COUNTRY PRIVATE SECTOR DIAGNOSTIC

CREATING MARKETS IN CHAD

Mobilizing Private Investment for Inclusive Growth

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ABBREVIATIONS AND ACRONYMS

AfCFTA	African Continental Free Trade Area
AFD	*Agence Française de Développement (French Development Agency)*
AfDB	African Development Bank
ANIE	Authority for Investment and Export Promotion *(Agence Nationale des Investissements et des Exportations)*
BEAC	Central Bank of Central African States *(Banque des Etats de l'Afrique Centrale)*
CEMAC	Central African Economic and Monetary Community *(Communauté Economique et Monétaire de l'Afrique Centrale)*
CFAF	*CFA Franc (Franc de la Communauté Financière d'Afrique)*
COBAC	Banking Commission of Central Africa *(Commission Bancaire d'Afrique Centrale)*
CPIA	Country Policy and Institutional Assessment
CPSD	Country Private Sector Diagnostic
EU	European Union
FAO	Food and Agriculture Organization
FODEP	Forum for Public-Private Dialogue (*Forum de Dialogue Etat Secteur Privé*)
GDP	Gross Domestic Product
ICT	Information and Communications Technology
IDA	International Development Association
IFC	International Finance Corporation
IMF	International Monetary Fund
Km	Kilometer
KYC	Know Your Customer
MNO	mobile network operator
MT	Metric Ton
MW	Megawatt
NGO	Non-Governmental Organization
NPL	Non-Performing Loan
NRI	Network Readiness Index

OECD	Organization for Economic Co-operation and Development
OHADA	Organization for the Harmonization of Business Law in Africa (*Organisation pour l'Harmonisation du Droit des Affaires en Afrique*)
PPA	Power Purchase Agreement
PPP	Public-Private Partnership
PV	Photovoltaic
RCA	Revealed comparative advantage
SCD	Systematic Country Diagnostic
SME	Small and Medium-sized Enterprise
SOE	State-Owned Enterprise
SNE	National Electricity Company (*Société Nationale d'Electricité*)
SSA	Sub-Saharan Africa
STEM	Science, Technology, Engineering and Mathematics
TFP	Total Factor Productivity
TVET	Technical and Vocational Education and Training
UNCTAD	United Nations Conference on Trade and Development
US$	United States Dollar
VAT	Value Added Tax
WBG	World Bank Group
WEF	World Economic Forum

EXECUTIVE SUMMARY

Chad, the largest landlocked country in Africa, is suffering from the confluence of three challenges: (a) weak political and economic governance as a result of elite capture, (b) endemic fragility, and (c) extreme exposure to climate change. For Chad, which ranked 187th out of 189 countries on the Human Development Index in 2020, these conditions have led to a failure to harness significant oil resources since 2000 — in spite of relative internal stability — and have perpetuated the country's status as one of the poorest performers in human development, as it has made only limited progress on poverty reduction, particularly for women and girls. Chad also remains the least electrified country in the world. The situation has further deteriorated as a result of COVID-19, which struck as the country appeared to be on the verge of a rebound — with gross domestic product (GDP) contracting by 1.6 percent in 2020 and by 1.2 percent in 2021 (respectively 4.6 percent and 4.1 per cent in per capita terms) following a 3.2 percent expansion in 2019.

Macroeconomic vulnerabilities have been further exacerbated by the COVID-19 pandemic. The latest Debt Sustainability Analysis (DSA) conducted jointly by the World Bank and the IMF in December 2021 shows a significant increase in debt vulnerabilities –as the debt service to revenue ratio will remain above the high-risk threshold. Chad is also in arrears to several creditors and was the first country to effectively reach a debt restructuring agreement with official and private creditors under the G20 Common Framework. This agreement provides Chad with adequate protection against downside risks while bringing the risk of debt distress to moderate. While the recent increase in oil prices has improved the country's fiscal stance, with total public debt expected to drop to 44.9 percent of GDP in 2022 (from 52.1 percent of GDP in 2021), a lack of macroeconomic stability remains a major impediment to private investment. Chad continues to face considerable challenges, including food insecurity, oil price volatility, climate change, and security issues, and continued reform efforts are needed to enhance growth and mobilize domestic resources to allocate to key social sectors given the low revenue base.

The oil boom of the 2000s failed to act as a development accelerator. The onset of oil production in 2003 presented Chad with a radical change in the structure of its economy, with foreign direct investment (FDI) inflows quintupling between 2000 and 2020 (and reaching a record 5 percent of GDP in 2019) and GDP per capita nearly doubling, rising from around US$897 in 2000 to US$1,519 in 2020 (purchasing power parity, constant 2017 international $). In fact, the country was receiving oil revenues that, on a per capita basis, were on par with Africa's leading oil-producing economies such as Nigeria. Yet the oil boom exacerbated some of the fragility drivers already existing in the country, including: (a) overcentralized, fractured, and non-inclusive governance; (b) regional imbalances and exclusion that fuel grievances; (c) insecurity, security sector dysfunction, and weak rule of law that prevent effective implementation of justice and mitigation of conflicts; and (d) intercommunal tensions that are aggravated by increasing natural resource scarcity and climate change.

The Chadian economy — now increasingly dependent on oil — remains largely undiversified and the country has made little progress in the area of human development. Export diversification declined over the past 10 years, even though Chad boasts significant opportunities for structural transformation to higher-value-added agricultural products. The situation further deteriorated on account of the large oil-price and security shocks of 2014–15, which led to a 15 percent decline in GDP per capita, eroding some of the gains of the past. In 2019, the country's gross national income (GNI) per capita of US$1,620 was the eighth lowest in the world.[1] With a score of 0.29, 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 of adults, is far lower than the Sub-Saharan African, low-income countries (LIC), and fragile and conflict-affected situations (FCS) averages. Chad also has one of the highest maternal mortality rates in Central Africa, with 1,140 deaths for every 100,000 live births. Given the deteriorating economic outlook and a relatively high population growth rate of 3 percent (which translates into fertility rate of six births per woman), the absolute number of poor people is expected to increase by about 700,000 to a total of 6.9 million by 2030.

Diversification and structural transformation of the Chadian economy are necessary to support sustainable economic development and to ensure a more equitable distribution of the fruits of growth. Reducing dependence on oil and cotton and enhancing conditions for other commodities in which Chad has a comparative advantage will create greater income-generating opportunities for the population at-large and build the basis for value addition in products that can assist Chad's transformation to a middle-income country. This need for diversification is why this report pays special attention to the nonoil sectors, bearing in mind that the hydrocarbon sector will continue to play a major role in generating fiscal revenue for the Chadian economy.

Despite the overall lack of progress, the onset of oil production in Chad in 2003 was associated with some improvement in development indicators. While poverty between 2011 and 2018 remained relatively stable at around 41 percent in the North Sahelian Zone and slightly increased to 14 percent in the capital city, N'Djamena, it declined markedly in the Saharan and South Sudanian zones by over 15 percentage points. In addition, inequality seems to have declined between 2011 and 2018 and signs of pro-poor growth are emerging. The consumption-based Gini coefficient fell from 42 percent in 2011 to 33 percent in 2018. Inequality fell across the board but faster in rural areas, where the Gini coefficient declined from 42 to 30 percent, compared with a decline from 36 percent to 34 percent in urban zones.[2] The growth incidence curves for 2011–18, which show the percentage change in average consumption for each percentile of the income distribution, are downwardly sloped, indicating higher growth among the poorest population groups. This pattern is observed mostly in rural areas, whereas the pro-poor benefits are quite limited in urban areas, particularly in the capital city.

As in other comparable Sub-Saharan countries, Chad's formal private sector is embryonic and characterized by a dual structure: a few large companies, mostly in agribusiness (cotton) and services (banking, telecommunications), coexist with a large number of informal firms. Market-based competition is weak despite formal regulation of monopolies, with significant state participation in key sectors of the economy – notwithstanding recent progress achieved in privatizing some state-owned or controlled enterprises. For example, in 2018 CotonTchad – the formerly state-owned enterprise with monopoly control of the country's cotton industry—was sold to Olam, with the state retaining 35 percent of the company.

OPPORTUNITIES FOR PRIVATE SECTOR INVESTMENT

Notwithstanding various challenges, Chad boasts considerable opportunities for private sector investment in sectors that can drive structural transformation, notably in livestock, sesame seed, and gum arabic as well as in cotton production—the historic cash crop. These sectors or products seem to present the largest opportunities for commercial success and development impact, determined on the basis of six criteria: (a) revealed comparative advantage;[3] (b) projected evolution of global demand; (c) employment elasticity; (d) prospects for domestic value addition; (e) private sector track record and interest; and (f) resilience to fragility drivers such as climate change and political governance. Political economy considerations also favor the selection of these sectors, as their exposure to political interference is limited—with the possible exception of livestock, for which significant interest from politically connected investors may affect the bargaining power and standing of pastoralists.

In livestock, Chad has a large revealed comparative advantage and enjoys a growing regional market. Already recognized as a priority in the National Development Plan, the sector offers potential for substantial domestic value addition in the production of meat, dairy, hides and skins. The technical requirements for success, however, are stringent, because modern slaughterhouses require both reliable electricity and throughput. The requirement that slaughterhouses process approximately 100–150 cattle per hour means that they could be operated profitably only with complementary investments in industrial-scale breeding and in pens that will ensure a consistent supply of livestock.

In sesame seed and gum arabic, Chad has a strong revealed comparative advantage. In the case of sesame, the global and regional markets are growing more rapidly than for any other sector. Sesame seed and gum arabic have demonstrated a potential to increase the purchasing power of rural farmers and entrepreneurs. Farmers have increasingly switched from cotton production to sesame, given that the two crops use similar nutrients and, as a result, cannot be farmed together on the same land. In contrast to cotton, sesame seed trading is decentralized, meaning it is being bought by multiple buyers and thereby offers a greater likelihood of competitive prices. Another advantage of investment in the sesame sector is that traders, wholesalers, and exporters of the product typically also export gum arabic, a product in which Chad also has a strong revealed comparative advantage. Although the global market for gum arabic has been stagnant, there are substantial opportunities for domestic value addition following the example of neighboring Sudan.

Cotton has been Chad's flagship export product since it was first promoted by the French colonial government in the early 20th century, though today the country's revealed competitive advantage is less than for other crops. Compared to gum arabic, livestock, and sesame seed, Chad's revealed competitive advantage in cotton exports is small, reflecting a highly competitive global export market. Exports collapsed in 2016, with export values falling below those of gum arabic or sesame, after the state-owned monopsony *CotonTchad Société Nouvelle* (CotonTchad) failed to pay farmers for output. Since the government sold a 65 percent equity stake in CotonTchad to Olam International, production has recovered somewhat, though it is still below historical highs. Global import demand for cotton has declined by 5 percent per annum, though imports by Chad's neighbors Nigeria and Cameroon have been growing over the past decade.

Yet cotton remains a pillar of Chad's economy and has two main outputs, seed cotton and cotton lint, each providing a distinct opportunity for value addition. Cotton lint is the raw fiber, which is ginned and then used as an input into textile manufacturing. The government is currently considering privatization of the state-owned textile manufacturer, the New Textile Society of Chad (NSTT). Seed cotton, the other output of cotton production, has a variety of uses in food and beverages and in pharmaceutical and cosmetic manufacturing; the kernels may also be used as a high-protein animal feed. Several processing facilities exist in the country.

SECTOR-SPECIFIC CONSTRAINTS

There are significant sector-specific and cross-cutting constraints that hinder growth in the chosen value chains. This section discusses sector-specific constraints first, followed by cross-cutting constraints.

- **Cotton**: CotonTchad's legal monopsony remains in place even under private ownership, with no clear timeline for liberalization, thus restricting farmers' bargaining power when prices are set and reducing the benefit to households from cotton production. Further, low productivity and inadequate water management make production challenging and costly, requiring input subsidies that are funded by CotonTchad's corporate tax revenue. These subsidies deter farmers from switching to other crops, such as sesame, in which Chad has a stronger comparative advantage and which are less input intensive.
- **Gum arabic**: Chad lacks quality grading and traceability (such as hand-picked-selected (HPS) grade) and has no program of forestry management, thus contributing to the overexploitation of wild trees (such as Acacia Senegal). Weak sector organization contributes to the limited bargaining power of producers.

- **Livestock:** Chad lacks the reliable electricity and cattle supplies needed to achieve scale economies for slaughterhouses. The levels of health inspections and veterinary services are insufficient. Under-resourced customs facilities at border points lead to congestion and informal trade. Policies such as a proposed ban on the export of live cattle could harm the bargaining power of pastoralists.
- **Sesame:** Government programs (for inputs, fertilizers, and for training) have been skewed toward cotton rather than sesame. Supporting sesame farmers is against the interests of CotonTchad because sesame and cotton are mutually exclusive crops. Exporters face significant local taxes, sometimes in each canton through which goods are being transited. The absence of sorting facilities reduces quality.

TABLE ES.1. TABLE OF RECOMMENDATIONS: PRIORITY INTERVENTIONS IN SELECT VALUE CHAINS

SECTORS	PRIORITY INTERVENTIONS	TIMING
Gum arabic	• Invest in a quality-grading and traceability system (such as hand-picked-selected, or HPS grade), and forestry management, working through exporter and trader associations.	MT
	• Support the professionalization of the value chain through collective action (such as for price negotia-tion, repayment collection, and community welfare).	MT
Livestock	• Ensure livestock exports are unrestricted in order to ensure export price parity for pastoralists selling to slaughterhouses. The reliable supply of livestock must come from breeding and pen operations, and unrestricted exports will ensure they offer slaughterhouses competitive prices.	ST
	• Expand and train a network of veterinary assistants; ensure the quality of imported veterinary pharmaceuticals.	MT
	• Invest in cold-chain infrastructure/Temperature-Controlled Logistics (TCL) services and promote the use of quality standards and certification.	MT
Sesame Seed	• Divert some subsidies for cotton exports to sesame to promote the use of fertilizers, certified seeds, or herbicides, potentially using e-vouchers, to promote the resilience of farmers through diversifica-tion of their crop portfolio.	MT
	• Exempt traders from taxes in multiple cantons.	ST
	• Invest in sorting facilities at key trading points, working through exporter and farmer associations.	ST
Cotton	• Articulate a clear timeline for liberalization of the cotton sector, in which new players are allowed to enter ginning in specific zones, as specified by the convention between CotonTchad and the govern-ment of Chad. The World Bank and IFC could provide inputs into a zoning arrangement based on the experiences in other countries.	ST
	• Invest in water management and yield improvement rather than deploying input subsidies through CotonTchad, which ties the use of subsidies to a specific crop. Subsidies could be diverted to the gen-eral input subsidy program run by the National Agency for Rural Development, ANADER (*Agence Nationale d'Appui au Développement Rural*), which allows farmers to choose the crop on which subsi-dies are used. Support expansion of sesame seed production through the previously stated interven-tions in order to improve farmers' options outside of cotton and to increase farmers' bargaining power with CotonTchad if it remains a monopsony.	MT MT

Note: MT = medium term; ST = short term.

CROSS-CUTTING CONSTRAINTS

In order for Chad to reap the full benefits of these high-growth sectors and boost overall private sector activity, the CPSD has identified the following seven economy-wide bottlenecks as binding constraints hindering the sectors' development:

- **Access to Electricity:** Lack of reliable and affordable access to energy represents the number one bottleneck for doing business in Chad. Chad's national power grid does not extend beyond the capital city, N'Djamena, and some provinces such as Sarh, Moundou, Abeche and Faya. Access to energy is cited by Chadian firms as the top constraint they face after political instability. The country suffers from high power generation costs (about 43 US cents per billed kilowatt-hour, which places Chad's tariffs among the highest in Sub-Saharan Africa), and the potential in renewable energy resources is untapped.
- **Access to Markets:** Poor transport and logistics services, including lack of temperature-controlled logistics (TCL), are major constraints to doing business in a landlocked country unfavored by geography, with the closest sea outlet located over 1,700 kilometers away. Chad has among the highest costs and longest handling periods in the transportation of goods in Sub-Saharan Africa. At the national level, Chad's road network (especially in rural areas) is in bad condition. Chad is also highly dependent on the N'Djamena-Douala rail/road transit corridor, which suffers from under-investment, while transportation and logistics services are offered by individuals or companies with only a few trucks.
- **Access to Digital Economy:** Despite recent government efforts to reduce the cost of digital connectivity, the digital sector in Chad is nascent with significant gaps in access to quality digital connectivity (36 percent of the population has a mobile phone subscription and 15 percent has a mobile internet subscription, compared with 47 percent and 24 percent in Sub-Saharan, respectively). Fixed broadband penetration in Chad is very low and access to digital services for businesses remains limited, with the country ranking among the worst performers in terms of e-commerce development.
- **Access to Water and Irrigation:** Chad is largely arid / semi-arid, but it has significant untapped water resources. These could be harnessed by increasing the contribution of the private sector to exploit these resources, including by strengthening the public-private partnership framework.

- **Access to Finance**: Firms in Chad suffer from limited access to financing (including bank financing for micro, small, and medium enterprises) and the slow progress in digitizing financial services. Chad's financial sector is one of the shallowest in the sub-region, with limited long-term resources and services to fund private enterprise and credit favoring a small number of large corporates. Financial inclusion lags other countries, with only 9 percent and 4 percent of Chadians having access to a formal bank account or to credit, respectively, the lowest ratio within the Central African Economic and Monetary Community.
- **Business Environment**: Enhancing transparency in public procurement, ensuring robust governance of tax policy and tax administration (such as tax exemptions and value added tax reform), and reforming the process of securing land titles and property registration are all part of a compelling agenda to stamp out corruption and foster a more favorable investment climate.
- **Access to Health Care**: Providing a better enabling environment for investments by the private sector in health care could be a win-win: with segments of the population able to afford obtaining health care abroad, greater availability of higher-quality private sector run facilities could make some evacuations abroad unnecessary. Experience shows that better-run private sector facilities attract high-income segments of the population. Key measures in support of greater investment by the private sector are the development of a clearer vision for collaboration between the public and the private sectors and updating the regulatory framework. In addition, performance-based management payments that aim to reward well-performing facilities can be an important element of a financial framework for the health system that incentivizes greater investment from the private sector. Furthermore, the outdated medical education system needs to be updated.

Finally, efforts to diversify the Chadian economy and boost private sector activity could also benefit from untapped resources within Chad's hydrocarbon industry. Specifically, three key competencies of Chad's oil and gas value chain could potentially create cross-industry linkages and positive spillover effects for the rest of the economy: (a) advanced data management based on the wealth of geospatial data collected that has the potential to help identify cross-sector opportunities and develop robust land-use strategies; (b) water management, with the effective management of "produced water" as a byproduct of oil and gas exploration; and (c) shared infrastructure and logistics, capitalizing on new and existing pipelines to bring utilities closer to rural communities (including electricity, fiber optics, and water).

ROADMAP FOR ACTION

Short- to medium-term actions that could alleviate these constraints include the following:

TABLE ES.2. PRIORITY INTERVENTIONS TO ALLEVIATE CROSS-CUTTING CONSTRAINTS

GAP	PRIORITY INTERVENTIONS	TIMING
Access to Electricity	• Support the development of alternative power generation solutions such as (a) renewables (large-scale solar) by adopting tax and duty exemptions and by introducing quality standards, (b) mini-grids / off-grid by devel-oping a regulatory framework, and (c) competitive procurement of independent power producer projects.	ST
	• Liberalize the distribution grid and encourage private sector entry into the distribution segment.	ST
	• Assist SNE (the national electricity company) in improving financial and operational performance by producing independent financial statements, clearing arrears to the public sector, and developing a least-cost energy generation plan.	MT
Access to Markets	• Modernize Chad's customs administration by automating customs clearance, improving information technol-ogy system interconnection with Cameroon, and upgrading the Douala Single Foreign Trade Window.	MT
	• Improve transit infrastructure and backbone services along the N'Djamena-Douala Corridor, including road maintenance and safety.	MT
	• Professionalize the trucking industry through fleet renewal programs and strict enforcement of rules (axle-loading).	MT
Access to Digital Economy	• Restructure or privatize the incumbent state-owned enterprise (Sotel) and introduce a wholesale open access model.	MT
	• Foster sector competition by enabling the entry of a third mobile network operator (such as by issuing licens-es for independent tower operators, allowing internet service providers to be facilities-based, and introducing specialized universal service providers).	MT
	• Reduce the cost of digital connectivity by promoting infrastructure-sharing (such as wholesale broadband li-censes) and reviewing taxation of the information and communications technology (ICT) sector.	ST
Access to Water	• Strengthen the institutional and regulatory framework for private participation in water and irrigation, includ-ing through public-private partnership provisions in the Public Procurement Code.	MT
	• Improve the enabling environment for irrigation investments, including by securing a productive environ-ment for irrigators, such as land and water rights.	MT
	• Develop regulations by determining potential uses for produced water, considering shared use of pipeline infrastructure, and providing for sound management of geospatial data collected through oil and gas explora-tion.	MT
Access to Finance	• Set up a risk-sharing facility (or MSME guarantee fund) to provide partial credit guarantee to financial institu-tions for increased MSME lending.	ST
	• Institutionalize mobile money as a means of payments, including for government payments (taxes, fines, so-cial cash transfers, bill payments, salaries, merchant payments, and so on).	ST
	• Develop leasing and warehouse receipt legislation and fiscal treatment to support agriculture finance.	MT

Note: MT = medium term; ST = short term. MSME = micro, small, and medium-sized enterprise.

GAP	PRIORITY INTERVENTIONS	TIMING
Business Environment	• Ensure effective protection of land titles (including customary rights) and design an alternative land dispute resolution mechanism to avert conflicts between herders and pastoralists.	MT
	• Pursue VAT reform to increase the number of VAT payers by broadening the tax net and introduce a VAT refund mechanism, streamline tax exemptions, and monitor tax expenditure.	MT
	• Adopt a framework for mandatory asset declarations by elected and public officials with a view to fighting corruption and strengthening governance in public institutions.	MT
	• Strengthen the legal framework and adopt information technology solutions for transparent public procure-ment.	ST
Health	• Develop a regulatory framework for private sector participation (including financial incentives)—for example, by establishing universal health insurance, such as in Côte d'Ivoire.	MT
	• Update the medical curriculum and expand training and skills-enhancing programs for health care workers.	MT
	• Implement a performance-based financing mechanism in the health care sector.	MT

Note: MT = medium term; ST = short term. MSME = micro, small, and medium-sized enterprise; VAT = value added tax.

Map of Chad

MAP ES.1. MAP OF CHAD

Map No. 3788 Rev. 10 United Nations / March 2014 Department of Field Support / Cartographic Section

1. OBJECTIVES AND APPROACH

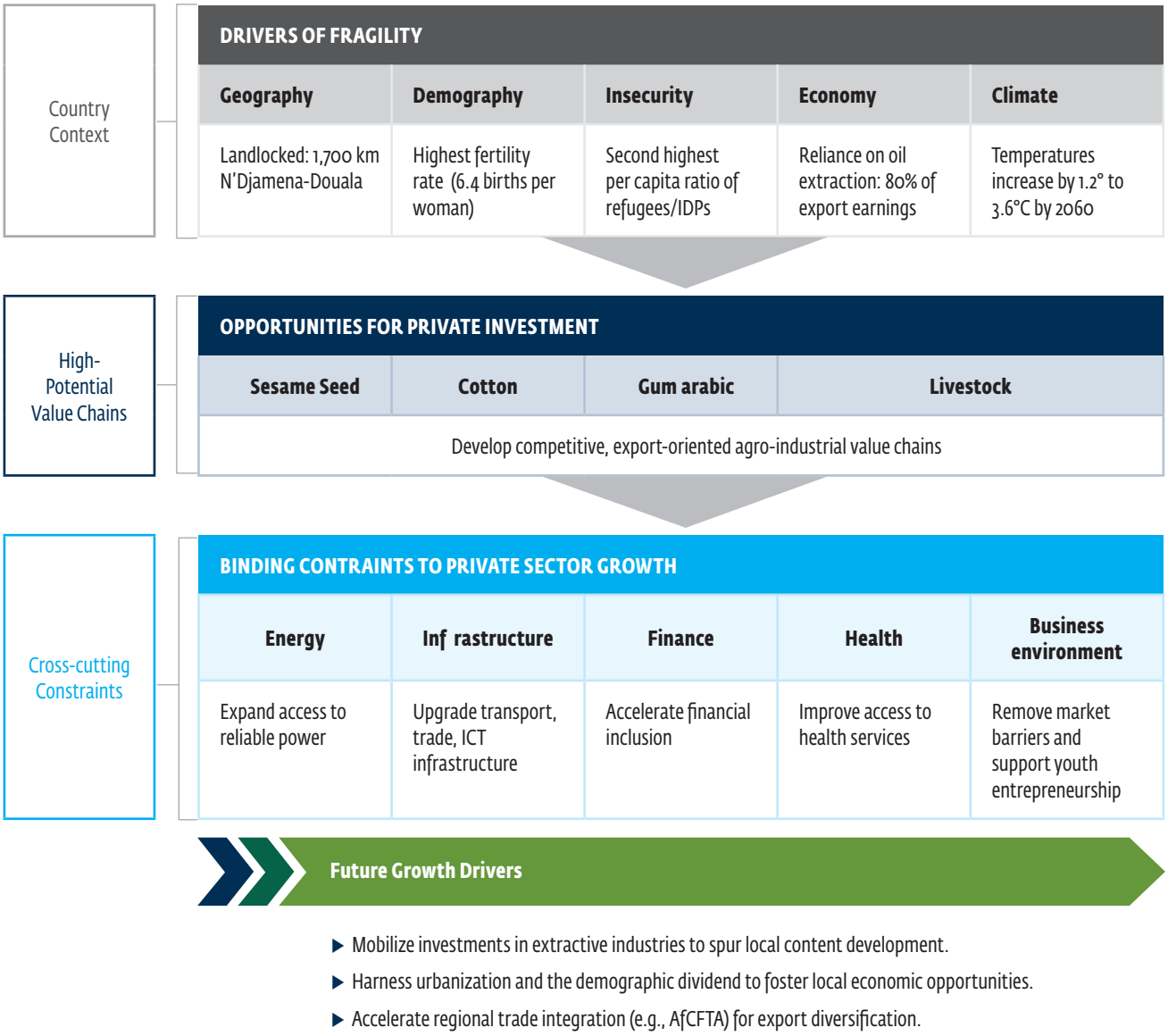
In Vision 2030: The Chad We Want, **Chadian authorities committed to transforming Chad into an emerging economy by 2030 by increasing the role of the private sector.** To aid in realizing that vision, this CPSD explores opportunities in productive sectors with the potential to drive sustainable and inclusive economic development, analyzes constraints that inhibit the productivity of and investment in those sectors, and proposes concrete steps that may be taken by the government and its development partners to address those constraints. Given the challenges presented by Chad's complex political economy for the implementation of comprehensive reform, the CPSD focuses particularly on specific actions that will help to enable transformative private investment in the short to medium term. Practical short-term steps are identified to address constraints on access to factors of production (energy, water and irrigation, land, finance) and access to markets (transport, logistics, information and communications technologies) and the enabling environment.

This CPSD uses seven criteria to identify opportunities in productive sectors. First, opportunities are assessed by analyzing (1) revealed comparative advantage (RCA), which serves as a proxy for a country's competitive export strengths; (2) growth in global and regional demand; and (3) interest from private investors. Second, the potential development impact of private investment is evaluated through (4) prospects for value addition to provide additional employment opportunities and tax revenue; (5) employment intensity of the sector, as measured by livelihoods potentially affected by growth in production and the labor intensity of processing of potential value-added products; (6) the current level of and potential for elite capture; and (7) projected effects of climate change on the viability of opportunities. As such, the selection of opportunities is informed not just by the characteristics of the sector but also by a review of Chad's history, its institutional qualities, and its geographic, demographic, and climatic characteristics.

The CPSD identifies cross-cutting constraints to the development of opportunities in productive sectors. Cross-cutting constraints involve the performance of enabling sectors, such as transport, power, water, digital infrastructure, finance, education, and health and the access of firms to factors of production (including land, labor, and capital) and markets and the functioning of the business environment. Cross-cutting constraints are identified by analyzing factors that inhibit the productivity of and investment in the productive sectors presenting significant development opportunities.

Figure 1.1 below captures the analytical framework used in the Chad CPSD.

FIGURE 1.1. ANALYTICAL AND IMPLEMENTATION FRAMEWORK—CHAD COUNTRY PRIVATE SECTOR DIAGNOSTIC



- Mobilize investments in extractive industries to spur local content development.
- Harness urbanization and the demographic dividend to foster local economic opportunities.
- Accelerate regional trade integration (e.g., AfCFTA) for export diversification.

Chad's opportunities and constraints are benchmarked against "structural" and "aspirational" peer countries, which share similar endowments, economic characteristics, or both. Structural peers are economies that are structurally similar to Chad and have similar income levels, whereas aspirational peers have overtaken Chad's income level at some point or have achieved Chad's strategic development goals. This exercise informs prioritizing policy and structural reforms in the context of fiscal constraints and also facilitates an understanding of Chad's development from a comparative perspective.

Structural peer countries identified for Chad include Mali, Niger, and Sudan:

- Mali and Niger are both landlocked, fragile Sahelian countries and are among the poorest in the world. Both countries share Chad's challenging geographic and geopolitical conditions, including high security risks and volatile politics. Their economies are focused on the export of a few commodities (gold, uranium, and cotton) subject to high price volatility and external shocks.
- Sudan is a fragile and conflict-affected country, lower-middle income oil exporter, and home to more than 3.7 million displaced people and refugees. Sudan's export basket is comparable to that of Chad, with crude oil representing the bulk of its export earnings and the remainder composed of gold (25 percent), resins and oily seeds (20 percent), livestock (12 percent), and cotton (less than 5 percent).

Aspirational peer countries for Chad are Côte d'Ivoire, Cameroon, Ethiopia, and Rwanda:

- Côte d'Ivoire shares with Chad a dependency on a few commodities (cocoa and coffee) and a challenging geopolitical environment. Côte d'Ivoire has emerged from a decade of civil strife with one of the world's highest economic growth rates and incipient diversification into agro-processing and resource-based manufacturing.
- Cameroon is a lower-middle income, oil-exporting country in the Central African Economic and Monetary Community (CEMAC) region. The economic capital and port, Douala, services 90 percent of Chad's exports. Cameroon shares with Chad the CFA Franc, which is pegged to the Euro and issued by the Bank of Central African States (BEAC), the regional Central Bank based in Yaoundé.
- Ethiopia and Rwanda are landlocked, fast-growing economies dependent on agricultural exports. Both Ethiopia and Rwanda are considered development "success stories" in Sub-Saharan Africa for having led incipient diversification of their economy (into agri-based light manufacturing Ethiopia; into services and tourism for Rwanda).

The CPSD is organized into five sections: Section 2 reviews the country context, summarizing Chad's geographical, climatic, and demographic characteristics; analyzing the country's economic history, political economy, and conflicts; and assessing current development challenges. Section 3 covers Chad's overall economic performance, the state of the private sector, and cross-cutting constraints to improving productivity and attracting investment. Section 4 presents the key opportunities for private sector development, identifies sector-specific constraints inhibiting the exploitation of those opportunities, and recommends actions to alleviate them over the short to medium term. Section 5 analyzes cross-cutting constraints identified as inhibiting the exploitation of private investment opportunities and recommends actions that would enhance overall economic productivity and stimulate private sector growth in Chad.

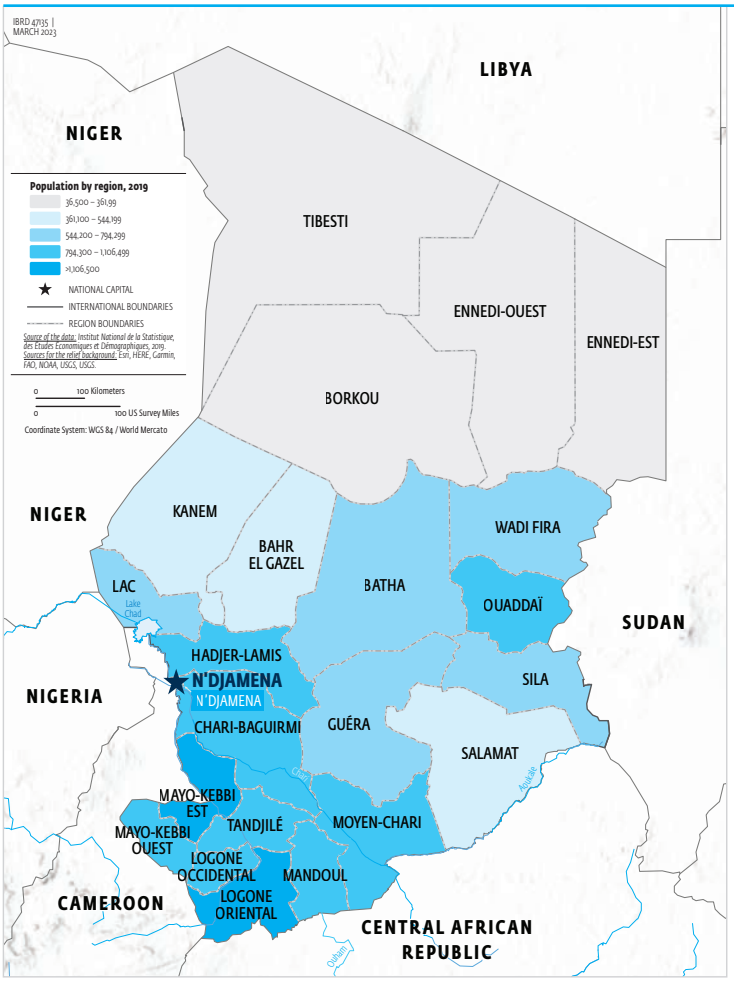
2. COUNTRY CONTEXT

Although growth rates and some human development indicators have improved since oil production began in 2003, Chad missed an opportunity to use oil revenues to fuel broad-based growth and reduce poverty. A landlocked and sparsely inhabited country of 16.4 million people, Chad's gross domestic product (GDP) per capita of $1,520 (2017 international dollars) was the 11th lowest in the world on a power purchasing parity (PPP)-adjusted basis in 2020. With borders drawn by colonial powers, Chad encompasses numerous transnational ethnic groups (section 2.1) and has suffered regular conflict since 1965. Conflicts over scarce natural resources, aggravated by rapid population growth and increasingly variable rainfall, are also increasing (section 2.2). Low levels of educational attainment and poor health outcomes place Chad near the bottom of global human capital indices and poverty rates, which had declined over the 2000s and 2010s, but have recently increased because of the effects of the COVID-19 pandemic on commodity prices and remittances (section 2.3).

2.1 GEOGRAPHY, CLIMATE, AND DEMOGRAPHY

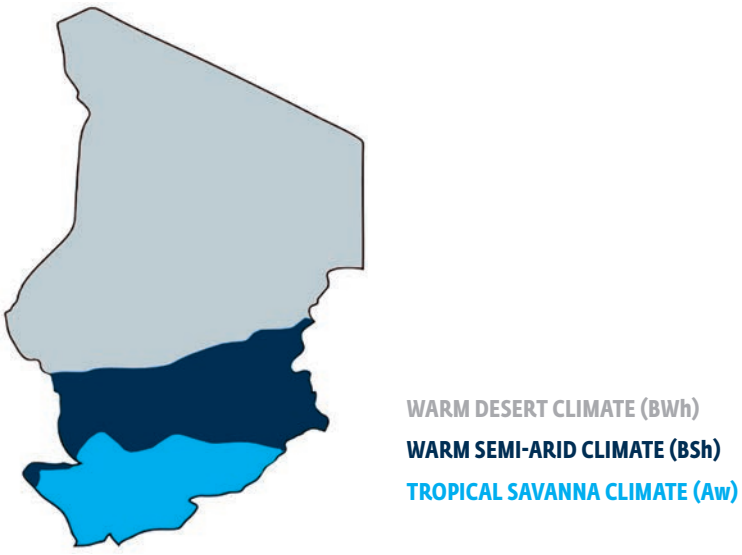
Chad is blessed with natural resources but is deeply landlocked. Chad has the 5th largest land area in Africa, stretching for 1,800 kilometers from its northernmost point to its southern boundary and averaging 800 kilometers in width[4], and is profoundly landlocked, with a lack of navigable rivers and major roads linking population centers to the ocean.[5] Chad spans three agro-ecological zones (figure 2.2): (1) a Saharan zone that receives less than 200 millimeters of rain annually and is inhabited by 100,000 pastoralists who leave after the brief wet season;[6] (2) a central Sahelian zone, which is semi-arid, receives 200–700 millimeters of rain annually, is inhabited by abundant wildlife,[7] and permits subsistence agriculture;[8] and (3) a southern Soudanian zone, which receives more than 700 millimeters of rainfall annually, is irrigated by the Chari and Logone river basins, and has three-fourths of Chad's cultivated land.[9] Lake Chad shrank from 25,000 square kilometers in the 1960s to 1,800 square kilometers in 2010, but grew to 14,000 square kilometers in 2019.[10]

FIGURE 2.1. REGIONS OF CHAD BY POPULATION



Source: Bvggy888.

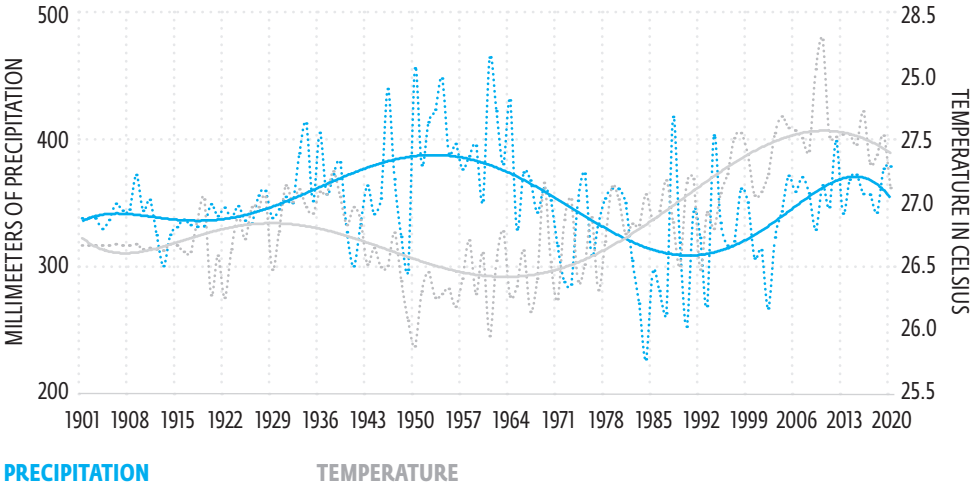
FIGURE 2.2. KÖPPEN CLIMATE ZONES



Source: World Bank Climate Knowledge Portal.

Chad's mineral resources include gold, natron, and oil. Gold deposits were first exploited by artisanal miners in the Tibesti region and the area around Lake Fitri in central Chad between 2011 and 2013. With no industrial mines currently operating, gold is informally mined by 300,000 artisanal miners.[11] Natron (sodium carbonate, or sal soda) is also mined around Lake Chad and the Kanem region for animal feed, preserving hides, soap production, washing, preservatives, and traditional medicine. Oil was first discovered in Chad at Sédigi in the Kanem region in 1974 and then near Doba in the Logone Oriental region in 1985, but not exploited until an agreement was reached with major oil companies following the rise of world oil prices in the 1990s.[12] As-yet unexploited mineral deposits include uranium (Tibesti region), titanium (Guera), bauxite (Soudanian zone), gold-bearing quartz (Biltine region), and tungsten (Tibesti).

FIGURE 2.3. ANNUAL PRECIPITATION



Source: (World Bank Group, 2021) .

Chad's climate, currently characterized by unpredictable variations in rainfall, is projected to become hotter. Chad's rainy season lasts from May to October in the Soudanian zone and June to September in the Sahelian zone, during which many roads become impassable.[13] Precipitation increased during the 1990s after severe droughts in the mid-1980s but remains below 20th-century averages (figure 2.3). Chad's rains are becoming increasingly unpredictable,[14] resulting in frequent droughts and floods.[15] Temperatures are projected to rise between 2.1 and 4.3°C by 2080 over preindustrial times (figure 2.4), increasing the number of +35°C days by 17 from 2000 to 2030.[16] Median models project heavy precipitation events to increase (figure 2.5).[17] Climate change may not affect the water supply per se (figure 2.6), but per capita water supply is projected to decrease by 75 percent between 2000 and 2080 due to population growth.[18] Climate change is expected to reduce yields of maize, millet, and sorghum, whereas yields of rice (which benefits from carbon dioxide fertilization) should increase.[19]

PROJECTIONS FOR CHAD FOR DIFFERENT GHG EMISSIONS SCENARIOS

FIGURE 2.4. AIR TEMPERATURE

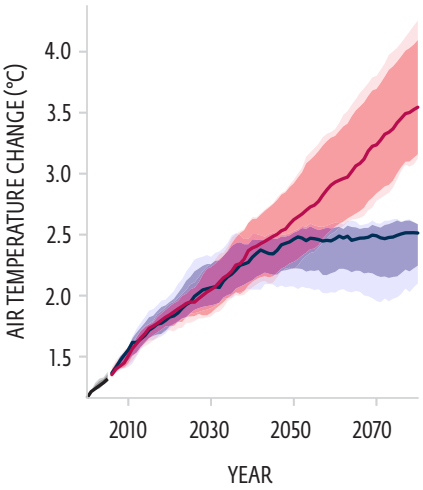


FIGURE 2.5. ANNUAL MEAN PRECIPITATION

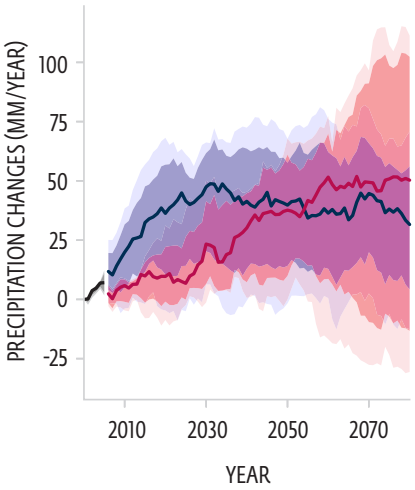
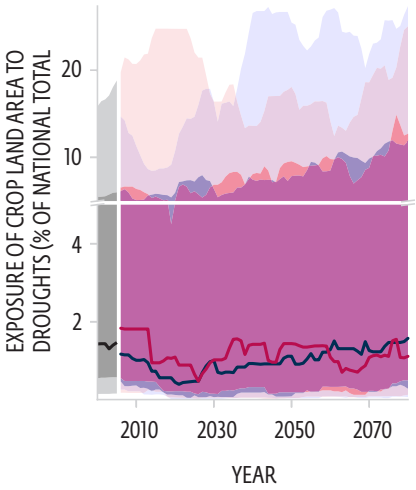


FIGURE 2.6. EXPOSURE TO DROUGHT

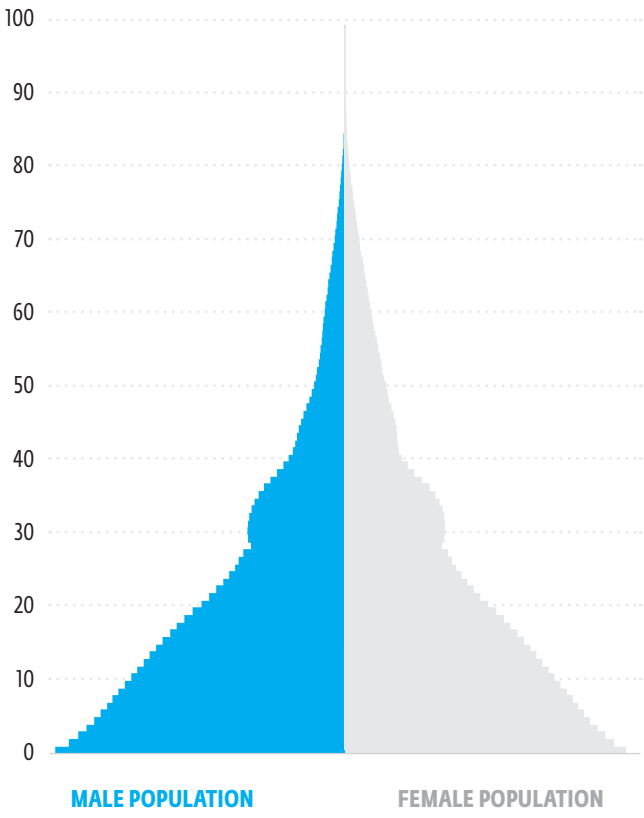


Source: BMZ (German Federal Ministry for Economic Cooperation and Development), "Climate Risk Profile: Chad" (BMZ, Bonn, Germany, 2021), https://agrica.de/wp-content/uploads/2021/01/GIZ_Climate-risk-profile-Chad_EN_final.pdf.

Note: The blue line represents a low emissions scenario (RCP2.6) and the red line represents a medium/high emissions scenario (RCP6.0).

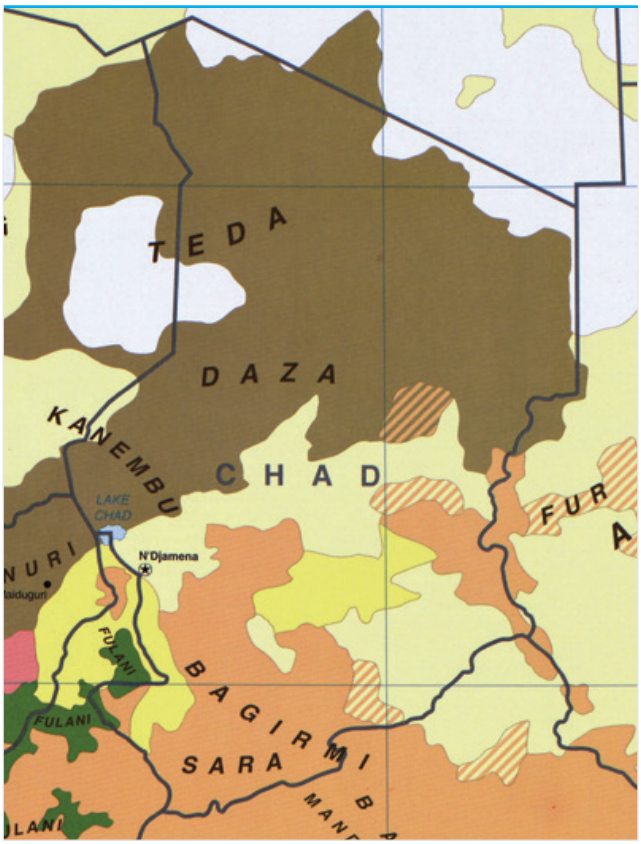
Chad's population is overwhelmingly rural, rapidly growing, and encompasses various transnational ethnic groups. Chad's population of 16.4 million—of which 47 percent is younger than 15 years old—is projected to double within the next 20 years (figure 2.7).[20] Less than one-fourth of the population lives in urban areas,[21] of which N'Djamena (1,000,000),[22] Moundou (150,000),[23] Sarh (100,000),[24] and Abéché (100,000) are the largest.[25] Chad has more than 200 distinct ethnic groups.[26] The Saharan and eastern Sahelian zones are populated by Muslim tribes (52 percent), including nomadic Arabs (10 percent), sedentary Kanembu (10 percent), sedentary Hadjerai (7 percent), semi-nomadic Toubou (6 percent), and semi-nomadic Zaghawa (1 percent).[27] The western Sahelian and Soudanian zones are populated by animist and Christian tribes (44 percent), of which the Sara (31 percent) is the most numerous (figure 2.8).[28] Reinforcing cleavages between northerners and southerners and, more recently, rivalry between the Hadjerai, Toubou, and Zaghawa have deeply affected post-independence politics.

FIGURE 2.7. POPULATION PYRAMID (2021)



Source: United States Census Bureau, International Data Base, 2021, Census.gov: https://www.census.gov/programs-surveys/international-programs/about/idb.html.

FIGURE 2.8. MAP OF ETHNOLINGUISTIC GROUPS OF CHAD



Source: Library of Congress, Africa—Ethnolinguistic Groups, Geography and Map Division, 1996.

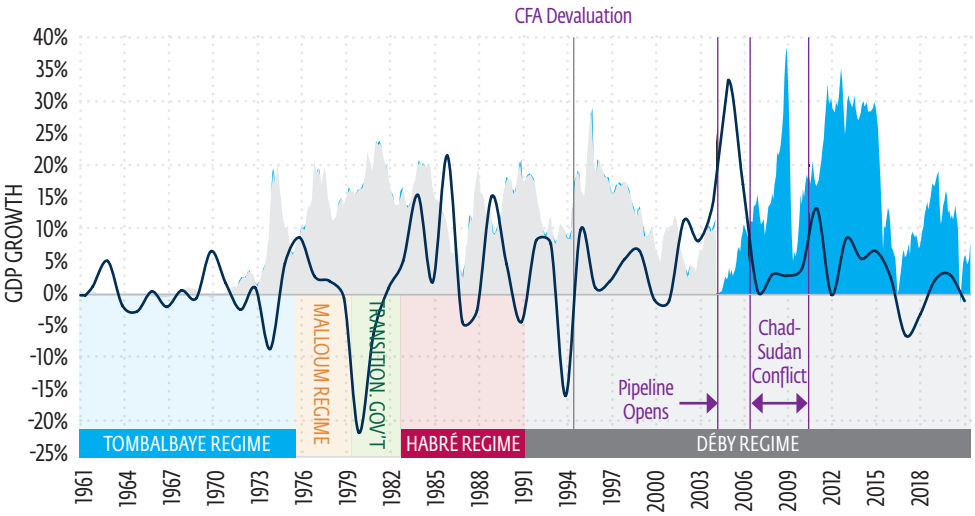
2.2 DRIVERS OF INSTABILITY

Resource rents have fomented instability throughout the post-independence period. Economic growth has been highly volatile throughout the period, with Chad's economy dominated before 2003 by cotton exports and after 2003 by oil exports (figure 2.9). Resource rents have facilitated clientelist political strategies that—in conjunction with fragility in neighboring countries—have contributed to instability. Disputes over natural resources—particularly gold and irrigated land—have recently emerged as an additional source of conflict.

Economic Legacy

Cotton was a key source of revenue for both colonial and post-independence states. After Chad became a French colony in 1900,[29] military officers conscripted Chadian labor,[30] while taxing the population and investing little in productive infrastructure.[31] Civilian administrators subsequently imposed cotton cultivation—including per capita production quotas[32] – on southern Chad in 1928 to generate revenue. *Société Cotonnière Franco-Tchadienne* (now Cotontchad) was accorded the status of a marketing board and has paid farm-gate prices to give smallholders the resources and incentive to improve productivity of cotton cultivation at the expense of subsistence crops.[33] The emphasis on cotton production continued after independence; by the 1960s,[34] cotton made up 70–80 percent of Chad's exports, with the rest consisting of cattle, beef, and leather goods.[35]

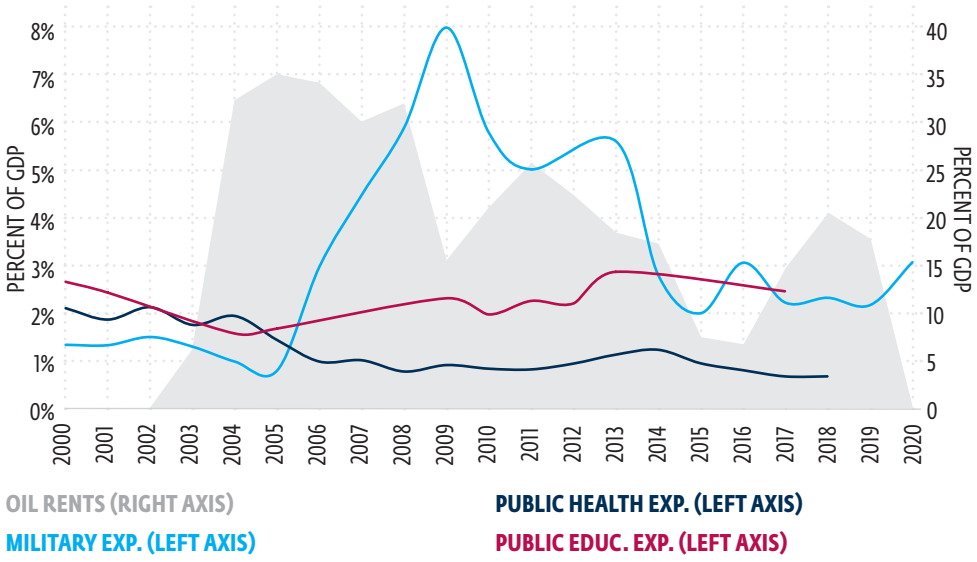
FIGURE 2.9. CHAD'S POST-INDEPENDENCE REGIMES AND ECONOMIC PERFORMANCE



Source: World Bank, 2021.

Oil transformed Chad's public finances in the early 2000s, but much of the windfall went to the military. Economic growth in the late 1990s was steady, with currency devaluation in 1994 increasing cotton exports. In 2003, the 1,070-kilometer Chad-Cameroon Pipeline began pumping oil from fields in Logone Oriental. The government had committed to use oil revenues—which quadrupled Chad's budget by 2014—to create a sovereign wealth fund, reduce poverty, and promote human development.[36] Facing a deteriorating domestic and regional situation, the government instead increased military expenditure (figure 2.10).[37] Heavy military spending, which continued into the 2010s,[38] enabled military interventions across the Sahel. Clashes with rebels broke out in northern Chad in the late 2010s, however, and in April 2021, President Déby died in the Tibesti region from injuries sustained while fighting to repel a rebel incursion. The president's son, Mahamat Déby, was subsequently installed as state leader, with the military council committing to transition to civilian rule by October 2024.

FIGURE 2.10. OIL RENTS AND PUBLIC EXPENDITURE ON EDUCATION, HEALTH, AND MILITARY, 2000-20

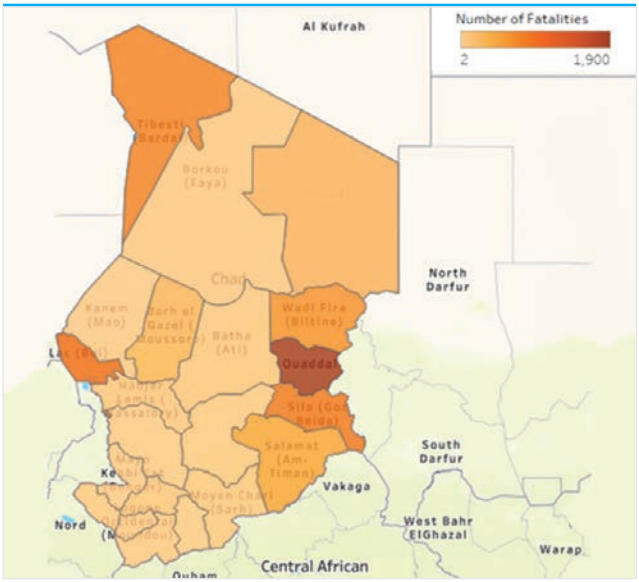


Sources: World Bank, 2021; Stockholm International Peace Research Institute, SIPRI Military Expenditure Database, 2021, https://www.sipri.org/databases/milex 202.

Drivers of Current Conflicts

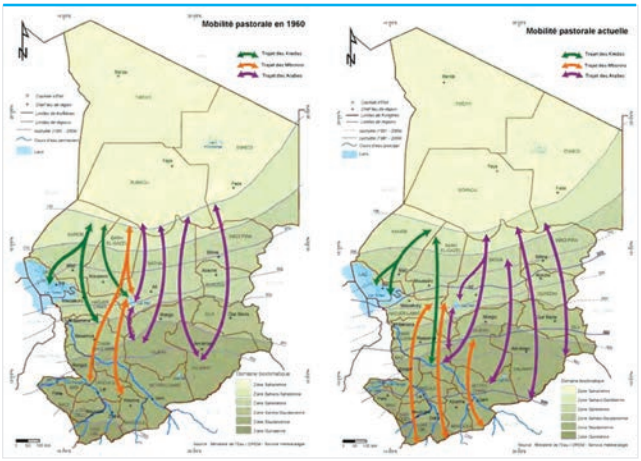
Conflict, a near-constant throughout the post-independence era,[39] has risen appreciably since 2015. The number of deaths due to fragility, conflict, and violence (FCV) rose from 259 in 2018 to 618 in 2020.[40] Insecurity is concentrated in the areas bordering Lake Chad (Lac), Sudan (Ouaddaï), and Libya (Tibesti)[41] and in N'Djamena (figure 2.11). The central and southern areas are generally more secure. Conflict has constrained economic growth throughout Chad's post-independence history, although the annual economic growth during the years affected by conflict rose from 1 percentage point before 2002 to 7 percentage points after 2002.[42]

FIGURE 2.11. CONFLICT DEATHS BY REGION, 1998 – 2019



Source: ACLED, The Armed Conflict Location & Event Data Project, 2021, https://acleddata.com/dashboard/#/dashboard.

FIGURE 2.12. CHANGES IN TRANSHUMANCE PATTERNS, 1960–2010



Source: S. Krätli et al., "Pastoral Systems in Dar Sila, Chad: A Background Paper for Concern Worldwide" (Feinstein International Center, Tufts University, Boston, 2018), https://reliefweb.int/sites/reliefweb.int/files/resources/FIC-Publication-Pastoral-Systems-web-2.26.1.pdf; B. Guibert, A. B. Bécher, and D. Madjidé, Étude prospective: *État des lieux et éléments stratégiques pour le développement pastoral au Tchad* (Paris and Montpellier: Institut de Recherches et d'Applications des Méthodes de Développement [RAM], 2014).

Manifestations of FCV suffered by Chad are complex in nature, yet generally take the form of political violence, cross-border spillovers, and resource conflicts:

- **Political Violence:** Political discontent has been the main source of instability in Chad from the 1965 Mangalmé Rebellion through the death of President Déby in April 2021 and has risen significantly in recent years due to dissatisfaction over constitutional changes and public sector retrenchment.
- **Cross-Border Spillovers:** Instability in neighboring countries has both fueled domestic political violence and served as an independent source of conflict:
  - Rebel movements—from FROLINAT in 1966 through FACT in 2021—have ordinarily operated from bases in neighboring countries and received support from neighboring governments. Examples include the 1978–87 war with Libyan-backed forces and the 2005–09 war with Sudanese-backed forces.
  - Domestic political instability in neighboring countries spills over into Chad. Over 2019–20, one-third of attacks in Chad were committed by Boko Haram.[43] Violence in Darfur has caused influxes of refugees; that in the Central African Republic and Libya results in arms, drugs, and human smuggling, and cross-border bandits kidnap and rob traders and pastoralists in the Mayo Kebbi region.[44]

- **Resource Conflicts:** Competition for land and minerals—aggravated by climate change and high population growth—has emerged as a significant source of conflict over recent years:
  - Since the start of artisanal gold mining in Tibesti in 2011–13, numerous clashes have broken out between the Chadian military and militias seeking to protect artisanal miners operating in defiance of government orders, as well as between rival militias.[45] Unsafe practices and infrastructure have also resulted in many mine collapses, maiming and killing miners.[46]
  - Pastoralists historically migrated along the transhumance corridor from the Saharan zone to the Central African Republic in search of pasturelands during the dry season.[47] Climatic variations since the 1970s have limited access to reliable water sources, forcing pastoralists to migrate toward the eastern Sahelian and Soudanian zones at times that coincide with cultivation[48] The change in migration routes — compounded by ill-defined land rights,[49] ineffective conflict resolution mechanisms, ethno-linguistic tensions, and the rise of "neo-pastoralists" supported by the military and local authorities (International Crisis Group, 2021, p. 21) — has resulted in clashes between pastoralists and farmers (figure 2.12).[50]

2.3 DEVELOPMENT CHALLENGES

Climate, geography, and conflict have made addressing Chad's development challenges difficult. Poverty and development outcomes have improved over the past two decades, but remain among the worst in the world. Educational outcomes in Chad improved with efforts to bolster community-based education, and child and maternal mortality rates have also declined somewhat, although all forms of mortality are very high. Development outcomes are particularly poor for women and girls. Poverty is concentrated in rural areas and correlated with household shocks. Although poverty rates had been falling, the COVID-19 pandemic reversed that trend.

Human Capital

Chad's poor human development outcomes constrain labor productivity and economic development. Chad ranked near the bottom of the Human Capital Index (HCI) 2020 (table 2.1).[51] Chad's score implies that a child born today will be 30 percent as productive in adulthood as she would be if she had access to quality education and health services.[52] Between 2010 and 2020, Chad's HCI score improved only slightly.[53] Households in the Soudanian zone tend to have slightly higher HCI scores than those in the Saharan zone, whereas the highest scores reported are in N'Djamena.[54]

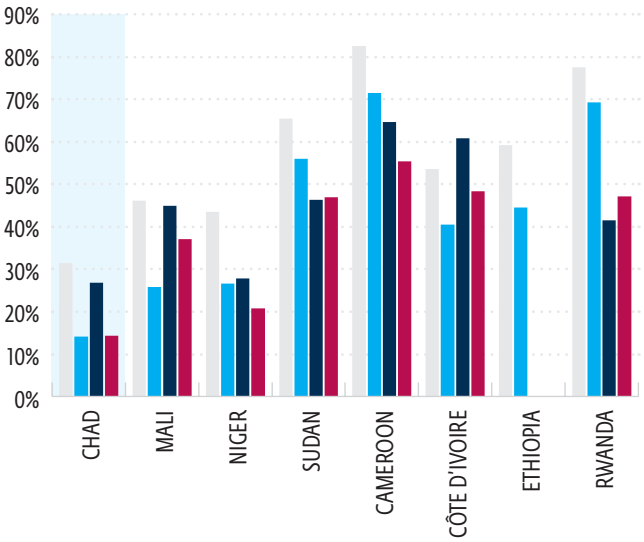
TABLE 2.1. HUMAN CAPITAL INDEX AND COMPONENTS FOR CHAD AND COMPARATOR COUNTRIES, 2020

	CHAD	STRUCTURAL PEERS			ASPIRATIONAL PEERS			
		MALI	NIGER	SUDAN	CAMEROON	CÔTE D'IVOIRE	ETHIOPIA	RWANDA
HCI 2020	**30%**	32%	32%	38%	40%	38%	38%	38%
Prob. Survival to Age 5	**88%**	90%	92%	94%	92%	92%	94%	96%
Exp. School Years	**5.3**	5.2	5.5	7.1	8.7	8.1	7.8	6.9
Harmonized Test Scores	**333**	307	305	380	379	373	348	358
Learning Adj. School Years	**2.8**	2.6	2.7	4.3	5.3	4.8	4.3	3.9
Adult Survival Rate	**65%**	75%	77%	79%	70%	66%	79%	81%
Child to Age 5 Not Stunted	**60%**	73%	52%	62%	71%	78%	63%	62%

Note: Exp. = expected. Pro

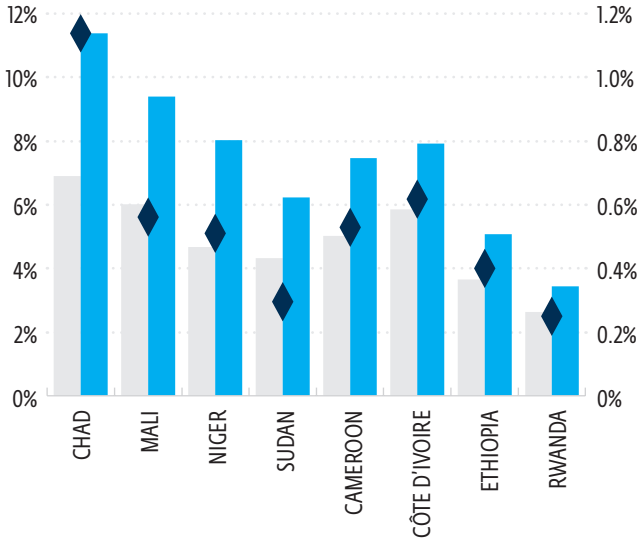
Limited access to quality education constrains the accumulation of human capital. Chadian children spend an average of 5.3 years in school, although due to poor educational quality, the learning-adjusted average education is just 2.8 years.[55] As of 2014, only 2 percent of 10-year-olds could understand a simple text, which is far below regional and income group averages.[56] Adult literacy is correspondingly low (figure 2.13). In recent years, primary enrollment rates have improved due to efforts to improve the quality of education and the contracting of community teachers.[57]

FIGURE 2.13. GENDER DIFFERENTIALS IN EDUCATION



MALE LITERACY (15+) | MALE 2° ENROLL. (GROSS)
FEMALE LITERACY (15+) | FEMALE 2° ENROLL. (GROSS)

FIGURE 2.14. HEALTH OUTCOMES



INFANT MORTALITY (<1 YEAR) | MATERNAL MORTALITY (RIGHT AXIS)
CHILD MORTALITY (<5 YEARS)

Source: World Bank, 2021

Due to limited access to quality health care, many Chadians die from preventable diseases. Chad has some of the world's highest infant, child, and maternal mortality rates and, at just 54 years, the world's second lowest life expectancy (figure 2.14). Twelve percent of children born in Chad die before their fifth birthday, 1 percent of expectant mothers die during pregnancy, and only 65 percent of 15 year-olds can expect to survive to age 60.[58] Poor health outcomes contribute to poor educational outcomes and low labor productivity.[59] Mortality rates have declined in recent decades but remain very high relative to regional averages.[60]

Poor human development outcomes are a product of historical underinvestment in education and health. Chad spends 1 percent of its GDP on public health infrastructure and services and 2.2 percent on public education, both of which fall far below regional and income group averages.[61] Child vaccination rates are very low.[62] Chad has only 1 doctor per 20,000 people,[63] and just 20 percent of women give birth in a health facility.[64] Although a large proportion of households suffer from poor nutrition and low school attendance, fewer households had access to health specialists in 2018 than in 2003.[65]

Gender

Cultural norms and poor access to education limit the ability of Chadian women to accumulate human capital, resulting in a high population growth rate and poor maternal health outcomes. Social norms that encourage early marriage and restrict the mobility of women result in low educational outcomes for girls, who average 4.4 calendar years and 2.3 learning-adjusted years in school[66] and transition from primary to secondary school at a rate 12 percentage points lower than that of boys.[67] Such low levels of schooling among adolescent women — along with a lack of reproductive and maternal health services — contribute to Chad's high adolescent fertility rate of 158 births per 1,000 adolescent women,[68] and to large gaps in male and female literacy, which stands at 27 percentage points among respondents ages 15–25 (figure 2.15; figure 2.16).[69]

FIGURE 2.15. FERTILITY RATE, 1999–2019

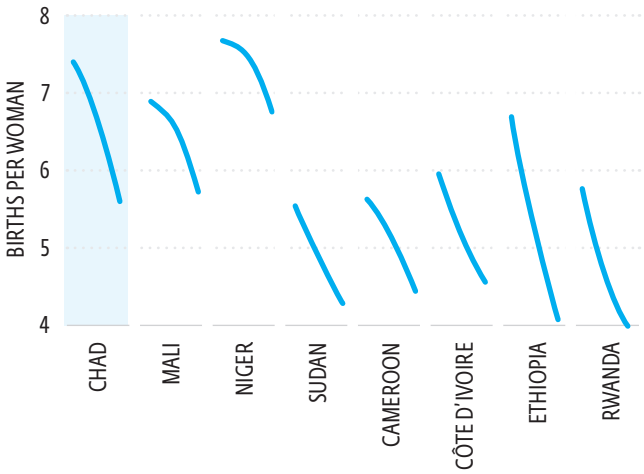
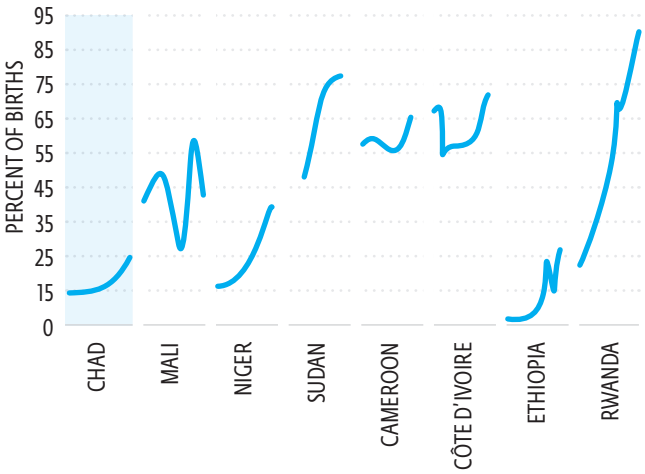


FIGURE 2.16. BIRTHS ATTENDED BY SKILLED HEALTH STAFF, 2000–16



Source:World Bank, 2021.

Poor educational and health outcomes, as well as social barriers, limit the ability of women to accumulate productive assets and generate income. The combination of high fertility rates and poor maternal health outcomes (see subsection 2.3.1) increase women's risk of poverty and vulnerability. Cultural norms that limit the mobility of women further restrict their access to income-generating opportunities. Female-headed households are more likely to be poor than male-headed households.[70] Only 11 and 5 percent of women over the age of 15 have a mobile-money and financial account, respectively, compared with 20 and 13 percent of men, respectively.[71] Reflecting those disparities, Chad ranked 160th of 162 countries in the Gender Inequality Index 2018.[72]

Poverty

Chad's population is heavily impoverished, particularly in rural areas. As of 2018, 42 percent of the population—3.4 million women and 3.1 million men—fell below the national poverty line.[73] Eighty-nine percent of poor households are in rural areas, although only 3 percent are in N'Djamena.[74] Monetary poverty is relatively common in the Soudanian zone and is highest in conflict-affected regions that border the Central African Republic, Cameroon, Sudan, and Nigeria.[75] Multidimensional poverty is lowest in N'Djamena and the Soudanian zone and highest in the Saharan zone.[76] Key sources of vulnerability of falling into poverty include illness or injury of a household member and irregular rainfall.[77]

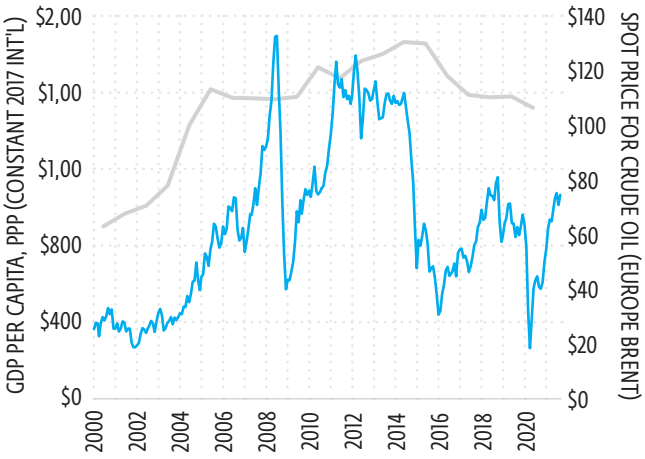
Poverty fell over the past two decades, although the pandemic has reversed those trends. Between 2003 and 2018, monetary and multidimensional poverty fell.[78] Despite those improvements, the absolute num-ber of poor Chadians is growing by 200,000 people annually due to population growth.[79] Falling cotton prices increased poverty levels in cotton-growing regions, and low rainfall increased poverty in the Saheli-an zone.[80] Interim survey data indicate that the pandemic has resulted in a loss of employment, income, and remittances; diminished access to basic services; increased the price of essential goods;[81] and in-creased Chad's poverty headcount rate by 5.5 percentage points, or 850,000 people.[82]

3. STATE OF THE PRIVATE SECTOR

3.1 ECONOMIC PERFORMANCE

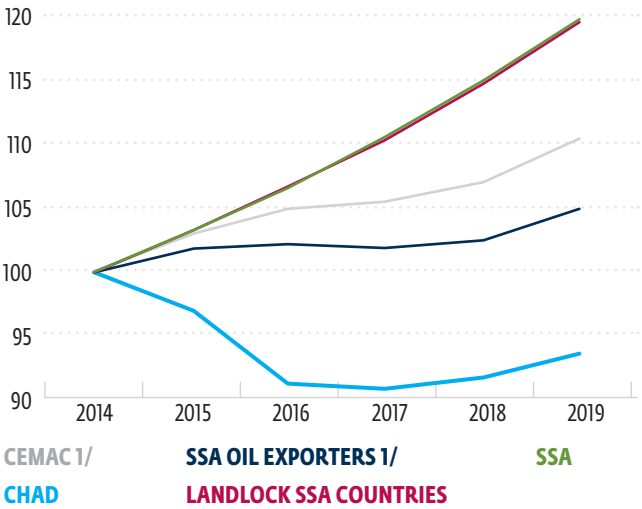
Chad's non-oil economy is held stagnant by poor governance, limited access to key factors of production, and high costs of accessing product markets. A weak oil revenue-management system, limited investment in human capital, and non-transparent revenue-sharing arrangements have throttled the growth of the non-oil economy since the first oil exports in 2003 (figure 3.1; figure 3.2). Chad's non-oil private sector currently consists mainly of subsistence farmers and pastoralists who coexist with state-owned enterprises (SOEs) that often function as patronage vehicles for the executive branch of government. The development of Chad's private sector is hindered by an array of cross-cutting constraints, including poor governance and regulation, limited access to key factors of production, and the difficulties created for producers by poor quality of transportation infrastructure and logistics services in getting goods to markets.

FIGURE 3.1. CHAD GDP PER CAPITA AND OIL PRICES



Source: U.S. Energy Information Administration, Europe Brent Spot Price FOB, Petroleum & Other Liquids, 2021, https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=rbrte&f=m; World Bank, 2021.

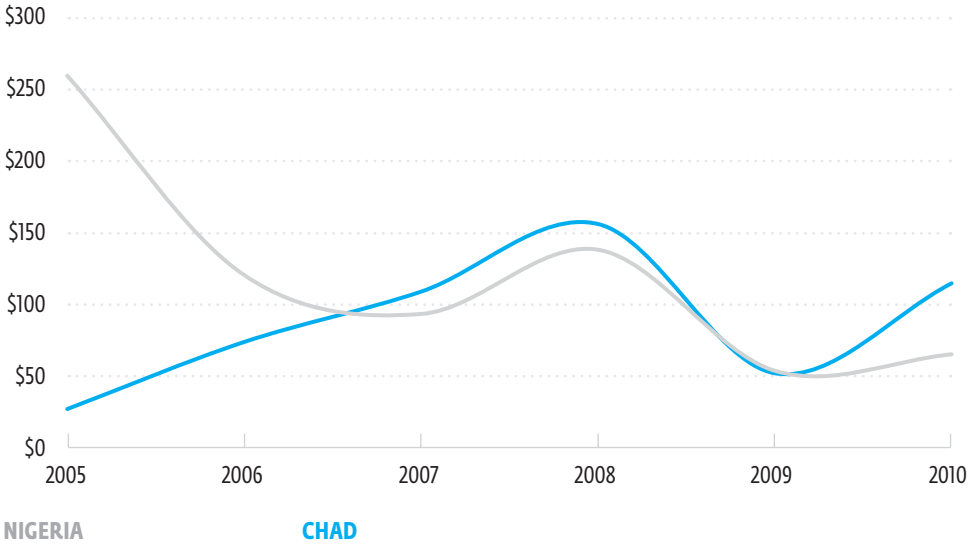
FIGURE 3.2. NON-OIL GDP



Source: IMF, Chad: Staff Report for the 2019 Article IV Consultation, Fourth Review Under the Extended Credit Facility Arrangement, Request for Modification of Performance Criteria, and Financing Assurances Review (Washington, DC: IMF, 2019).

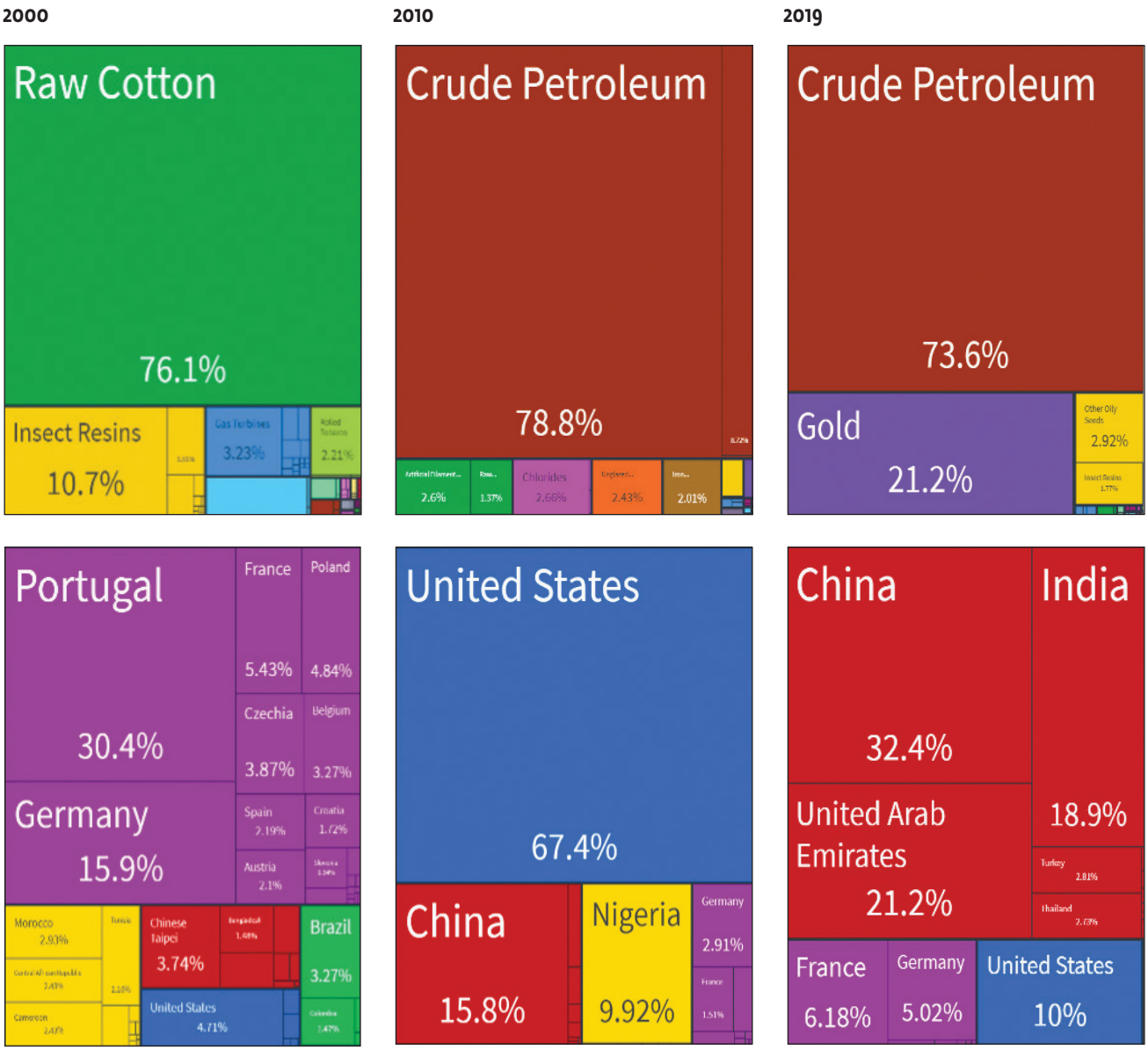
Since 2003, Chad's economy has become dependent on oil prices. In the late 2000s, Chad's per capita oil revenues rose to a level comparable to major oil-producing countries such as Nigeria (figure 3.3). Currently, oil represents 94 percent of total exports, with cotton,[83] livestock, and other agricultural products accounting for the remaining 6 percent (figure 3.4; figure 3.5). Due to the lack of a structural mechanism for managing oil revenue, fiscal policy has been pro-cyclical. Education, health, and other public service spending fell in the wake of the 2008 decline in oil prices.[84] In 2014, a sharper decline in oil prices imperiled Chad's ability to meet its commercial external debt obligations[85] and led to a fall in GDP per capita to US$1,580 in 2019.[86] Because Chad's economic growth rate is well below its population growth rate,[87] Chadians are, on average, getting poorer.

FIGURE 3.3. PER CAPITA OIL REVENUE



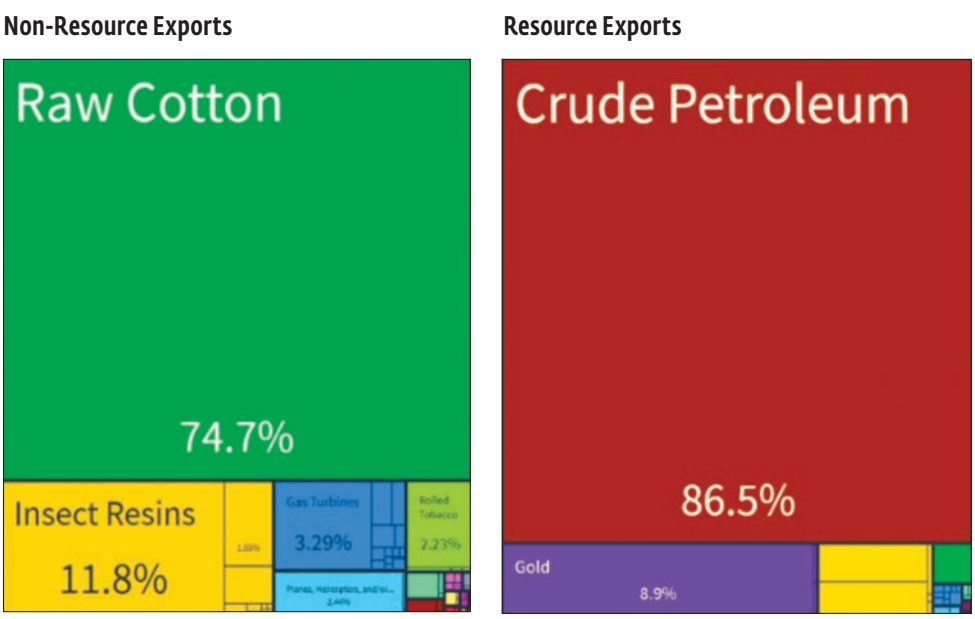
Source: CPSD team calculation from WBG data.

FIGURE 3.4. EXPORT COMPOSITION AND EXPORT MARKETS



Source: Observatory of Economic Complexity.

FIGURE 3.5. PRODUCT SPACE WITHIN NON-RESOURCE AND RESOURCE EXPORTS



Source: Observatory of Economic Complexity.

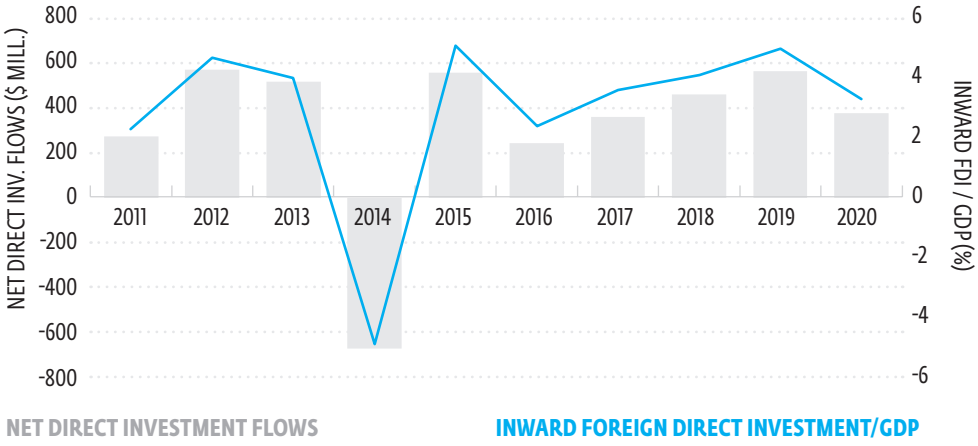
Dutch disease—stemming from a lack of revenue management—has stunted the growth of Chad's non-oil economy (**figure 3.5**). As a result of the failure to sterilize inflows, Chad's real effective exchange rate has been overvalued, by 10 percent from 2003–2011 and 6 percent since 2011.[88] In addition, increased public expenditure has crowded out private sector investment, with private contributions to gross fixed capital formation and domestic credit to the private sector negatively correlated with oil revenue after 2002.[89] Although domestic credit to the private sector as a ratio of GDP has increased steadily since the mid-2000s, levels remain among the lowest in central and western Africa.[90] Of the revenue generated by oil exports, little has reached the agricultural sector. From 2003–12, public expenditure on agriculture averaged only 4.1 percent of agricultural GDP, well below the 10-percent level prescribed by the Maputo Declaration.[91]

Notwithstanding the oil boom, Chad has accumulated significant external debt and macroeconomic vulnerabilities have been further exacerbated by the COVID-19 pandemic. While Chad's public debt ratio has remained below 50 percent of GDP (well below the CEMAC standard of 70 percent of GDP), the latest Debt Sustainability Analysis conducted by the World Bank and the IMF in December 2021 deemed Chad's debt to be unsustainable at 52.1 percent of GDP, as the debt service to revenue ratio will remain above the high-risk threshold. Chad is also in arrears to several creditors and was the first country to effectively reach a debt restructuring agreement with official and private creditors under the G20 Common Framework. This agreement provides Chad with adequate protection against downside risks while bringing the risk of debt distress to moderate. With the recent increase in oil prices, Chad's fiscal balance is projected to reach a moderate surplus of 2.8 percent of GDP in 2022 (from -2.2 percent of GDP in 2021), with higher oil revenue offsetting high social and defense spending, and total public debt expected to drop to 44.9 percent of GDP in 2022. Yet

a lack of macroeconomic stability remains a major impediment to private investment, and the country continues to face considerable challenges, including food insecurity, oil price volatility, climate change, and security issues, and continued reform efforts are needed to enhance growth and mobilize domestic resources to allocate to key social sectors given the low revenue base.

Despite the decline in GDP since 2014, investment inflows have remained robust. Foreign direct investment (FDI) net inflows boomed throughout the 2010s, reaching a record 5.1 percent of GDP in 2015 (figure 3.6), and real GDP per capita more than doubled, from US$897 in 2000 to US$1,866 in 2014.[92] FDI inflows have nonetheless remained robust in recent years, with net flows into Chad more than doubling, from US$245 million in 2016 to US$567 million in 2019. Although the vast majority of FDI was directed to extractives, the Singapore-based agribusiness conglomerate Olam invested heavily in the cotton sector.

FIGURE 3.6. FOREIGN DIRECT INVESTMENT, 2011–20

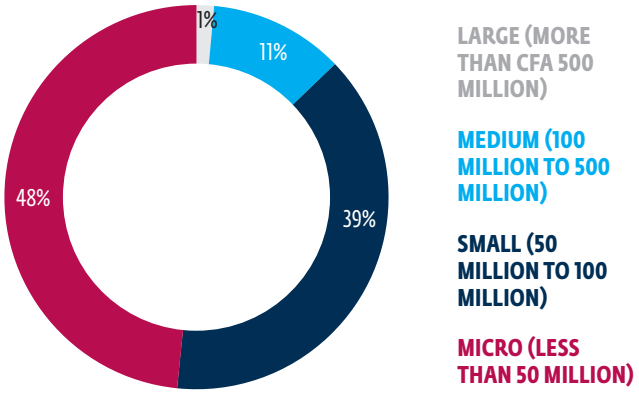


Source: CPSD team calculation from WBG data.

3.2 PRIVATE SECTOR CHARACTERISTICS

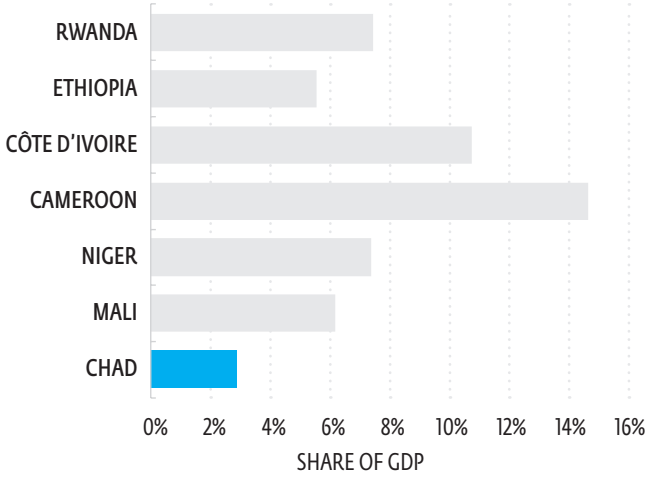
Subsistence agriculture and pastoralism dominate Chad's non-oil economy. Agriculture and pastoralism account for 73 percent of household income, nonfarm activities make up just 22 percent, and remittances constitute 5 percent.[93] The manufacturing sector is anemic, with manufacturing value added amounting to less than 3 percent of GDP in 2019 (figure 3.8) and manufacturing activities attracting less than 5 percent of total bank credit (figure 3.9). Despite the oil boom, the share of the population employed in the agricultural sector has remained constant for the past two decades,[94] and agricultural productivity has not substantially improved over the past 50 years.[95] The economy of the Saharan zone is dominated by animal husbandry, and only 10 percent of households are engaged in crop production.[96] Remittances contribute just 5 percent to total household income, varying from 2 percent for rural households to 6 percent for urban households.[97] In the Soudanian zone, more than 50 percent of households engage in both crop and livestock production.[98]

FIGURE 3.7. CHADIAN FIRMS BY ANNUAL REVENUE SIZE



Source: Central Bank (BEAC).

FIGURE 3.8. MANUFACTURING VALUE ADDED, 2014–19



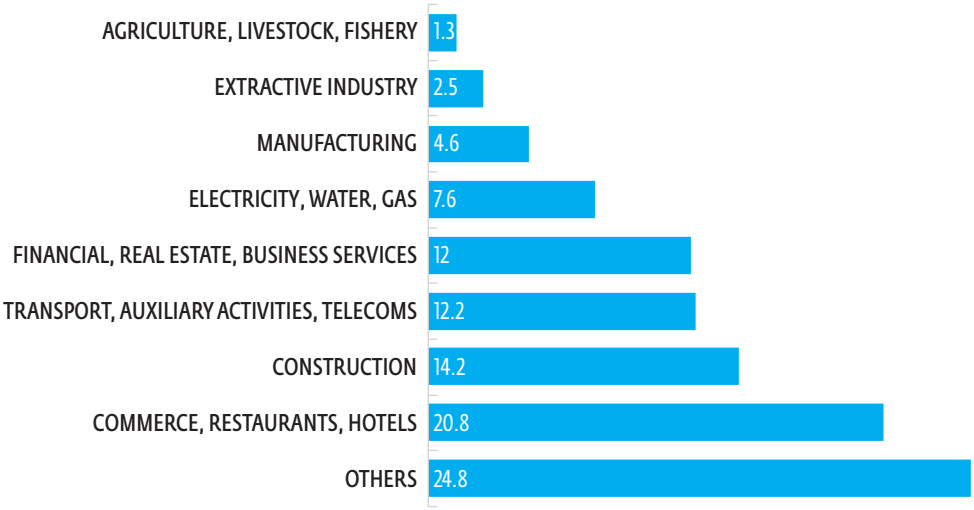
Source: World Bank, 2021.

Non-farm enterprises make only a minor contribution to household income. On average, non-farm enterprises (NFEs) provide 20 percent of income for rural households and 40 of income for urban households.[99] NFEs include retail traders (33 percent), food producers (24 percent), and personal services providers (12 percent)[100] and are mostly informal—less than 6 percent are formally registered.[101] As with many informal firms in developing countries, most Chadian NFEs employ family labor and are characterized by a high rate of entry and exit.[102] Chad's small formal private sector is dominated by micro, small, or medium enterprises (MSMEs), and the few large firms are concentrated in N'Djamena. More than 98 percent of the country's formal enterprises have annual revenue less than CFA 500 million (about US$900,000) (figure 3.7).

Chad's manufacturing sector is extremely small compared with that of other African countries. The small size of the manufacturing sector reflects the poor state of development of those industries in which Chad has a potentially comparative advantage, notably textiles and processing of agricultural products (figure 3.9). The oil sector is dominated by the Chinese National Petroleum Corporation (CNPC) and an international consortium made up of ExxonMobil affiliate EssoChad, Petronas, and ChevronTexaco.

Commercialization of agriculture and pastoralism is very limited.[103] Chadian farmers devote almost 70 percent of land to cereal production,[104] of which 80 percent is consumed at home.[105] Similarly, only 25 percent of households that sell livestock receive cash income from selling animals, and less than 3 percent receive cash income from selling the meat.[106] Even in the Soudanian zone, where cash income from agriculture is most prevalent, average total household income agriculture is below the individual poverty line.[107] Groundnuts (16 percent of farmland), paddy rice (8 percent), and sesame (6 percent) are the most common cash crops,[108] with sesame having a relatively high degree of commercialization, at 50 percent.[109] Other cash crops include gum arabic, grown mostly in the Sahelian zone;[110] shea, grown mostly in the Soudanian zone; and date palms, grown exclusively in the Saharan zone.[111] Even though agriculture is the most important source of income for most of the population, it receives the lowest share of credit (figure 3.9).

FIGURE 3.9. BANK CREDIT BY SECTORS, SHARE OF TOTAL



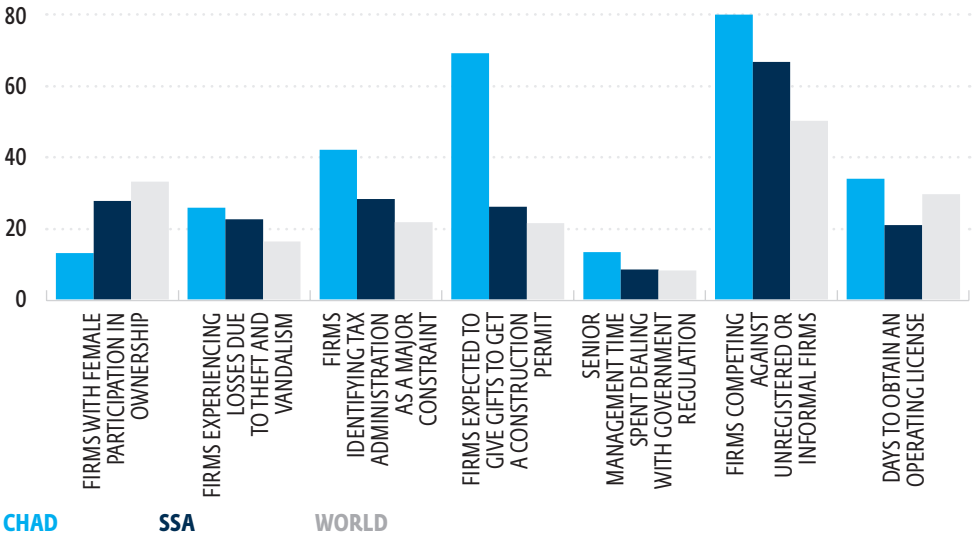
Source: Central Bank (BEAC).

State involvement in the economy is substantial. Despite the privatization of several SOEs in recent years, the state remains a key player in many sectors. Chad's telecommunications firm (Société des telecommunications de Tchad, or Sotel) was privatized in 2014, but the state retains control of the electricity and water distribution companies. CotonTchad, the monopsonist purchaser of cotton, was sold to Olam in 2018, but the state retains 35-percent control. Subsidies for state-owned enterprises and legal monopolies (for example, the case of CotonTchad) imply that there are few large players in many sectors. Chad does not have national competition legislation, and the government regulates the formation of monopolies and oligopolies inconsistently.[112] As of 2017, Chad had no fewer than 17 SOEs spanning at least 11 sectors, with SOEs holding 100 percent of the market share in at least 6 subsectors.[113] As noted above (subsection 3.1), those SOEs often exist to serve a political function in helping the executive branch of government dispense patronage and develop political coalitions.

3.3 CROSS-CUTTING CONSTRAINTS TO PRODUCTIVITY AND INVESTMENT

The development of Chad's non-oil economy is constrained by poor governance and regulation. Private enterprises regularly encounter institutional barriers.[114] Chadian businesses pay up to 64 percent of commercial profit in taxes and mandatory contributions, a figure higher than the average of 47 percent for Sub-Saharan Africa.[115] Inconsistency in government regulation of and participation in markets, advantages accorded to some SOEs and private firms (such as preferential regulations, tax exemptions, sole-source procurement, and other inducements), and an undeveloped competition framework create uncertainty and the perception of an unfair playing field that further inhibits private sector investment (figure 3.10).[116] A Chamber of Commerce, Industry, Agriculture, Mines and Crafts (CCIAMA), created in 1935 to voice private sector interests, has recently been revamped to advance sector-specific interest groups, such as for mines and industry, agriculture, livestock and fisheries, and handicrafts.

FIGURE 3.10. CHARACTERISTICS OF CHADIAN FIRMS, 2018



Source: World Bank, 2018.

Limited access to factors of production—including land, skilled and able labor, electricity, irrigation, and insurance—limits productivity and investment. Agricultural productivity is hindered by small plot sizes,[117] insecure land rights,[118] a lack of irrigation,[119] limited mechanization and use of improved inputs,[120] and the absence of crop or livestock insurance.[121] Poor health outcomes limit the supply of agricultural labor, and poor educational outcomes and a lack of technical expertise inhibit farmers from managing high-value crops such as gum arabic and shea,[122] availing extension services,[123] and forming farmer organizations.[124] Pastoral productivity has similarly been limited by declining access to traditional grazing lands (as a result of both climate change and insecurity in the Central African Republic) and resulting conflict with farming communities[125] and by a lack of processing and cooling infrastructure for meat and dairy production—the consequence of an insufficient electricity supply—and limited use of veterinary medicine.[126] Many of those constraints are being further aggravated by climatic variability and poor governance.[127] Low levels of access to finance—only 24 percent of the population age 25 and older has a financial or mobile money account—also represents a general constraint on enterprise.

Limited access to product markets further constrains the Chadian economy. Chad's poor road and market infrastructure and the adverse effects of climate change on them hinders the capacity of farmers and pastoralists to profitably sell produce.[128] The density of Chad's road network is among the lowest on the African continent. In addition, the rainy season, which lasts from May to October in the Soudanian zone and June to September in the Sahelian zone, renders many roads impassable.[129] Fragility also frequently hinders cross-border trade. Repeated closures of the Nigerian border since August 2019, for instance, have adversely affected both farm-gate and input prices.[130]

4. OPPORTUNITIES FOR THE PRIVATE SECTOR

Despite the challenges presented by Chad's economic and political context, there are opportunities to promote economic diversification, reduce extreme poverty, and boost shared prosperity. Analysis of the commercial opportunities (as indicated by revealed comparative advantage, growth in global and regional demand, and interest from private investors) and the effect of potential development (as indicated by prospects for value addition to increase employment and tax revenue, employment intensity,[131] and the current level of and potential for elite capture) indicate that the value chains of cotton, gum arabic, sesame seed, and livestock hold significant promise (table 4.1).

TABLE 4.1. CHAD'S AGRICULTURAL PRODUCT SPACE

Most attractive products based on five (5) criteria: (i) average RCA, (ii) aggregate demand growth, (iii) private sector interest, (iv) job creation potential and (v) added value .

PRODUCT	RCA	AGGREGATE DEMAND GROWTH		PRIVATE SECTOR TRACK RECORD AND INTEREST	EMPLOYMENT (DIRECT/INDIRECT)	DOMESTIC VALUE-ADDITION
	AVERAGE 2012–18	CAGR, 2012–18		2021	HOUSEHOLDS 2019	
		GLOBAL	REGION			
Gum arabic	646.7	0.4%	–11.4%	• Multiple exporters trading both gum arabic and sesame • No state ownership	300,000[1]– 500,000[2]	• Spray-dried gum for export • Food and beverage manufacture
Live bovine	149.8	1.3%	15.5%	• Foreign ownership of 2 abattoirs with minority state ownership	300,000[3]	• Frozen beef • Dairy • Hides and skins
Sesame seed	67.9	9.5%	128.1%	• Multiple exporters trading both gum arabic and sesame • No state ownership	331,000– 662,000[4]	• Sesame oil • Sesame cakes • Tahini
Cotton	17.7	–5.2%	10.3%	• Monopsony with minority state ownership (Co-tonTchad) • New entrants prohibited	62,000– 279,000[5]	• Textile manufacturing • Animal feed from cotton seed
Groundnuts	0.71	3.3%	8.3%	• No formal trading • No state ownership	780,000– 1,560,000[6]	• Food and beverage manufacture
Sugar	0	–1.2%	3.7%	• One foreign firm with min. state ownership (CST) • 15% import duty	2,000–6,000[7]	• Refined sugar • Food and beverage manufacture

Sources: G. Gaulier and S. Zignago, "BACI: International Trade Database at the Product-Level. The 1994–2007 Version" (CEPII Working Paper 2010-23, Centre Études Prospectives et d'Informations Internationales, Paris, 2010), http://www.cepii.fr/CEPII/fr/publications/wp/abstract.asp?NoDoc=2726; FAO (Food and Agriculture Organization of the United Nations), FAOSTAT Statistical Database, 2021).

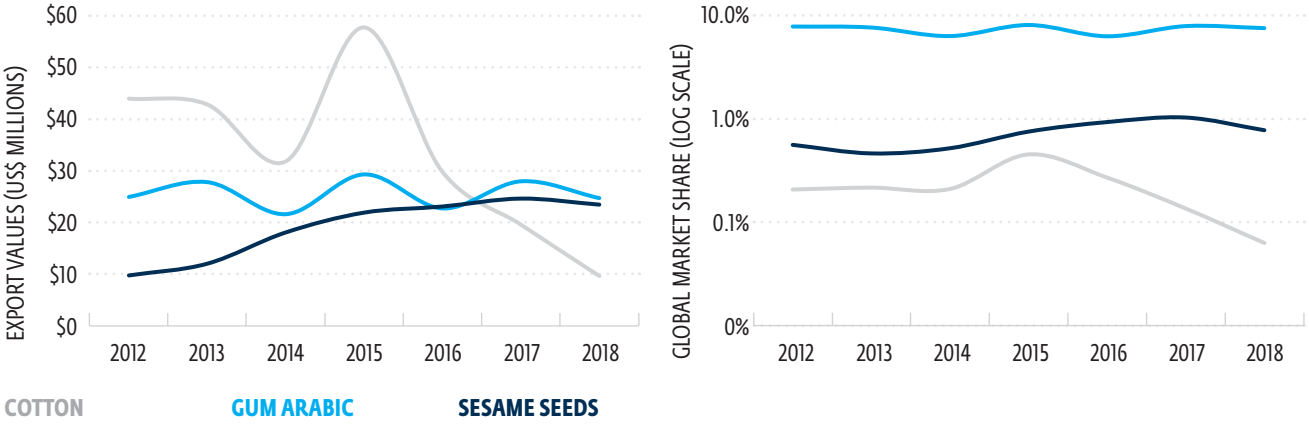
Notes: RCA is the ratio of the product's share in Chad's exports to the product's share in exports of all countries. CAGR is the cumulative annualized growth rate. Global CAGR is the growth of import value by all countries. Region CAGR is the growth of import value by countries with contiguous land borders (Central African Republic, Cameroon, Libya, Niger, Nigeria, and Sudan). Average household size is 5.8 (Institut National de la Statistique des Études Économiques et Démographiques —INSEED/Tchad, 2014–2015). CST = Compagnie Sucrière du Tchad.

Estimate Notes:

1. World Bank, "Republic of Chad: Bovine Live Stock and Arabic Gum Value Chains: Opportunities, Challenges, Actions" (internal document, World Bank, 2014).
2. G. Ahmed, "Chad: Upgrading in the Sesame Seeds and Arabic Gum Global Value Chains" (Background paper for "Chad, Leveraging Export Diversification to Foster Growth," World Bank, Washington, DC., 2018).
3. Calculated from FAOSTAT reported cattle stock, assuming 102 cattle per household, 2020.
4. Calculated from the area under cultivation (FAOSTAT, 2021), assuming one-third of household land devoted to sesame and 1.6–3.2 hectares per household.
5. Lower bound is the number of farmers selling to CotonTchad in 2018. Upper bound is the number expected in 2024, assuming constant hectares per farmer.
6. Calculated from the area under cultivation (FAOSTAT, 2021), assuming one-third of household land devoted to groundnuts and 1.6–3.2 hectares per household.
7. Employment on CST plantation today and under planned expansion.

Given Chad's factor endowments and prevailing cross-cutting constraints, agribusiness appears to offer the best potential to increase factor productivity, attract investment, and spur broad-based development. Opportunities to stimulate the development of the oil sector have been pursued, such as by the construction of the CNPC refinery to serve the domestic market and the Chad-Cameroon Pipeline to serve export markets. RCAs for other minerals—such as for gold (RCA of 5.4) and tin (1.1)—are modest and significantly lower than for agricultural, pastoral, and forestry goods. Hence, Chad has a clear comparative advantage in the processing of agricultural products — a type of light manufacturing strategy that would also be consistent with a World Bank review of Chad's opportunities for structural transformation and, in addition, help create jobs for less-skilled labor.[132] Alternative paths to structural transformation appear to be infeasible. The export of services at scale, for instance, is improbable given the scarcity of human capital. The export of manufactures unrelated to agriculture would likewise be challenging, given human capital, very high transportation costs, and the limited comparative advantage relative to Asian producers. (See figure 4.1.)

FIGURE 4.1. CHAD'S LEADING FORMAL AGRICULTURAL EXPORTS



Source: G. Gaulier and S. Zignago, "BACI: International Trade Database at the Product-Level. The 1994–2007 Version" (CEPII Working Paper 2010-23, Centre Études Prospectives et d'Informations Internationales, Paris, 2010), http://www.cepii.fr/CEPII/fr/publications/wp/abstract.asp?NoDoc=2726;
Note: Data do not include products traded informally, including primarily livestock, and in varying quantities other products such as groundnuts, garlic, onions, rice, and maize.

The livestock, sesame seed, and gum arabic value chains offer the best opportunities for commercial success and development impact:

- **Gum Arabic** (section 4.1): Chad also has a strong RCA in gum arabic. The global market is currently stagnant, although the example of neighboring Sudan indicates that there are substantial opportunities for domestic value-added. Gum arabic has a high degree of overlap between traders, wholesalers, and exporters of sesame seed. Potential collection sites for gum arabic are spread broadly across both the Sahelian and the Soudanian zones (figure 4.2), and, as with sesame seed, the development of value chains for gum arabic may help address regional economic imbalances.

FIGURE 4.2. ACACIA TREE DISTRIBUTION (2017 ESTIMATES)

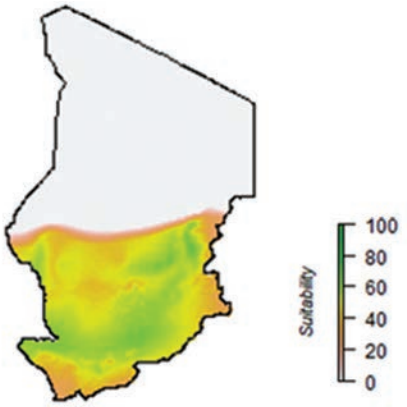
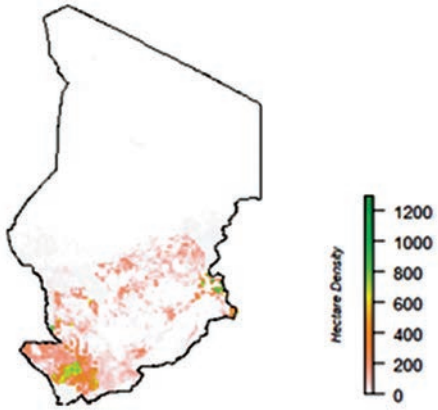


FIGURE 4.3. SESAME SEED HARVESTED AREAS (2017 ESTIMATES)



Source: IFPRI (2020).

- **Livestock** (4.2): Chad possesses a large comparative advantage in the product, enjoys a growing regional market, and has attracted interest from several private investors. Livestock is a priority in the National Development Plan and there is potential for adding value through the domestic production of meat, dairy, and hides and skins. Efficient operation of modern slaughterhouses requires both reliable electricity and throughput of approximately 100–150 cattle per hour, which in turn would require complementary investment in industrial-scale breeding and pens. However, there is a risk that livestock investment may entrench the interests of a non-inclusive elite. The livestock sector has been a favored area for investment within the military, with senior officers investing in large herds and hiring armed shepherds to manage migrating herds. Past state investment aiming to boost the productivity and competitiveness of the livestock sector has benefited military investors.[133]
- **Sesame Seed** (4.3): Chad has a strong RCA in sesame seed, and global and regional markets are growing faster than for any other product. Sesame seed trading is decentralized and thereby offers farmers and traders competitive prices. As a result of this, and as cotton and sesame seed use similar nutrients and cannot be farmed on the same land, farmers are switching from cotton to sesame cultivation. Sesame seed is cultivated across the Soudanian zone (figure 4.3) and can potentially be a vehicle for addressing economic imbalances between N'Djamena and the rest of the country.

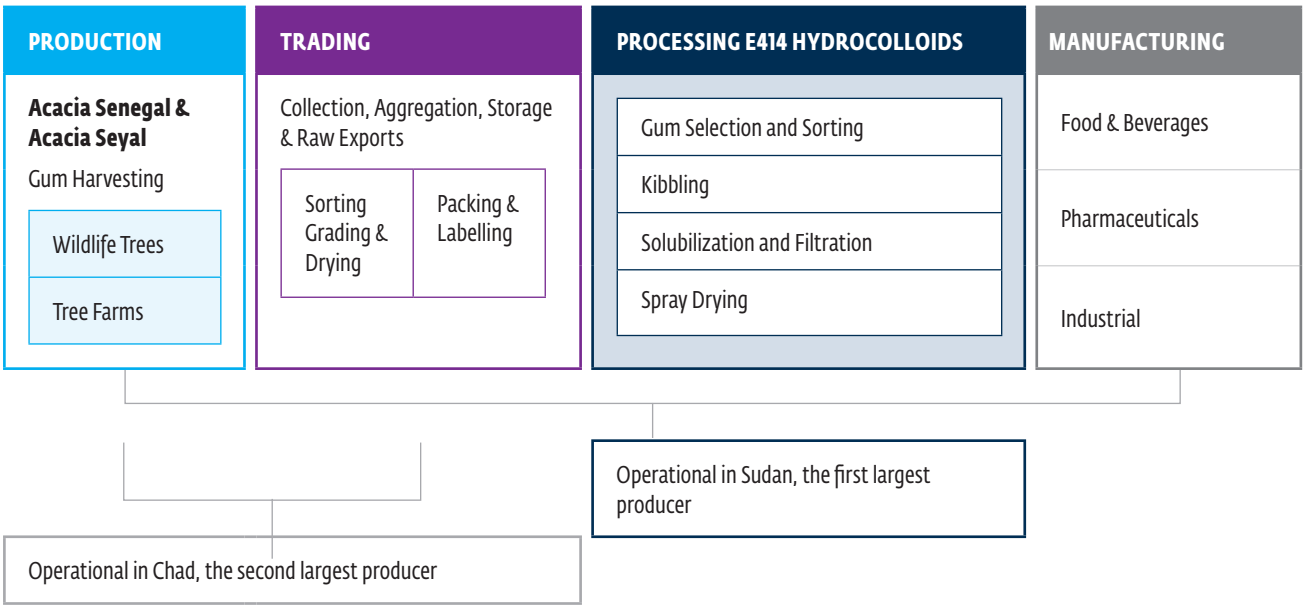
- **Cotton** (4.4): Chad's traditional export has a declining global market, small RCA, and global prices that until recently were so low as to require subsidies to induce cultivation. A legal cotton monopsony limits the surplus captured by farmers when international prices rise. The power of the monopsony could be reduced if subsidies were rebalanced toward other crops or were distributed in a way that is crop-neutral, for instance, through vouchers.

4.1 GUM ARABIC

Opportunities

Of agribusiness products, Chad has the highest RCA in gum arabic. Gum arabic, known in processed form as E414, is used as an emulsifier and thickening agent in the manufacture of foods and beverages, pharmaceuticals, cosmetics, and paper (figure 4.4). In 2018, Chad's exports comprised 7 percent of the global market, making it the second-largest exporter after Sudan. Due to the slow growth in international import demand for gum arabic over the past decade (0.4 percent per annum), the value of Chad's gum arabic exports has been flat.

FIGURE 4.4. MAP OF THE VALUE CHAIN FOR GUM ARABIC



Source: G. Ahmed, "Chad: Upgrading in the Sesame Seeds and Arabic Gum Global Value Chains" (Background paper for "Chad, Leveraging Export Diversification to Foster Growth," World Bank, Washington, DC., 2018).

Chadians are primarily employed in the harvesting, drying, sorting, and bagging segments of the value chain. Harvesters use manual tools to collect the gum from wild trees and sell to traders who then sell to exporters based in N'Djamena connected to major international gum processors such as Nexira (France), the largest in the segment, Kerry (Ireland), and TIC Gums (United States). The value chain supports the livelihoods of 300,000 to 500,000 households, who rely on gum arabic for 15–30 percent of their income[134] and helps diversify household income from cotton and planted crops. Virtually all gum arabic is cultivated in the "Gum Belt," spanning the wooded savannas of the central part of the Sahelian zone and which includes the Batha, Sila, Chari Baguirmi, Hadjer-Lamis, Guéra, and Salamat regions of Chad.[135]

Raw gum is currently not processed in Chad and the experience of Sudan indicates that it may be possible for Chad to move up the value chain (figure 4.4). Processing involves breaking the gum into small pieces (kibbling), dissolving in water, and filtering the solution to remove impurities and microorganisms. The filtered solution is then pasteurized and sprayed into fine droplets, which, once the water has evaporated, becomes dried gum powder. In Sudan, where a state-trading monopoly was lifted in 2009, this spray-dried gum is produced by private firms, that both export and sell to local food and beverage manufacturers. In 2017, the Dal Food Industry Group, Sudan's Coca Cola bottling company and largest food and beverage manufacturer, opened the country's largest gum-drying facility, which also includes a dried milk operation.

Constraints

Sector-specific factors limiting exports and the development of processing facilities include the lack of quality grading and traceability, inadequate resource management, and limited organization:

- **Quality Grading and Traceability**. Currently, the Chamber of Commerce, Industry, Agriculture, Mines and Crafts receives a tax of about 1 CFAC/kg to provide a certificate of origin, though this is not the same as quality grading or traceability. Without such a system, collectors lack incentives to invest in delivering high-quality gum, which in turn undermines the quality of gum delivered to exporters, which in turn precludes Chad from benefiting from the international price premium that exists for gum that can be traced to the collector. In contrast to Chad, Sudan has a well-established, six-tiered grading system.[136]
- **Resource Management.** The overexploitation of wild trees — especially Acacia Senegal, which produces the premium gum — is a concern. Although accurate information on the number of trees and the rate of deforestation is unavailable, some have speculated that Chad will lose its trees in about 25 years.[137] There does not seem to be any program to replenish, treat, and protect gum arabic trees, and a lack of training in how to collect gum leads collectors to mutilate and damage the trees.
- **Sectoral Organization.** Sudan provides a model for organizing the sector. There, it is organized under the Gum Arabic Producers Association (GAPA), a joint liability group established in 1993 and comprising around 36 gum arabic producers' cooperatives, including about 2,338 members. GAPA functions include forestry management, price negotiation, collector and trader credit delivery and repayment collection, drinking water distribution, and school development activities in gum-producing communities.

Relative to other sectors, cross-cutting factors do not significantly limit the productivity of and private investment in the gum arabic sector. Because exporters provide trade credit to agents in the supply chain, limited access to formal credit does not necessarily constrain trade. Access to electricity is also not essential for gum arabic harvesting and sorting, although electrification would be needed for a processing facility. The most important general issue facing the sector is the quality of infrastructure and the speed of customs processing along the N'Djamena–Douala corridor, as well as the reliability of available transport services, which determine the efficiency with which the good is exported.

Recommendations

To enhance the productivity of gum arabic cultivation and attract additional private investment to the sector, it is important to support the development of market institutions and explore the feasibility of establishing processing facilities:

- **Build Market Institutions**. Establish a quality-grading (such as hand-picked selected), traceability, and forestry management system, building on experience in Sudan and working through exporter and trader associations. Efforts to support trader associations should seek to professionalize the value chain through collective action (such as for price negotiation, repayment collection, or trade credit).
- **Study Potential for E414 Hydrocolloid Processing**. Commission a study on the private and public investments required to establish an E414 processing facility in Chad, building on the experience of Sudan. Proposals may be requested from entrepreneurs to establish the facility and to identify what is required from the public sector (such as land, locations of electricity, or water connections) to develop the facility.

4.2 LIVESTOCK

Opportunities

Although official trade statistics suggest limited trade, informal exports of livestock to Cameroon and Nigeria are estimated at around $275 million annually, making livestock the second-largest export after oil.[138] Chad has 30 million heads of cattle, of which approximately 3 million are sold each year.[139] Sixty to 75 percent of cattle sold are exported to Nigeria through northern Cameroon (figure 4.5), 30 percent of cattle are sold to domestic butchers, with the remainder sold live to households.[140] Pastoralists, with an average of 100 cattle per household, lead a semi-nomadic lifestyle, migrating North during the rainy season and traveling South in search of green pastures during the dry season.[141] A long and complex livestock value chain connects rural producers to N'Djamena and the main consumption basins in Nigeria and the Economic Community of Central African States. Because of tariff and nontariff barriers and an undeveloped regional road network, livestock trade is usually unrecorded, avoiding official checkpoints and/or administrative and sanitary procedural requirements.

Cattle offer many opportunities for value addition: beef, dairy, hides, and skins. To exploit opportunities in the beef, hides, and skins segments, the government has built three mechanized and refrigerated slaughterhouses, with capacity to produce 156,000 metric tons (mt) of beef per year (Djermaya, 72,000 mt/year; Farcha, 42,000 mt/year; Moundou, 42,000 mt/year). Foreign investors own a majority of the Djermaya and Farcha facilities, with the government holding a minority stake. Assuming 0.15 mt of meat per cow, these three slaughterhouses alone could process one-third of annual offtake, or 1 million cows. Of the potential segments that offer opportunities for value addition, hides and skins are potentially the easiest value-added segment to capture, as a cold chain is not required for trade and export margins are substantial.[142]

Constraints

Sector-specific factors constraining productivity and value addition include a lack of aggregated supply chains, the absence of a cold-chain distribution network, and inefficient practices to process cattle at border crossings:

- **Aggregation of Cattle Supply Chain.** Of the three mechanized and refrigerated slaughterhouses, none are currently operational, due, in part, to difficulties in procuring cattle at scale. To be economical, slaughterhouses must process 100–150 cattle per hour, so they require a large and reliable supply of cattle. Given the small herd sizes of individual pastoralists (who, on average, export 6–7 cattle per year), achieving the required throughput with the existing supply chain would potentially impose extremely challenging coordination problems. A large-scale breeding and pen operation that can reliably supply sufficient cattle—with attendant inspection infrastructure and veterinary services—is required to ensure continuous and profitable slaughterhouse operations.
- **Cold-Chain Distribution.** Milk production is primarily done informally by households. Although a modern dairy was established in 2010 to serve the domestic market, production is constrained by the absence of a cold-chain distribution network.
- **Border Practices.** Congestion at border crossing points and corruption in customs create incentives for pastoralists to export informally.[143]

Insufficient electricity and distortionary taxes constrain productivity and value addition in the livestock sector. An insufficient supply of electricity has shuttered the three mechanized and refrigerated slaughterhouses built by the government and is also constraining the operation of the dairy established to serve the domestic market. However, issues with access to finance and land appear to have been overcome to a certain extent, with foreign investors already having identified land for breeding and pen operations, and sourcing capital to invest in the existing slaughterhouses. Taxation is another issue that may affect the sector, with processed meat for export being taxed at a slightly higher rate (CFAF 58 per kg) than for the local market (CFAF 56 per kg), and slaughterhouses being subject to additional taxes.[144]

Recommendations

To enhance the productivity of live exports and exploit opportunities for value addition, efforts should be made to increase production capacities, expand inspection and veterinary services, better connect production and consumption centers, and promote livestock-driven agro-industrialization:

- **Production Capacities.** A differentiated approach should be taken for the pastoral, the semi-sedentary (agro-pastoral), and the intensive system in peri-urban fattening and ranches/state farms. To increase the supply of cattle necessary to ensure continuous slaughterhouse operations, the previous government and some operators proposed banning informal butcheries and live exports. However, this policy would establish a monopsony that would disadvantage pastoralists and not lessen the complexity—or enhance the reliability—of the supply chain. Achieving aggregation while preserving competitiveness should instead be pursued by growing the domestic stock of cattle through modern, industrial-scale breeding and pen operations and through expanded domestic production of animal feed. Export price parity for pastoralists selling to abattoirs should be assured by phasing out additional taxes and other restrictions on livestock exports.
- **Inspection and Veterinary Services.** Traders should be empowered to comply with standards and regulations and position themselves on markets at national, regional, and international levels. Although a public network of veterinary assistants currently undertakes inspections, it will be important for Chad to train a network of veterinary assistants to support the increased capacity utilization of slaughterhouses.[145] Currently, private veterinarians compete both with imported (and potentially counterfeit) pharmaceuticals sold directly to breeders and state vaccination campaigns, which offer free vaccination twice a year. The development of in-house veterinary capacity will be required to support a large-scale breeding operation.[146] In addition, it is important that the government ensure the quality of imported veterinary pharmaceuticals.
- **Connectivity between Production and Consumption Centers.** Policies to enhance market connectivity include (a) providing an adequate means of transport of live animals, (b) measures to expedite and streamline procedures and land border crossing land and air borders, (c) quarantine facilities, (d) elimination of tariff and nontariff barriers, and (e) positioning in destination markets. Training for clearing and forwarding agents to align professional behaviors with standards comparable to benchmark countries could reduce congestion in border crossing formalities areas, hence increasing transparency and limiting opportunities for corruption in customs.

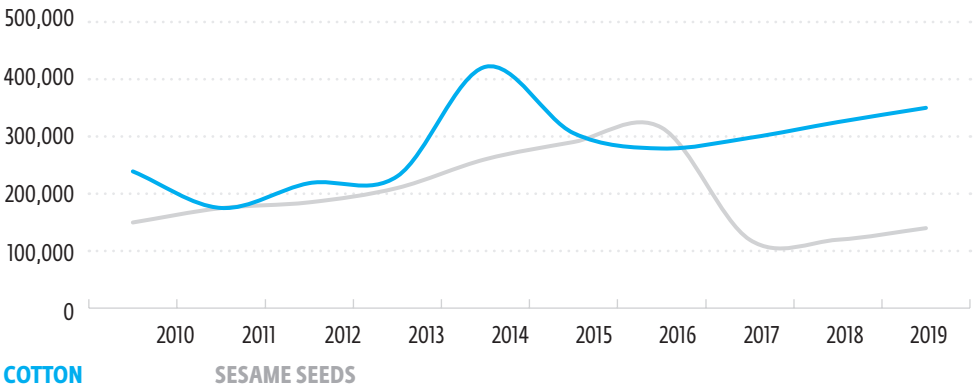
4.3 SESAME SEED

Opportunities

Cultivation of sesame seed, in which Chad has a large RCA, provides farmers with an alternative to cotton and increases their bargaining power. As of 2018, Chad's international market share in sesame seed was 0.8 percent. Unlike gum arabic, sesame seed exports have been growing steadily during the recent decade (figure 2.6), with international demand increasing by 9.5 percent per year. Eighty-nine percent of Chad's exports go to Türkiye, with most of the remainder going to Egypt and Nigeria. Sesame production supports the livelihoods of between 331,000 and 662,000 households. In contrast to cotton (for which CotonTchad holds a monopsony), multiple traders bid for sesame output, giving farmers more bargaining power.[147] Because of dissatisfaction with low farmgate prices caused by the monopsony over cotton,[148] land allocated to sesame has increased since 2010 as land allocated to cotton has declined (figure 4.6).

Processing of sesame provides an opportunity for value addition. Primary processing, completed by traders also involved in the gum arabic industry, involves removing foreign matter from bags and sorting and bagging seeds for export. Secondary processing is primarily artisanal transformation of seeds into oil, cakes, and tahini for domestic consumption.[149] Although oil is currently only consumed domestically, cakes—a byproduct of oil—are used for animal feed locally and by Nigerian buyers. There is also at least one small tahini and sesame-based sweets processor in N'Djamena for local consumption.[150] Ethiopia, where several firms (such as Repi Soap and Detergent S.C. and Hamaressa Edible Oil Share Company) process seeds into edible oils and soaps, provides an example of how to develop the value chain.

FIGURE 4.5. HECTARES HARVESTED OF COTTON AND SESAME SEED, 2010–19



Source: FAOStat, 2021.

Constraints

Sector-specific constraints on increasing productivity and availing opportunities for value addition include a lack of inputs, inefficient export licensing requirements, high levels of local taxation, and a lack of facilities for sorting:

- **Farm Inputs.** Although the government has a long history of providing inputs into cotton cultivation, no similar policy exists to encourage farmers to adopt fertilizers, certified seeds, or herbicides for sesame seed production. As a result, sesame seed yields have been roughly flat over the past decade at approximately 0.5 mt/ha.[151]
- **Export Licensing.** The Chadian government requires traders to acquire a license to export sesame. Although intended to improve the quality of exports, licensing creates an opportunity for rent-seeking (traders report that extraneous payments are often required to procure a license) and limits competitiveness.
- **Local Taxation.** Private firms subcontracted by local governments levy per-bag taxes on transactions along the value change. Taxes as high as 10 percent are levied by multiple cantons (the smallest administrative unit), increasing substantially the cost of moving sesame from farm to the point of export.[152]
- **Sorting Facilities.** Quality assurance requires ensuring that bags include only whole sesame seeds. Given limited sorting facilities near the farm gate, traders often export bags that contain sand and other materials and which therefore do not meet the quality requirements of international firms.

Inadequate access to land and limited availability of irrigation reduces the productivity of sesame seed cultivation, while insufficient electricity inhibits primary and secondary processing. As with the gum arabic industry, the quality of infrastructure and speed of customs processing along the N'Djamena–Douala corridor, as well as the reliability of available transport services, determine the efficiency with which the good is exported.

Recommendations

To enhance the productivity and exploit opportunities for value addition, efforts should be made to increase production capacities, expand inspection and veterinary services, better connect production and consumption centers, and promote livestock-driven agro-industrialization:

- **Farm Inputs.** Subsidies currently provided for cotton exports should be reallocated to promote the use of fertilizers, certified seeds, and/or herbicides for sesame seed productions. Such efforts should be coordinated through the two main federations of farmer cooperatives, the Observatory of the Sesame Sector in Chad and the Coordination of the Sesame Sector in Chad, each of which covers approximately 850 cooperatives.
- **Local Taxation and Licensing.** To promote exports and value addition through lowering the costs of trade, domestic and international trade in sesame seeds should be exempted from all transaction taxes and licensing requirements. Rules providing for free transit of goods through cantons, without local tax, would need to be enforced by national authorities.

- **Sorting Facilities.** To encourage value addition and enhance the value of exports, investment is required in sorting facilities at key trading points. Private management by either exporters or farmers' cooperative associations provide alternative organizational structures for the sorting facilities.

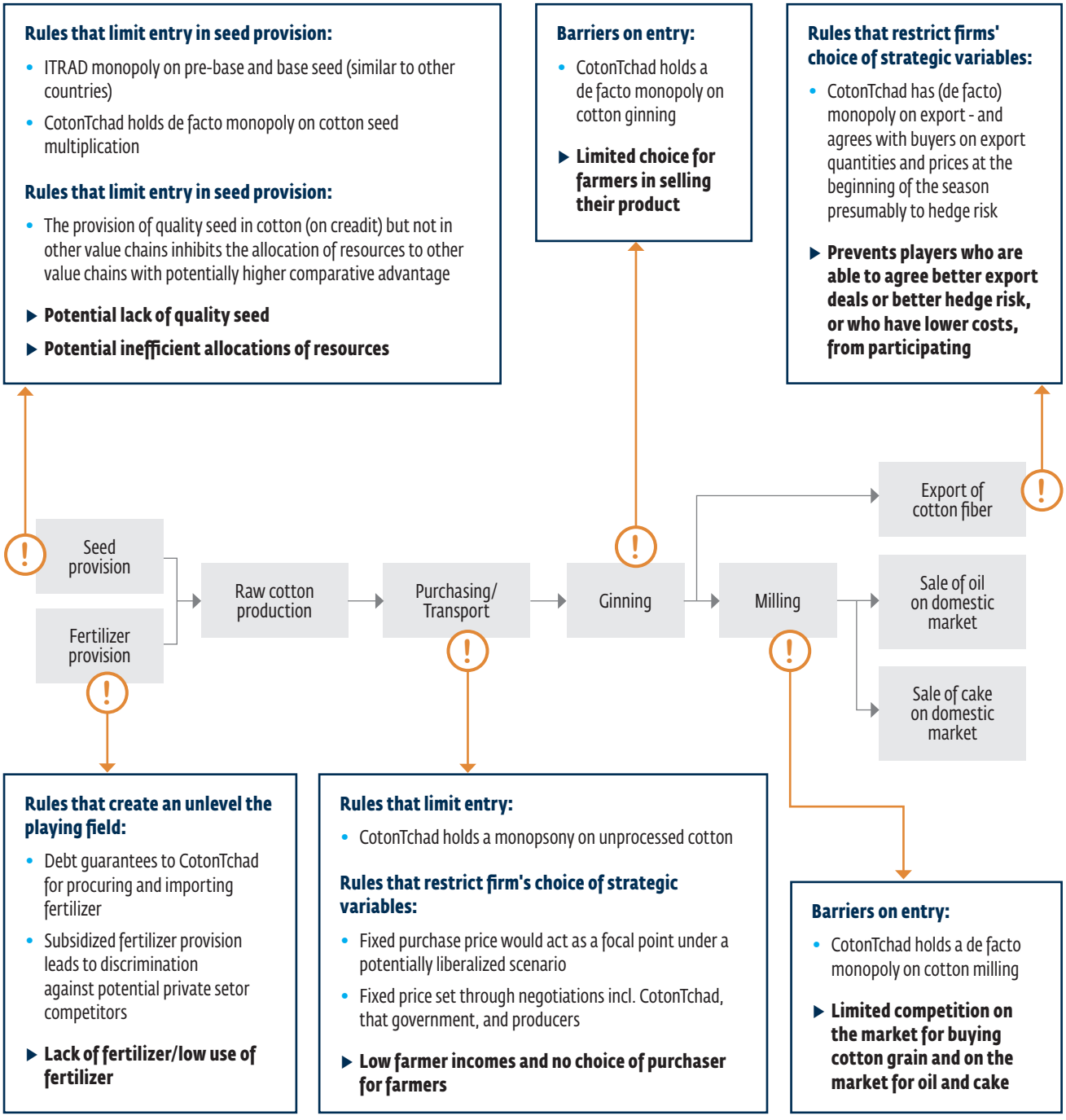
4.4 COTTON

Opportunities

Cotton—which has two main outputs which each provide distinct opportunities for value addition—has been Chad's flagship export since it was first promoted by the colonial government, but it now falls behind sesame and gum arabic in RCA. Cotton exports were promoted first through a marketing board, Cotonfran, and, after 1971, by the state owned CotonTchad. Although CotonTchad has generated revenues for the state, cultivators have suffered from a regime that demanded increased cotton output at the expense of subsistence crops.[153] Over the past decade, global import demand for cotton has declined at 5.2 percent per year, though imports by Nigeria and Cameroon have been growing. Cotton currently provides two outputs: lint, the raw fiber, which is ginned for use as an input into textile manufacturing; and seed cotton, which has a variety of uses in food and beverages, pharmaceutical, cosmetic manufacturing, and as a high protein animal feed.[154]

Recently privatized, CotonTchad has ambitious goals of expanding production, but retains a legal monopsony.[155] After CotonTchad failed to pay farmers for output in 2016, exports collapsed, as many farmers abandoned production. In 2018, new capital was injected into the firm when the government sold a 65 percent equity stake in CotonTchad—and extended a call option for a further 20 percent—to Olam International.[156] Under new ownership, the company seeks to return area under cultivation to its 2016 levels by 2024 and to increase production to 265,000 tons of seed cotton and 111,500 tons of cotton lint. There has already been some improvement, aided by an increase in international prices. Lint will be processed by nine gins, seven of which are currently operational. This growth is expected in part to be driven by an increase in yields supported by subsidized inputs funded by corporate tax revenue from CotonTchad. Under the terms of the agreement with the government, other firms are prohibited from competing with CotonTchad in the entire south of the country and farmers cannot sell their output to any other firm. Beyond purchasing, the cotton sector is characterized by limited competition at all stages of the value chain, including seed and fertilizer provision, as well as ginning, milling, and the negotiation of export transactions (figure 4.7).

FIGURE 4.6. LIMITATIONS ON COMPETITION AT VARIOUS STAGES OF COTTON VALUE CHAIN



Note: ITRAD = Institut Tchadien de Recherche Agricole pour le Développement.
Source: World Bank, 2018.

Constraints

The lack of competition across the cotton value chain reduces returns to cotton farming and, by extension, productivity and investment, while subsidies for cotton inputs discourage farmers from shifting to crops with higher RCAs:

- **Productivity of and Investment in Cotton Farming.** Through its monopsony, CotonTchad provides farmers with insurance against declines in the international price,[157] but the absence of competition in purchasing and ginning inevitably reduces the average farmgate price provided to farmers over the long run. By reducing the returns earned by cotton farming, the lower farmgate prices that result from the monopsony arrangement reduce overall productivity and investment in the sector.
- **Crop-Specific Subsidies**. The state subsidization of inputs to cotton farming specifically inhibits the allocation of land and labor to crops with a higher RCA. Before privatization, pre-base and base seed were provided by the *Institut Tchadien de Recherche Agricole pour le Développement* (ITRAD), and fertilizers were procured by CotonTchad, both at subsidized rates. Although privatization may permit the expansion of the quality of inputs procured, inputs will still be provided by CotonTchad and subsidized using its corporate tax receipts. As Chad has a greater RCA in other crops, this expenditure could be better deployed on inputs for sectors other than cotton. Diverting subsidies to other crops would improve farmers' outside option to cotton production, increasing their bargaining power with the cotton monopsony.

Insufficient electricity, the quality of transportation and customs infrastructure, and access to finance constrain productivity and value addition in the cotton sector. Currently, some gins lack a consistent power supply, reducing their output. The efficiency of trade on the N'Djamena-Douala corridor is also important for exporting the crop, although Olam has considerable power to organize exports. Limited access to finance would be a constraint on new entrants into ginning, were they permitted, given that their competitor, Olam, has considerable access to internal finance. Increased access to finance for farmers would enhance the ability of farmers to invest in response to higher prices.

Recommendations

To enhance the productivity of land, labor, and finance currently dedicated to cotton production and to enhance investment in productive opportunities generally, competition in the cotton sector should be increased:

- **Water Management.** A program to better manage water resources and provide irrigation will help adapt to climate change.
- **Liberalization of Entry into Purchasing and Ginning.** Additional entry into ginning would increase the surplus captured by farmers, since farmers could solicit bids from competing gins to find the best price. The convention between CotonTchad and the Government of Chad provides that new players will eventually be allowed to enter ginning in specific zones, but a roadmap to this goal has not been articulated. A timeline for new entry should be developed. The example of Côte d'Ivoire, which unlike Chad privatized its cotton gins in the 2000s by selling to multiple buyers and allowing entry,[158] shows that it is economically feasible for a market of Chad's size to support more competition and more gins. Today, Chad and Côte d'Ivoire have similar cotton production volumes, but Côte d'Ivoire has five independent firms operating over twenty cotton gins, whereas Chad has only one firm operating seven cotton gins.

- **Liberalization of the Input Market and Progressive Removal of Cotton Subsidies.** Rather than deploying agricultural subsidies through CotonTchad, which ties their use to a specific crop, funds for subsidies could be diverted to the general input subsidy program run by *Agence Nationale d'Appui au Développement Rural* (ANADER), which allows farmers to choose the crop on which subsidies are used. A domestic market for inputs could be developed by directing ANADER tenders to domestic input suppliers, where possible. E-vouchers can be an effective means to distribute subsidies, while directing business to domestic input suppliers. In Nigeria, e-vouchers covering 50% of the cost of fertilizer and 90% of the cost of improved seeds have been effective in increasing farmer productivity and welfare and have benefited both small- and large-scale farmers to a similar degree.[159]
- **Promotion of the Sesame Seed Industry to Improve Farmer Bargaining Power.** Building sorting facilities for sesame, and exempting sesame trade from local tax, would increase farmers' bargaining power with CotonTchad by improving the value of their outside option to cotton production. Such interventions would increase competition in the cotton market even if CotonTchad retains a monopsony over ginning and purchasing. Deepening the market for a substitute crop to cotton will also increase the resilience of farmers' incomes when cotton price declines, reducing the need for the cotton price stabilization scheme operated by CotonTchad.

4.5 OTHER PRODUCTS

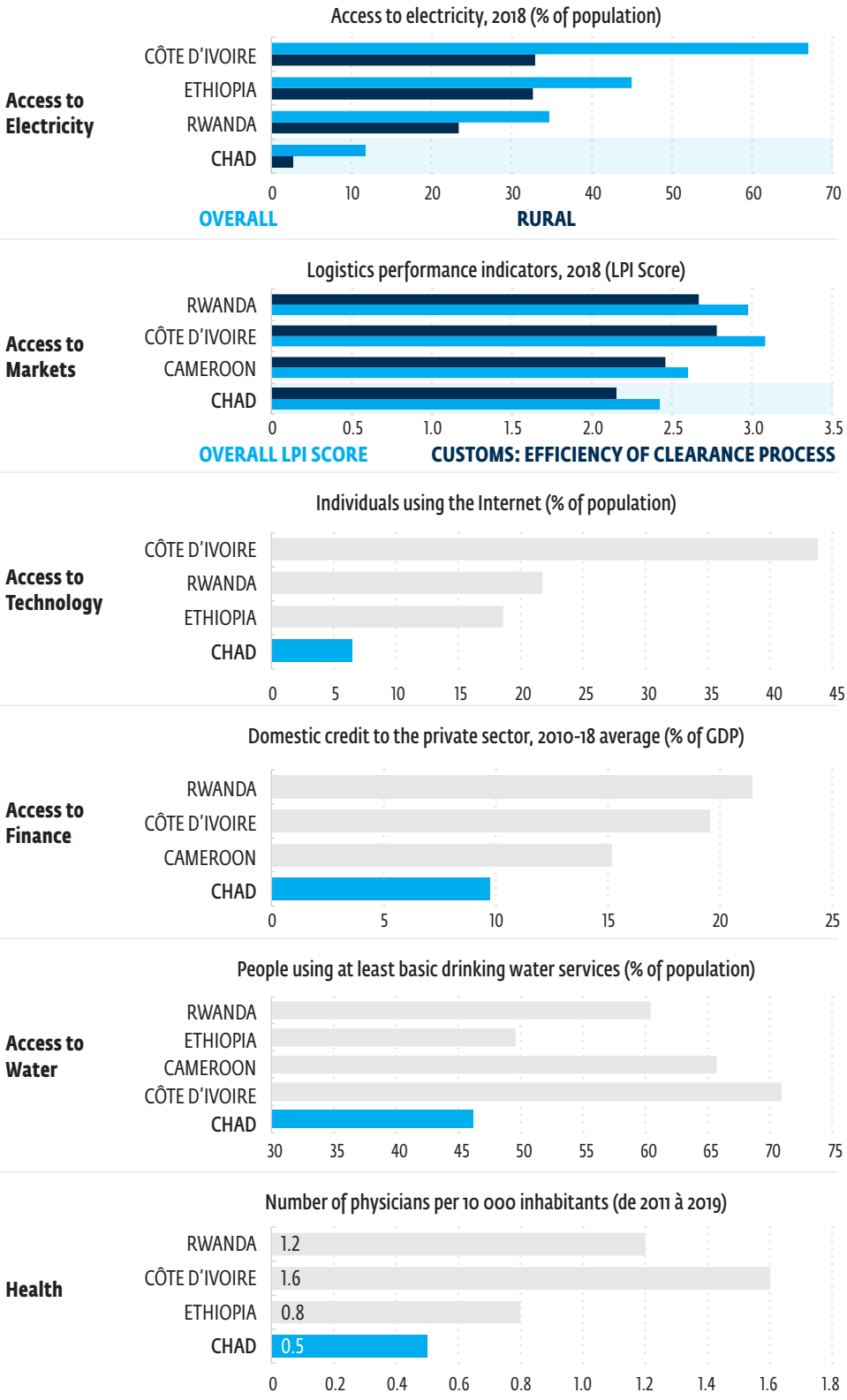
Groundnuts are cultivated more widely than cotton or sesame seeds. In 2019, 824,000 hectares of groundnuts was harvested, as compared with 350,000 hectares for sesame seed and 140,130 hectares for cotton.[160] Groundnuts may be intercropped with both other food crops (such as maize and sorghum) and cash crops. There is potential for domestic value added in the processing of groundnuts into cooking oil, though given widespread production of the crop in West and Central Africa, it is questionable whether Chad has a strong latent comparative advantage that would allow it to rapidly expand exports to the regional market.

Chad's domestic market for sugar is estimated at 130,000 tons per year, and local production could potentially substitute for imports. Currently a single producer (CST) produces 35,000 to 40,000 tons per year, employing approximately 2,000 workers in harvesting and processing the sugar. The operation could potentially scale to serve the domestic market at prices competitive with imports, though this would be done through a partially mechanized plantation. Given that few small-holder farmers are engaged in sugar production, the reach of such a project would be limited.

5. CROSS-CUTTING CONSTRAINTS TO PRIVATE SECTOR DEVELOPMENT

Chad's enabling sectors lag those in comparator countries. The exploitation of opportunities for value addition in productive sectors is hindered by the difficulties in accessing factors of production and markets and by the overall enabling environment for the private sector. Severe constraints on productivity and investment across the economy specifically stem from limitations on access to electricity (section 5.1), markets (5.2), information and communication technologies (5.3), water and irrigation (5.4), finance and insurance (5.5), as well as by constraints on the access to land and general deficiencies in the business environment (5.6). Chad's large human capital deficit, resulting from an under-performing health care sector, represents an additional bottleneck (5.7). In addition to the lack of adequate health care, Chad also suffers from persistent weaknesses in the vocational education system, leading to serious skills gaps that affect private sector investment in growth sectors.[161] The performance of most of these enabling sectors in Chad lags those of aspirational peers such as Côte d'Ivoire, Ethiopia, and Rwanda (figure 5.1). By addressing these economy-wide constraints, the Chadian government and its partners can improve productivity, spur investment and drive transformation.

FIGURE 5.1. CONSTRAINTS TO THE PRIVATE SECTOR IN CHAD BENCHMARKED AGAINST ASPIRATIONAL PEERS



Note: LPI = Logistics Performance Index.
Source: CPSD team calculation from WBG data.

5.1 ACCESS TO ELECTRICITY

Overview

Chad has one of the lowest electrification rates in the world. Only 6 percent of Chad's population have access to electricity.[162] Ninety-five percent of all households and 99 percent of poor households lack access to electricity, while 76 percent of households with access reported an outage in the past 7 days.[163] Access to electricity among the 77 percent of the population that live in rural areas is less than 1 percent, while 20 percent of those who reside in urban areas have access to electricity.[164] Power consumption in N'Djamena accounts for 90 percent of sales by Chad's national utility, but electricity is accessible only to the wealthiest third of the city's inhabitants.[165] Deficits in the fuel supply and pervasive weaknesses in generation, transmission, and distribution result in regular load shedding and shortages.[166] Outages last on average 4.5 days and occur an average of 1.9 times per day.[167] Many businesses and some households use standalone Diesel generators to overcome the deficiencies in the quantity and quality of electricity supplied through the national grid.[168] Due to low levels of access, many poor households must rely on biomass for cooking and kerosene lighting.[169]

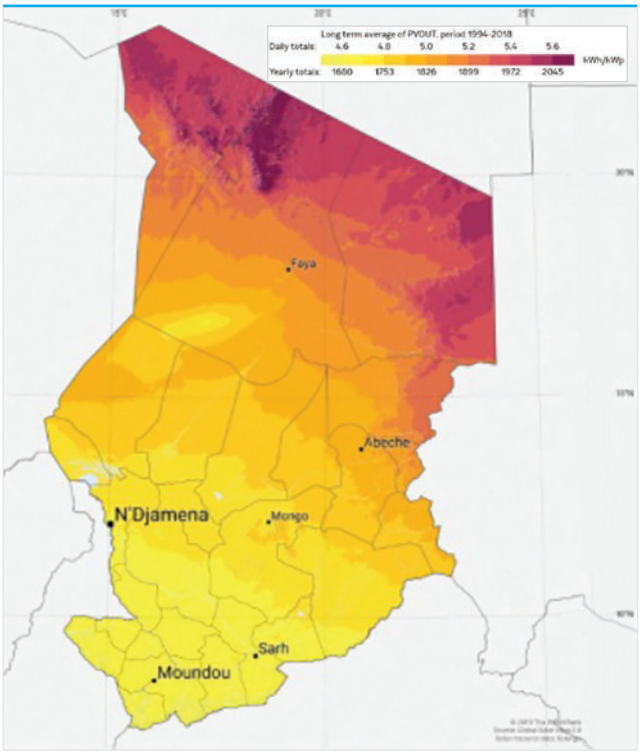
Chad's electricity sector is extremely inefficient, imposing high tariffs on users and consuming substantial subsidies. The average tariff charged to end-users in Chad — $0.25/kWh — are among the highest in the world.[170] Although high, the tariffs are significantly below the cost of service. Although the unit cost of generation is $0.24/kWh, the cost of service rises to $0.49/kWh, when nonpayments and commercial and technical losses are accounted for.[171] As a result of fraud, nonpayment, deficient metering and illegal connections, billing collection by the national utility is just 43 percent.[172] Billing collection rates are particularly low among ministries and other public agencies.[173] Given technical and nontechnical losses of a further 35 percent, revenues are recouped for only 28 percent of generated electricity.[174] Due to the high level of nonbilling and nonpayment of tariffs and the large difference between average tariff and the cost of supply, the sector is subsidized through the public provision of fuel to the national utility and to independent power producers. In 2019, the value of in-kind (fuel) subsidies ($89 million) exceeded revenue from electricity sales ($84 million). As connection to the national grid is strongly correlated with wealth, the subsidies to the sector are regressive.

Opportunities

Chad enjoys excellent solar and wind resources that have only begun to be exploited. Levels of solar irradiation range from 5.8kWh/m²/day in the south and 6.8kWh/m²/day in the north of the country (figure 5.2).[175] Wind potential also exists, with wind speeds in the northern part of the country averaging 7–8 m/s (figure 5.3). 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, suggest that off-grid technologies powered by renewable sources—such as solar mini-grids and standalone solar systems—will represent the least expensive and most feasible means of increasing the energy access of the population over the medium term.[176] World Bank analysis indicates that dozens of towns and secondary cities have electricity demand in excess of 1MW and can potentially support relatively large mini-grids.[177]

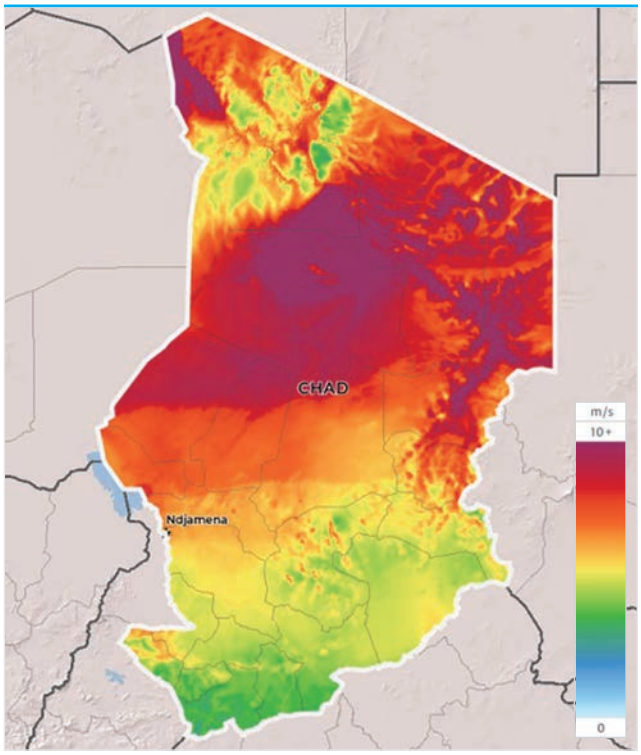
Micro-solar technologies can power productive infrastructure, even in remote rural areas. The market for solar-powered productive use equipment—particularly for agricultural processing and storage—is largely untapped and could represent a means of increasing energy access and stimulating the creation of jobs in rural areas.[178] Solar energy is currently barely used across Chad, even by SSS and solar home systems (SHS). Between 2016 and 2019, only 12,000 quality-verified products were sold.[179] Suppliers of SSS and SHS products are mostly small and local; the few international companies present in Chad have a limited market presence.[180] Suppliers further have narrow geographical coverage and limited supply chain and distribution networks, inhibiting them from reaching customers in rural areas.[181]

FIGURE 5.2. PV POWER POTENTIAL—CHAD



Source: World Bank Group, ESMAP, and Solargis (2021).

FIGURE 5.3. MEAN WIND SPEED AT 100M—CHAD



Source: Technical University of Denmark, "Mean Wind Speed at 100m– Chad," Global Wind Atlas, 2021, https://globalwindatlas.info/area/Chad.

Constraints

The delivery of inexpensive electricity to the Chadian population is complicated by geography, demography, fragility and other deep constraints that will not be alleviated in the short-term. Such deep constraints include: the country's landlocked geography, which increases the cost of imported inputs; a low population density, which increases the cost of constructing and maintaining transmission and distribution infrastructure for a national grid; a high level of poverty and high dependency ratio, which constrains ability to pay;[182] and civil and political uncertainty that deters private investment.[183]

Several more proximate constraints that could be addressed in the short- to medium-term also contribute to the high cost of electricity and low level of access. These constraints include (a) generation infrastructure reliant on the use of diesel and, to a lesser extent, heavy fuel oil;[184] (b) obsolete and inadequate transmission and distribution infrastructure that result in a high level of technical losses; (c) operational and commercial inefficiencies that result in a very low rate of payment of tariffs and which have effectively bankrupted the national utility (SNE), which in turn limits the ability to undertake necessary investments and assume contingent liabilities inherent in PPAs and/or guarantees provided to IPPs;[185] and (d) discouragement of private investment in the sector (and a failure to convert proposals into projects) due to weak negotiating capacity, inefficient and unpredictable decision-making,[186] an inadequate regulatory framework, deficient technical capacity,[187] a lack of standard contractual documents, the weak financial position of SNE, and political interference in regulatory decisions.[188]

Recommendations

Institutional Strengthening

Private-sector participation in generation can be encouraged by addressing SNE's technical and operational inefficiencies and its lack of creditworthiness. Measures necessary to address institutional deficiencies include the following:

- Full corporatization of SNE and institution of a performance-based contract
- Adoption of a least-cost generation and transmission master plan for the next 10–15 years; adoption of standard term sheets and other necessary documents for IPPs; and strengthening of government and SNE capacity to adopt competitive procurement of all new generation capacity
- Implementation of waterfall mechanism and/or escrow accounts to ensure the appropriate prioritization of the distribution of tariff revenue from the sale of electricity to IPPs and other suppliers[189]
- Installation of smart meters with appropriate fraud control and remote disconnection (potentially leveraging blockchain technology), including for public sector clients, to improve collection ratios
- Agreement with government on robust tariff payment mechanisms for public entities, consequences of nonpayment, and schedule of cross-debt settlements for electricity consumption by central government, and adoption of a program for promoting energy efficiency in public buildings
- Development of a regulatory framework for mini-grids, including tariffs, subsidies, service level, technical and performance standards, licensing requirements and procedures, relationship with the national grid, and entry conditions

Generation, Transmission, and Distribution

Transparent accounting of on-going generation projects, exploration of lower cost alternatives, and analyses of potential bottlenecks in transmission and distribution infrastructure are required to assure future investors and ensure the productivity of current investments. Key measures include the following:

- The development of a comprehensive least-cost development strategic plan and regular status reports on on-going projects (as well as the institution of functional donor coordination mechanisms) is essential to reduce the risk associated with the potential for duplicative or otherwise uneconomical investments given the breadth of generation projects under implementation or consideration and uncertainties concerning project statuses and timelines.
- The government and development partners should reassess the need to prioritize investments in transmission and distribution given the obsolescence of existing infrastructure and uncertainty over whether network capacity is sufficient to absorb the projected volume of generation.[190]
- To reduce electricity costs, the potential for flared gas-to-power projects (for example, using gas from the Doba and/or Sedigi fields) is also deserving of further attention given the country's vast oil reserves and the low cost of generation relative to diesel or HFO-powered plants.

5.2 ACCESS TO MARKETS

Overview

Chad's transport and logistics infrastructure lags regional peers. Due to Chad's geography, infrastructure connectivity is critical to link consumer markets with production zones. However, the quality of Chad's transport infrastructure and logistics services is generally very poor. The 2018 Logistics Performance Index—which measures the extent to which local infrastructure (ports, railroads, roads, and information technologies) and logistics services allow goods to move efficiently between manufacturers, consumers, and international markets[191]—ranks Chad 140th out of 160 countries (figure 5.4 and figure 5.5). Chad's trucking providers are generally informally organized and operate fleets generally more than 10 years old, which encourages short-term profit-maximizing behavior such as overloading.

FIGURE 5.4. LOGISTICS PERFORMANCE INDEX, 2018

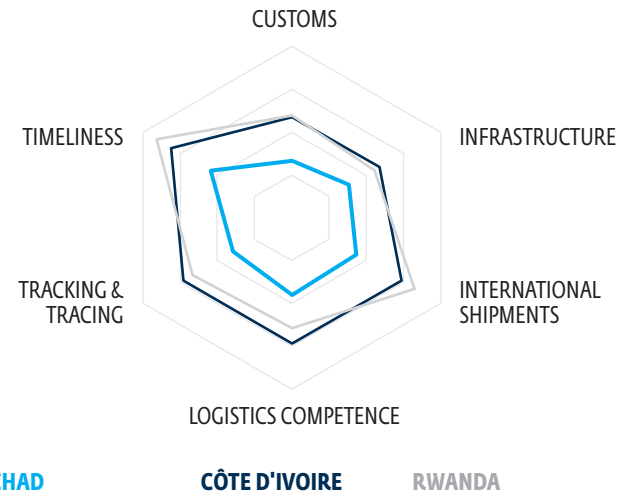
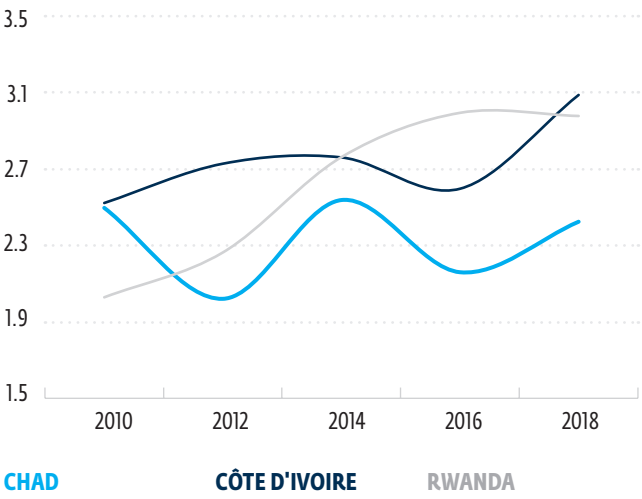


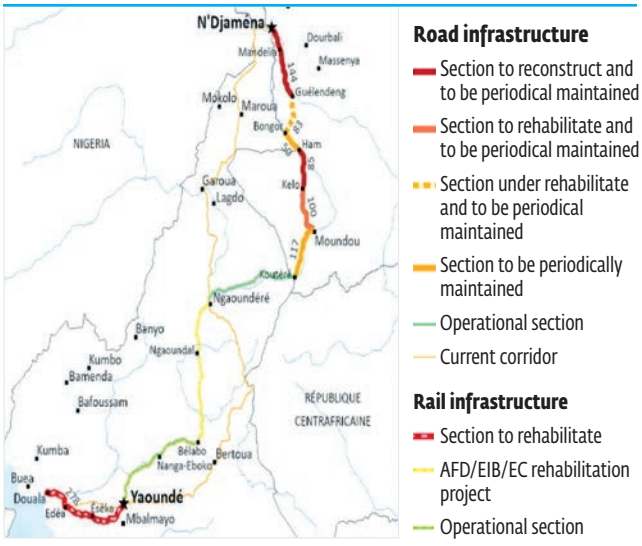
FIGURE 5.5. LOGISTICS PERFORMANCE INDEX, 2010-18



Source: World Bank (2018).

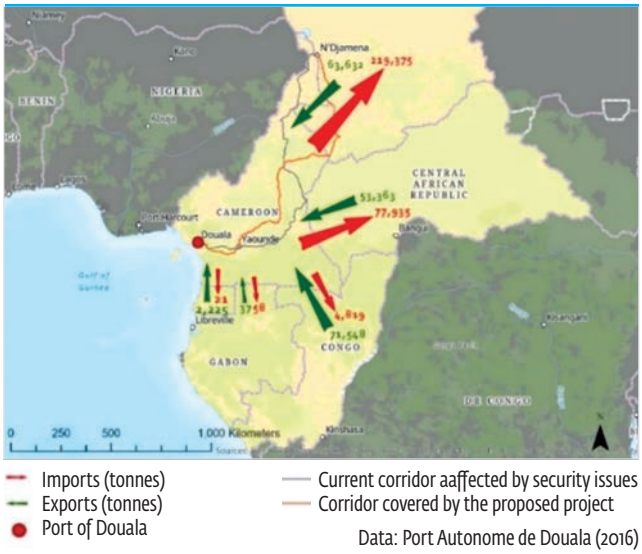
Chad is dependent on the N'Djamena–Douala transit corridor for access to ocean-going trade. N'Djamena's closest ports, Douala and Lagos, are both 1,700 km away, although Douala, located within the CEMAC regional bloc, is Chad's primary port, served by road/rail multimodal infrastructure.[192] Over the past decade, 80 percent of transit trade through Douala was destined for Chad (figure 5.6 and figure 5.7). An alternative corridor to Port Sudan (Red Sea), which would reduce costs of trade with China, is at an early stage of construction.[193] Although degraded, the Douala–Koutéré–N'Djamena corridor currently provides Chad with the most reliable port access.[194]

FIGURE 5.6. CAMEROON–CHAD TRANSPORT CORRIDOR



Note: AFD = Agence France Developpement; EIB = European Investment Bank ; EC = European Commission.
Source: World Bank, Douala–N'Djamena corridor project.

FIGURE 5.7. FREIGHT TRANSITING DOUALA PORT



Data: Port Autonome de Douala (2016)

Source: World Bank, Douala–N'Djamena corridor project.

High costs and delays make the Douala–N'Djamena transit corridor one of the least efficient in Sub-Saharan Africa.[195] The costs of international trade for Chad are very high, even for landlocked countries. This is largely the result of inefficient market organization and cumbersome procedures. Shipping a container from Doula or Lagos to N'Djamena can take four to six weeks and €4,500.[196] As a result, basic products can be 30 percent more expensive in N'Djamena than in neighboring Cameroonian cities.[197] Although consumers and producers in other landlocked countries in west and central Africa face the same unit costs with respect to procedures and market organization, population and production centers in these countries are generally closer to port cities (about 1000 km). Kigali is located approximately the same distance from the sea as N'Djamena, but it faces 30 percent lower trade costs due to the more efficient transport corridors in East Africa.[198]

Opportunities

Coordinated action to upgrade the Chad–Cameroon transit corridor can improve trade competitiveness and promote regional integration. Improving the existing transport infrastructure along the N'Djamena–Douala corridor offers the most feasible option to reduce the costs of international trade for Chad. An integrated approach, involving both investments on the rail and road infrastructure along the corridor and intervention on trade facilitation, has the potential to improve Chad's export competitiveness.

Modernizing logistics infrastructure and services through temperature-controlled logistics presents opportunities for private sector participation.[199] Demand for TCL services (such as refrigerated road transport and cold storage) is growing across several subsectors, including shea butter, meat and dairy. Investment in cold chain infrastructure and related services is required to relieve constraints on export commodities requiring refrigeration. Currently, Chad has several logistics zones or "dry ports" (including one inland container depot) providing multimodal transport and logistics solutions for cross-trade shipments, refrigerated transport, and warehousing. Developing cold-chain infrastructure and attracting TCL operators would increase efficiency, improve service quality, and generate additional value for all industries requiring cold chain, including the food and pharmaceutical industries.[200] Cold-chain infrastructure can also help address fundamental development challenges such as food security, climate change, and the COVID-19 response. The outsourcing of TCL services to specialized private entities through public-private partnerships can potentially improve quality and reduce costs.[201]

Constraints

Trade facilitation is constrained by a lack of coordination across numerous institutions and stakeholders with uneven capacities and commitments. Specifically, customs and tax administration is undermined by weak physical and human resource capacity.[202] Custom offices lack a consistent electricity supply and use outdated equipment. Physical inspections are made for 100 percent of imports and exports, with goods subject to multiple inspections by border control officers, regional customs branches, and the special customs police. Due to weak controls, poor governance, and an array of ad hoc taxes, corruption in customs and tax administration is widespread. Border crossings could be quickened by addressing congestion at crossing points, which results in long stays for live animals at the border, substantially raises total logistics costs, and undermines competitiveness. Transport sector planning and monitoring is also hindered by the lack of reliable, accurate, and complete data, including data on transport operators, transport vehicles, transport costs and prices.

Inadequate axle-load control has long been a major setback resulting in rapid road deterioration. Efficient implementation of axle-weight control is hindered by (a) high transport costs, which make overloading a sensible strategy to reduce costs; (b) widespread bribery due to low public sector salaries and a pervasive informal sector; (c) inappropriate weighbridge equipment; and (d) inappropriate overload control operations. Axle-weight enforcement remains, however, essential along this corridor as $1 invested in axle-load control would translate into $20 of savings.[203] Fleet renewal would also help in the formalization of the trucking industry and would reduce the road damage caused by old vehicles.

Freight-sharing quota schemes signed with Cameroon and other coastal transit countries, coupled with a corrupt-prone queuing system and cartel practices, limit market access and undermine transport service quality. Other factors that hinder market access for Chadian producers include (a) the small scale of the Douala single window and long port dwell times, (b) a lack of professionalism among transport providers, (c) inadequate transport data management systems, (d) nontransparent and inefficient land freight management and allocation systems, and (e) inadequate bilateral and national sector dialogue frameworks. A 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 lack of land transport freight bureaus constitutes an important factor explaining high transport costs and discourages new investments in the trucking industry.

Recommendations

Upgrading the Chad–Cameroon Corridor

Upgrading transport infrastructure, modernizing customs, and enforcing existing regulations will help improve the access of producers and consumers to international trade. Key reforms include the following:

- Negotiation of a bilateral framework with Cameroon for transit facilities that will revamp multimodal transport, improve road maintenance and safety
- Establishment of a transit authority in Douala port to supervise trade facilitation reforms
- Interconnection of the customs information systems of Chad and Cameroon to allow for electronic exchange of transit data between customs systems.
- The establishment of an implementation-efficient bond management system
- Streamlining rail-road transport mode transit documentation and procedures
- Upgrading of Douala Single Window for Foreign Trade by reorganizing port processes, ramping up the dematerialization program, and promoting risk-based inspection systems.

Addressing Trucking Market Distortions

Transport sector reform and professionalization of transport actors can potentially reduce the costs of accessing markets for Chadian producers and consumers. Key measures include the following:

- The government and/or development partners should explore to support trucking fleet renewal through scrappage schemes and financing mechanisms for new truck purchases.[204] In West Africa, a fleet renewal financing facility for long-haul heavy cargo trucks is being created with support from the World Bank Group and development partners. Additionally, IFC could set up a risk-sharing mechanism with other institutions to finance transporters' purchases of new trucks.
- Build the capacity of professional associations in the transport sector to raise awareness and increase adherence to road transport regulations (for instance, weight and axle load controls).
- Ensure transparent allocation of transit freight, for example, by establishing a virtual freight exchange.

5.3 ACCESS TO INFORMATION AND COMMUNICATIONS TECHNOLOGIES

Overview

The digital sector in Chad remains nascent. Chad has significant gaps in access to information technology. Most users are connected through mobile devices—38 percent of the population have a mobile phone subscription and 17 percent have a mobile internet subscription, compared with an average of 48 percent and 24 percent, respectively, in Sub-Saharan Africa and 41 and 21 percent across low-income countries.[205] Access to digital services remains limited, and the country ranks among the worst performers among emerging markets in terms of e-commerce development.[206] Private investments in the digital economy have stalled, with average annual capital expenditure in mobile networks dropping by 6 percent over the past five years.[207]

Numerous policy reforms over the past few years have supported the development of the digital economy, but significant gaps remain. Policy reforms have encompassed infrastructure sharing, liberalization of the international gateway, establishing a licensing regime for mobile virtual network operators, adoption of cost-oriented regulation of access to broadband networks, including mobile termination, and the ongoing implementation of mobile number portability. Although these regulations were intended to improve the competitiveness of the sector, their framing is not yet conducive to private sector investment as they are biased toward the incumbent operators and especially SOEs and government agencies.

Internet and mobile broadband prices dropped by 30 to 60 percent. On January 22, 2022, the government obtained a reduction in connectivity prices from the leading telecommunication operators by 30 to 60 percent. To achieve this objective, capacity providers significantly lowered their prices; for example, the price of a monthly gigabyte of the internet has dropped by at least 60 percent. Moreover, the Minister of Finance and Budget signed on January 22, 2022, an arrêté granting duties and taxes exemptions on the import of telephones, wireless cellular networks, computers, and tablets for five years. However, users of connectivity services complain that the decrease in prices comes along with a considerable drop in the quality of connectivity.

Opportunities

Increasing access to digital connectivity in Chad presents opportunities for private sector investment not only in digital infrastructure, but also in the broader digital economy. Key opportunities in the digital infrastructure sector include investments in cross-border broadband networks, national backbone network, metro networks and towers, as well as edge data centers. Evidence from other emerging markets like Senegal, with the entry of Free, and India, with the expansion of Reliance Jio, suggest that individuals and businesses increase their demand for digital connectivity when its services are good quality and affordable. However, Chad has so far seen limited investment across the digital infrastructure value chain.

Increased access to information technology can create opportunities to develop digital financial services, e-commerce, and e-logistics platforms. Emerging markets such as Kenya, Nigeria, or Bangladesh have experienced significant growth in these technology sectors with the expansion of digital connectivity. Chad, despite its distinct country context, could experience a similar development, providing an opportunity for venture capital investments in startups across those areas. The penetration of digital services in Chad is among the lowest among emerging markets, with fewer than 30 percent of adults having received or made payments through a mobile phone, less than 2 percent having used the internet to buy something online, and only 10 percent of firms owning a website (as compared with 30 percent across all of Sub-Saharan Africa).

Constraints

Gaps in connectivity in Chad result from limited network availability, limited service affordability, and low broadband network capacity (table 5.1). Around 23 percent of Chadians are covered by 4G mobile broadband network, compared with averages of 48 and 55 percent in Sub-Saharan African and low-income countries, respectively. A medium package of mobile telephony or internet costs 36 percent of GNI per capita, compared with 12 percent in Sub-Saharan Africa and 20 percent in low-income countries.56 Outside of urban centers, such prices represent significant barriers to access to connectivity. Network availability challenges result from limited investment in telecom network, especially in rural areas—over 2014–18, the average capital expenditure in mobile network was just $10 per user, compared with $15 across Sub-Saharan Africa.[208]

Challenges in service affordability and broadband capacity result from competition issues, limited availability of international connectivity 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.[209] The first-to-middle mile of the broadband value chain, including the Central African Backbone connecting the country to submarine cable via Cameroon, is controlled exclusively by the state-owned incumbent, Sotel Chad. Chad has limited access to international connectivity capacity and international internet bandwidth capacity per user is among the lowest in the world—1.4 kbps, compared with 34 kbps in Sub-Saharan Africa and 21 kbps in low-income countries.[210] The country hosts no independent data center currently, but the government has expanded the national backbone via Sudan and through the Sahara in conjunction with Niger and constructed a national data center under a PPP model.

Several cross-cutting issues continue to limit access to quality connectivity in Chad. High fees—in the form of sector-specific taxes, fees, and fines—are another barrier 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.

TABLE 5.1. BENCHMARKING DIGITAL CONNECTIVITY IN CHAD

	CAMEROON	C.A.R.	CHAD	CONGO, REP.	GABON	NIGER	S.S.A.	LOW INCOME
3G population coverage	89%	40%	**95%**	89%	90%	74%	81%	79%
4G population coverage	63%	18%	**23%**	69%	90%	15%	55%	48%
Mobile subscribers	52%	23%	**38%**	47%	63%	34%	48%	41%
Mobile internet subscribers	34%	11%	**17%**	32%	38%	14%	27%	21%
Price of data & voice (% GNI)	6%	44%	**36%**	13%	3%	38%	12%	20%

Note : CAR = Central African Republic; SSA = Sub-Saharan Africa; LIC = Low Income Countries.
Source: GS : World Bank MA Intelligence, ITU (2020).

Recommendations

Liberalization, competition and regulation, infrastructure sharing, and universal services can improve the competitiveness of the Chadian telecom sector and deliver significant economic benefits for individuals, businesses, and government.[211] Key reforms include the following:

- Restructure and privatize Sotel, the incumbent SOE, and introduce wholesale open-access model.
- Enable the entry of a third mobile network operator by facilitating the entry and operations of independent tower operators. This could be achieved through a licensing regime.
- Support the development of wholesale broadband operators, for example, by issuing licenses; allow ISPs to own broadband infrastructure; and allocate radio frequency spectrum resources to ISPs and other players for fixed wireless access.
- Introduce specialized universal service operators.
- Institutionalize mobile money as a means of payments (taxes, fines, social cash transfers, bill payments, salaries, merchant payments, and so forth).
- Review taxation in the sector and strengthen local regulator with comprehensive regulatory technical assistance program.

5.4 ACCESS TO WATER AND IRRIGATION

Overview

Only 0.8 percent of total farmland of 7,000 hectares is irrigated, which makes agriculture productivity dependent on rainfall. Rainfed agriculture—in particular, good germination and crop stand establishment—does not require an enormous amount of water, but rainfall needs to be well distributed. Regular moderate rains are better for agriculture than infrequent large rains. Yet in-season variability and overall inter-season weather variability pose a constant challenge, with farmers less inclined to make investments if there is a high risk of crop failure year-over-year. Currently, farmers do not have access to accurate local forecasts, which would reduce the risk of poor germination as planting would be timed to ensure adequate soil moisture. (See figure 5.9 and figure 5.10).

FIGURE 5.8. COEFFICIENT OF VARIATION FOR JUNE–SEPT. RAINFALL, 2006–20

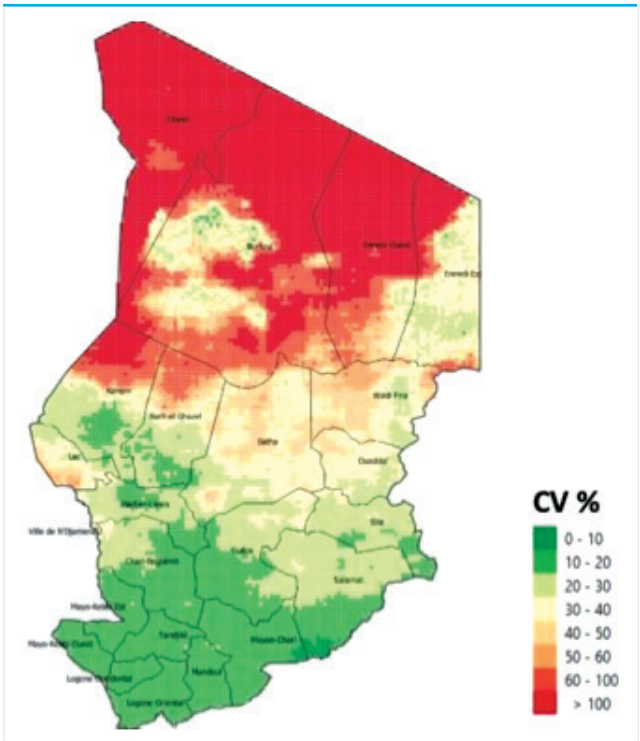
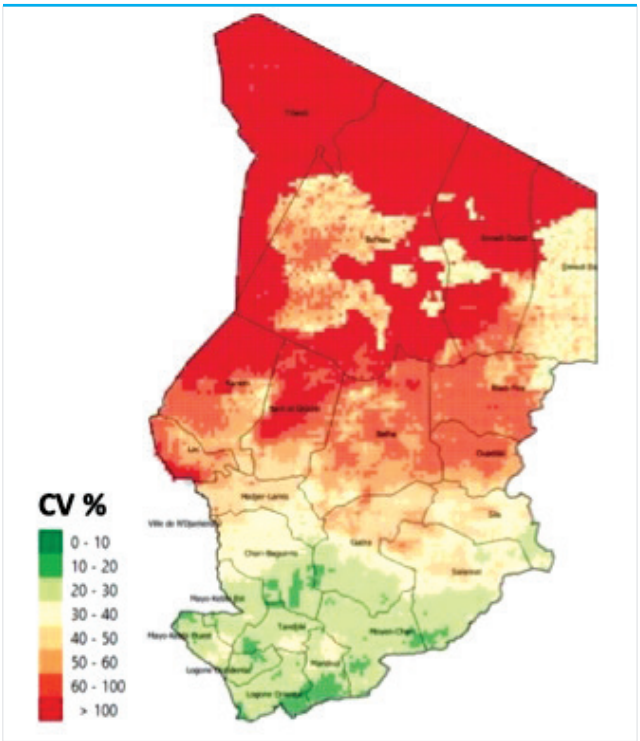


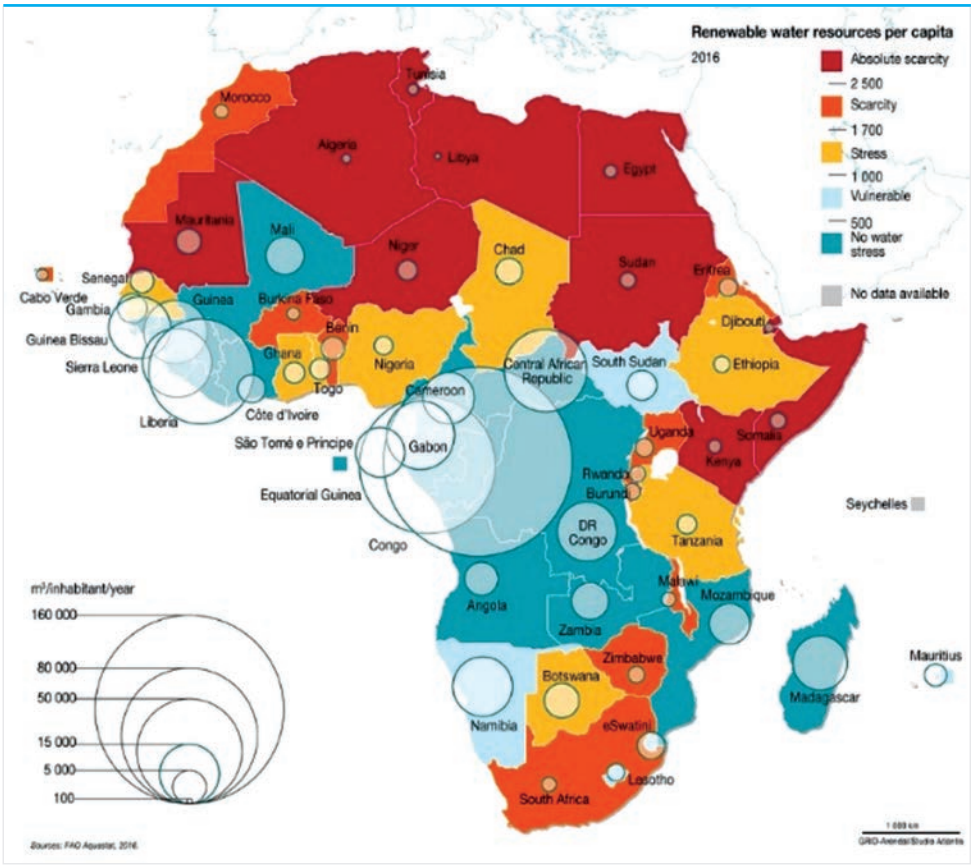
FIGURE 5.9. COEFFICIENT OF VARIATION FOR JUNE RAINFALL, 2006–20



Source: World Bank, Climate Change Knowledge Portal.

Unlike neighboring countries, Chad has the groundwater resources to increase agricultural production substantially (figure 5.11). Almost three-quarters of Chad has sedimentary basins with several layers of groundwater. The volume of subterranean water ranges between 263 and 455 billion m^3 per year, with a replacement volume of 21 billion m^3. Due to a failure to properly exploit these water resources, Chad's agricultural potential is untapped. Only 6 percent of the country's 39 million hectares of arable land is under cultivation as only 9 percent of water resources are used. With appropriate infrastructure and support, it is possible that one-third of Chad's arable land area could be used to grow crops. Villages in the Soudanian zone also suffer from a failure to maintain irrigation facilities, dams, and dikes built between 1950 and 1974, which leaves them vulnerable to uncontrolled floodwaters.

FIGURE 5.10. RRENEWABLE WATER RESOURCES PER CAPITA, 2016



Source: FAO Aquastat data, 2016.

Lack of access to adequate water, sanitation, and hygiene services worsens health conditions. In urban areas, the vast majority of residents (90 percent in some cities) live in informal settlements, most of which lack clean water and sewage facilities. Only 55 percent of the poor population has access to water from an improved source, and over two-thirds of households lack access to adequate sanitation.[212] This causes the spread of chronic diarrheal diseases such as cholera, typhoid, and meningitis as well as malabsorption phenomena. Although access to safe drinking water has been improving in recent decades, access to sanitation remains stagnant.

Opportunities

There is untapped potential for private sector investors to improve the water supply and irrigation sectors. Chad has sufficient water resources to irrigate 5.6 million hectares of farmland, as compared with 7,000 hectares currently. Private sector actors could invest in new or in modernizing existing infrastructure in selected areas and oversee operations, with development partners undertaking technical, financial, and legal due diligence and facilitating PPP-type transactions. There is also great potential for PPP-type interventions (such as management contracts) in water supply and sanitation, such as the development of boreholes and drinking water supply systems in rural areas and the use of solar pumping technology in urban areas.[213]

Climate change is increasing opportunities for the production of rainfed crops but will require adjustments to manage increased rainfall variability. Due to accelerated climate change, the area suitable for rainfed agriculture has increased by 18 million hectares since 2010. Investment in soil analysis and variety-testing can determine whether the agro-ecology of these newly irrigated regions will support the development of new varieties. Geospatial targeting of specific crops based on weather-driven analytics will reduce the risk of crop failure and support operations that maximize yield and quality. Rainfall is projected to further increase in the Sahelian zone,[214] which should translate into increased yields of rainfed crops (such as cotton, rice, sesame sorghum, millet, and rice). Nonetheless, the potential for increased rainfall variability makes it critical that strategies are adopted—including the application of climate-smart agriculture techniques and the use of type 1 (such as *bas-fonds or seuils d'épandag*e) irrigation investments—and are applied to ensure the resilience of key cash crops to erratic rainfall and to accelerate agricultural development.

Opportunities exist to leverage produced water, geo-spatial data and shared logistics infrastructure created by oil and gas companies to alleviate water and land use constraints in Chad:

- **Produced Water.** Developing the know-how necessary for the correct management of "produced water." Produced water is, by volume the largest by-product of oil and gas exploration and production. Produced water is currently either "reinjected" or "tossed," but technological advancements can permit the gathering, storing, treatment, and transportation of produced water from oil fields for use for irrigation or other purposes.[215]

- **Geospatial Data.** Improvements in data storage and computing power have greatly enhanced access to geological and hydrological information, but oil and gas operators in Chad currently do not make such information available to government agencies for spatial planning. Public private partnerships to apply survey planning, advanced imaging, and reservoir analysis and interpretation could help identify cross-sector opportunities and develop robust land and water use strategies.
- **Shared Infrastructure.** Pipelines move oil and gas over long distances in a reliable, energy efficient, and secure manner and may potentially be used to bring water (and electricity and/or fiber optics) to peripheral areas. The development of shared-use pipelines could help oil and gas companies and the government achieve economies of scale and economies of scope (as one single pipeline development project brings two or more categories of services closer to the end users).

Constraints

Administration of water resources is dispersed across multiple stakeholders, complicating coordination and resulting in policy and implementation failures. The Ministry of Water is responsible for developing and implementing environmental and water policy yet lacks financial resources and sufficient technical and environmental knowledge. The Ministry of Agriculture is responsible for the irrigation system and the Department of Rural Engineering and Irrigation is responsible for the design and implementation of irrigation policy. Local traditional leaders are largely responsible for ensuring that water uses conform with customary and Islamic law, although coordination with local governments has reportedly been low. Chad is also a member of the Lake Chad Basin Commission, which regulates the use of basin water by member countries (Central African Republic, Chad, Cameroon, Niger, Nigeria, and Sudan). The low capacity of these different agencies and a lack of coordination between them has led to conflicts over water use between upstream and downstream communities.

Investment in Chad's water and irrigation sector also suffers from a weak regulatory framework, such as the absence of a provision on PPPs in the Public Procurement Code. This issue is illustrated in particular by (a) the ambiguity surrounding the provisions applicable to public service delegations, which limits investors' propensity to engage in a PPP; (b) the lack of a framework for forms of PPP other than public service delegation, which limits options offered by PPP as a tool for developing and operating infrastructure; and (c) the lack of suitable arrangements for the identification and contracting of a private partner. Lack of selection criteria and a procurement process well-suited to PPPs further limits potential investments.

Uncertainty over the impact of climate change hinders agricultural investment planning. A lack of hydro-geological studies, accessible weather forecast information, and soil analyses needed to improve soil health and screening of new crop varieties compounds the increasing variability of rainfed-growing season and complicates estimation of the returns to different agricultural investments.

Recommendations

Institutional Framework

Establishing a regulatory and institutional framework more favorable to private investment in the water and irrigation sector may help relax constraints to water and irrigation in Chad. Key measures include the following:

- Develop the regulatory framework for private participation in the water and irrigation sector, including by launching discussions on the possibility of strengthening the current Public Procurement Code to include provisions adapted to PPPs, drafting a law specific to PPP, and modifying the decrees establishing the procurement and regulatory authorities to consider the specificities of PPPs.
- Strengthen the institutional framework, including creating a PPP unit aimed at facilitating the development and implementation of PPPs and identifying resources within the Ministries of Finance and Budget to analyze PPP projects' financial impacts and the optimal structuring of the public part of PPP financing.
- Build partner capacity at technical, managerial, and/or financial levels, including supporting the teaching of soil and water management and good agricultural practices.
- Conduct hydro-geological assessments to ensure sustainable supply of water adequate for the project's needs.
- Monitor sociological aspects of moving from rainfed to irrigated agriculture, phase in gradually, and accompany, monitor, and troubleshoot the projects very closely.

Fostering an enabling environment and securing irrigators' productive environment will help incentivize private investments in water and irrigation. Key measures include the following:

- Provide concessions to investors in financing, taxes, revenue sharing, and licenses, as well as create opportunities to raise debt and equity financing from users and other parties.
- Increase access to water along the transhumance corridors for both pastoralists and neighboring populations.
- Secure irrigators' productive environment through consolidating land and water rights, water service quality and predictability, subsector organization, and agricultural loans.
- Support individual large farms, collective farms ("cooperatives"), or women's groups in expansion of irrigation.

To help reduce agro-pastoral conflict, irrigated fodder may be introduced into livestock supply chains. In the N'Djamena area, several local entrepreneurs produce irrigated fodder on a small scale and may be able to scale up.[216]

Leveraging Oil and Gas Capacities and Infrastructure

By leveraging capacities and infrastructure of oil and gas companies operating in the country, the government can alleviate water and land use constraints. Key measures include the following:

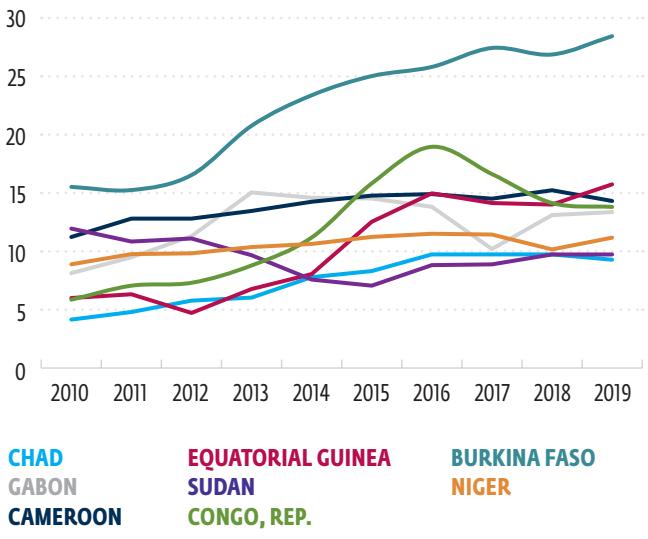
- The government should develop regulations determining potential uses of produced water and treatments appropriate for each use case and ensure reasonable operating costs.[217]
- The government should request oil and gas companies to transfer existing electronic geological records to a single data repository.[218] New information layers—including soil, water, population, agriculture, and climate—could then be overlayed as a basis for spatial planning.
- To encourage private-public partnerships to share infrastructure, the government should establish a legal framework that describes infrastructure made available for shared use, establishes realistic time frames for the access application process, and develop procedures for resolving disputes.

5.5 ACCESS TO FINANCE AND INSURANCE

Overview

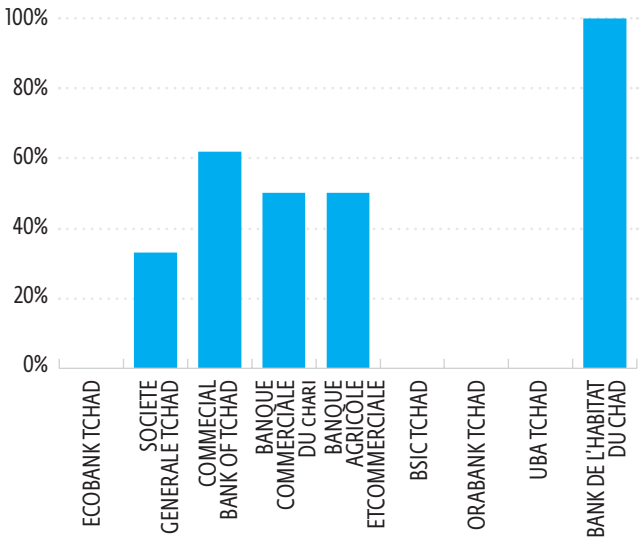
Underdeveloped financial services and low financial inclusion constrain private sector development and poverty alleviation. With the economy slowly recovering from the 2014–15 oil price collapse and COVID-19 crisis, these gaps also represent opportunities to grow SME finance, and to diversify into new products, including leasing, risk sharing facilities and agriculture financing. Meanwhile, ICT sector developments have the potential to unlock digital financial services and the fintech sector, which in turn could rapidly increase the quality and reach of financial services in the more remote parts of Chad. (See figure 5.12 and figure 5.13.)

FIGURE 5.11. DOMESTIC CREDIT TO PRIVATE SECTOR, 2011-19



Source: World Bank Open Data (2021).

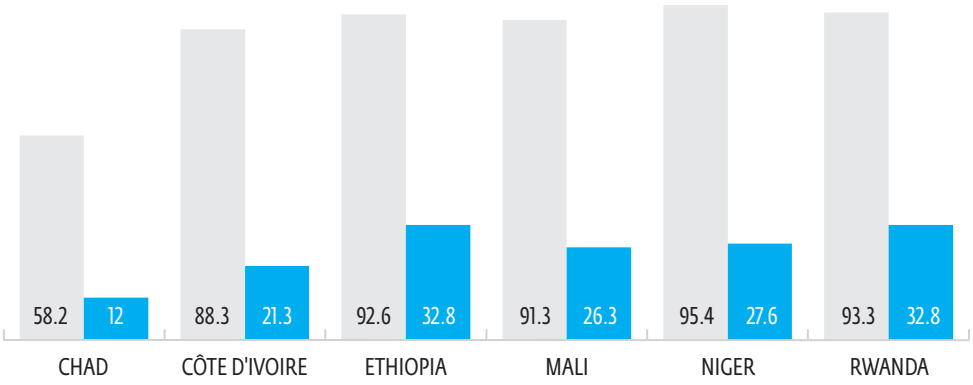
FIGURE 5.12. STATE PARTICIPATION IN CHADIAN BANKS, 2019



Source: Association of Credit Institutions of Chad, 2019 newsletter.

The banking sector is small and concentrated, with three banks holding close to two thirds of total assets. Out of nine commercial banks operating in the country, the two largest groups are subsidiaries of foreign banks, while four other banks include state participation ranging from 33 to 100 percent of total equity (BAC, 100 percent; CBT, 62 percent; BHT, 50 percent; and BCC, 50 percent). As of July 2020, total banking sector assets amounted to $2.2 billion (up from $1.4 billion in December 2016), equivalent to 7 percent of CEMAC banks' assets, while Chad accounts for almost 15 percent of CEMAC's total GDP. There are no capital markets or money markets in Chad. Chad's private sector credit to GDP ratio of 9.8 percent is well below regional and continental averages (figure 5.14).

FIGURE 5.13. FIRMS' ACCESS TO FINANCIAL SERVICES, 2018



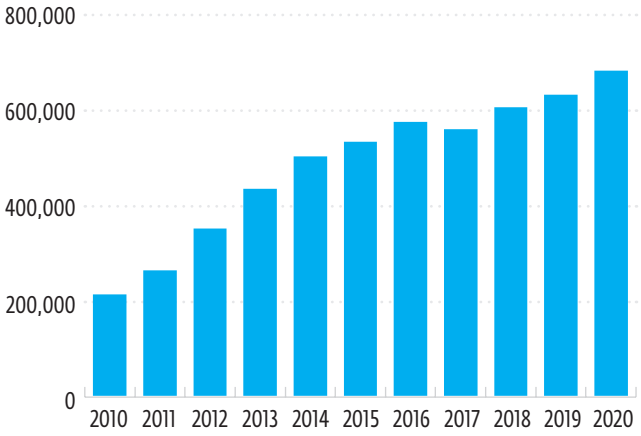
PERCENT OF FIRMS WITH A CHECKING OR SAVINGS ACCOUNT
PERCENT OF FIRMS WITH A BANK LOAN/LINE OF CREDIT

Source: World Bank Enterprise Surveys, 2018.

The financial sector is one of the shallowest in the region, with limited long-term resources and services to fund private enterprise. Despite increased diffusion of financial services in recent years, the ability of the banking sector to finance private sector activity is limited. Banking intermediation is weak, interbank transactions are minimal, and there is no established secondary market for government debt. As of 2018, only 12 percent of Chadian firms reported having a loan or line of credit, less than in Mali (26 percent) or Niger (28 percent) (figure 5.15 and figure 5.16). The agricultural sector only receives about 2 percent of total credit provided by commercial banks.[219] Credit remains heavily concentrated and many MSMEs cannot access credit; the MSME finance gap was estimated to be $1.1 billion in 2017, or 10 percent of GDP.[220] High collateral requirements (reaching 100 percent of loan value[221]), difficulties in accessing land titles,[222] and inadequate loan sizes and maturities deter SMEs from requesting loans.

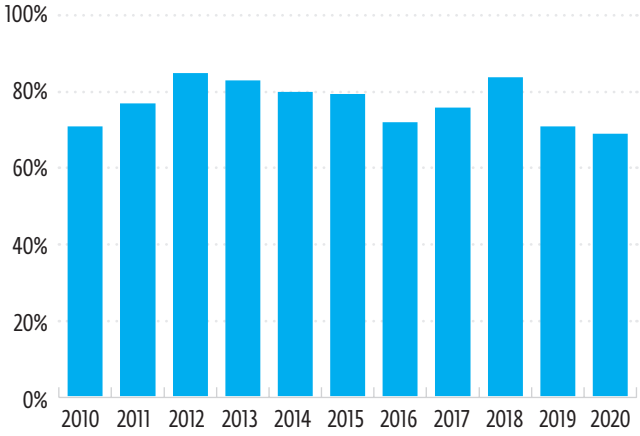
The banking sector is vulnerable due to its exposure to government revenue and commodity exports. Chad's shallow financial sector is heavily dependent on government bonds, which is the largest source of exposure for Chadian banks. Banking credit to the private sector accounts for nearly 69 percent of total credit to the economy in 2020, with the remaining 31 percent financing government needs. Despite a steady increase in private credit in the past decade, the private sector share of total credit has declined. Bank loans generally fund expenditure by the government and large companies in the cotton, sugar, and oil sectors. Outside these sectors, there are very few creditworthy borrowers who can provide satisfactory documentation to assess risk for loan decisions. Thus, Chadian banks are highly exposed to the public sector and, as a result, to fluctuations in the prices of key exports.

FIGURE 5.14. TOTAL CREDIT TO PRIVATE SECTOR



Source: BEAC, evolution of Chad's banking system.

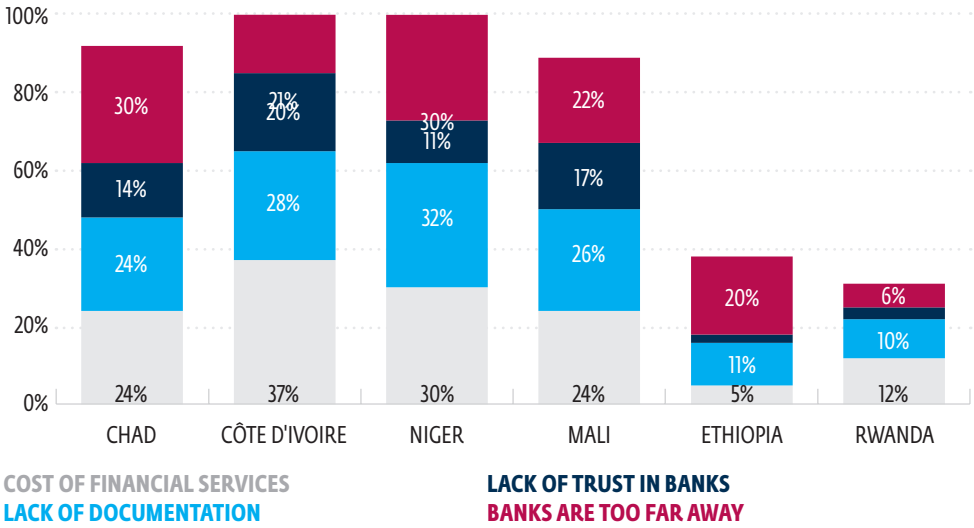
FIGURE 5.15. PRIVATE SECTOR SHARE OF TOTAL CREDIT



Source: BEAC, evolution of Chad's banking system.

Financial inclusion is low. In 2017, only 9 percent and 4 percent of the adult population had access to a formal bank account and to credit, respectively, as compared with 33 percent and 8 percent across Sub-Saharan Africa.[223] Formal savings and borrowing have declined over the past decade. Access to financial services generally is almost nonexistent in rural areas, and Chadian women have much lower access to basic financial services than do men. Common factors inhibiting access include geographic distance to a financial institution (30 percent) as well as cost (24 percent) and lack of documentation (24 percent) (figure 5.17). Other constraining factors include poor network connections and a low literacy rate.

FIGURE 5.16. BARRIERS TO ACCOUNT OWNERSHIP



Source: A. Demirgüç-Kunt et al., The Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution (Washington, DC: World Bank Group, 2018), https://globalfindex.worldbank.org/.

Opportunities

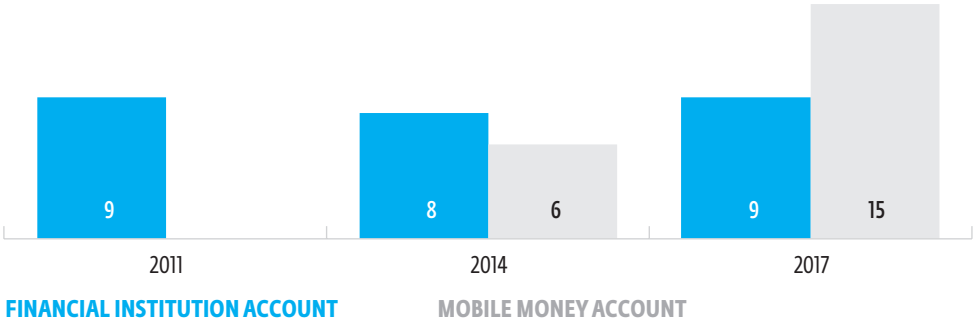
Banks would like to increase MSME lending. During engagement with IFC, Chadian banks have expressed interest in increasing SME lending activities. Key challenges include banks' internal capacities to appraise SMEs and monitor risks, as well as SMEs' poor management and financial reporting capacities. SME advisory programs can provide near-term opportunities to expand access to finance by reducing market risks and increasing capacities of potential SME clients. Operationalization of credit rating agencies and collateral registries would also potentially help.

Alternative financial modalities are underdeveloped but could potentially catalyze financial inclusion:

- **Microfinance:** The microfinance sector in Chad is vast, yet has faced severe challenges in recent years. There are more than 100 licensed microfinance institutions in Chad, the second largest CEMAC market after Cameroon (531 MFIs). In 2015, MFIs were estimated to have 200,000 beneficiaries, credit of CFAF 18 billion, and CFAF 12 billion in savings (2.8 and 1.9 percent of GDP, respectively). However, most MFIs have poor internal controls, high administrative costs, and a lack of risk management procedures, while supervisory authorities lack capacity. Bad roads and security threats limit MFI presence outside of N'Djamena. A lack of access to refinancing—commercial banks charge MFIs interest rates of 12.5 percent annum—represents an additional constraint.

- **Mobile Banking and Digital Financial Services:** Mobile banking and digital financial services provide an entry-point for credit and savings products. Chad is one of only 10 countries where more adults have a mobile money account than one at a financial institution, with more than 2.5 million subscribers and 271,000 active users.[224] But although Chad has made significant progress, it lags regional peers (table 5.2). Only 19 percent of the population made or received digital payments in 2019, compared with 35 percent across Sub-Saharan Africa. A more digitized financial system based on mobile money will improve productivity via reduced transaction costs and enable coverage of remote and/or insecure areas. (See figure 5.18.)

FIGURE 5.17. ACCOUNT OWNERSHIP IN 2011, 2014, AND 2017



Source: A. Demirgüç-Kunt et al., The Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution (Washington, DC: World Bank Group, 2018), https://globalfindex.worldbank.org/.

Leasing and agriculture finance provide opportunities to diversify and develop new financial products. Chad's leasing market potential was valued at $202 million in 2016, of which only $5 million—largely limited to vehicle financing—has been tapped.[225] The 2016 Leasing Law provides opportunities for leasing to support further development of key sectors. In addition, there is potential to expand agriculture finance, particularly through partnerships with local banks, anchor investors such as Olam, and strategic initiatives (for example, the Sahel Irrigation Initiative) to support the cotton, gum arabic, and other emerging agricultural value chains.

TABLE 5.2. ACCOUNT OWNERSHIP ACROSS CEMAC MEMBERS

	CHAD	CAMEROON	CENTRAL AFRICAN REPUBLIC	CONGO, REP.	GABON	S.S.A.
National Identity Card	**37%**	76%	–	59%	68%	–
Account	**22%**	35%	14%	26%	59%	43%
Financial Institution Account	**9%**	27%	14%	23%	34%	33%
Mobile Money Account	**15%**	15%	–	6%	44%	–
Debit Card	**3%**	11%	4%	12%	16%	18%
Credit Card	**3%**	3%	3%	4%	6%	3%

Note: : CAR = Central African Republic; SSA = Sub-Sarahan Africa.
Source: A. Demirgüç-Kunt et al., The Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution (Washington, DC: World Bank Group, 2018), https://globalfindex.worldbank.org/.

Constraints

Banks' exposure to the public sector increases risks associated with cuts in public investment and consumption, which can lead to the accumulation of domestic arrears and a deterioration of banks' loan portfolio. The government's increasing needs for domestic financing burden banks and crowd out credit to the private sector. The December 2019 IMF ECF Review notes that the banking sector, while considered broadly stable, is deteriorating due to a challenging macroeconomic environment.[226] The problem is illustrated by the banks' large accumulation of domestic arrears and sharp increase in domestic debt, coupled with 45 percent of total banking sector assets being concentrated in two large public banks. Asset quality has also weakened substantially, with the incidence of nonperforming loans exceeding 20 percent.[227]

Inefficiencies in CEMAC's financial sector regulation and supervision constrain the operation of the financial sector. The regulation and supervision of Chad's financial sector occurs at the regional level. CEMAC's regional credit reporting system suffers from several weaknesses which impact the quality and availability of information about borrowers' behaviors. The effectiveness of the regional central bank's credit risk registry (Centrale des Risques) is hampered by delays in updating information collected from banks and the noninclusion of data from MFIs. The efficiency of the supervisory framework also suffers from the limited independence of the supervisory authority (COBAC), a failure to align prudential norms with best practices, and inadequate resources allocated to COBAC.

The pandemic has generated additional hardships for the financial system. Outstanding loans from commercial banks to SMEs and households declined by 14 and 9 percent, respectively, between 2018 and 2019.[228] However, increases in domestic debt over the pandemic, coupled with the concentration of debt in the two large public banks, have heightened the vulnerability of the banking system.[229] Data from Q1-2020 suggest liquidity and collateral constraints in several banks, deterioration of capital adequacy ratios, and increased levels of overdue loans. Nonperforming loans declined from 29 percent in 2018 to 23 percent in 2019, but they were expected to increase in 2020. The Ministry of Finance started the monthly repayment of arrears owed to the two large public banks (CFAF 250 million and CFAF 500 million per month, respectively) and planned to recapitalize by mid-2020 one of the two banks by injecting CFAF 3 billion.

Numerous additional constraints to accessing finance affect SMEs. On the supply side, the lack of reliable information on SMEs increases risks for financial institutions and raises credit risk and costs. On the demand side, SME clients generally lack structure and capacities, reducing opportunities and further raising transaction costs. SMEs are also constrained by a lack of specialized financial products such as leasing, guarantee funds, agricultural finance (and insurance), or factoring product.

Recommendations

Financial Ecosystem

Achieving durable improvements in access to finance requires addressing information asymmetries through strengthening the financial ecosystem. Key measures include the following:

- Support the creation of a risk-sharing facility to provide partial credit guarantees to financial institutions lending to SMEs, incorporating lessons learnt from benchmark countries.
- Support the development of a mutualized and digitized regulatory and credit reporting system, establish a credit bureau and moveable collateral registry, and promote credit information-sharing systems, and explore options to reform land ownership and registration rules and procedures to facilitate collateralization of land.
- Introduce and implement laws to protect property and creditor rights, set standards for disclosure and transparency and strengthen consumer education and protection.

Financial Innovation

To accelerate the digitization of financial services—which can reduce the cost of transactions and expand the scope of services—tailored support should be provided to select institutions. Key measures include the following:

- Accelerate digitization of government payments (including salaries, pensions, social transfers, as well as the collection of taxes, customs, and utility bills) through digital platforms that support mobile money and leverage digital financial solutions through a digital retail payment platform connecting financial institutions.
- Simplify documentation requirements, allowing correspondent banking and shifting to the use of electronic payments into bank accounts for government payments.
- Improve competition and ensure interoperability between digital financial service actors, by ensuring a fair access to Unstructured Supplementary Service Data code, currently the best available communications technology to deliver mobile financial services to low-income customers, and providing targeted support such as acquiring hardware and software, building capacity, and drafting regulations.

Agriculture Finance

Improving the access of smallholder farmers to finance requires targeted measures to promote the development of specialized financial products and to enhance the credit-readiness of farmers and small agribusinesses. Key measures include the following:

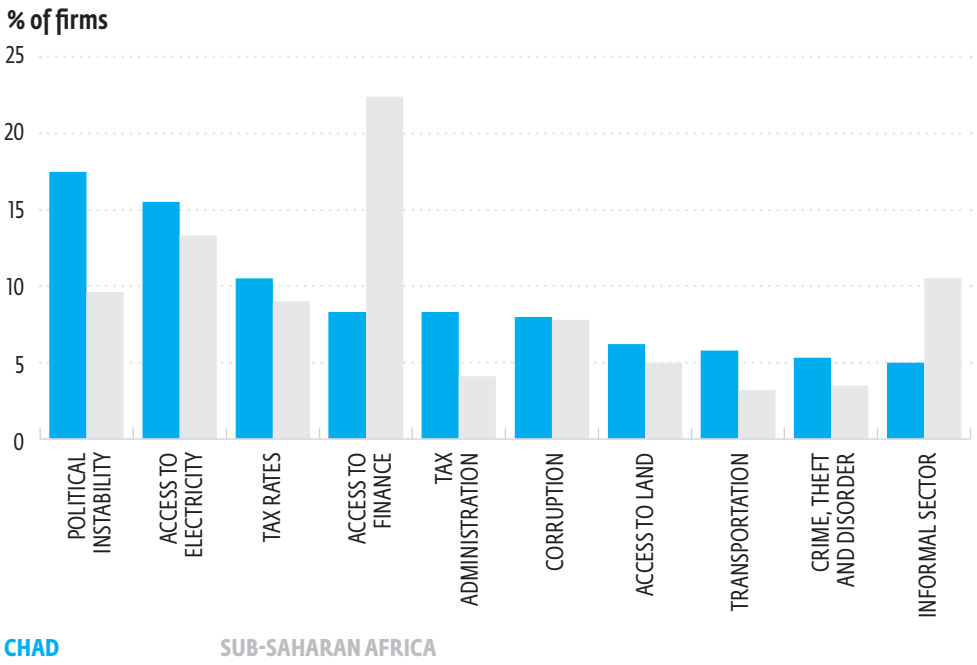
- Enhance the legal framework to enable leasing as a financing solution, and improve leasing and warehouse receipt system legislation, with a view to supporting SME access to finance.
- Develop business advisory programs targeting 100–150 SMEs across three agricultural supply chains (such as livestock, gum arabic, sesame, and dates) for tailored financial, technical/digitization, and managerial support.

5.6 BUSINESS ENVIRONMENT

Overview

The formal private sector in Chad operates in a particularly difficult and unstable business environment. Top concerns cited by private firms include political instability and insecurity, tax policy and administration, as well as access to energy (figure 5.18).[230] The private sector is adversely affected by political interference and corruption in the tax and customs administration. Improvements are needed in all areas of business regulation, with the biggest challenges revolving around property registration, contract enforcement, and cross-border trade. Chad performs poorly across a range of governance and corruption indicators. Chad's ranking on the Corruption Perception Index, currently 160th out of 179 countries,[231] has not changed substantially since 2011.

FIGURE 5.18. TOP CONSTRAINTS CITED BY CHADIAN FIRMS, 2018



Source: World Bank, Enterprise Survey (2018).

Opportunities

The productivity of, and investment in, Chad's private sector could significantly improve if state-capture and corruption were substantially reduced. Improving governance and fighting corruption in Chad would help improve the allocation of public resources, foster private sector led development and raise growth. The IMF estimates that, by reducing corruption to the CEMAC or, more ambitiously, Sub-Saharan African average, GDP per capita growth in Chad would increase by 0.6 percentage points or 2.1 percentage points, respectively.[232] In 2018, the private sector organization, Forum for the Recovery (Forum pour la Relance), identified corruption as the primary constraint on the private sector. Chad took a positive step in 2018 toward controlling corruption by becoming the 186th state to ratify the United Nations Convention against Corruption.

The recent consolidation of land laws has yielded positive results and has established reform momentum. In 2014, the government begun developing a unified land code, which represented a positive step to ensure internal consistency and make land law more accessible. The country's existing land legislation was adopted in the 1960s—specifically laws number 23, 24, and 25 of July 22, 1967—and the new code merges into one text the three existing laws dealing respectively with state-owned land; private land ownership and customary rights; and restrictions on land rights. Building on this 2014 reform, future reforms can address unresolved issues such as the protection of customary land rights and the prevention of conflicts between herders and farmers.

Recent efforts to improve tax collection and improve competition have been beneficial. In January 2018, authorities introduced a new measure requiring that taxes be paid through the banking system (*bancarisation des recettes*), which has helped improve tax collection. Measures have also been undertaken to reduce the administrative burden involved in setting up a business through the establishment of a National Agency for Investment and Exports and a Business Formalities Centre, as well as the establishment of a ministry for SMEs and industries (Ministère de l'industrie et de la promotion de entrepreneuriat). Following parliamentary approval of a competition law in November 2014, a Competition Council was established in 2018, although it has yet to become fully operational.

Efforts to control corruption over the past decade have signaled government concern over the issue. In 2012, the government launched Operation Cobra, which resulted in the recovery of CFAF 25 billion (€38 million) and dismissal of 400 "corrupt" officials (according to the Ministry of Morality and Good Governance).[233] The creation of an anti-corruption court was also announced in January 2017. Articles 72 and 104 of Chad's constitution requires the president and members of the parliament to declare assets when assuming their positions, although implementing legislation and a well-equipped agency to ensure reporting, assessment and enforcement are needed to implement this requirement.

Constraints

Tax administration remains highly vulnerable to corruption. Public revenue is limited by widespread exemptions—which cost around CFAF 45 billion as of 2016, or about 1 percent of non-oil GDP[234]—as well as weak VAT collection. Revenue from VAT, which stands at about 1 percent of non-oil GDP, is among the lowest in Sub-Saharan Africa and particularly suffers from weak administration, deficiencies in the refund mechanisms, exemptions, and the large size of the informal sector. Nonetheless, high tariff and nontariff barriers results in a high cost of imports.

Access to land and property is problematic in Chad. As noted in subsection "Drivers of the Current Conflict", farmer–pastoralist conflicts and poor conflict resolution mechanisms hinder the productivity of and investment in agriculture and pastoralism. Land conflicts and instances of land expropriation are facilitated by a lack of formal land titles across much of rural Chad and by widespread corruption in the court system.[235]

Chad's legal anti-corruption framework suffers from large deficiencies. A roadmap for implementing provisions of UNCAC, which Chad ratified in 2018, has yet to be developed and core elements of an effective anti-corruption regime are still missing. Recent attempts to establish mechanisms to control corruption (including the establishment of an ethics ministry, the oil management regime,[236] and Operation Cobra in 2012) have yielded poor results. On both the Worldwide Governance Indicators and Transparency International's Corruption Perception Index, Chad performs lower than the average for CEMAC and is considerably below the average for Sub-Saharan Africa. The anticorruption court announced in January 2017 does not appear in the new Constitution of 2018. In addition, despite being part of a Regional Competition Agreement with Central African Republic, Cameroon, and Gabon, Chad is the only country that does not yet have competition legislation.

Recommendations

Tax Administration

Given the importance of mobilizing non-oil revenue and reducing the cost of imports, it is critical for the government to make efforts to broaden the tax base while simplifying taxes on trade. Key measures include the following:

- Efforts are needed to widen the tax base and, in particular, to better control the granting of exemptions, to regularly publish a list of all new exemptions, to set up a VAT refund mechanism, and to reduce VAT exemptions.
- Lower tariff and nontariff barriers to trade are needed, as well as to reduce the number of customs procedures as recommended by the IMF.[237]

Land Rights

To limit the adverse effect of conflicts over land on productivity and investment, it is important that the government build on recent efforts to consolidate legislation on land rights. Key measures include the following:

- Protect customary land rights (conditioned to the existence of a land title and excluding those that are not formally registered) and develop an effective means for documenting customary rights without necessarily converting them into private land ownership.
- Safeguard against compulsory land acquisitions by the state, particularly for customary title holders, by establishing a compensation system that recognizes the contributions of land to livelihoods.
- Recognize pastoral land use as a valid form of productive land use by establishing a right to pastoral mobility and establishing conflict prevention and management systems for regulating the interface between herding and farming including conflict prevention and management as well as establishing effective dispute resolution mechanisms, such as alternative land dispute resolution systems.
- Safeguard commercial land-based investment by establishing mandatory local consultation requirements and defining the conditions whereby the state may allocate land from private domain.

Procurement and Competition Framework

Chad's procurement and competition frameworks should be adequately resourced to ensure compliance with constitutional and supra-national provisions, ensure transparency and secure the recovery of proceeds of corruption from abroad, and improve the overall business climate. Key measures include the following:

- Strengthen the legal framework and adopt IT solutions for transparent public procurement, including publishing procurement policies; timely publishing of procurement plans; advertisement of tender notices, including evaluation criteria; publishing of contract awards and prices paid; and supplier sanction lists.
- Provide adequate resources and skilled personnel to anticorruption agencies.[238]
- Develop implementing legislation and establish a well-equipped agency to report, assess, and enforce asset disclosure by high-level public officials, encompassing UNCAC requirements such as disclosing assets legally owned and beneficially owned.
- Strengthen the AML/CFT framework to facilitate detection, investigation, and recovery of proceeds of corruption abroad and to assist in the investigation and prosecution of bribery.
- Adopt national competition legislation, in line with regional peers such as Central African Republic, Cameroon, and Gabon.

5.7 HEALTH

Opportunities

In the healthcare sector, where Chad ranks among the worst performers in the world, private investment can increase the domestic availability of high-end medical services for wealthy patients, while relieving stresses on the public health system. Chad's health outcomes are among the worst in the world. According to World Bank data, the population has a life expectancy of 54 years (186th place out of 187 total countries), and a 7 percent lifetime risk of maternal death (187th out of 187) in the world. One contributing factor is the considerable healthcare worker shortage in Chad. Current estimates are that there are 3 healthcare workers (doctors, nurses, or midwives) per 100,000 population.[239] Although Chad's health system is dominated by the public sector, the private sector—albeit relatively smaller compared with African peers—is growing in importance (table 4.1). Currently, there are 226 nonprofit private health centers, 11 nonprofit private hospitals, 27 for-profit clinics, 66 for-profit surgeries, and 109 for-profit private care practices.[240] This expansion took place notwithstanding the relatively high cost of services by private health services.[241] Wealthy Chadians who currently seek treatment abroad may choose to remain in Chad if services were of a higher quality. Better quality private facilities, if they were able to attract wealthier patients currently availing public health services, could also potentially increase the availability of services available to poorer patients.

Financing from development partners has successfully expanded the capacity of private health facilities in recent years. Development partners in Africa have supported several healthcare facilities with positive results. Clinique de la Providence, which had 20 beds, 100,000 patients, and a turnover of $800,000 in 2015, received €1.23 million in 2015 to increase capacity and offer new specialties such as cardiology, pneumology, intensive care, orthopedics, surgery and oncology. Clinique de la Providence has become a private referral hospital providing a diverse set of medical care, and the need for evacuations of Chadians for specialized care has fallen.

Constraints

The ability of private operators to contribute to improving the availability of quality health services in Chad is impeded by a limited supply of qualified medical professionals, an outdated medical curriculum and a lack of sector-specific regulation:

- **Human Resources.** Most healthcare facilities employ expatriate labor which impedes profitability. Although the government has created decentralized training sites in Abéché, Moundou, Sarh, and N'Djaména and a school in Biltine,[242] the expansion of the private health facilities in other countries has been associated with the migration of better-qualified doctors from public facilities to private clinics that offer better remuneration. Finding qualified instructors is a challenge, compounded by high staff turnover and faculty shortages. To prevent the degradation of the quality of the public sector on which the poorest patients depend, it is therefore essential to ensure that any moves to increase the role of private operators in health care are accompanied by efforts to increase the output of medical training facilities.

- **Medical Curriculum.** The medical curriculum to train physicians in Chad's oldest public medical school has not been updated since its design in 1990, and it has not factored in advances in medicine and changes in the landscape of the healthcare system. By expediting the licensing process through a less intensive course of study and only training generalists, the school was expected to be able to accommodate larger student populations with a view to addressing the urgent health care needs of one of the least developed countries in the world. Favoring quantity over quality has resulted in school leadership to weaken recruitment standards. This has limited the responsiveness of public education to the needs of the nascent private sector resulting in the private sector's reluctance to hire medical graduates and limiting the private sector's propensity to invest in Chad, as they have to rely on expensive expatriate labor for their operations. Main deficiencies of the current curriculum include (a) no outlined competencies for students to master nor list of topics/content to cover during some courses; (b) the failure to integrate the core foundational medical science subjects, resulting in disjointed learning; (c) overteaching of clinically irrelevant core basic science concepts (biophysics, organic chemistry, and abstract teaching of core medical subjects); and (d) a disconnect between preclinical and clinical education, and few clinical role models for students.
- **Regulation.** Private sector participation in the provision of healthcare services—beyond medical equipment and supply chains—is not part of the government's vision. As a result, the involvement of private operators in the health sector is developing independently of the public sector, without any regulatory framework or direct supervision by the government.

Insufficient electricity and limited access to finance also hinder the viability of private health operations. Electricity is an essential input to modern health care and the high cost and unreliable supply of electricity in Chad increases the cost and reduces the quality of private health services in Chad. Limitations on access to finance are also a constraint.

Recommendations

To enhance the contribution of private operators to the availability of health care in Chad, efforts should focus on expanding the supply of medical professionals, strengthening the legal and regulatory framework for the private provision of health services, and deploying innovative mechanisms to finance the provision of health services by private operators:

- **Human Resources and Medical Curriculum Reform.** To increase the availability of qualified personnel, the medical education system should be strengthened by overhauling the WHO-mandated curriculum to allow for training of specialists, strengthening theoretical foundations, and eliminating less relevant topics (such as physics or chemistry) and by strengthening the responsiveness of medical education to the needs of the market. A framework to approach curricular reform in Chad is needed to both formalize it and align it more closely with the needs of the healthcare system and the country's national health strategy—including modernizing course syllabi and incorporating more preclinical theoretical underpinnings to the disciplines currently being taught, focusing on neonatal services, oral maxillofacial surgery and maternal health as sectors that would benefit the most from an updated curriculum.

- **Regulatory Framework.** The legal and regulatory framework for private health providers—and for the cooperation between private and public sectors—should be clarified. The government may wish to explore establishing universal health insurance, as has been done by Côte d'Ivoire.
- **Funding.** Innovative mechanisms for financing investments in private health care should be pursued, such as using modalities such as performance-based financing (PBF).[243] Lessons from a PBF pilot involving the Ministry of Health, NGOs, and private health facilities between 2014 and 2018[244] (table A.1) could inform the design of new PBF instruments. Lessons learned from this pilot project are included in Appendix A.

APPENDIX

APPENDIX A: SCALING UP PERFORMANCE-BASED FINANCING IN CHAD'S HEALTH CARE SYSTEM

TABLE A.1. CATALYSTS AND BARRIERS TO SCALING UP THE PBF PILOT PROJECT IN THE HEALTH-CARE SECTOR IN CHAD

PHASES	CATALYSTS	IMPEDIMENTS
Planning and programming	• Political will at the highest level to address maternal and child health issues. • Reestablishment of cooperation between the World Bank and Chad and availability of funds for health financing and the FBP in particular.	• Fragmentation of health financing initiatives to address maternal and child health issues. • Establishment of the FBP within an HIV/AIDS program, managed by the Ministry of Economy and International Cooperation. Although this allowed for a faster availability of funds, the institutional arrangement remained unclear and fragmented, with insufficient control of the FBP by the Ministry of Health.
Design	• Training of national managers and organi-zation of study tours on the FBP (2011).	• The planning and implementation phases were too fast, which did not allow the full appropriation of the new FBP concept.
Implementation	• A Steering Committee was created at the end of 2010, composed of staff from key minis-tries (health, economy, finance and budget, social action) and donors; the Project Coordi-nation Unit at the World Bank was responsible for strategic decision-making and monitoring of the FBP project. • A technical unit was created in February 2012 to act as the secretariat of the Steering Com-mittee and also as an interface between ex-ternal technical assistance and the Ministry of Health. The members it comprised came from a single department of the Ministry of Health.	• The Steering Committee met only four times in 3 years and not all key players regularly attended these meetings. There was a lack of engagement with realities in the field. • Staff members did not always have the technical skills or time to assume their intended role. The cell held only one meeting in 14 months. • Technical assistance for the implementation of the project and the function of the performance purchasing agency was entrusted to a local NGO and an international consulting firm in the form of a consortium, with however few means to ensure a transfer of competences to the national part (the Ministry of Health). National actors were involved rather passively in the implementation of the project. On the importance of assigning the role of purchasing performance to national actors, see the policy note, "Advanced stages of PBF scale-up: lessons learned from Cameroon on the transfer of the strategic purchasing function to national agencies." • There was a high frequency of ministerial reshuffles: Between 2010 and 2013, there were four Ministers of Health and five Secretaries of State, and low political ownership of the FBP. • There was lower World Bank involvement in the concrete implementation of the PBF on the ground (compared with the design and planning phase of the project), in addition to short-term funding commitments for the FBP project, both from the World Bank (20 months) and the Chadian government (6 months).
Scaling	• The results of the FBP project were generally positive and satisfactory, as shown by inter-nal and external evaluations. • There was availability of local expertise to ensure the role of the performance purchas-ing agency (the local NGO member of the consortium).	• There was a lack of technical capacity and political ownership within government bodies, particularly at the level of the Ministry of Health.

Source: Kiendrébéogo JA, Shroff ZC, Berthé A, Yonli L, Béchir M, Meessen B. Why Performance-Based Financing in Chad Failed to Emerge on the National Policy Agenda. Health Syst Reform. 2017 Apr 3;3(2):80-90. doi: 10.1080/23288604.2017.1280115. PMID: 31514677.

REFERENCES

ACLED. (2021, November 1). *The Armed Conflict Location & Event Data Project*. Retrieved from ACLED: https://acleddata.com/dashboard/#/dashboard

Abatoni, H. (2021, April 26). Idriss Deby Itno: les querelles de famille intensifient les tensions de la transition au Tchad. *BBC News | Afrique*. Retrieved from https://www.bbc.com/afrique/region-40343707

Africa Development Bank (2013). Business Climate Improvement and Economic Diversification Support Project (PACADET). Available at https://bit.ly/3h9n3ED

Africa Intelligence. (2021, July 28). "Bedey", le neveu d'Idriss Déby qui fait voler le Conseil militaire de transition. *Événement*. Retrieved from https://www.africaintelligence.fr/afrique-ouest-et-centrale_business/2021/07/28/bedey-le-neveu-d-idriss-deby-qui-fait-voler-le-conseil-militaire-de-transition,109682532-eve

Africa Intelligence. (2021, June 15). "Kaka" dynamite les réseaux de l'ex-première dame Hinda à la Société des hydrocarbures du Tchad. *Africa Intelligence*. Retrieved from https://www.africaintelligence.fr/petrole-et-gaz_strategies-etat/2021/06/15/kaka-dynamite-les-reseaux-de-l-ex-premiere-dame-hinda-a-la-societe-des-hydrocarbures-du-tchad,109672768-art

African Minerals Development Centre. (2021). *Chad ASM Profile*. Retrieved from United Nations Economic Commission for Africa: https://knowledge.uneca.org/ASM/chad

Ahmed, G. (2018). *Chad: Upgrading in the Sesame Seeds and Arabic Gum Global Value Chains. Background paper for World Bank* (2019). World Bank, Background paper for "Chad, Leveraging Export Diversification to Foster Growth". Washington, DC.

Arvis, J.-F. (2004). *Chad Trade and Transport Facilitation Audit*. Washington, DC: World Bank. Retrieved from https://documents1.worldbank.org/curated/en/345051468017457955/pdf/477750WP0TD0Fa1Box0338860B01PUBLIC1.pdf

Azevedo, M. (1981). The Human Price of Development: The Brazzaville Railroad and the Sara of Chad. *African Studies Review,* 24(1), 1-19.

Azevedo, M. (1998). *The Roots of Violence: A History of War in Chad*. Charlotte: Gordon and Breach Publishers.

Azevedo, M. (2005). *The Roots of Violence: A History of War in Chad*. Routledge: London.

Azevedo, M., & Decalo, S. (2018). *Historical Dictionary of Chad* (4th Edition). Lanham, MD: Rowman & Littlefield.

Azevedo, M., & Nnadozie, E. (1998). *Chad: A Nation in Search of Its Future*. Oxford: Westwind Press.

Baffes, J., Larson, D., & Varangis, P. (2001). *Commodity market reforms: lessons of two decades*. Washington, D.C.: World Bank.

BBC News. (2019, September 26). *Chad gold mine collapse leaves about 30 people dead*. Retrieved from BBC News: https://www.bbc.com/news/world-africa-49839574

Berger, T., & Cotula, L. (2015). *A Time for Change: Comments on Chad's Draft Land Code*. London: International Institute for Environment and Development. Retrieved from https://pubs.iied.org/sites/default/files/pdfs/migrate/G03953.pdf

Bertelsmann Stiftung. (2020). *BTI 2020 Country Report — Chad. Gütersloh: Bertelsmann Stiftung.* Retrieved from https://bti-project.org/fileadmin/api/content/en/downloads/reports/country_report_2020_TCD.pdf

Brachet, J., & Scheele, J. (2018). Fiscalité marginale sur mesure. L'économie politique du natron au Borkou, Tchad. *Politique Africaine,* 3(159), 39-59. Retrieved from https://www.cairn.info/revue-politique-africaine-2018-3-page-39.htm

Buijtenhuijs, R. (1978). *Le Frolinat et les Révoltes Populaires du Tschad*, *1965–1976*. New York: Mouton.

Cabot, J. (1957). La Culture du Coton au Tchad. *Annales de Géographie*, *66* (358), 499-508.

CIA. (2021, October 14). *Chad*. Retrieved from The World Factbook: https://www.cia.gov/the-world-factbook/countries/chad/

Collelo, T. (Ed.). (1988). *Chad: A Country Study.* Washington: GPO.

Decalo, S. (1997). *Historical Dictionary of Chad*. Lanham, MD: Scarecrow Press.

Demirgüç-Kunt, A., Klapper, L., Singer, D., Ansar, S., & Hess, J. (2018). *The Global Findex Database 2017 - Measuring Financial Inclusion and the Fintech Revolution*. Washington, DC: World Bank Group. Retrieved from https://globalfindex.worldbank.org/

Dietrich, T. (2019, January 21). Alexandre Benalla, pour Tout l'or du Tchad. *Libération*. Retrieved from https://www.liberation.fr/debats/2019/01/21/alexandre-benalla-pour-tout-l-or-du-tchad_1704358/

DW Afrique. (2020, May 15). Tchad : l'omniprésence de la fondation de Hinda Déby dérange. *DW*. Retrieved from *https://www.dw.com/fr/tchad-lomnipr%C3%A9sence-de-la-fondation-de-hinda-d%C3%A9by-d%C3%A9range/a-53450774*

FAO. (2020). "*The economics of pastoralism in Argentina, Chad and Mongolia*.". FAO Animal Production and Health Paper 182.

FAO. (2020, 2 11). *Strengthening Social Cohesion among Communities in the Central African Republic and Chad through Sustainable Management of Cross-Border Transhumance*. Retrieved from reliefweb: https://reliefweb.int/report/chad/strengthening-social-cohesion-among-communities-central-african-republic-and-chad

FAO. (2021). F*AOSTAT Statistical Database*.

French National Archives: FCMGT. (1966, October 1). Confidentiel Tchad. *Situation Générale dans la République du Tchad*. Paris, France: Carton 2, A4/1.

Fuglie, K. (2015). Accounting for Growth in Global Agriculture. *Bio-Based and Applied Economics*, 4(3), 221-254.

Funk, et al. (2012). A Climate Trend Analysis of Chad, U.S. Geological Survey Fact Sheet. Available at https://pubs.usgs.gov/fs/2012/3070/

Gaulier, G., & Zignago, S. (2010, October). BACI: International Trade Database at the Product-Level. The 1994-2007 Version. *CEPII Working Paper* (2010-23). Retrieved from *http://www.cepii.fr/CEPII/fr/publications/wp/abstract.asp?NoDoc=2726*

German Federal Ministry for Economic Cooperation and Development. (2021, January). *Climate Risk Profile: Chad*. Retrieved from AGRICA - Climate Risk Analyses for Adaptation Planning in Sub-Saharan Africa: https://agrica.de/wp-content/uploads/2021/01/GIZ_Climate-risk-profile-Chad_EN_final.pdf

Gervais, R. (1981). La plus riche des colonies pauvres: La Politique monétaire et fiscal de la France au Tchad 1900-1920. *Canadian Journal of African Studies / Revue Canadienne des Etudes Africains, 16* (1).

GOGLA. (2020). *Global Off-Grid Solar Market Report - Semi-Annual Sales and Impact Data January - June 2020*. Retrieved from https://www.gogla.org/sites/default/files/resource_docs/global_off_grid_solar_market_report_h1_2020.pdf

Goldstein, M., Houngbedji, K., Kondylis, F., O'Sullivan, M., & Selod, H. (2018, May). Formalization without Certification? Experimental Evidence on Property Rights and Investment. *Journal of Development Economics, 132*, 57-74. Retrieved from https://www.sciencedirect.com/science/article/pii/S030438781730127X

Grove, A. T. (2021, October 14). *Chad*. Retrieved from Britannica: https://www.britannica.com/place/Chad

GSMA (2016), Digital inclusion and mobile sector taxation in Chad, Deloitte, November 206. Available at www.gsma.com/mobilefordevelopment/wp-content/uploads/2017/01/Digital-Inclusion-and-Mobile-Sector-Taxation-in-Chad_English_report.pdf

Guibert, B., Bécher, A. B., & Madjidé, D. (2014). *Étude prospective: État des lieux et éléments stratégiques pour le développement pastoral au Tchad*. Paris and Montpellier: Institut de Recherches et d'Applications des Méthodes de Développement (RAM).

Hansen, K. (2017, November 9). *The Rise and Fall of Africa's Great Lake*. Retrieved from NASA Earth Observatory: https://earthobservatory.nasa.gov/features/LakeChad

Hicks, C. (2015, June). Chad and the West: Shifting Security Burden? *Africa Policy Brief* (13).

Hollick, J. C. (1982, August). Civil War in Chad, 1978-82. *The World Today, 38*(7/8), pp. 297–304.

IEA. (2020). *SDG7: Data and Projections*. Paris: IEA. Retrieved from https://www.iea.org/reports/sdg7-data-and-projections

IMF. (2019). *Chad: Selected Issues* (July 2019). Retrieved from https://www.imf.org/en/Publications/CR/Issues/2019/07/31/Chad-Selected-Issues-48548

Institut National de la Statistique des Études Économiques et Démographiques - INSEED/Tchad, M. d.-M. (2014-2015). *Enquête Démographique et de Santé et à Indicateurs Multiples (EDS-MICS 2014-2015)*. Rockville, Maryland, USA: INSEED, MSP et ICF International.

International Bank for Reconstruction and Development. (1971). *The Current Economic Situation and Prospects of Chad*. Wsahington, DC: International Development Association.

International Crisis Group. (2009). Chad: Escaping from the Oil Trap. *Africa Briefing 65*. Retrieved from https://www.crisisgroup.org/africa/central-africa/chad/chad-escaping-oil-trap

International Crisis Group. (2019, May 17). *Chad: Avoiding Confrontation in Miski*. Retrieved from International Crisis Group: https://www.crisisgroup.org/africa/central-africa/chad/274-tchad-sortir-de-la-confrontation-miski

International Crisis Group. (2021, January 22). Les Défis de L'Armée Tchadienne. *Rapport Afrique* (298).

International Trade Administration. (2020, September 7). *Mining and Precious Metals / Chad - Commercial Country Guide*. Retrieved from Country Commercial Guides: https://www.trade.gov/country-commercial-guides/chad-mining-and-precious-metals

Jeune Afrique. (2016, November 2). Un outsider s'invite dans l'appel d'offres de CotonTchad. *JeuneAfrique*. Retrieved from https://www.jeuneafrique.com/370709/economie/vainqueurs-de-lappel-doffres-de-cotontchad-2/

Kodmadjingar, A. (2016, August 3). Afrique : rôle des membres des familles présidentielles – le Tchad. *VOA Afrique*. Retrieved from https://www.voaafrique.com/a/afrique-role-des-familles-presidentielles-le-tchad/3446904.html

Krätli, S., Sougnabé, P., Staro, F., & Young, H. (2018). *Pastoral Systems in Dar Sila, Chad: A Background Paper for Concern Worldwide*. Boston: Feinstein International Center, Tufts University. Retrieved from https://reliefweb.int/sites/reliefweb.int/files/resources/FIC-Publication-Pastoral-Systems-web-2.26.1.pdf

Ksoll, C. D., Pulido, D., & Gupta, H. (2021). *Temperature Controlled Logistics: Essential for Health and Growth*. Washington, DC: World Bank Group.

Levy-Carciente, S., & Montanari, L. (2020). I*nternational Property Rights Index 2020*. Washington, DC: Property Rights Alliance. Retrieved from https://atr-ipri2017.s3.amazonaws.com/uploads/IPRI+2020+Full+Report.pdf

Library of Congress. (1996). Africa - Ethnolinguistic Groups. Washington, DC, USA: Geography and Map Division.

Lopez Calix, Jose R; Pitigala, Nihal 2019. Trade Policy to Catalyze Export Diversification: What Should Landlocked Fragile Countries Do? The Cases of Mali, Chad, and Niger (English). Policy Research working paper; no. WPS 9036 Washington, D.C: World Bank Group.

Sandrine Kablan & Josef Loening & Yasuhiro Tanaka (2014), "Is Chad Affected by Dutch or Nigerian Disease?", Journal of Empirical Economics, Research Academy of Social Sciences, vol. 3(5), pages 278-295.

Made, J. v. (2021, February 16). Macron takes aim at Sahel jihadist groups, Chad to send troops. *rfi*. Retrieved from https://www.rfi.fr/en/africa/20210216-macron-takes-aim-at-sahel-jihadist-groups-chad-to-send-troops-g5-summit-military-operation-barkhane

Magrin, G. (2017, October 16). *Image à la une: orpaillage illégal au Fitri (Tchad central*). Retrieved from Ressources de géographie pour les enseignants: http://geoconfluences.ens-lyon.fr/informations-scientifiques/a-la-une/image-a-la-une/magrin-orpaillage-tchad

Magrin, G., & Pérouse de Montclos, M.-A. (Eds.). (2018). Crisis and Development: The Lake Chad Region and Boko Haram. Paris: Agence Française de Développement. Retrieved from https://www.afd.fr/en/ressources/crisis-and-development-lake-chad-region-and-boko-haram

Martínez, A. J., Josa, S. O., Magrinyà, F., & Gauthier, J.-M. (2018, January). Cost-effectiveness of enforcing axle-load regulations: The Douala-N'Djamena corridor in Sub-Saharan Africa. *Transportation Research Part A: Policy and Practice,* 216-228. Retrieved from https://www.sciencedirect.com/science/article/pii/S0965856416311946

MEPA. (2017). "*National Livestock Development Plan: 2017-2021.*"

Ministère de la Santé Publique du Tchad. (2018). *Plan National de Développement Sanitaire (PNDS3 2018-2021)*. N'Djamena: Ministère de la Santé Publique du Tchad.

Minority Rights Group International. (2020, November). Chad. Retrieved from World Directory of Minorities and Indigenous Peoples: https://minorityrights.org/country/chad/

Nako, M. (2018, June 20). Agroalimentaire: la viande, prochain pilier de l'économie tchadienne. *JeuneAfrique*. Retrieved from https://www.jeuneafrique.com/mag/575793/economie/agroalimentaire-la-viande-prochain-pilier-de-leconomie-tchadienne/

Notre Dame Global Adaptation Initiative. (2021, October 12). *ND-GAIN Country Index*. Retrieved from Notre Dame Global Adaptation Initiative: https://gain.nd.edu/our-work/country-index/

Opening Central Africa. (2020, April 13). Tchad: Quand les Kleptocrates Frappent Plus Fort que la Maladie. *Opening Central Africa*. Retrieved from https://openingcentralafrica.com/fr/2020/10/07/tchad-quand-les-kleptocrates-frappent-plus-fort-que-la-maladie/

PAFIB. (2017). *Renforcer les Capacites des Acteurs de la Filiere Bovine au Tchad*. N'Djamena: JVL Consultin, Iram and Euro Consultants.

Pinard, M. I. (2010). *Overload Control Practices in Eastern and Southern Africa : Main Lessons Learned*. Sub-Saharan Africa Transport Policy Program (SSATP) Working Paper No. 91. Washngton, DC: World Bank.

Powell, N. (2020). *France's Wars in Chad: Military Intervention and Decolonization in Africa*. Cambridge, UK: Cambridge University Press.

Raballand, G., Refas, S., Beuran, M., & Isik, G. (2012). *Why Does Cargo Spend Weeks in Sub-Saharan African Ports?* Lessons from Six Countries. Directions in Development - Trade. Washington, DC: World Bank. Retrieved from https://openknowledge.worldbank.org/handle/10986/13535

Rahim, A. H., Ierland, E. C., & Weikard, H.-P. (2010). Competition in Gum Arabic Market: A Game Theoretic Modelling Approach. *Quarterly Journal of International Agriculture, 49*(1), pp. 1-24.

Rice, X. (2008, September 11). World Bank cancels pipeline deal with Chad after revenues misspent. *The Guardian*. Nairobi. Retrieved from https://www.theguardian.com/world/2008/sep/12/worldbank.oil

Saturnin, A. N.-D. (2017, July 21). Ibn Oumar Mohamed Saleh Quitte la CotonChad SN. *Le Pays*. Retrieved from http://www.lepaystchad.com/2872/

Stockholm International Peace Research Institute. (2021, November 1). *SIPRI Military Expenditure Database*. Retrieved from Stockholm International Peace Research Institute: https://www.sipri.org/databases/milex

Tahir, B. A., & Vishwanath, A. (2015, November). Market and Value Chain Analyses of Marketable Natural Products from Agroforestry Systems in Eastern Sudan. *Journal of Geoscience and Environment Protection, 3,* 57-73. Retrieved from https://pdfs.semanticscholar.org/2da1/239007451b728c66a357919c804099f7ea4e.pdf

TCHADINFOS. (2020, May 25). *Opinion : "Non monsieur le président, la SNE n'a pas changé ses mauvaises pratiques*". Retrieved from TCHADINFOS: https://tchadinfos.com/tchad/opinion-non-monsieur-le-president-la-sne-na-pas-change-ses-mauvaises-pratiques/

Technical University of Denmark. (2021, November 2). *Mean Wind Speed at 100m - Chad*. Retrieved from Global Wind Atlas: https://globalwindatlas.info/area/Chad

Transparency International. (2021). *Corruption Perceptions Index 2020*. Berlin: Transparency International.

Tubiana, J., & Debos, M. (2017). *Déby's Chad - Political Manipulation at Home, Military Intervention Abroad, Challenging Times Ahead*. Washington, DC: U.S. Institute of Peace. Retrieved from https://www.usip.org/publications/2017/12/debys-chad

Tubiana, J., & Debos, M. (2017). *Deby's Chad: Political Manipulation at Home, Military Intervention Abroad, Challenging Times Ahead*. Washington, DC: United States Institute for Peace.

U.S. Energy Information Administration. (2021, October 12). *Europe Brent Spot Price FOB*. Retrieved from Petroleum & Other Liquids: https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=rbrte&f=m

UNDP (2019), Investment Policy Review of Chad

UNHCR. (2021, October 16). *Data Finder*. Retrieved from Refugee Data Finder: https://www.unhcr.org/refugee-statistics/download/?url=q2vViO

United States Census Bureau. (2021, October 16). *International Data Base*. Retrieved from Census.gov: https://www.census.gov/programs-surveys/international-programs/about/idb.html

USAID FEWS NET. (2005). *Chad Livelihood Profiles*. Washington, DC: USAID. Retrieved from https://pdf.usaid.gov/pdf_docs/PNADE389.pdf

Vivekananda, J., Wall, M., Nagarajan, C., Sylvestre, F., & Brown, O. (2019). *Shoring Up Stability: Addressing Climate and Fragility Risk in the Lake Chad Region*. Berlin: adelphi. Retrieved from https://shoring-up-stability.org/wp-content/uploads/2019/06/Shoring-up-Stability.pdf

World Bank (2015), Republic of Chad. Systematic Country Diagnostic. Priorities for ending poverty and boosting shared prosperity.

WTO (2018). Chad. Available at https://bit.ly/3jiBhVF

World Bank. (1974). *Le Développement du Tchad : Possibilités et Limites*. Rapport Economique de la Banque Mondiale. Washington, DC: World Bank.

World Bank. (1987). *Chad: Economic Situation and Priorities*. Washington, DC: World Bank.

World Bank. (2006). *TCHAD - Etude diagnostique sur l'intégration commerciale (Volume 1)*. Washington, DC: World Bank. Retrieved from https://enhancedif.org/en/system/files/uploads/chad_dtis_fr_0.pdf?file=1&type=node&id=2902

World Bank. (2009, November 23). *Management Statement on the Lessons from Evaluation of the Chad-Cameroon Oil Development and Pipeline Program*. Retrieved from The Chad-Cameroon Petroleum Development and Pipeline Project: http://web.worldbank.org/archive/website01210/WEB/0__CO-10.HTM

World Bank. (2014). *Republic of Chad: Bovine Live Stock and Arabic Gum Value Chains: Opportunities, Challenges, Actions*.

World Bank. (2017, December 21). Financing Agreement between Republic of Ghana and International Development Association. *Second Macroeconomic Stability for Competitiveness and Growth - Development Policy Financin*g. Washington, DC: https://documents1.worldbank.org/curated/en/142401513961087274/pdf/ITK425962-201711221142.pdf.

World Bank. (2018). *Enterprise Surveys: Chad Country Profile 2018*. Washington, DC: World Bank. Retrieved from https://openknowledge.worldbank.org/bitstream/handle/10986/30297/129278-WP-PUBLIC-Chad-2018.pdf?sequence=1&isAllowed=y

World Bank. (2018). *Escaping Chad's Growth Labyrinth: Disentangling Constraints from Opportunities and Finding a Path to Sustainable Growth*. Washington, DC: World Bank.

World Bank. (2018, July 28). *Logistics Performance Index 2018*. Retrieved from World Bank: https://lpi.worldbank.org/

World Bank. (2018). *The Republic of Chad - Power Sector Note*. Washington, DC: Energy and Extractices Global Practice, Africa Region.

World Bank. (2019). *Chad - AFCW3 Growth and Diversification - Leveraging Export Diversification to Foster Growth*. Washington, DC: World Bank. Retrieved from https://elibrary.worldbank.org/doi/abs/10.1596/31839

World Bank. (2020). *Chad - Human Capital Index 2020*. Washington, DC: The World Bank. Retrieved from https://databank.worldbank.org/data/download/hci/HCI_2pager_TCD.pdf?cid=GGH_e_hcpexternal_en_ext

World Bank. (2020). *Land Property Rights, Investments, and Agricultural Productivity in Chad: Evidence from the 2018 LSMS-ISA in Chad, Volume I - Main Synthesis Report*. World Bank: Washington, DC.

World Bank. (2020). *Project Appraisal Document for the Cameroon - Chad Power Interconnection Project*. Washington, DC: Energy and Extractives Global Practice - Africa Region.

World Bank. (2021). *Chad Energy Access Scale Up Project (P174495) Concept Note*. Washington, DC: World Bank.

World Bank. (2021). *Chad Poverty Asssessment: Investing in Rural Income Growth, Human Capital, and Resilience to Support Sustainable Poverty Reduction*. Washington, DC: The World Bank.

World Bank. (2021). *Risk and Resilience in Chad*. Washington, DC: World Bank.

World Bank. (2021). *The Human Capital Index 2020 Update - Human Capital in the Time of COVID-19*. Washington, DC: The World Bank. Retrieved from https://openknowledge.worldbank.org/bitstream/handle/10986/34432/9781464815522.pdf?sequence=4&isAllowed=y

World Bank. (2021, October 15). *World Development Indicators*. Retrieved from DataBank: https://databank.worldbank.org/source/world-development-indicators

World Bank Group. (2021, November 1). *Climate Change Knowledge Portal*. Retrieved from World Bank Group: https://climateknowledgeportal.worldbank.org/download-data

World Bank Group, ESMAP, and Solargis. (2021, November 2). Chad. Retrieved from Global Solar Atlas: https://globalsolaratlas.info/download/chad

World Health Organization. (2021). *World Health Statistics 2021 - Monitoring Health for the SDGs*. Geneva: World Health Organization. Retrieved from https://apps.who.int/iris/bitstream/handle/10665/342703/9789240027053-eng.pdf

Wossen, T., Tahirou, A., Arega, A., Shiferaw, F., Jacob, R.-G., Mayong, V., & Amoke Awotide, B. (2017). Productivity and Welfare Effects of Nigeria's e-Voucher-Based Input Subsidy Program. World Development, 251-265.

Zavala, L. (2020). "*Unfair Trade: Market Power in Agricultural Value Chains*". Yale University manuscript.

NOTES

1 World Bank, *Republic of Chad Systematic Country Diagnostic: Priorities for Ending Poverty and Boosting Shared Prosperity* (Washington, DC: World Bank, 2015).

2 It is conceivable that the decline in the Gini coefficient is overstated on account of noise in the 2011 data that exaggerated the extent of inequality.

3 Revealed comparative advantage (RCA) is based on Ricardian trade theory, which posits that patterns of trade among countries are governed by their relative differences in productivity. Although such productivity differences are difficult to observe, an RCA metric can be readily calculated using trade data to "reveal" such differences. The metric can be used to provide a general indication and first approximation of a country's competitive export strengths—without prejudice to applied national measures that affect competitiveness such as tariff/nontariff measures, subsidies, and others. When a country has a revealed comparative advantage for a given product (RCA >1), it is inferred to be a competitive producer and exporter of that product relative to a country producing and exporting that good at or below the world average. A country with a revealed comparative advantage in product i is considered to have an export strength in that product. The higher the value of a country's RCA for product i, the higher its export strength in product i.

4 Thomas Collelo, ed., *Chad: A Country Study* (Washington, DC: Federal Resource Division, Library of Congress, 1988).

5 N'Djamena is 1,100 kilometers (km) from the Atlantic Ocean. The eastern population center of Abéché is 2,650 km from the Red Sea, and the northern population center of Faya-Largeau is 1,550 km from the Mediterranean Sea. The Chari (1,200 km) and the Logone (960 km) Rivers flow from the highlands of Cameroon and Central African Republic into Lake Chad. .

6 Only palm groves south of the Tropic of Cancer survive the dry season in the Saharan zone. United States Agency for International Development Famine Early Warning System Network (USAID FEWS NET), *Chad Livelihood Profiles* (Washington, DC: USAID, 2005). https://pdf.usaid.gov/pdf_docs/PNADE389.pdf.

7 The wildlife include elephants, hippopotamuses, rhinoceroses, warthogs, giraffes, antelopes, lions, leopards, and cheetahs. A. Thomas Grove and Douglas Henry Jones. "Chad" (*Encyclopedia Britannica*, December 9, 2021). https://www.britannica.com/place/Chad.

8 The northern Sahel features wild shrubs and acacia trees and permits the cultivation of date palms, cereals, and garden crops in scattered oases; the central Sahel features drought-resistant grasses and small woods; the southern Sahel features rainfall sufficient to permit crop production on unirrigated land. (Collelo, *Chad: A Country Study*).

9 Collelo, *Chad: A Country Study*. Although Chad's total agricultural land exceeds 49 million hectares, only 6 percent of arable land is cultivated. World Bank, *Chad Poverty Asssessment: Investing in Rural Income Growth, Human Capital, and Resilience to Support Sustainable Poverty Reduction* (Washington, DC: World Bank, 2021), 65.

10 Janani Vivekananda, *Shoring Up Stability: Addressing Climate and Fragility Risk in the Lake Chad Region* (Berlin: Adelphi, 2019), 11, *https://shoring-up-stability.org/wp-content/uploads/2019/06/Shoring-up-Stability.pdf*; Kathryn Hansen, "The Rise and Fall of Africa's Great Lake" (Greenbelt, MD: NASA Earth Observatory, 2017), *https://earthobservatory.nasa.gov/features/LakeChad*.

11 African Minerals Development Centre, "Chad ASM Profile" (Addis Ababa: United Nations Economic Commission for Africa, 2021), https://knowledge.uneca.org/ASM/chad. As of 2018, gold exports totaled $138 million, of which most went to Dubai. International Trade Administration, "Chad: Country Commercial Guide—Mining and Precious Metals" (International Trade Administration, 2020), https://www.trade.gov/country-commercial-guides/chad-mining-and-precious-metals.

12 International Crisis Group, "Chad: Escaping from the Oil Trap" (Africa Briefing 65, Nairobi/Brussels: International Crisis Group, April 26, 2009), https://www.crisisgroup.org/africa/central-africa/chad/chad-escaping-oil-trap.

13 BMZ (German Federal Ministry for Economic Cooperation and Development), "Climate Risk Profile: Chad" (Bonn, Germany: BMZ, 2021), https://agrica.de/wp-content/uploads/2021/01/GIZ_Climate-risk-profile-Chad_EN_final.pdf.

14 BMZ, "Climate Risk Profile: Chad."

15 The 2010 drought resulted in a 25-percent fall in agricultural output and a 16-percent fall in real investment. World Bank, *Escaping Chad's Growth Labyrinth: Disentangling Constraints from Opportunities and Finding a Path to Sustainable Growth* (Washington, DC: World Bank, 2018), 39.Floods in 2012 destroyed 255,000 hectares of cropland. BMZ, "Climate Risk Profile: Chad."

16 World Bank, *Escaping Chad's Growth Labyrinth*. Projections reflect the medium/high emissions scenario (RCP6.0), with temperatures averaged over the whole country. Under the scenario, some parts of the country are projected to have 300 days with temperatures +35°C by 2080.

17 World Bank, *Escaping Chad's Growth Labyrinth*.

18 World Bank, *Escaping Chad's Growth Labyrinth*. Independent of any changes in population, water availability is projected to increase significantly in northern Chad and increase more modestly in central Chad. BMZ, "Climate Risk Profile: Chad."

19 Ibid.

20 Chad's population growth rate fell from a high of 3.9 percent in 2003 to 3.0 percent in 2020. World Bank, *Chad Poverty Assessment: Investing in Rural Income Growth, Human Capital, and Resilience to Support Sustainable Poverty Reduction* (Washington, DC: World Bank, 2021). As of 2021, Chad hosted 479,000 forcefully displaced persons (mostly from Sudan, Central African Republic, and Nigeria), while 336,000 Chadians were internally displaced. UNHCR (United Nations High Commissioner for Refugees), Refugee Data Finder (Geneva: UNHCR, 2021), https://www.unhcr.org/refugee-statistics/download/?url=q2vViO.

21 World Bank, *Chad Poverty Assessment*, 52. Chad's urbanization rate is lower than the Sub-Saharan African average (40 percent) and has not changed for 25 years. World Bank, *Chad Poverty Assessment*, 52.

22 N'Djamena, which serves as a regional market for products such as livestock, salt, dates, and grains sits at the confluence of the Logone and Chari Rivers and forms a transborder agglomeration with Kousséri in Cameroon.

23 Moundou is a historical center of industry, featuring factories for ginning and processing of cotton (constructed in 1926 by the company that became CotonTchad in 1972), a major brewery, and cigarette factory; it is proximate to the country's major oil fields. Moundou is 475 km south of N'Djamena and is on the Mbéré River, a tributary of the Logone.

24 Sarh has a large textile complex constructed in 1967 and is 560 km south of N'Djamena along the Chari River.

25 The economy of Abéché, which is in the far east near the Sudanese border, is dominated by cattle raising, the manufacture of camel-hair blankets, and the delivery of humanitarian assistance to Darfuri refugees.

26 Grove and Jones, "Chad."

27 Grove and Jones, "Chad."

28 Central Intelligence Agency (CIA), "Chad," T*he World Factbook* (2021), https://www.cia.gov/the-world-factbook/countries/chad/

29 The French first invaded Chad in 1891, although not until the Battle of Kousséri in 1900 did France consolidate its authority across the territory. In 1910, Chad was incorporated into the federation of Afrique Équatoriale Française, and, in 1920, Chad became a separate colony. Chad's colonization was presaged by the weakening of the Baguirmi, Ouaddai, and Borno sultanates—which were built on surpluses from trade in ivory, gum arabic, ostrich plumes, salt, and slaves—by wars, predatory raids, shifting trade routes, and a lack of firearms.

30 Most notorious was the Congo-Brazzaville Railway, which killed an estimated 10,000 Chadians. Mario Azevedo, "The Human Price of Development: The Brazzaville Railroad and the Sara of Chad," *African Studies Review* 24, no. 1 (1981): 1–19.

31 Colonial officials instituted a currency "head tax." See Mario J. Azevedo and Emmanuel U. Nnadozie, *Chad: A Nation in Search of Its Future* (Oxford: Westwind Press, 1998): 25. In 1928, 5,000 people were massacred when resisting tax collection (Azevedo and Nnadozie, *Chad: A Nation in Search of Its Future*, 27). Over 1913–18, repression and droughts led to a famine, killing 300,000 people. Samuel Decalo, *Historical Dictionary of Chad* (Lanham, MD: Scarecrow Press, 1997), 327.

32 Jean Cabot, "La Culture du Coton au Tchad," *Annales de Géograph*ie 66, no. 358 (1957): 500.

33 Cabot, "La Culture du Coton au Tchad," 500.

34 Coercion of farmers to increase yields may have contributed to a famine in the early 1970s. Decalo, *Historical Dictionary of Chad*, 29.

35 Robert Buijtenhuijs, *Le Frolinat et les Révoltes Populaires du Tschad, 1965–1976* (New York: Mouton, 1978): 22.

36 Xan Rice, "World Bank Cancels Pipeline Deal with Chad After Revenues Misspent," *The Guardian* (September 11, 2008). https://www.theguardian.com/world/2008/sep/12/worldbank.oil.

37 Celeste Hicks, "Chad and the West: Shifting Security Burden?" (Africa Policy Brief 13, EGMONT—Royal Institute for International Relations, Brussels, Belgium, 2015). Over 2006–09, 80 percent of oil revenues were spent on the military, much of which went to the presidential guard. Battles with Sudan-based rebels broke out in N'Djamena in 2006 and 2008, and the war ended with a peace agreement with Sudan in 2010.

38 Of $10 billion earned from oil over 2003–13, $4 billion was spent on the military. Hicks, "Chad and the West."

39 As of 2018, Chad had experienced conflict and violence in 61 percent of its post-independence years. World Bank, *Escaping Chad's Growth Labyrinth*, 18.

40 World Bank, *Chad Poverty Assessment*, 42.

41 World Bank, *Chad Poverty Assessment*, 42.

42 World Bank, *Escaping Chad's Growth Labyrinth*, 18.

43 Such attacks disrupted trade flows to Nigeria, Chad's biggest export market for livestock.

44 Géraud Magrin and Marc Antoine Pérouse de Montclos, eds., *Crisis and Development: The Lake Chad Region and Boko Haram (*Paris: Agence Française de Développement, 2018): 118, https://www.afd.fr/en/ressources/crisis-and-development-lake-chad-region-and-boko-haram.

45 BBC News, "Chad Gold Mine Collapse Leaves About 30 People Dead," September 26, 2019, https://www.bbc.com/news/world-africa-49839574; Thomas Dietrich, "Alexandre Benalla, Pour Tout l'or du Tchad. [Alexandre Benalla, For All the Gold in Chad], Libération, January 21, 2019, https://www.liberation.fr/debats/2019/01/21/alexandre-benalla-pour-tout-l-or-du-tchad_1704358/.

46 BBC News, "Chad Gold Mine Collapse."

47 FAO, 2020.

48 World Bank, 2021, 58.

49 In rural areas, land traditionally belongs to the community, and no formal titles exist; hence, local populations cannot prevent occupation of their land by powerful individuals, leading to de facto expropriation of land.

50 In August 2019, a state of emergency was declared in Sila and Ouaddaï due to such disputes. World Bank, *Chad Poverty Asssessment*, 68.

51 World Bank, *Chad Poverty Assessment*, 41. The 2020 HCI does not report rankings because of the increase in coverage, the potential for rankings to "artificially inflate small differences in HCI scores," the potential for rankings to "suppress information on the absolute gains and losses economies have made on the HCI," and rankings may distract from the meaningful units described by the index. World Bank, Chad Poverty Assessment, 39–40.

52 World Bank, 2020.

53 World Bank, C*had Poverty Assessment*, 104.

54 World Bank, C*had Poverty Assessment*, 104

55 World Bank, 2020.

56 ibid.

57 ibid., p. 107

58 World Bank, 2020.

59 Stunting, which affects 40 percent of Chadian infants, places children at risk of lifelong cognitive and physical limitations. World Bank, *Chad Poverty Assessment*.

60 World Bank, *Chad Poverty Assessment*, 116–7.

61 Regional average expenditure is 2.4 percent of GDP for public health and 4.0 percent for public education. Income group averages are 2.1 percent for public health and 3.6 percent for public education (World Bank, 2020).

62 Data from 2015 indicate that one-fourth of infants ages 12–23 months have received all prescribed vaccines, and 19 percent had yet to receive any vaccine (World Health Organization, *World Health Statistics 2021: Monitoring Health for the SDGs* (Geneva: World Health Organization, 2021), https://reliefweb.int/report/world/world-health-statistics-2021-monitoring-health-sdgs

63 Fifty percent of Chad's doctors, 88 percent of pharmacists, 100 percent of dentists, and 56 percent of midwives are in N'Djamena. World Bank, *Chad Poverty Assessment*, 121.

64 An estimated 80 percent of newborn deaths could be prevented by skilled birth attendance. World Bank, C*had Poverty Assessment*, 116. Postnatal care for mothers and infants is also low: 78 percent of mothers and 94 percent of newborns do not receive care within 41 days of birth.

65 World Bank, C*had Poverty Assessment*, 23

66 World Bank, 2020.

67 World Bank, C*had Poverty Assessment*, 107

68 World Bank, 2020.

69 Chad's fertility rate of 6.5 births per woman in 2011 fell to 5.7 births per woman in 2018. Chad has one of the highest fertility rates among comparator countries, second only to Mali (5.9 births per woman). World Bank, *Chad Poverty Assessment*, 115.

70 World Bank, C*had Poverty Assessment*, 48.

71 World Bank, C*had Poverty Assessment*, 16.

72 World Bank, C*had Poverty Assessment*, 48.

73 World Bank, *Chad Poverty Assessment*, 19.

74 Fifty percent of households in rural areas are poor, compared with 14 percent in N'Djamena and 23 percent in other urban areas. World Bank, *Chad Poverty Assessment*, 14, 19.

75 World Bank, *Chad Poverty Assessment*, 19.

76 At a regional level, the highest levels of multidimensional poverty are in Lac (which borders Nigeria and Lake Chad and is suffering from population displacement due to the Boko Haram insurgency) and Sila (which borders Sudan and suffers from tensions between farmers and pastoralists and a sharp decline in global price of cotton). World Bank, C*had Poverty Assessment*, 14.

77 Given the importance of family labor to planting, cultivation, and harvesting and to non-farm enterprises, the illness or death of a family member can threaten the livelihood of an entire household. World Bank, 2021, 14, 77.

78 Reductions in the incidence of multidimensional poverty have been driven by housing improvements, increases in asset ownership (particularly cellphones) (World Bank, C*had Poverty Assessment*, 23), and increases in access to electricity among N'Djamena residents; and a broad-based increase in access to improved water sources (World Bank, C*had Poverty Assessment*, 13, 29).

79 World Bank, C*had Poverty Assessment*.

80 World Bank, C*had Poverty Assessment*, 20.

81 World Bank, C*had Poverty Assessment*, 46.

82 World Bank, *Chad Poverty Assessment*, 46.

83 Cotton is one of the only agricultural value chains with industrial processing capacities.

84 Health and education expenditures fell by 8.4 and 5.2 percentage points between 2005 and 2009, respectively. World Bank, 2018, 19.

85 World Bank, Escaping *Chad's Growth Labyrinth*, 15.

86 The Chadian government borrowed $1.4 billion from Glencore to buy back Chevron's shares in the consortium that extracts oil from the Doba fields, a debt that was to repaid by apportioning Glencore a share of oil exports (T. Dietrich, "Alexandre Benalla, pour Tout l'or du Tchad," *Libération*, January 21, 2019, https://www.liberation.fr/debats/2019/01/21/alexandre-benalla-pour-tout-l-or-du-tchad_1704358/). The fall in the price of oil pre-vented repayment deadlines from being met. World Bank, 2021.

87 Between 2016 and 2020, Chad's economy shrank by 5 percent (GDP growth was –6.3 percent in 2016, –3.0 percent in 2017, 2.4 percent in 2018, 3.2 percent in 2019, and –0.9 percent in 2020), whereas its population grew by 16 percent.

88 World Bank, 2018, 21.

89 World Bank, 2018, 23.

90 World Bank, 2018, 23.

91 World Bank, 2018, 48.

92 GDP per capita figures are adjusted to provide purchasing power parity and are expressed in constant 2017 international currency. Analysis of changes in nightlights over the period suggests that national accounts data overstate the extent of growth in the overall economy. World Bank, *Escaping Chad's Growth Labyrinth*, 15. World Bank, 2021.

93 Overall, 28 percent of households generate income from the sale of livestock (World Bank, 2021, 55,70).

94 World Bank, 2018, 43.

95 Between 1962 and 2014, 50 percent of agricultural growth in Chad was driven by the intensive use of inputs—that is, the accumulation of labor and livestock—with just 8 percent stemming from productivity improvements, such as by investing in better seeds, mechanization, or employing advanced cultivation techniques. World Bank, *Escaping Chad's Growth Labyrinth*, 45.

96 World Bank, 2021, 55.

97 Remittances make up a larger proportion of income for households in the Sahelian zone (12 percent) than the Soudanian zone (3 percent). World Bank, 2021, 63.

98 World Bank, 2021, 55.

99 World Bank, 2021, 60.

100 World Bank, 2021, 60.

101 Ninety-nine percent of rural NFEs are informal (World Bank, 2021, 60). NFEs engaged in construction and personal services are less likely to be informal (World Bank, 2021, 60, 62).

102 World Bank, 2021, 61.

103 According to 80 percent of households cite the need to produce food for their own consumption as an obstacle to commercialization (World Bank, 2021, 65).

104 Millet and sorghum account for 33 and 25 percent of farmland, respectively, and are the least commercialized, at 35 and 45 percent (World Bank, 2021, 56). Crop diversification is limited in the Saharan and north Sahelian zones, where 80 percent of land is allocated to millet, but more diversified in the south Sahelian and Soudanian zones.

105 World Bank, 2021, 59.

106 Most livestock sales are made to alleviate economic pressures rather than to provide steady income (World Bank, 2021, 59, 66).

107 World Bank, 2021, 59.

108 World Bank, 2021, 56.

109 World Bank, 2021, 65.

110 Chad is the world's second largest producer of gum Arabic, and the product is Chad's fourth largest export product.

111 As of 1990, two-thirds of date palms in Sub-Saharan Africa were in Chad (primarily in Borkou, Ennedi, and Tibesti). World Bank, 2021, 66. [[AQ: Replace year with title.]]

112 As a member of the Central African Economic and Monetary Community (CEMAC), Chad participates in a regional competition agreement in which competition infringements with regional impacts are investigated by the regional competition authority. Bertelsmann Stiftung, 2020. *BTI 2020 Country Report—Chad. Gütersloh: Bertelsmann Stiftung*. https://bti-project.org/fileadmin/api/content/en/downloads/reports/country_report_2020_TCD.pdf.

113 The six subsectors were electricity generation, transmission, and distribution; post and courier services; water collection, treatment, and supply; fixed line telecommunications; cotton; and sugar (World Bank, 2018, 26, 28).

114 The World Bank Group CPIA business regulatory environment rating—which measures the extent to which the legal, regulatory, and policy environments help or hinder private businesses—was 2.5 for Chad in 2019 (1 = Low to 6 = High). This rating is lower than the Sub-Saharan African average (3.0) and has not changed since 2012.

115 ibid.

116 World Bank, 2018, 24.

117 More than 80 percent of farms cultivate fewer than two hectares (World Bank, 2021, 65).

118 Reports that fewer than 3 percent of Chad's cultivated plots have formal titles, with customary tenure systems dominating (World Bank, 2021, 68). The lack of tenure security potentially hinders long-term investment. Notes that the deficiencies in land registration reduce the cultivatable area available to farmers and hinder the collateralization of land (World Bank, 2018, 51).

119 Less than 2 percent of cultivated plots were irrigated in 2018 (World Bank, 2021, 59). Data from 2002 indicate that just 9 percent of the country's water resources were being used for irrigation and that irrigation networks then covered less than 1 percent of agricultural land (World Bank, 2021, 65). Reasons for the low uptake of irrigation include the "high costs of investment, inefficient use of water resources and a lack of water storage and delivery techniques" (German Federal Ministry for Economic Cooperation and Development, *Climate Risk Profile: Chad*).

120 Whereas 80,640 metric tons (MTs) of synthetic fertilizer was used in Mali between 1990 and 2014, just 9,180 MTs were used in Chad.

121 Insurance encourages farmers to assume risks associated with new crop types and production models (World Bank, 2021, 68).

122 The prevailing method of cultivating gum arabic in Chad relies on propagation, which results in low-quality gum attractive to only a narrow band of export markets (World Bank, 2021, 67).

123 World Bank, 2021, 67.

124 The World Bank found that one-half of rural households had a sick member who did not seek medical treatment even though their condition prevented them from working (World Bank, 2021, 67). A majority of both male and female plot managers lack formal education (57 and 81 percent, respectively) (World Bank, 2021, 67). A further consequence or cause of the lack of technical expertise is insufficient agricultural research, with Chad investing less than 0.1 percent of its agricultural GDP on agricultural research between 2009 and 2014 (World Bank, 2018, 46) found a positive conditional correlation between the proportion of output sold by farmers and the presence of a farmer organization (World Bank, 2021, 67).

125 Notes that "Pastureland is especially critical in Chad, where only 20 percent of households report buying animal fodder" (World Bank, 2021, 58). FAO, 2020.

126 Reports that only 15 and 25 percent of households, respectively, [use] deworming and vaccination services (World Bank, 2021, 58, 59).

127 Crops are primarily rainfed, and productivity is thus adversely affected by the increasing unpredictability of the length and intensity of the rainy season (BMZ, *Climate Risk Profile: Chad*) finds that drought or irregular rainfall affects 20 percent of households (World Bank, 2021, 69).

128 Approximately 3.2 percent of households regularly use asphalt roads, and only 3.4 percent are within reach of a permanent market (World Bank, 2021, 66) notes that "a lack of functioning markets through which high quality, productivity enhancing inputs can be distributed and produce be sold constitutes a key constraint" (World Bank, 2018, 46) found a positive conditional correlation between output sold and access to an asphalt (but not laterite) road and proximity to a permanent (but not periodic) market (World Bank, 2021, 67).

129 BMZ, *Climate Risk Profile: Chad*

130 World Bank, 2021, 69.

131 Employment intensity is measured by livelihoods potentially affected by growth in production and the labor intensity of processing of potential value-added products.

132 World Bank (2022).

133 M. Nako, "Agroalimentaire: la viande, prochain pilier de l'économie tchadienne," *JeuneAfrique*, June 20, 2018, https://www.jeuneafrique.com/mag/575793/economie/agroalimentaire-la-viande-prochain-pilier-de-leconomie-tchadienne/.

134 G. Ahmed, "Chad: Upgrading in the Sesame Seeds and Arabic Gum Global Value Chains" (Background paper for "Chad, Leveraging Export Diversification to Foster Growth," World Bank, Washington, DC., 2018).

135 The regions of Kanem and Ouaddaï may have some producing trees as well.

136 B. A. Tahir and A. Vishwanath, "Market and Value Chain Analyses of Marketable Natural Products from Agroforestry Systems in Eastern Sudan," *Journal of Geoscience and Environment Protection* 3, no. 57-73 (2015), https://pdfs.semanticscholar.org/2da1/239007451b728c66a357919c804099f7ea4e.pdf. Initiatives to formalize quality-grading and traceability should be coordinated with exporter and trader associations such as the Chadian Association for the Promotion of the Arabian Gum (organized in 1999 by Agence Française de Développement) and the National Professional Association of Gum Arabic, as well as regional professional associations that exist in the Batha, Guerra, Salamat, and Hadjer-Lamis regions.

137 Ahmed, "Chad: Upgrading in the Sesame Seeds and Arabic Gum Global Value Chains."

138 World Bank, *Chad—AFCW3 Growth and Diversification—Leveraging Export Diversification to Foster Growth* (Washington, DC: World Bank, 2019), 32, https://elibrary.worldbank.org/doi/abs/10.1596/31839.

139 FAOSTAT, 2021.

140 World Bank, "Republic of Chad: Bovine Live Stock and Arabic Gum Value Chains: Opportunities, Challenges, Actions" (World Bank, Washington, DC, 2014).

141 FAO (2020).

142 World Bank, "Republic of Chad: Bovine Live Stock and Arabic Gum Value Chains."

143 G. Raballand et al., *Why Does Cargo Spend Weeks in Sub-Saharan African Ports? Lessons from Six Countrie.* (Directions in Development—Trade, Washington, DC: World Bank, 2012), https://openknowledge.worldbank.org/handle/10986/13535.

144 World Bank (2018).

145 Health inspections must occur before slaughter to prevent the slaughtering of sick animals, and after slaughter, carcasses must be stamped to indicate the condition of the animal.

146 An attempt to establish a private system of veterinarians in the 1990s through deregulation failed. MEPA (Ministry of Livestock and Animal Husbandry), "National Livestock Development Plan: 2017–2021" (MEPA, N'Djamena, 2017).

147 L. Zavala, "*Unfair Trade: Market Power in Agricultural Value Chains*," (Yale University research, New Haven, CT, 2020).

148 Ahmed, "Chad: Upgrading in the Sesame Seeds and Arabic Gum Global Value Chains."

149 Processors use manual and semi-manual methods to produce 0.5-1 liter of oil from 2 kg of seeds. In some cases, sesame seeds are pressed with peanuts to produce edible oil when peanut prices are high.

150 Ahmed, Chad: Upgrading in the Sesame Seeds and Arabic Gum Global Value Chains."

151 FAOSTAT, 2021.

152 Ahmed, "Chad: Upgrading in the Sesame Seeds and Arabic Gum Global Value Chains."

153 Faced with a loss of production and reduced cotton prices shortly after independence, Chadian government officials employed physical coercion to local leaders and villages to increase cotton yields, contributing to famine early and mid-1970s following major droughts in the Sahel. R. Buijtenhuijs, *Le Frolinat et les Révoltes Populaires du Tschad, 1965–1976* (New York: Mouton, 1978), 29.

154 Several processing facilities exist in the country.

155 Before privatization (World Bank, 2018), it was recommended to break up the CotonTchad monopsony by divesting gins to multiple investors. As this didn't occur, CotonTchad's control of the entire value chain provides Olam with clear commercial benefits at the expense of farmers.

156 The transaction involved a CFAF 29 billion loan to the government in order to clear arrears to farmers accrued by the company under state ownership. The loan will be repaid over 3 years through deductions from CotonTchad's tax liability. The government is also currently considering privatization of the state-owned textile manufacturer, the New Textile Society of Chad.

157 In early 2021, CotonTchad bought cotton at CFAF 227/kg, above the international price of CFAF 202/kg, with the plan to recoup the subsidy by offer a price lower than the international price when the latter recovers. It is unclear how much of the surplus farmers will receive once international prices recover. Agence Française de Développement and CotonTchad provided seed financing to commence this subsidy program.

158 J. Baffes, D. Larson, and P. Varangis, *Commodity Market Reforms: Lessons of Two Decades* (Washington, DC: World Bank, 2001).

159 T. Wossen et al. "Productivity and Welfare Effects of Nigeria's e-Voucher-Based Input Subsidy Program," *World Development* (2017): 251–65.

160 FAOSTAT, 2021.

161 Such skills gaps are common in Sub-Saharan Africa, and it is not further discussed in the context of this CPSD.

162 According to SDG7 data published by the IEA in 2019, South Sudan (1 percent) and Central African Republic (3 percent) have lower levels of access than Chad (9 percent) and levels of access in Democratic Republic of Congo (9 percent) are comparable to Chad. IEA (International Energy Agency), "SDG7: Data and Projections," IEA report, 2020, https://www.iea.org/reports/sdg7-data-and-projections. See also World Bank (2021).

163 Twenty-three percent of poor households in N'Djamena are connected to the national grid. World Bank (2021), p. 37.

164 World Bank (2021).

165 World Bank (2020).

166 World Bank (2018). TCHADINFOS, "Opinion: Non monsieur le président, la SNE n'a pas changé ses mauvaises pratiques," 2020, https://tchadinfos.com/tchad/opinion-non-monsieur-le-president-la-sne-na-pas-change-ses-mauvaises-pratiques/. TCHADINFOS noted, "A N'Djaména, l'électricité demeure toujours un luxe. Certains quartiers font plus d'une semaine pour recevoir ou pas de l'énergie. Dans d'autres, les ampoules s'allument vers 2 heures du matin et s'éteignent à l'aube."

167 World Bank (2021), p. 37.

168 World Bank (2021).

169 World Bank (2021).

170 World Bank (2020).

171 The World Bank (2018) reports that power supply costs in Chad are comparable to other small African countries, including Cape Verde, the Comoros, the Gambia, Liberia, São Tomé and Principe, and Sierra Leone.

172 World Bank (2018).

173 World Bank (2018).

174 World Bank (2018).

175 World Bank (2018).

176 World Bank (2021). Access may also be increased by increasing imports from Cameroon and developing transmission and distribution infrastructure.

177 World Bank (2021).

178 World Bank (2021).

179 GOGLA, *Global Off-Grid Solar Market Report—Semi-Annual Sales and Impact Data, January–June 2020*, 2020, https://www.gogla.org/sites/default/files/resource_docs/global_off_grid_solar_market_report_h1_2020.pdf. The World Bank (2021) reports "the results of an off-grid solar energy market study, conducted under the ROGEP project, the solar irrigation/pumping market comprises more than 45,000 units."

180 World Bank (2021).

181 World Bank (2021).

182 The World Bank (2021) reports that the main barriers to the increased adoption of SHS include "(a) low affordability; (b) competition by the informal market of substandard products; (c) lack of financing for both companies and end users; (d) low levels of consumer awareness of solar solutions; and (e) country security constraints."

183 Seventy percent of the rural and 27 percent of the urban population cannot spend more than $10 per month in out-of-pocket expenses on electricity.

184 Foreign investment in the power sector is particularly affected, as the profitability of investments requires the government to respect PPAs, guarantees, and other contractual terms.

185 Conversion of 80 percent of diesel plants to HFO would lower average generation cost to $0.19/kWh (World Bank 2020).

186 SNE currently lacks a "systematic least-cost planning approach" for generation, transmission, or distribution (World Bank, 2018), resulting in the acceptance of unsolicited proposals that would represent marginal savings over existing generation technologies and that potentially impose additional contingent liabilities that further undermine the creditworthiness of the utility.

187 High turnover at the ministerial level has hindered the capacity of technical experts to develop a least-cost strategy or master plan, while the centralization of authority under the previous administration further undermined the involvement of technical experts.

188 These deficiencies manifested in the recurring acceptance of unsolicited and relatively high-cost proposals for capacity generation, the preparation of projects without feasibility studies, and a lack of transparency within SNE and its reporting agencies that hindered the capacity of donors and other stakeholders to coordinate investments and interventions.

189 A few viable projects have been stalled by negotiations with the government over PPAs (tariffs), guarantees, and other terms.

190 A waterfall mechanism was instituted for the power sector in Ghana in 2017. World Bank, "Financing Agreement between Republic of Ghana and International Development Association. Second Macroeconomic Stability for Competitiveness and Growth - Development Policy Financing," Washington, DC, 2017, https://documents1.worldbank.org/curated/en/142401513961087274/pdf/ITK425962-2017112211142.pdf.

191 World Bank (2018).

192 The feasibility of building transmission infrastructure to connect Chad's largest towns and cities might also be further explored.

193 The N'Djamena–Doula corridor is intermodal, with a railway link between Douala and Ngaoundere in northeastern Cameroon.

194 The corridors through Sudan and Libya simply make no economic sense due to the long overland distances, the traffic conditions, and the fact that they are at the opposite ends of the country's populated centers.

195 The corridors through Sudan and Libya simply make no economic sense due to the long overland distances, the traffic conditions, and the fact that they are at the opposite ends of the country's populated centers.

196 Logistics Cost Study of Transport Corridors in Central and West Africa, *SSATP 2013*.

197 Border compliance to export (import) is 202 hours (271 hours) in Cameroon; 106 hours (242 hours) in Chad; and 97 hours (126 hours) across Sub-Saharan Africa. Border compliance to export (import) is $983 ($1,407) in Cameroon; $319 ($965) in Chad; and $603 ($691) across Sub-Saharan Africa. (World Bank, World Development Indicators, 2021).

198 J.-F.Arvis, *Chad Trade and Transport Facilitation Audit* (Washington, DC: World Bank, 2004), https://documents1.worldbank.org/curated/en/345051468017457955/pdf/477750WP0TD0Fa1B0x033886OB01PUBLIC1.pdf.

199 TCL providers transport, store, and distribute foodstuffs and other perishable products in a temperature-controlled environment.

200 C. D. Ksoll, D. Pulido, and H. Gupta, *Temperature Controlled Logistics: Essential for Health and Growth* (Washington, DC: World Bank Group, 2021). TCL providers transport, store, and distribute foodstuffs and other perishable products in a temperature-controlled environment.

201 Due to the ability to sell production much farther afield and/or on demand, TCL contributes to income stabilization for agricultural households. In emerging markets, credible third-party TCL providers are increasingly involved in developing multi-user cold-chain facilities.

202 World Bank, *TCHAD—Etude diagnostique sur l'intégration commerciale*. vol. 1 (Washington, DC: World Bank, 2006), https://enhancedif.org/en/system/files/uploads/chad_dtis_fr_0.pdf?file=1&type=node&id=2902.

203 A. J. Torres Martínez et al., "Cost-Effectiveness of Enforcing Axle-Load Regulations: The Douala-N'Djamena Corridor in Sub-Saharan Africa," *Transportation Research Part A: Policy and Practice* 107 (January 2018): 216–28, https://www.sciencedirect.com/science/article/pii/S0965856416311946; M. I. Pinard, "Overload Control Practices in Eastern and Southern Africa: Main Lessons Learned" (Sub-Saharan Africa Transport Policy Program (SSATP) Working Paper 91, World Bank, Washngton, DC, 2010).

204 A deep-dive diagnostic and market analysis of the transport sector in Chad and Cameroon can help understand challenges, market gaps/barriers, and necessary activities to be developed for IFC engagement with financial institutions that want to expand their transport portfolio through the fleet renewal of trucks in this corridor.

205 GSMA Intelligence (2020).

206 Chad ranks 100th of 101 emerging markets in terms of B2C e-commerce (UNCTAD, 2020).

207 ITU (2019).

208 GSMA Intelligence (2020).

209 The retail market hosts a third mobile operator with less than 1 percent market share.

210 Telegeography (2019).

211 Under a best-case scenario, the reform mix could result in up to a 50 percent drop in the wholesale transit price and a 10 percent drop in retail market concentration, increasing the coverage of mobile telephony and internet by 3 and 5 percentage points, respectively, by 2025, increasing 4G coverage by 8 percentage points, and reducing the price of mobile telephony and internet by 6 and 9 percent, respectively. As a result, the penetration rates of mobile telephony and internet would reach 45 percent and 27 percent, respectively, by 2025, instead of a projected 44 percent and 26 percent, absent any reform (GSMA Intelligence, 2020). Such increase in access to quality mobile connectivity will add up to $55 million to GDP from 2025 onward, create 8,400 jobs, and lift approximately 180,000 individuals out of poverty.

212 World Bank (2021), p. 37.

213 Chad's National Development Plan 2017–2021 estimates financing needs at $66 million and $10 million, respectively.

214 IFC (2020).

215 For every barrel of oil, at least three barrels of produced water are generated. Because the water has been in contact with the hydrocarbon-bearing formation for centuries, it has some of the chemical characteristics of the formation and the hydrocarbon itself. It may also include water from the reservoir, water injected into the formation, and any chemicals added during the drilling, production, and treatment processes. However, existing technologies and treatment processes can turn produced water into fresh water, offering water-stressed, oil-producing countries like Chad an opportunity to develop produced water management capacities.

216 One option is to leverage Olam's investment in livestock to create a demand for irrigated fodder.

217 Such operating costs may include the cost of constructing and operating treatment and disposal facilities; the cost of managing any residuals or by-products resulting from the treatment of produced water; permitting, monitoring, and reporting costs; and transportation costs.

218 Oil companies are obliged to provide original data to the Ministry of Petroleum, which is currently developing a data management and cadaster system with World Bank support. The Ministry and the NOC, however, have limited capability to carry out G&G interpretation.

219 World Bank, *Chad—AFCW3 Growth and Diversification: Leveraging Export Diversification to Foster Growth* (Washington, DC: World Bank, 2019), 32, https://elibrary.worldbank.org/doi/abs/10.1596/31839.

220 SME Finance Forum (2017).

221 Chad Financial Sector Note (2021).

222 The cost of registering a property in 2020 was 8.1 percent of the property value, compared with 7.3 percent in Sub-Saharan Africa (World Bank, Doing Business Indicators, 2020).

223 Banking penetration is lower than the average rate in the CEMAC subregion (12 percent).

224 A. Demirgüç-Kunt et al., *The Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution* (Washington, DC: World Bank Group, 2018), https://globalfindex.worldbank.org/.

225 IFC, "Equipment Leasing in Africa: Handbook of Regional Statistics 2017" (IFC, Washington, DC, 2017).

226 IMF (International Monetary Fund), "Chad: Selected Issues," July 2019, https://www.imf.org/en/Publications/CR/Issues/2019/07/31/Chad-Selected-Issues-48548.

227 IMF, *Chad: Staff Report for the 2019 Article IV Consultation, Fourth Review Under the Extended Credit Facility Arrangement, Request for Modification of Performance Criteria, and Financing Assurances Review* (Washington, DC: IMF, 2019).

228 IMF Financial Access Survey data.

229 Even before the pandemic, Chad's banking system was in a poor state. As of December 2019, five out of eight Chadian banks were classified as fragile by COBAC and one bank was rated in "critical" condition. An August 2020 IMF report noted worsening banking sector vulnerabilities due to the crisis, the tight sovereign-bank nexus, and high dependency on the oil sector.

230 World Bank (2018).

231 Transparency International, *Corruption Perceptions Index 2020* (Berlin: Transparency International, 2021).

232 IMF, *Chad: Staff Report for the 2019 Article IV Consultation*.

233 Bertelsmann Stiftung's Transformation Index (BTI), Chad Country Report (2022). In an interim report published in November 2012, the Chadian Minister of Justice and Good Governance announced that CFAF 25 billion (about €38 million) had been recovered thanks to the anti-corruption campaign. However, the operation was deemed by international observers as politically motivated and used as a way to eliminate political opposition.

234 IMF, *Chad: Staff Report for the 2019 Article IV Consultation*.

235 T. Berger and L. Cotula, *A Time for Change: Comments on Chad's Draft Land Code* (London: International Institute for Environment and Development, 2015), https://pubs.iied.org/sites/default/files/pdfs/migrate/G03953.pdf. Chad ranked 120th out of 129 countries in the 2020 International Property Rights Index. See S. Levy-Carciente and L. Montanari, *International Property Rights Index 2020* (Washington, DC: Property Rights Alliance, 2020), https://atr-ipri2017.s3.amazonaws.com/uploads/IPRI+2020+Full+Report.pdf.

236 Multiple bodies are involved in the oversight of the oil sector. The oil sector is under the supervision of the Ministry of Petroleum and Energy, which is responsible for the development and implementation of the government policies for the sector. The main bodies involved in oil sector oversight are the Collège de Contrôle et de Surveillance des Recettes Pétrolières, which is in charge of verifying the appropriate budgetary allocation and use of petroleum resources, and SHT, the public enterprise that manages government oil assets.

237 IMF, *Chad: Staff Report for the 2019 Article IV Consultation*.

238 IMF, *Chad: Staff Report for the 2019 Article IV Consultation*.

239 The World Health Organization estimates that 230 health workers per 100,000 population is the necessary minimum threshold to ensure proper population health.

240 *Plan National de Développement Sanitaire* (2018–2021).

241 A consultation in the public sector, for instance, cost CFAF 500 in 2020, whereas a consultation with a private sector specialist could cost CFAF 10,000.

242 *Plan National de Développement Sanitaire* (2018–2021).

243 PBF combines linking health-care payments to performance with increased provider autonomy and supervision. PBF makes a payment to a government, organization, or individual provided that specific measurable actions have been undertaken to achieve a desired goal. With the support of various donors such as USAID, many developing countries have used PBF to improve the quality, availability, and adoption of health services (Mayaka Manitu et al., 2015).

244 Kiendrébéogo et al. (2017).

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