, deductions (e.g., operating costs and capital depreciation), and tax.	Four components: royalty, cost recovery, oil profit, and tax.
Royalties	Unit or percentage of production or sale. Fixed or on a sliding scale, paid in cash or in kind, negotiable or biddable. Tax-deductible.	Royalty as in concessionary systems. Normally not cost recoverable.
Fiscal costs	Described in legislation/agreement. Royalties and operating expenses normally expensed in the year in which they occur. Depreciation calculated according to applicable legislation. Some countries allow the deduction of investment credits, interests, and bonuses.	Defined in the legislation/PSC. Production remaining after payment of royalties and cost recovery in accordance is split between host government and contractor. Split is fixed or on a sliding scale. Parameters stipulated or negotiated. Fiscal costs often differ from cost recovery.
Taxable income	Income taxed at the country's basic corporate tax rate/special resource taxes: flat rate or sliding scale. Investment incentive may apply. Tax loss carry forward: unlimited/limited. Tax may be paid by host government/national oil company on behalf of investor.	Income taxed at the country's basic corporate tax rate/special resource taxes: flat rate or sliding scale. Investment incentive may apply. Cost recovery limits often apply. Tax loss carry forward: unlimited/limited. Tax may be paid by host government/national oil company on behalf of investor.

Source: Fiscal Regimes for Hydrocarbons, World Bank 2007.

Annex B.1. Oil Price Projection Assumptions

Markov Switching Process

Three AIE regime are considered: low, reference, and high will be endowed with a normal distribution, centered at the level of the AIE projection for the year of the simulation and with a standard deviation that is built to cover the space between scenarios. There is a larger mass of the distribution around the mean. Figure B-1 provides a visual representation of the distribution centered around the projection outlined Figure 2-7. The probability to move from one regime

to another is calibrated to meet the different regime observed on oil price in the last two decade. To switch from one regime to another, the following Markov chain is used to create 1000 simulations:

$$\begin{matrix} \\ Low \\ Reference \\ High \end{matrix} \begin{pmatrix} 0.8 & 0.2 & 0 \\ 0.1 & 0.8 & 0.1 \\ 0 & 0.2 & 0.8 \end{pmatrix}$$

The matrix has the following characteristics:

- To go from a low to high regime, the process must go through reference, and vice versa.
- To simulate the duration of a cycle of about five years, the probability to stay in the same regime is 80 percent.
- It the same probability to go to low or high under the reference regime.

Random Walk Process

The data generating process is obtained by fitting a known distribution over this empirical distribution. A Student distribution provides a much better approximation of the empirical distribution. including its fat-tail property. Figure B.2: density of the month-to-month change in the price of the Brent oil in USD for 2000–2018 Mean: 0.135 Median: 0.859 Std. Dev.: 5.620 Skewness: –1.174 Kurtosis: 5.984.

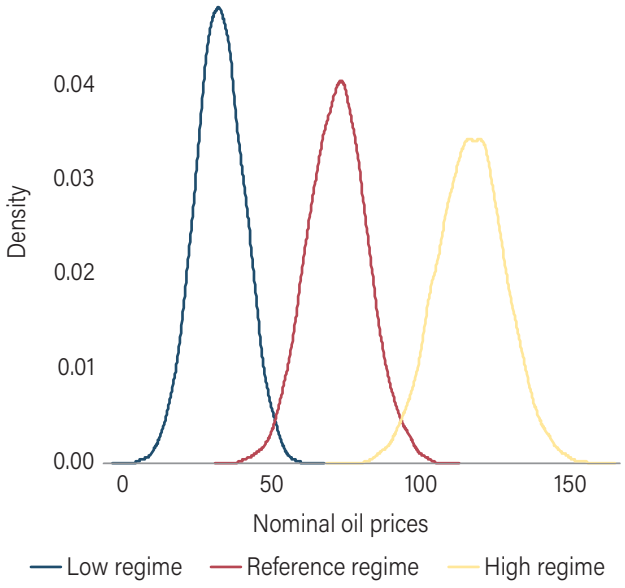
The data generating process for the monthly price of oil that used in the CEM assumes that the price of the Brent oil follows a random walk with a deterministic drift:

$$P^{oil}_{t} = P^{oil}_{t-1}(1 + drift_t) + \varepsilon_t \; avec \; \varepsilon_t \sim \sigma * T(v)$$

The $drift_t$ is calibrated to the long-term growth of nominal oil prices forecast by the World Bank of 0.74 percent per year. The innovation of the process is assumed to be of mean zero (as opposed to the positive mean observed over the period) and to follow a Student distribution calibrated over the period 2000–2018. The best fitted distribution is obtained for $\sigma = 4$ and $v = 5$. The monthly price trajectories are then averaged to obtain annual price trajectories, see Champagne et al (2019).

Figure B-1

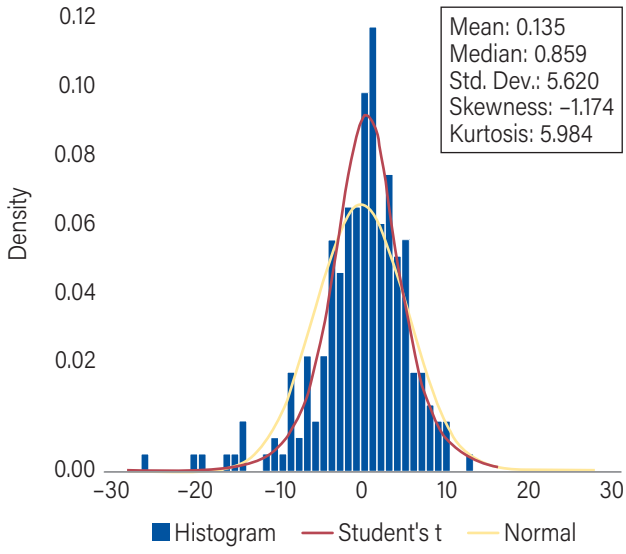
Oil Price Distribution in 2022: Three Regimes



Source: Authors' assumptions.

Figure B-2

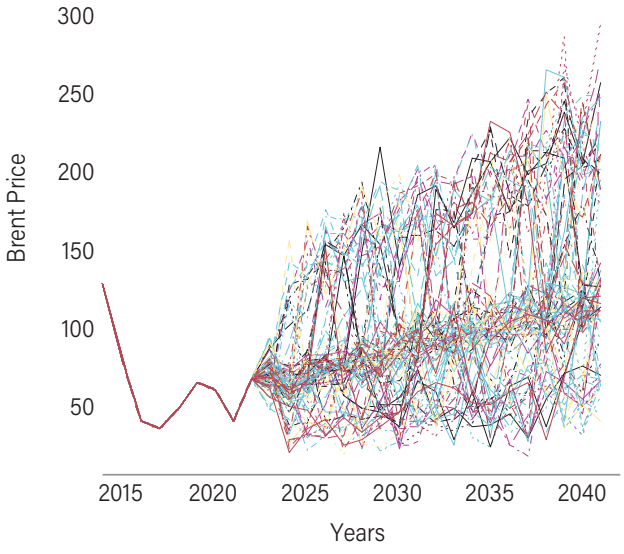
Density of the Month-to-Month Change in the Price of the Brent Oil in USD for 2000–2018



Source: Authors' assumptions.

Figure B-3

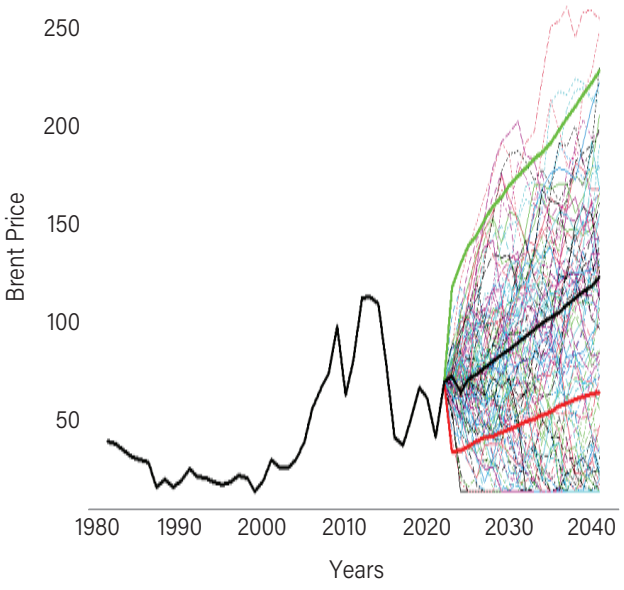
Simulated Oil Price Paths using Markov Switching Assumptions with Three Deterministic Paths



Source: Authors simulations.

Figure B-4

Simulated Oil Price Paths using Random Walk Assumptions



Source: Authors simulations.

Annex B.2 : Fiscal Rule

Fiscal rule 1 formula[61]

$$E_t^{elastic} = \frac{E_{t-1}^{elastic}}{E_{t-1}^{total}} [Rev_t^{total} - Wages_t - IntPayments_t + Borrlim_t^{net}]$$
$$= \frac{E_{t-1}^{elastic}}{E_{t-1}^{total}} [Rev_t^{dispo} - Borrlim_t^{net}]$$

Where Rev_t^{total} is total public revenues; Rev_t^{dispo} is disposable revenues after payment of wages ($Wages_t$ and interest payments ($IntPayments_t$; and $Borrlim_t^{net}$ is the government's net borrowing limit, including Glencore repayments.[621]

[61] Government spending is projected as a share of non-oil GDP.

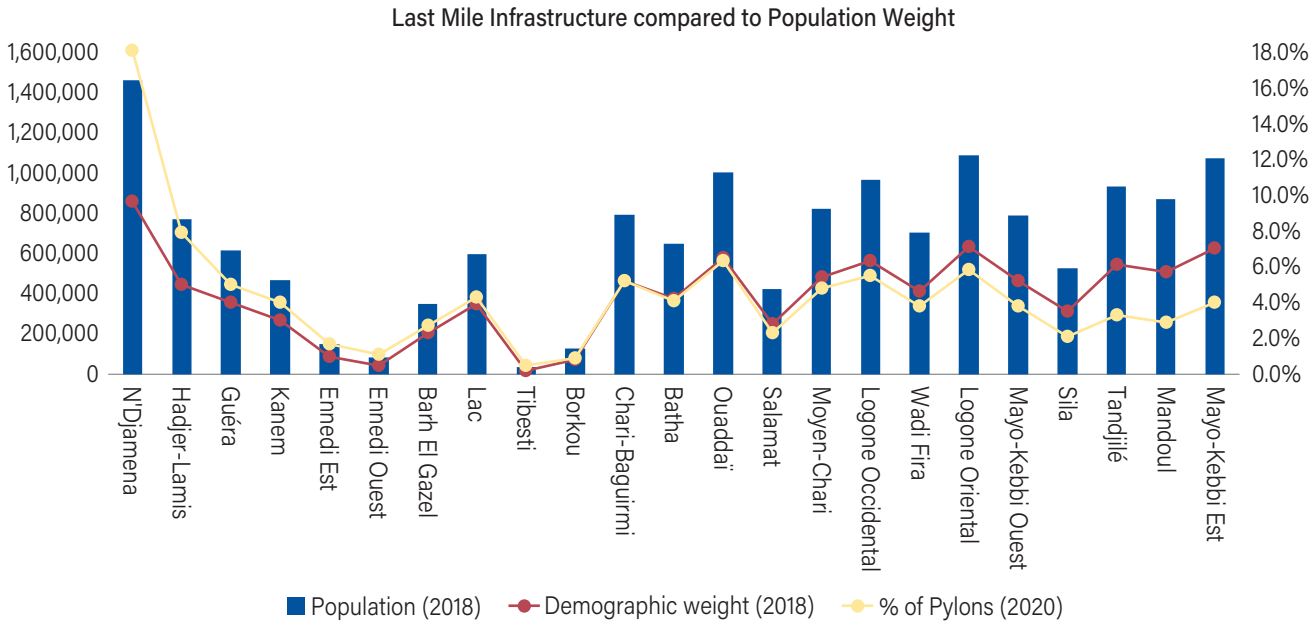
[62] The borrowing limit is first defined and computed from the IMF program's Medium-Term Fiscal Framework (MTFF) as the sum of loan disbursements, Treasury bills and bonds, and relief under the Heavily Indebted Poor Countries initiative minus amortizations scheduled in the fiscal framework.

ANNEX C: Road Network

Annex C.1: Last Mile Infrastructure across the Country versus Economic Potential

Figure C-1

Last Mile Infrastructure across the Country versus Economic Potential



Source: ARCEP Chad 2020 Markets Observatory Report and INSEED Chad 2018 Trend scenario.

Figure C-2
Chad Map

Source: Wikipedia.

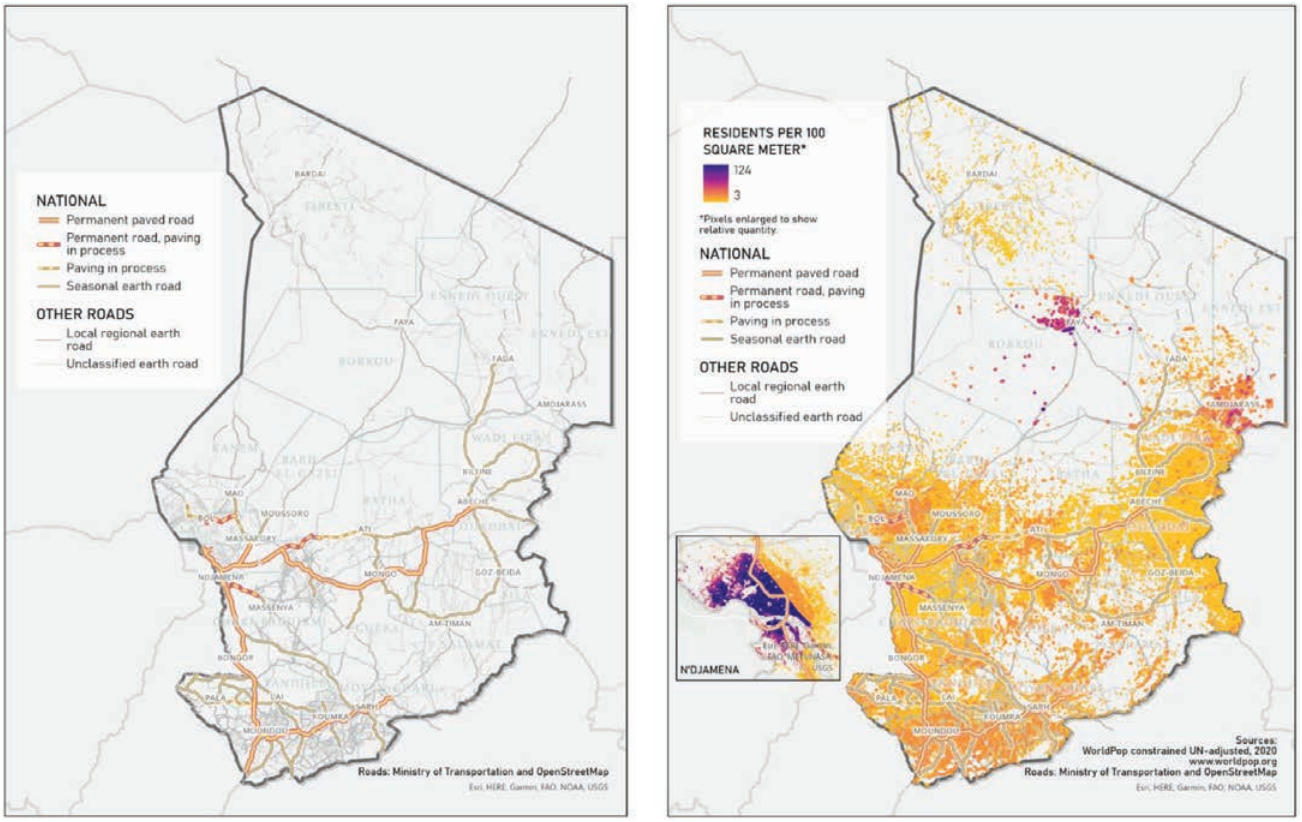
Annex C.2: Digital Infrastructure Gap

Table C-1
ICT Needs and Gaps

Challenge	Potential Remedy	Result Indicators	Baseline	Target
Increase independent routes to improve the reliability of the international connectivity and lower the wholesale prices and provide large band experience to population	Build additional international exits and upgrade of existing ones	**Number of independent fiber optic international exits**	2	**5**
		International bandwidth per Internet user (kbit/s)	9.4*	**128**
Expand the national backbone so that 100 percent of the population is within 25 km reach of a fiber optic node	Extend the fiber optic network to the West and North and mesh the national network to have backups on important sections	**Number of Fiber Optic backbone Km per million of inhabitants**	128*	**381****
Build a competitive domestic market for broadband transmission	Assign the management of the West backbone (towards Niger Border) under construction, to an operator other than SudaTchad	**Cost of 1 STM 16 Domestic Transmission Service (Per Km per Month)**	114,231 USD	**50,000 USD**
Have IXP and NDC that meet international standards in this area	Attract private investors to build and operate theses Middle supportive infrastructure within the framework of a PPP	**Number of IXP and NDC operational**	0	**2 IXP and 2 NDC**
Expand of broadband coverage in rural and insecure areas	Incentivize mobile operators to invest in areas that are not economically viable in the short term, using the Universal Service Fund (USF) or government subsidies	**Large Band (3G and above) Coverage**	48%*	**90%**
Establish of a competitive wholesale market and reduction of the cost of acquiring digital handsets	Introduce new players in the first- and middle-miles connectivity markets and reduce taxation of digital handsets	**Mobile data and voice basket (high consumption) as a % of GNI p.c.**	41.3%*	**2%****
Closing the gap between service availability and usage	Improve the digital literacy rate of populations, offer them digital content adapted to their needs and guarantee them an environment of trust regarding the security of their transactions and the protection of their personal data.	**Active mobile-broadband subscriptions per 100 inhabitants**	3%*	**30%**

Source: Authors.

Figure C-3
Chad Road Map



Source: World Bank.

Table C-2

Detailed Reforms to Improve Good Infrastructure

	Objective	Reforms
Road Maintenance Fund/Road asset management	Restructure, modernize road maintenance fund and strengthen road asset management	▪ Management of the RMF: Update the legal status of RMF – Update as needed (allow Audits of RMF by MO) ▪ Increase RMF levy in fuel prices ▪ Modernize funds collection systems (tolls, taxes on petroleum products…) with a focus on transparency ▪ Allocate state resources (direct grant from the RMF) for periodic maintenance of dirt roads ▪ Reforms on procurement and payment through AGER (Possibility of AGER to procure and pay contractors directly) ▪ Organization and Capacity Building of the RMF ▪ Drafting of a road asset management strategy ▪ Establishment of road database system
Rural Access and Connectivity	Prioritize and ensure maintenance of rehabilitated rural roads	▪ Put in place appropriate prioritization tools for rural road investments ▪ Establishment of a rural transport fund for community road maintenance as a window in the RMF plus state subsidy. ▪ Include the periodic maintenance of dirt roads with funding in AGER's obligations with systematic implementation of community-based maintenance programs
Urban Transport	Address the Urban Transport challenges in Ndjamena	▪ Drafting of the sectoral policy note for public urban transport in Ndjamena ▪ Establish an urban mobility authority for Ndjamena placed under the technical supervision of the Ministry of Transport
Professionalization of the trucking industry	Improve efficiency in the sector	▪ Launch a review for the modernization of both the profession and the networks through training and reinforce control and identify schemes for upgrading the fleet

Source: Authors.

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