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Poverty Notes

Dynamics of Poverty and Inequality following the Rise of the Oil Sector

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GOVERNMENT FISCAL YEAR

WEIGHTS AND MEASURES

Metric System

ABBREVIATIONS AND ACRONYMS

BIA	Benefit Incidence Analysis
CFAF	Central African CFA Franc
DSA	Debt Sustainability Analysis
GDP	Gross Domestic Product
GNI	Gross National Income
HDI	Human Development Index
ECOSIT	Chadian Household Consumption and Informal Sector Survey (*Enquête sur la Consommation et le Secteur Informel au Tchad*)
HIV	Human Immunodeficiency Virus
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IMF	International Monetary Fund
IMF	International Monetary Fund
INSEED	National Institute of Statistics and Economic and Demographic Studies *(Institut National de la Statistique, des Études Économiques et Démographiques)*
MDGs	Millennium Development Goals
MoH	Ministry of Health
NGO	Non-Governmental Organization
NPRS	National Poverty Reduction Strategy
PER	Public Expenditure Review
PRSP	Poverty Reduction Strategy Paper
PRSP I	First Poverty Reduction Strategy *(Première Stratégie Nationale de Réduction de la Pauvreté)*
PRSP II	Second Poverty Reduction Strategy *(Deuxième Stratégie Nationale de Réduction de la Pauvreté)*
MTEF	Medium-Term Expenditure Framework
UNDP	United Nations Development Program
WDI	World Development Indicators

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Table of Contents

List of Tables

List of Figures

List of Appendixes

List of Appendix Tables

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The quantitative analysis of trends in poverty and inequality presented here is based primarily on the 2003 and 2011 Chadian Household Consumption and Informal Sector Surveys (ECOSIT2 and ECOSIT3), which were funded by the World Bank.

Executive Summary

i. In Chad, as in many other countries Sub Saharan African Countries, poverty remains a primarily rural phenomenon. According to the most recent household consumption and informal sector survey (ECOSIT3), conducted in 2011, the incidence of monetary poverty was over twice as high in rural areas (52 percent) as it was in in urban centers (21 percent). Since roughly 82 percent Chadians live in rural areas the combination of a higher poverty incidence and a larger population share means that the rural sector is home to the overwhelming majority of the nation's poor.

ii. Not only is rural poverty more pervasive than urban poverty, it is also far more severe. The poverty gap index (a measure of how far the average income of the poor falls below the poverty line) is much higher for the rural population than it is for their urban counterpart (at 22.6 percent and 6.6 percent, respectively). Poverty in Chad is also closely correlated with low level of education, large numbers of children per household, and a large overall household size—educational and demographic features that are especially common in rural areas.

iii. Between 2003 and 2011 Chad achieved moderate but significant progress in overall poverty reduction, and the national poverty headcount rate fell from 55 percent to 47 percent during the period. However, the decline in the poverty rate was more than offset by population growth, and as a result the total number of poor Chadians increased by 15 percent. Progress on nonmonetary poverty has been similarly modest. Despite improvements in school attendance and access to clean drinking water many Chadians still face severe deprivation across a range of basic needs. For instance, an estimated 93 percent of Chadians lack access to adequate sanitation.

iv. An increase in rural-urban migration accompanied, and appears to have contributed to, the reduction in poverty observed during the 2003-2011 period. Oil revenues have fuelled a boom in public infrastructure projects and spurred an influx of rural Chadians to the country's major cities. These dynamics have directly contributed to rural poverty reduction by attracting poor rural workers to higher-paying urban jobs, and have generated equally important indirect effects, through higher domestic remittances and increased urban demand for rural goods[1], with the latter demonstrated by rapidly rising food prices. Indeed the rural-urban population shift contributed to more than 30 percent of the poverty reduction observed between 2003 and 2011. Rural poverty is both a cause and effect of the way the rural economy is structured. Because of the abundant labor supply, production in nearly all segments of the rural economy is extremely labor-intensive. Farmers, and especially the poorest among them, typically use hand tools and

[1] Food prices increased on average by more than 5 percent annually since 2003.

animal traction, while mechanization is essentially limited to a small number of cash-crop plantations.

v. Measures of the antipoverty impact of growth and inequality dynamics present a mixed picture. In 2003 a 1 percent increase in consumption translated into a 0.81 percent reduction in the poverty headcount, but in 2011 a 1 percent increase in consumption prompted a drop of 1.05 percent in the poverty headcount. Meanwhile, the percentage decrease in poverty as a result of a 1 percent decrease in inequality (measured as the Gini coefficient) rose sharply, from 0.17 percent in 2003 to 0.35 percent in 2011. Going forward, a central challenge of Chad's poverty-reduction strategy will be to broaden the inclusiveness of growth and moderate the accelerating stratification of income and wealth that is too often the consequence of a booming natural-resource sector.

vi. Chad launched its First Poverty Reduction Strategy (PRSP I) in 2003, and over the past decade the government's poverty-reduction efforts have benefitted from a dramatic increase in public investment which accompanied the growth of oil production. In addition to its impact on employment and income, oil-revenue-financed public investment has yielded considerable improvements in the country's infrastructure. In 2004 only about 700 km of Chad's roadways were paved (less than 2 percent of the total road network). By 2012 about 1600 km of roadway had been paved, including most major roads in N'Djamena and the roads connecting major cities. Investment in the health and education sectors has also increased substantially during the oil era. However Chad's investment spending has not been very efficient and its impact could be greatly strengthened by improvements in public financial management.

vii. A number of factors impeded the implementation of both the PRSP I and its successor, the PRSP II. The physical and economic damage caused by internal political instability, which erupted into large-scale violence in 2006 and 2008, greatly disrupted poverty-reduction efforts. In addition, severe humanitarian crises in neighboring Sudan and Central African Republic have driven hundreds of thousands of refugees across the border into Chad, compounding the internal displacement of native Chadians and further straining the country's fiscal and economic resources. Finally, demographic pressures remain a serious challenge, as achieving broad-based income growth and sustainable poverty reduction in the context of an annual population growth rate of 3.5 percent will continue to prove extremely difficult.

viii. Notwithstanding the positive income and employment impacts of increased infrastructure investment, the overall effect of oil revenues on the national poverty rate has been relatively small, and the benefits of growth have accrued primarily to wealthier Chadians. The richest 20 percent of Chadians accounted for about 48 percent of total consumption expenditures in 2011, while the poorest 20 percent accounted for only 5 percent. Growth in consumption expenditures has been driven by increases in urban areas, while the rural

sector has lagged behind. This pattern provides a further indication of the relative concentration of growth in the urban economy and its widening disparity with the rural sector. This divide is also evident in the analysis of poverty dynamics by province, though changes in predominantly urban and rural provinces have not been uniform and stem from a number of different causes. N'Djamena had the country's lowest poverty rate in 2011, reflecting in part the disproportionate benefits of oil revenue and oil-related investment concentrated in the capital. The decline of the cotton sector, which was the nation's largest export industry before the advent of oil production, severely affected the Logone Occidental and Tandjilé Regions, both of which saw their poverty headcount rates rise over the period. Meanwhile, the Mayo-Kebbi Region, the poorest in 2003, experienced the largest reduction in poverty, with an absolute decrease in the poverty headcount rate of 29.2 percent, thanks largely to government investments in rice production and the support of non-governmental organizations (NGOs) and the donor community.

ix. Thus far, the impact of the oil sector on the domestic non-oil economy appears relatively limited. Oil production has not helped to reduce Chad's economic vulnerability because oil company activities in are highly localized, capital-intensive and import-dependent. As a result, the only direct links between the oil sector and the larger economy are through the employment of a small number of local workers and through investment in oil-related development activities. In 2012, oil company employment and oil-related development activities together represented just 3.6 percent of GDP.

x. Substantial progress has been made in extending key social services to the poor and underserved, yet the overall fiscal orientation of public spending on the education and health sectors is not pro-poor. In the health sector beneficiaries in the poorest consumption quintile received only 6 percent of total public healthcare spending, while beneficiaries in the richest quintile received 46.5 percent. Public healthcare spending is not targeted to the poor in any meaningful way, and the most sophisticated and well-funded facilities are located in wealthier urban centers. In the education sector public spending is more uniform across income groups, and the poorest enjoy a slight advantage at the primary-school level. However, at the secondary level spending and benefits start to become very regressive, and this trend accelerates in tertiary education, where the richest quintile captures almost 70 percent of total public spending. This is not the result of spending inequities between schools or a bias in favor of secondary- and tertiary-education overall, but is instead the effect of unequal access to higher education levels. Members of the richest quintile attend universities at a rate that vastly exceeds that of the poor. By contrast, access to primary education is basically uniform, in line with the government's objective of providing universal service.

1. Introduction

1.1 **Chad's chronically unstable security situation has long undermined broad-based economic growth and sustainable poverty reduction**. Since independence in 1960 Chad has suffered from sporadic political violence and ongoing tensions between different factions. The country's fragile security has been further compromised by interference from neighboring states and spillover effects from regional conflicts. However, after rebel attacks in 2008 and 2009, and following the recent conclusion of a peace agreement between Chad and Sudan, the security situation in the country has remained relatively calm, presenting a valuable window of opportunity for development efforts to take root.

1.2 **Chad remains among the poorest and least-developed countries in the world.** Chad ranked 183rd out of 187 countries in the 2012 Human Development Index (HDI). While some progress has been made **towards** the achievement of the Millennium Development Goals (MDGs), the country is not on track to reach many of these targets. According to the 2010 MDG implementation report, only three of Chad's MDGs are within reach: primary education, access to safe drinking water, and the fight against HIV/AIDS (UNDP 2010).

1.3 **The emergence of the oil sector offers unprecedented prospects for economic growth and poverty reduction.** Since oil production came on-stream in 2003 public revenues and expenditures have increased dramatically. The 2004 budget was the first to reflect the influx of oil revenues, and total government revenue increased more than six fold between 2003 and 2011. However, Chad's estimated oil reserves are relatively modest and are expected to be depleted within the next 25 years.

1.4 **In 2011 the government carried out its third Household Consumption and Informal Sector Survey (ECOSIT3).** This was a follow-up to the 2003 survey (ECOSIT2), which provided a baseline for poverty levels in Chad prior to the emergence of oil revenues. ECOSIT3 followed the **ECOSIT2** methodology as closely as possible, and it is the comparability of results between poverty estimates for 2003 and 2011 that enables an assessment of the impact of oil production on poverty and inequality in Chad.

1.5 **The objective of this Poverty Note is to examine changes in poverty and inequality in Chad since the emergence of the oil sector.** It will focus on the evolution of poverty indicators from the 2003 pre-oil baseline captured in the ECOSIT2 to the more recent findings of the 2011 ECOSIT3 and **compare** current monetary and nonmonetary poverty conditions in Chad with those of comparable countries. It will go on to assess the impact of oil production on the non-oil sectors of the Chadian economy. Finally, it will evaluate the extent to which public expenditures in the social sectors benefit the poor by analyzing the progressivity of social spending.

2. Overarching Trends: Modest Poverty Reduction Coupled with Growing Inequality

2.1 **In order to monitor changes in economic and social development conditions in Chad the National Institute of Statistics and Economic and Demographic Studies (INSEED) and its partners have been collecting cross-sectional nationally representative household survey data since 2003 through the ECOSIT survey.** The first ECOSIT survey (ECOSIT1) took place in 1995, but it was not nationally representative and the methodology, particularly the consumption module, was altered substantially prior to the second round in 2003. Unfortunately, the methodological differences between these two household surveys limit the possibilities for evaluating longer-term trends. Key differences between the ECOSIT1 and its two successors, including their geographical coverage, sample size, nomenclature, data collection techniques, and the calculation of key indicators make impossible to compare their results directly.

2.2 **However, the ECOSIT2 and ECOSIT3, conducted in 2003 and 2011, were based on a very similar methodology, allowing for an evaluation of trends in poverty and inequality as oil revenues and oil-related investments impacted the Chadian economy.** The following sections examine this impact in terms of: (i) monetary poverty trends (ii) distributional changes in consumption expenditures, (iii) trends in inequality, (iv) the poverty-growth-inequality triangle, (v) multidimensional poverty trends, and (vi) the experience of poverty reduction in Chad compared with that of some countries in Sub-Saharan Africa.

A. The Implementation of the ECOSIT Surveys and the Methodology for Constructing the Welfare Aggregate and Poverty Line.

2.3 **The samples in each of the two ECOSIT surveys are nationally representative; they are disaggregated into urban and rural cohorts and by geographic region.**[2] The sampling unit is the household. The surveys were conducted using a sample of 7,008 households in 2003 and 10,206 households in 2011 and cover a broad range of household demographic characteristics, including education and literacy, health status, employment, migration and displacement, housing conditions, household expenses, income-generating activities, and access to basic services.

2.4 **To ensure comparability with the ECOSIT2 the same techniques were used for defining the welfare aggregate and the poverty line, as well as for recording regional disparities.** The indicator measuring the welfare of the household is the average annual household consumption per capita, normalized by a cost-of-living index. Final household consumption includes monetary consumption, consumption of home production, food items received as gifts, remittances from other households, and the rental cost of all housing and durable goods owned by the household. The food poverty line is derived from the basic-needs food basket, which includes 33 food items commonly consumed in Chad, and is based on the generally recommended food-energy threshold of 2400 kcal per capita per day.

[2] The ECOSIT3 sampling framework consists of a comprehensive list of 12,150 enumeration areas (EAs) from the Second Census of Population and Housing. The ECOSIT3 and ECOSIT2 are a two-stage areal sampling with stratification in the first degree; the EA is the primary sampling unit. Each region is divided into two (2) strata: urban and rural. Given the high population density of N'Djamena, each of its 10 districts is an urban stratum.

2.5 **The national poverty line is the sum of the cost of reaching the food threshold plus the cost of essential non-food goods.** The latter is calculated as the average non-food expenditure of the 10 percent of households closest to the food-poverty line (the 5 percent of households below it and the 5 percent above). Finally, regional disparities in terms of relative cost of living in different regions are accounted for by regional deflators. In 2011 the national poverty line was CFAF 237,942, of which CFAF 159,991 reflected the cost of reaching the food threshold and CFAF 77951 reflected the cost of essential non-food goods.

2.6 **In 2003, the national poverty line was CFAF 144,570, of which CFAF 102,243 represented the food threshold, and CFAF 42,328 represented the cost of essential non-food goods.** To calculate the regional deflator region-specific prices of each item in the food basket were compared. Household food consumption calculations were done using adult-equivalent measures. The equivalence scale used is in the same as in the analysis of living standards for ECOSIT2, for which an adult man is 1 adult equivalent, an adult woman is 0.8, and a child under 15 is 0.5.

B. MONETARY POVERTY TRENDS

National, Rural and Urban Monetary Poverty

2.7 **In 2011, about 47 percent of Chadians were living below the national poverty line.** Table 2.1, below, shows that the incidence of monetary poverty is over twice high in rural areas (52 percent) as it is in urban centers (21 percent). As Chad's population is overwhelmingly rural (82 percent), the higher rural poverty incidence means that the countryside is home to nearly 92 percent of the nation's poor. Despite the 21 percent urban poverty rate only 8 percent of the poor live in urban areas.

Table 2.1: Monetary Poverty by Urban and Rural Areas in 2011

	Poverty Headcount Rate		Poverty Gap		Squared Poverty Gap		Distribution of the Poor		Distribution of Population	
	2003	**2011**	**2003**	**2011**	**2003**	**2011**	**2003**	**2011**	**2003**	**2011**
Urban	24.4	20.9	7.4	6.6	3.2	3.0	4.7	8.2	10.5	18.4
Rural	58.4	52.5	23.1	22.6	11.7	12.6	95.3	91.8	89.5	81.6
Total	**54.8**	**46.7**	**21.5**	**19.7**	**10.8**	**10.8**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Authors' calculations based on data from the ECOSIT3

2.8 **Rural-urban migration contributed substantially to poverty reduction in Chad between 2003 and 2011.** As Table 2.1 illustrates, the urban share of the population nearly doubled during the period, yet the urban poverty rate declined. A sectoral decomposition of the change poverty rates[3] indicates that the intra-sectoral component (poverty reduction within urban and rural areas) represents 69.2 percent of the overall poverty change, while the inter-sectoral component (the population shift between urban and rural areas) represents 33.1 percent.

[3] See Appendix Table C.1.

2.9 **The antipoverty impact of rural-urban migration appears to be the result of a virtuous cycle spurred by urban development.** New opportunities in urban areas attract poor rural workers, who benefit directly through higher wages. Meanwhile, those who remain in rural areas benefit indirectly through domestic remittances and through increasing demand for rural goods in urban areas, boosting food prices and increasing rural incomes (Christiaensen et al. 2013). Although the oil sector is both highly capital-intensive and import-dependent, which reduces its direct employment impact, the dramatic increase in both public and private investment that accompanied the rise the industry generated a large number of construction-related jobs, bolstering the rural-urban migration trend.

2.10 **Although monetary poverty remains pervasive, the national poverty headcount rate fell from 54.8 percent in 2003 to 46.7 percent in 2011.** This trend was driven by declining rural poverty rates, which fell from 58.4 to 52.5 percent, while urban poverty rates fell more modestly from 24.4 to 20.9 percent. This dynamic reflects the primary impact of oil-related investment on urban employment, which spurred a moderate reduction in urban poverty despite large-scale rural-urban migration, as well as the more complex secondary impact of a growing urban economy on the rural sector. Although recent growth has been largely urban-focused the indirect effects of urban growth on poverty reduction in the rural sector have not only been both relatively larger in percentage terms than the direct effects on the urban sector, they have also had a far greater influence on poverty reduction nationwide.

2.11 **The decrease in the poverty headcount rate during the period, though substantial, was more than offset by population growth, and as a result the absolute number of Chadians living in poverty rose from 4.1 million in 2003 to 4.7 million in 2011.** The rural and urban sectors also exhibited widely different trends in population growth and absolute poverty rates. The total number of urban poor doubled during the period, yet the urban population grew so rapidly that its poverty rate still declined. Meanwhile, the total number of rural poor increased by just 9 percent, well below the rural population growth the rural population growth rate. These trends further illustrate the dramatic impact of rural-urban migration on the dynamics of poverty in Chad.

2.12 **Measures of the severity of poverty present a mixed picture.** The poverty gap index,[4] which measures the difference between the average income of the poor and the poverty line, decreased slightly from 21.5 percent to 19.7 percent, indicating that not only did the poverty rate decline, but those that remained below the poverty line were, on average, marginally better off. However, the squared poverty gap, a variation on the poverty gap index that is especially sensitive to extreme poverty, stood unchanged at 10.8 percent. As with the poverty headcount, the poverty gap and the squared poverty gap were higher for rural areas. The poverty gap dropped from 23.1 percent in 2003 to 22.6 percent in 2011, while the squared poverty gap rose from 11.7 to 12.6

[4] The poverty headcount, the poverty gap and the poverty and the squared poverty gap are members of the Foster-Greer-Thorbecke poverty indexes. The poverty headcount index shows the share of households below the poverty line, but it does not measure how far below. The poverty gap shows how far below the poverty line households are on average, and is expressed as a percentage of the poverty line. The squared poverty gap gives greater weight to inequality among the poor. Squaring the poverty gap for each household creates a measure that is especially sensitive to incomes that fall far below the poverty line rather than those that are just slightly below it. As a result, the poverty gap index not only illustrates the income gap between the poor and the non-poor, it also emphasizes the prevalence and severity of extreme poverty.

percent. This marginal increase in extreme poverty may be an indirect consequence of rural-urban migration, as the booming urban economy is likely drawing-off some of the most productive workers from poor rural families, and urban-rural remittances may not always be sufficient to compensate for the loss of labor income.

Regional Monetary Poverty Trends

2.13 **The ECOSIT surveys revealed large variations in the distribution of monetary poverty across Chad's regions.** In 2011 the poverty rate was lowest in N'Djamena (11 percent), while the two highest poverty rates were found in Moyen-Chari/Mandoul and Logone Occidental. N'Djamena, Chad's largest city and primary economic center, has benefitted more from the growth of oil production, construction and services than the rest of the country. In the largely agricultural Moyen-Chari/Mandoul and Logone Occidental Regions, however, growth was slowed by an overall decline in cash-crop production, particularly cotton, which was Chad's largest export commodity prior to the emergence of the oil sector.

2.14 **Chad's cotton sector, which has long played a central role in the rural economy, is mired in a deep and sustained crisis.** Cotton production decreased from 270,000 metric tons in 1997 to just 33,000 metric tons in 2009. The cotton sector faces a number of significant challenges. On the external side, export prices remain depressed due to the lingering effects of the global economic slowdown, and the CFAF is appreciating relative to the US Dollar. On the domestic side, many producer organizations are in deep financial arrears to Cotontchad, the state cotton company, which itself suffers from a dysfunctional institutional structure. Finally, the Ouaddaï/Sila Region experienced a spike in local inflation that negatively affected the purchasing power of its population; this was caused by a large influx of refugees from the conflict in neighboring Darfur beginning in 2005.

2.15 **While monetary poverty rates by region illustrate the geographical distribution of poverty, population data indicate the relative contribution of each region to the national poverty rate.** The data presented in **Error! Reference source not found.** show that in 2011 N'Djamena had the smallest fraction of poor people, while the Moyen-Chari/Mandoul, Mayo-Kebbi and Chari-Baguirmi/Hadjer-Lamis Regions had the three largest. N'Djamena had the country's fifth-largest population share (8.2 percent) but due to its low poverty rate it accounted for a very small fraction of the total poor population (1.9 percent). Meanwhile, Moyen-Chari/Mandoul, Mayo-Kebbi and Chari-Baguirmi/Hadjer-Lamis, the three regions with largest shares of the total population, were also the three largest contributors to the national poverty rate.

2.16 **The Logone Occidental, Ouaddaï/Sila and Tandjilé Regions all saw their monetary poverty headcount rates rise between 2003 and 2011.** In every other region the incidence of poverty declined, but to different degrees.[5] Deteriorating conditions in the cotton sector affected Logone Occidental and Tandjilé most severely, as cotton cultivation is especially important in these areas, and the impact of weakening cotton production is reflected in their rising poverty rates.

[5] It should be noted that the observed reductions in Batha and Ouaddai/Sila were not statistically significant. For more, see Table A3 in Appendix.

2.17 **The Mayo-Kebbi Region, which had been the poorest in the nation in 2003, experienced the largest decrease in its headcount poverty rate—a decline of 29.2 percent.** This was due to a combination of large-scale government investments in rice production and successful interventions by both non-governmental organizations (NGOs) and donors in support of rural populations in the region.

Table 2.2: Monetary Poverty by Region

	Poverty Headcount Rate		Distribution of the Poor		Distribution of Population	
	2003	**2011**	**2003**	**2011**	**2003**	**2011**
Batha	47.8	45.6	5.7	3.6	6.5	3.7
Borkou/Ennedi/Tibesti/Wadi-Fira	55.1	39.4	4.3	4.8	4.3	5.6
Chari-Baguirmi/Hadjer-Lamis	49.3	43.5	9.1	11.0	10.1	11.8
Guéra/Salamat	62.4	59.8	7.7	9.9	6.8	7.8
Bahr-el-Gazel/Kanem/Lac	54.3	40.6	8.7	7.3	8.8	8.4
Logone Occidental	57.5	66.4	7.3	9.7	7.0	6.8
Logone Oriental	64.6	48.6	9.2	8.4	7.8	8.1
Mayo-Kebbi	71.8	42.5	15.7	12.6	12.0	13.8
Moyen-Chari/Mandoul	68.9	67.0	14.8	16.2	11.8	11.3
Ouaddaï/Sila	34.4	35.3	6.3	6.9	10.0	9.1
Tandjilé	61.8	65.3	8.4	7.8	7.4	5.5
N'Djamena	20.7	11.0	2.9	1.9	7.6	8.2
Total	**54.8**	**46.7**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Authors' calculations based on data from the ECOSIT2 and ECOSIT3

Monetary Poverty Demographics

2.18 **In both 2003 and 2011 the monetary poverty rate among female-headed households was lower than the rate for male-headed households.** In 2011 the poverty rate for female-headed households was 42.6 percent, compared with 47.4 percent for households headed by men. The poverty headcount rate for female-headed households of declined by 8.9 percent from 2003, but the share of poor people living in female-headed households increased slightly from 13.4 percent to 14.3 percent. Meanwhile, the total number of poor people living in female-headed households rose by 21 percent, from 550,716 to 667,209, as the poor population increased nationwide.

2.19 **The relationship between poverty and the education level of the head-of-household displays a more conventional pattern, with educational attainment inversely correlated with poverty incidence.** More than six out of ten poor people live in households headed by a person with no formal schooling, and nearly three out of ten live in households whose head achieved only primary school. Households headed by a graduate of secondary school or a professional (vocational/technical) school are far less likely to be poor, while poverty in households headed by a university graduate is extremely rare.

Table 2.3: Monetary Poverty by Gender and Education of the Head of Household, 2003 and 2011

	Poverty Headcount Rate		Distribution of the Poor		Distribution of Population	
	2003	**2011**	**2003**	**2011**	**2003**	**2011**
Gender of the household head						
Male	55.4	47.4	86.6	85.7	85.7	84.4
Female	51.5	42.6	13.4	14.3	14.3	15.6
Education of the household head						
Without school	54.7	48.5	62.1	62.9	62.2	60.5
Islamic school	47.8	36.4	4.5	1.7	5.1	2.1
Primary school	63.9	52.1	26.1	26.7	22.4	23.9
Secondary school	44.8	34.0	6.9	8.4	8.4	11.6
Professional school	18.4	9.7	0.3	0.1	0.8	0.6
University	8.5	7.6	0.2	0.2	1.1	1.3
Total	**54.8**	**46.7**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Authors' calculations based on data from ECOSIT2 and ECOSIT3

2.20 **Household poverty rates were positively correlated with large numbers of children and with large overall household size**. The poverty headcount increased with the number of children aged 0-6 living in the household. The poverty headcount was higher than average among households with two or more children in 2003 and among households with three or more children in 2011. Poverty rates also increased with household size. In 2011 poverty rates were lowest among single-person households (10.9 percent) and highest among households with 7 members or more (54.1 percent); poverty rates were higher than average for all households with 6 members or more, reflecting the large median household size among the poor.

Table 2.4: Monetary Poverty by Demographic Composition

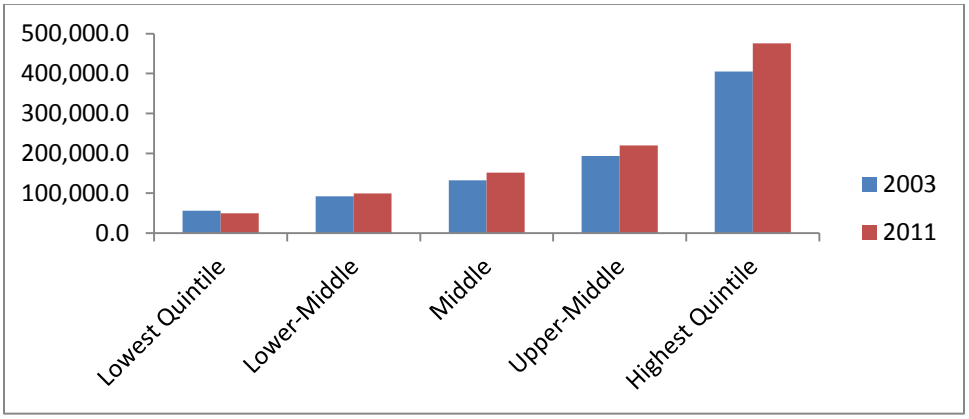
	Poverty Headcount Rate		Distribution of the Poor		Distribution of Population	
	2003	**2011**	**2003**	**2011**	**2003**	**2011**
Number of children 0-6 years old						
no children	41.1	37.5	14.8	13.9	19.8	17.2
1	48.9	42.8	17.7	16.7	19.9	18.2
2	55.7	45.1	27.4	27.0	26.9	28.0
3 or more	65.7	54.1	40.1	42.4	33.4	36.6
Household size						
1	14.9	10.9	0.2	0.3	0.8	1.1
2	18.6	17.3	1.0	1.1	3.1	3.1
3	28.3	27.5	2.9	3.1	5.6	5.2
4	35.3	29.6	5.6	6.5	8.7	10.2
5	43.4	40.2	8.8	10.6	11.1	12.4
6	54.9	52.5	11.9	15.5	11.9	13.8
7 or more	64.8	54.1	69.6	62.9	58.9	54.3
Total	**54.8**	**46.7**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Authors' calculations based on data from ECOSIT2 and ECOSIT3

C. DISTRIBUTIONAL CHANGES IN CONSUMPTION EXPENDITURES

2.21 **In order to better understand trends in the incidence and severity of poverty it is useful to analyze changes in the distribution of consumption expenditures.** On average, real consumption expenditures are higher in urban areas than in rural areas, and the consumption gap between the rich and poor has widened over time. In 2003 the mean per capita consumption expenditure of the top quintile was about 7 times higher than that of the bottom quintile. In 2011 it was 9 times higher. Moreover, consumption in the bottom quintile decreased slightly over the period, while consumption expenditures increased for all other groups. Consumption in the top quintile rose by18 percent.

Figure 2.1: Average per Capita Consumption by Quintile, 2003 and 2011



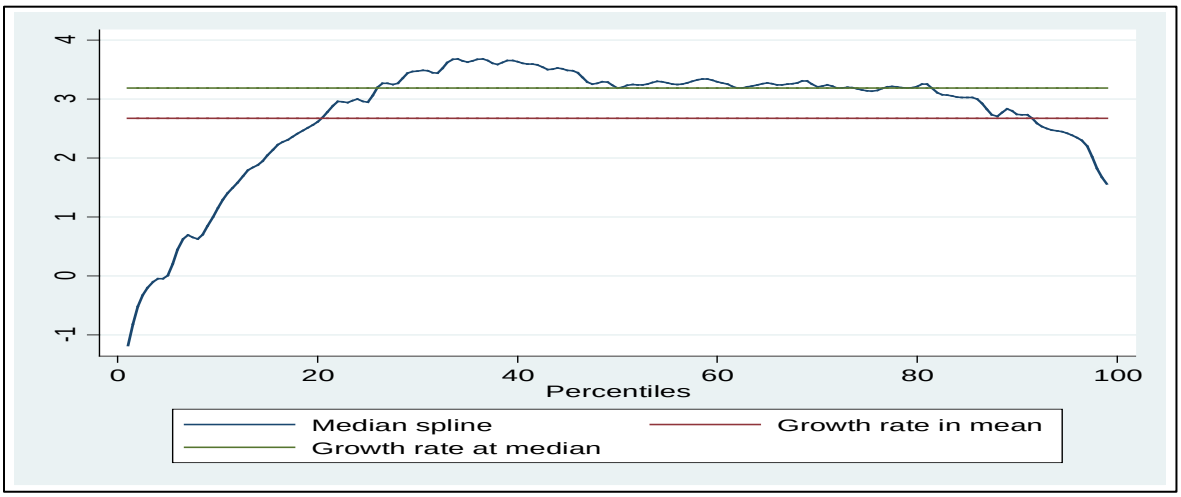
Source: Authors, based on data from ECOSIT2 and ECOSIT3

2.22 **Regionally, N'Djamena enjoyed the highest average consumption expenditures, at twice the national average, and experienced the largest increase in consumption over the period, at 14.1 percent.** Average consumption expenditures increased between 2003 and 2011 in almost all regions, but at widely different growth rates. Outside the capital consumption growth exceeded the national average (1.7 percent) in four regions: Mayo-Kebbi (6.3 percent), Borkou/Ennedi/Tibesti/Wadi-Fira (6.0 percent), Bahr-el-Gazel/Kanem/Lac (3.4 percent) and Logone Oriental (3.1 percent). These regions also recorded very large absolute declines in poverty incidence. However, consumption expenditures declined in three regions where the poverty incidence either increased or remained unchanged: Logone Occidental (-2.9 percent), Tandjilé (-1.0 percent) and Moyen-Chari/Mandoul (-1.0 percent)

2.23 **The effect of recent economic growth on overall poverty reduction has been relatively small, as the benefits of growth have accrued largely to wealthier Chadians.** Growth incidence curves provide a useful illustration of this trend (Ravallion 2003; Haughton and Khandker 2009). These curves show growth rates in consumption across consumption groups, starting from the poorest on the left to the wealthiest on the right. The national growth incidence curve presented in Figure 2.2 shows real average annual growth rates between 2003 and 2011 for each percentile of the consumption distribution. Consumption levels have increased for almost all percentiles except those in the bottom fifth of the distribution. The annual consumption growth rates from the 20^{th} to the 90^{th} percentiles are over the mean growth rate. However, the average

growth rates in the lowest percentiles are negative, and growth rates remain below average for the entire bottom quintile. These results reflect a substantial increase in inequality over the period.

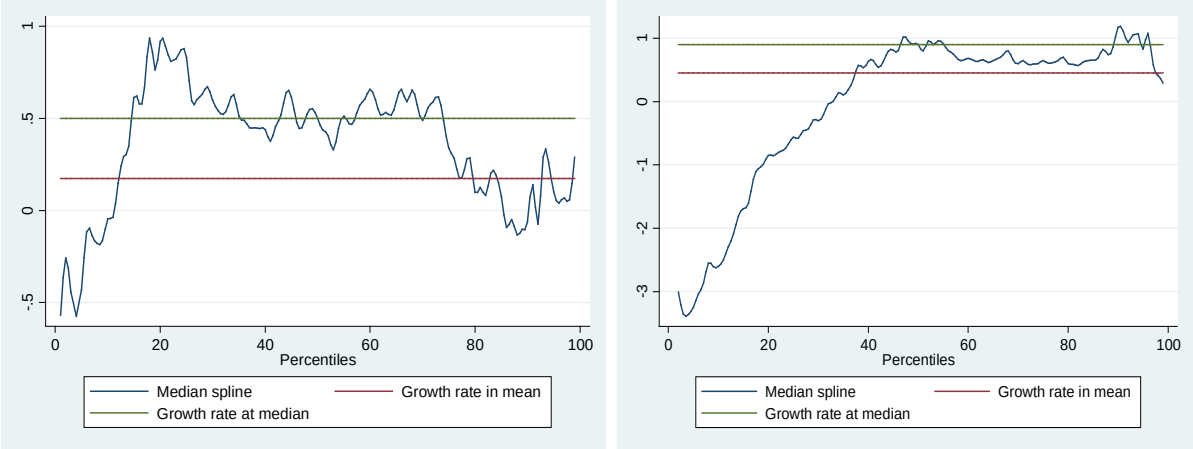
Figure 2.2: Consumption Growth Incidence Curve, 2003-2011



Source: Authors, based on data from the ECOSIT2 and ECOSIT3

2.24 **Economic growth during the period had a greater impact on the urban poor than on the rural poor, though rural-urban migration complicates the observed trends.** The difference between consumption growth in rural and urban areas is illustrated in Figure 2.3. Whereas consumption growth rates in rural areas were positive only for those in the 40th percentile and above, in urban centers positive growth rates began at the 10th percentile.

Figure 2.3: Consumption Growth Incidence Curves for Urban and Rural, 2003-2011

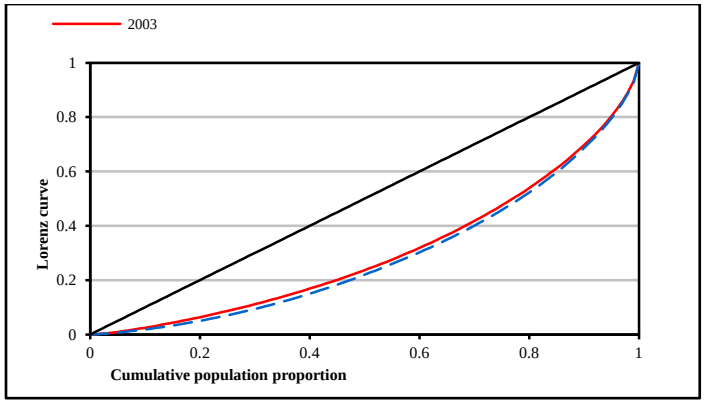


Source: Authors, based on data from the ECOSIT2 and ECOSIT3

D. TRENDS IN INEQUALITY

2.25 **Between 2003 and 2011 inequality in the distribution of consumption increased moderately across nearly all consumption groups.** Figure 2.4 shows that the 2011 Lorenz curve falls below the 2003 curve from the 10th to the 90th percentile, while the extreme ends of the distribution show no meaningful change. The Gini coefficient[6] rose from 39.4 percent in 2003 to 42.1 percent in 2011.

Figure 2.4: Consumption Lorenz Curves, 2003-2011



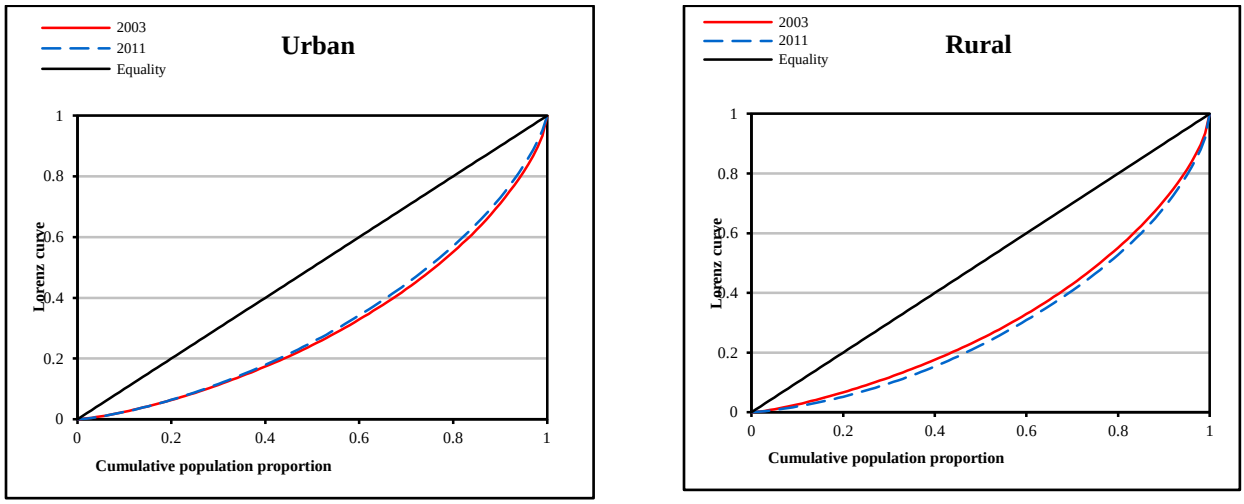
Source: Authors, based on data from ECOSIT2 and ECOSIT3

2.26 **Inequality was greater in rural areas than in urban centers, and this disparity increased over the period**. In 2011 rural areas displayed a Gini coefficient of 41.6, compared with 36.2 for urban areas; however, in 2003 the rural and urban Gini coefficients were virtually identical at 38.2 and 37.9, respectively. As shown in

2.27 Figure 2.5, inequality declined in urban areas for the 30 percentile and above, while inequality in rural areas increased between the 10th and 95th percentiles of the consumption distribution. This latter trend indicates that the distribution of consumption appears to have deteriorated between 2003 and 2011.

[6] The Gini coefficient for any year is defined as the area between the line of equality and the Lorenz curve of that year divided by the total area under the line of equality.

Figure 2.5: Consumption Lorenz Curve for Urban and Rural Areas, 2003-2011

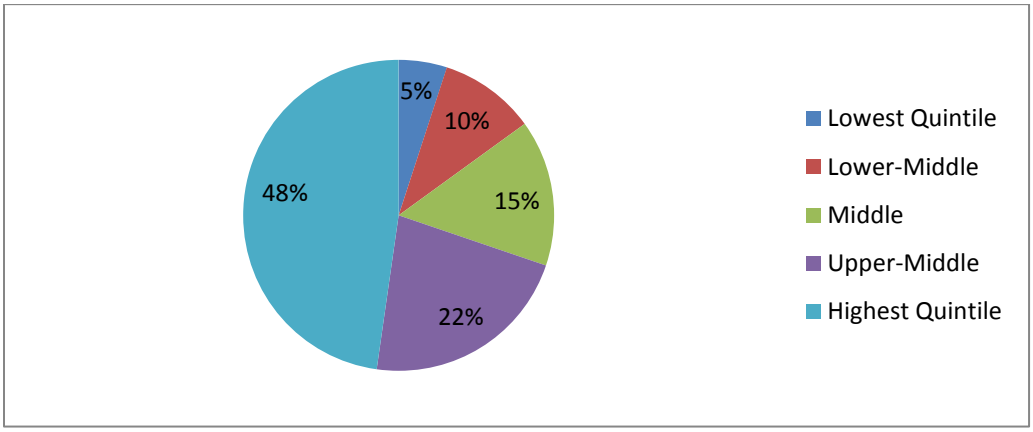


Source: Authors, based on data from the ECOSIT2 and ECOSIT3

2.28 **Income inequality varied substantially across regions.** In 2011 inequality was highest in Borkou/Ennedi/Tibesti/Wadi-Fira, with a regional Gini coefficient of 44.7, followed by Tandjilé at 44.6. The distribution of welfare became increasingly unequal between 2003 and 2011 in most regions, reflecting the broader national change in income inequality. However, inequality declined in N'Djamena, falling by 4.3 over the period, while Mayo-Kebbi and Logone Oriental also experienced drops in their Gini coefficients of 1.3 and 1.4, respectively. In line with the broader trend of greater urban equality N'Djamena became the least unequal region in consumption terms in 2011, with a Gini coefficient of 33.2.

2.29 Consumption disparities between the richest and poorest are very large. The richest 20 percent of Chadians accounted for about 48 percent of total consumption expenditures in 2011, while the poorest 20 percent accounted for just 5 percent. The total consumption share of the top quintile was about 9.5 times more than the bottom quintile (see figure 2.6 below).

Figure 2.6: Consumption Shares by Quintile, 2011



Source: Authors, based on data from ECOSIT2 and ECOSIT3

2.30 **Sustainable poverty reduction in Chad will require not only the continuation of strong GDP growth rates, but also broad decreases in inequality.** In 2003 a 1 percent increase in consumption translated into a 0.81 percent reduction in the poverty headcount, but in 2011 a 1 percent increase in consumption yielded a 1.05 percent reduction, indicating that poverty rates are adequately sensitive to income growth. Meanwhile, the percentage decrease in poverty as a result of a 1 percent decrease in inequality (measured by the Gini coefficient) rose from 0.17 percent in 2003 to 0.35 percent in 2011, underscoring the considerable pro-poor impact of declines in inequality. These results imply that effective poverty reduction in Chad will require both a sustained long-term increase in the mean level of per capita income and greater equality in the distribution of income.

2.31 **Many factors contribute to the relatively low level of poverty reduction observed in Chad during its recent period of rapid growth.** High rates of rural poverty are a both a cause and effect of the way the rural economy is structured. A large majority of the Chadian labor force (over 70 percent in 2011) is engaged in agriculture or closely related activities in the rural economy; most of these workers are employed on smallholder farms or in family-run microenterprises. Because of the abundant labor supply, production in nearly all segments of the rural economy is extremely labor-intensive. Farmers, and especially the poorest among them, typically use hand tools and animal traction, while mechanization is essentially limited to a small number of cash-crop plantations. Animal husbandry, agroforestry, fishing and other ancillary rural-sector activities are most often based on a household production model in which labor is the most important component, and even the retail, transportation and service sectors tend to favor labor-intensive practices. With an extremely high labor-to-capital ratio, the returns to labor across all sectors of the rural economy are extremely low (World Bank 2012).

Table 2.5: Elasticity of Poverty with Respect to Consumption and Inequality, National, Urban and Rural, 2003 and 2011

	Poverty Headcount Rate		Poverty Gap		Squared Poverty Gap	
	2003	2011	2003	2011	2003	2011
Elasticity of Poverty with Respect to Consumption						
Urban	-1.75	-1.59	-2.07	-1.93	-2.22	-2.07
Rural	-0.77	-1.00	-1.43	-1.22	-1.77	-1.42
Total	-0.81	-1.05	-1.45	-1.26	-1.79	-1.45
Elasticity of Poverty with Respect to Inequality						
Urban	2.09	2.09	4.07	4.09	5.39	5.42
Rural	0.11	0.09	1.30	1.52	2.33	2.60
Total	0.17	0.35	1.55	1.90	2.65	3.08

Source: Authors' calculations based on data from the ECOSIT2 and ECOSIT3

E. MULTIDIMENSIONAL POVERTY TRENDS

2.32 **The information provided by monetary poverty analysis can be very useful for policy design, but without a thorough understanding of poverty's nonmonetary dimensions it remains incomplete.** Nonmonetary poverty includes lack of education, health, housing, employment, empowerment, dignity, and personal security, among many others. The Multidimensional Poverty Index (MPI), launched by the United Nation's Development Programme's Human Development Reports Office in 2010, is designed to quantify and measure

these aspects of poverty. A modified version of the MPI was used to assess multidimensional poverty dynamics in Chad between 2003 and 2011.[7]

2.33 **Chadians continue to face severe deprivation across a range of basic needs.**[8] In 2011 45 percent of Chadians lived in households in which no member could read and write in either French or Arabic; more than half of all Chadians lived in households in which per capita food consumption was below the food-poverty line; about 93 percent of Chadians lived in households that lacked adequate sanitation; and nearly all Chadians lived in households that relied on environmentally damaging and potentially hazardous biomass fuels such as wood or charcoal. Nevertheless, there have also been some moderate improvements in primary school attendance, access to clean drinking water, and basic asset ownership.

2.34 **Illiteracy is an especially serious concern, and the percentage of Chadians with literate household members declined significantly between 2003 and 2011.** The share of Chadians reporting no literate household members rose from 33 percent to 45 percent at the national level. This trend was widespread; literacy indicators deteriorated in rural areas, urban centers and in almost all regions. Improvements were recorded in only three regions: Logone Oriental, Mayo-Kebbi and Moyen-Chari/Mandoul.

2.35 **There has been meaningful improvement in primary school attendance, though attendance rates remain relatively low.** The proportion of individuals living in households in which children did not attend school decreased from 50 percent to 45 percent; this trend was driven by increased school attendance rates in rural areas and partially offset by lower attendance rates in urban centers. School attendance improved in all regions except Chari-Baguirmi/Hadjer-Lamis, Bahr-el-Gazel/Kanem/Lac and N'Djamena, where it increased, presumably, because of the frequent employment of children under 15 years old in the informal sector in those regions and because of rapid rural-urban migration—as large numbers of people move to the cities, urban schools have trouble absorbing the influx of new students. These three regions have relatively large urban populations, which is causing their overall regional enrollment rates to deteriorate.

2.36 **More than half of all Chadians lived in households in which per capita food consumption was below the food-poverty line.** There was no significant change in this indicator between 2003 and 2011, either at the national level or between the rural and urban sectors. Improvements in food consumption were observed in three regions. In Logone Oriental the share of the population with food expenditures below the food-poverty line declined from 65 percent to 56 percent; in Mayo-Kebbi the share dropped from 71 percent to 53 percent; and in N'Djamena it fell from 32 percent to 24 percent.

2.37 **Fewer than 4 percent of Chadians lived in households which had access to electricity or owned a generator or a solar panel.** Power generation, both public and private, is essentially confined to the capital, and only a tiny fraction of the rural population has access to electricity. Indeed, the only area to experience a measurable improvement in electrification was N'Djamena, where the share of the population without electric power decreased from 81 percent to 75 percent.

[7] A methodological overview of the MPI and its adaptation for use in Chad is provided in Appendix A.
[8] Tables A5 and A6 in appendix provide data on the MPI.

This trend was driven by rising urban incomes and falling prices for generators and solar panels, with private power generation now becoming the main source of household electricity.

2.38 **93 percent of Chadians lived in households that lacked adequate sanitation.** Sanitation indicators deteriorated between 2003 and 2011, as the share of the population without adequate sanitation access rose from 87 percent to 93 percent nationwide. Declines in sanitation access were especially pronounced in urban areas, where the rate of deprivation increased by 20 percent, compared with a 7 percent increase in rural areas.

2.39 **Access to clean drinking water improved over the period, yet more than sixty percent of Chadians still lacked an adequate water source.** The proportion of individuals living in households without access to clean drinking water fell from 71 percent to 61 percent, as improving water access in rural areas offset a worsening trend in urban centers. This dynamic may be the result of rural-urban migration, as a swiftly rising urban population strains an already inadequate urban water infrastructure. Meanwhile, migration slows the rural population growth rate, allowing rural water projects to catch up with demand

2.40 **In 2011, 98 percent Chadians lived in households which used wood or charcoal for cooking, compared with 89 percent in 2003.** The widespread deforestation caused by the use of biomass cooking fuel presents a serious environmental threat, particularly in Chad's northern Saharan and central Sahelian regions. The production and sale of artisanal charcoal is officially illegal, though enforcement is highly uneven. The lowest rate was recorded in N'Djamena, where the use of biomass fuel fell from 90 percent to 85 percent over the period, due in part to stricter local enforcement of the charcoal ban and in part to the greater availability of electricity and hydrocarbon fuels in the nation's largest urban market.

2.41 **In 2011 93 percent Chadians lived in households which had a dirt, sand or dung floor, which serves as a proxy for overall housing quality.** At the national level the incidence of inadequate housing decreased slightly between 2003 and 2011, driven by improvements in urban housing, where the share of people with dirt, sand or dung floors fell from 77.5 percent to 73 percent.

2.42 **Asset ownership has increased dramatically, and between 2003 and 2011 the proportion of Chadians living in households that did not own at least one radio, telephone, bicycle or motorbike was cut nearly in half.** This was due in large part to the proliferation of mobile phones, with inexpensive cellphone models and low-cost airtime now available throughout much of the country. Once again, N'Djamena was far ahead of the national trend, with basic asset ownership rates rising from 62.5 percent in 2003 to 93.6 percent in 2011.

2.43 **In 2011 roughly 84 percent of Chadians experienced material deprivation under at least three of the nine MPI indicators.** Chad's aggregate MPI score for 2011 was 0.562, marginally better than its 2003 MPI score of 0.569. In broad terms, the decline of the MPI in 2011 is due in part to Chad's falling poverty headcount rate and the moderate decrease in the intensity of poverty observed between 2003 and 2011. However, there are also a number of complicating factors associated with the rapid growth of the oil sector and its effects on the urban and rural economies.

2.44 **Multidimensional poverty is both more intense and more severe in rural areas than it is in urban centers, and many of the observed trends in multidimensional poverty are the result of complex rural-urban dynamics.** A booming urban economy is driving improvements in asset ownership (supported by lower cellphone prices) and in housing quality, while higher urban incomes (and cheaper generators) are also partially offsetting the failure of electrification rates to keep pace with population growth. However, the influx of people to major cities is also straining infrastructure and administrative capacity, with negative impacts on school enrollment and on water and sanitation access. Nationwide rates of school enrollment and access to clean water remain positive despite worsening in urban areas, while the inadequacy of urban sanitation systems is leading the negative trend in sanitation access nationwide. Finally, rates of food consumption, literacy and the use of biomass cooking fuel are either unaffected by this process and remain essentially unchanged, or they are impacted by exogenous factors such as enforcement of the charcoal ban.

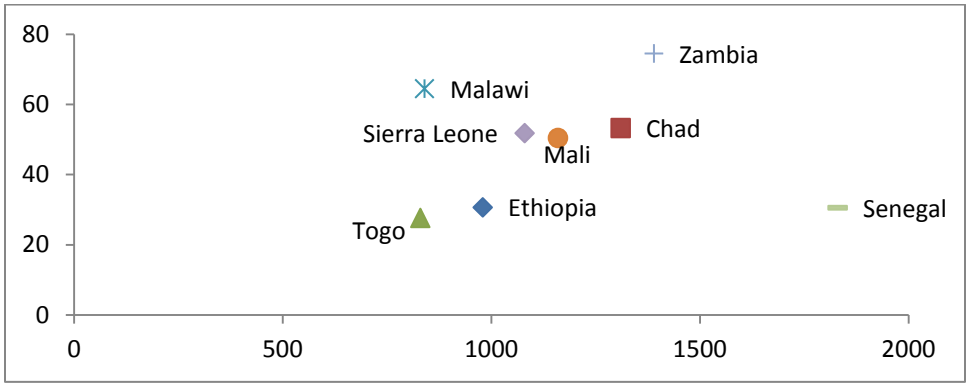
2.45 **Regional changes in nonmonetary poverty indicators closely reflect trends in monetary poverty.** N'Djamena has the lowest MPI score of any region in the country, while the regions with the three highest MPI scores, Chari-Baguirmi/Hadjer-Lamis, Mayo-Kebbi and Moyen-Chari/Mandoul, have the nation's three highest poverty headcount rates.

2.46 **Despite their lower monetary poverty rate Chadians living in female-headed households experienced more multidimensional poverty than those in male-headed households.** The monetary poverty headcount for female-headed households was 52 percent in 2003 and 43 percent in 2011, while for male-headed households it was 55 percent and 47 percent, respectively. However, female-headed households had higher MPI scores than their male-headed counterparts (see Table 2.3, above, and Table A6 in Appendix).

F. POVERTY REDUCTION IN CHAD COMPARED WITH OTHER RESOURCE-BASED AND NON-RESOURCE-BASED ECONOMIES

2.47 **In Figure 2.7 below, Chad's GNI per capita and poverty headcount ratios are compared with those of other African countries.** The advent of oil production has increased Chad's GNI per capita beyond that of other Sahelian countries, such as nearby Mali. During the last decade Chad's GNI per capita has increased by more than 100 percent, versus 59 percent in Mali. However, this increase in national income did not lead to a commensurate reduction in poverty. Despite its high GNI per capita compared to other countries, Chad's poverty headcount stands at 53 percent. This compares unfavorably against rates of 50 percent in Mali and 28 percent in Togo.

Figure 2.7: GNI per capita (US$ PPP) and Poverty Headcount Ratios for Selected African Countries



Source: The World Bank.

Note: This figure compares poverty headcount ratios using available household surveys in 2010-2011; GNI per capita is calculated using the international poverty line of US$ 1.25 (US$ PPP) in 2010.

3. The Impact of the Emerging Oil Sector on the Domestic Economy and the Public Finances

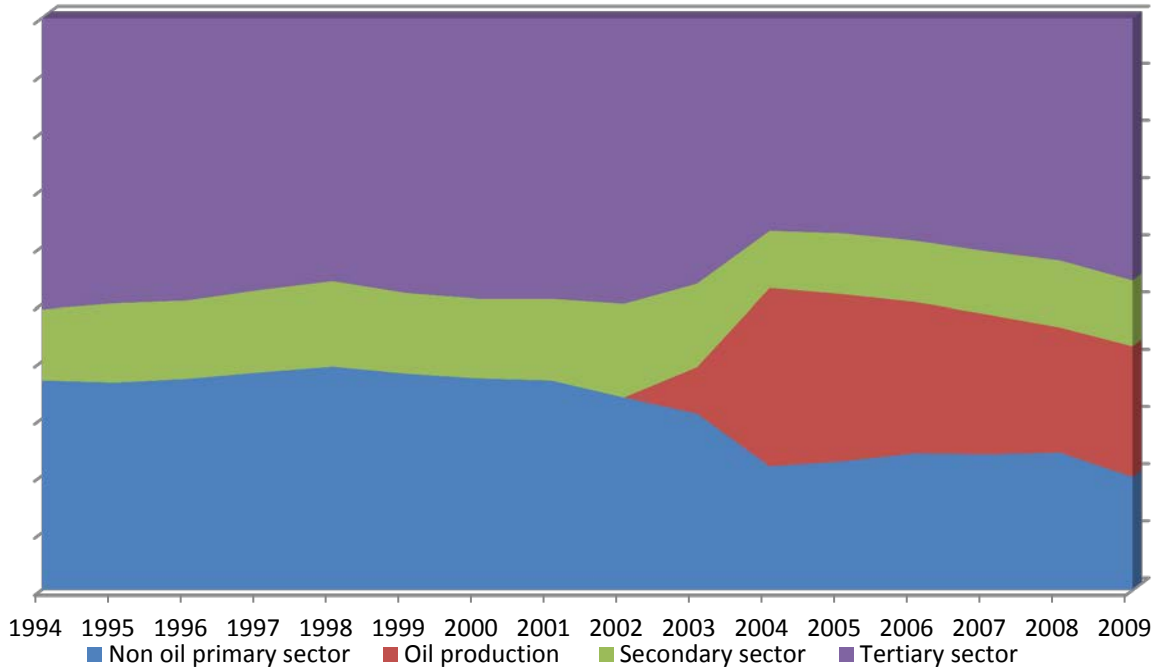
3.1 **Between 2002 and 2003 production commenced in Chad's incipient oil sector.** Crude oil swiftly came to dominate Chadian exports and provided a massive infusion of public revenue. Private investment, concentrated in N'Djamena and other urban centers, also increased dramatically, and the direct and indirect impacts of the oil sector have greatly influenced trends in poverty and inequality.

3.2 **Prior to the oil era Chad's economy was predominately agrarian, and cotton was the country's largest export.** In 2002, just before oil production came on-stream, Chadian GDP per capita was around US$205, less than half of the average for Sub-Saharan Africa (SSA). Cotton production provided the livelihood of about one-third of Chad's population, and cattle herding was the country's second largest employment sector. However, a series of major structural shifts accompanied the advent of oil production.[9]

3.3 Figure 3.1 below, shows the evolution of the Chadian macroeconomy in the wake of oil production. Oil extraction was the main source of economic growth during the development phase and the initial production phase. From 2000-2005 oil exploration, investment and initial production pushed the average annual real GDP growth rate to 12.6 percent. From 2006-10, however, annual GDP growth dropped to 1.1 percent as oil production volumes leveled off. In 2011 oil accounted for 35 percent of Chad's GDP, more than 70 percent of fiscal revenues and about 90 percent of total goods exports. Since then the ongoing crisis in the cotton sector has further accentuated the economic importance of the oil sector, and oil production currently accounts for an estimated 20 percent of GDP and 90 percent of exports. Over the medium term oil production is expected to rise from 110,000 barrels per day (bpd) in 2011 to an average of about 180,000 bpd from 2015-17 and is likely to further increase its share of overall production, exports and government revenues. However, Chad's total estimated oil reserves are relatively low, and unless new discoveries are made oil production may start diminishing as early as 2016.

[9] Chad's oil resources are small compared with other SSA countries and will not last long. Compared to Angola, Nigeria or Gabon, Chad's oil production started recently and its reserves—estimated at 1.5 billion barrels (145 barrels per capita)—are expected to be depleted within the next 20 years.

Figure 3.1: Shares of the Primary, Secondary and Tertiary Sectors in GDP



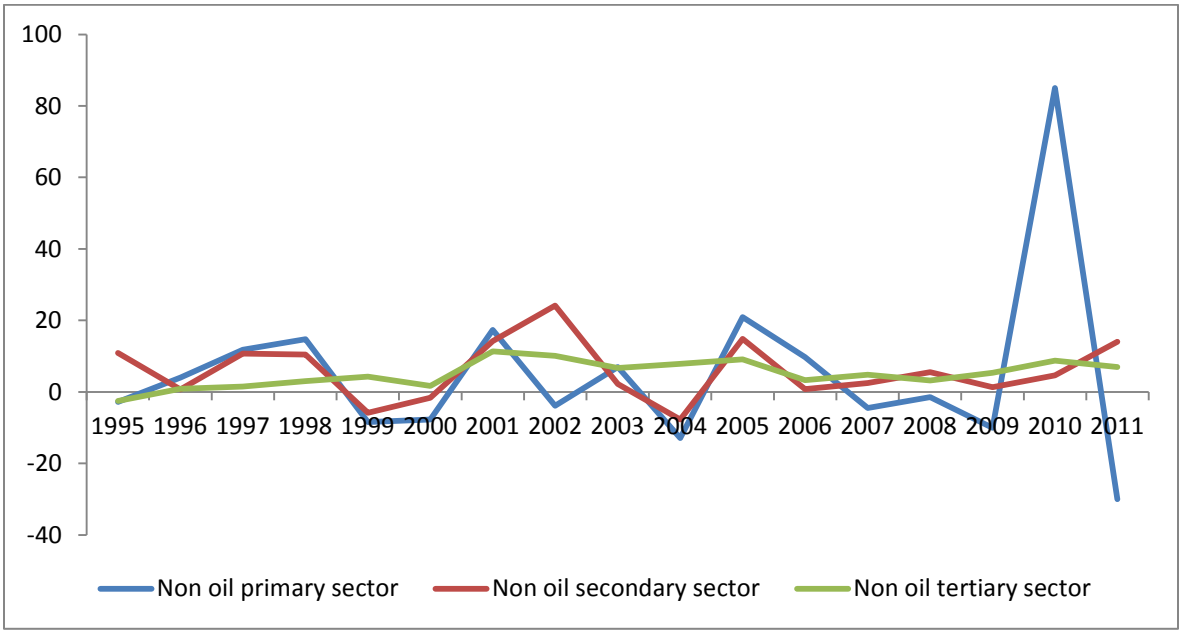
Source: IMF

3.4 **The direct impact of the oil sector on the non-oil economy has been relatively limited.** As shown in Figure 3.2, the non-oil primary and secondary sectors remained highly volatile.[10] Growth in the non-oil primary and secondary economy continues to fluctuate and depends largely on annual rainfall. Nor has oil production helped to reduce the vulnerability of primary and secondary sectors (which together represent the livelihood of more than 80 percent of population), because oil company activities within Chad are highly localized and of limited size. The major links between the oil sector and the larger domestic economy are (i) local employment in the sector, which is very modest, (ii) private investment in oil-related development activities, and (iii) the indirect impact of public spending of oil revenues.

3.5 **Because the petroleum sector is highly capital-intensive and import-dependent its influence on domestic employment is weak.** At the end of 2012 the oil company Esso employed more than 5,000 Chadian workers. Annual wage payments were estimated at just over CFAF 60 billion (almost US$120 million), which represents 1.8 percent of GDP. Meanwhile, oil-company purchases of goods and services from local suppliers also totaled over CFAF 60 billion in 2012 and reflected an ongoing commitment by international oil firms to support local businesses.[11] The oil industry's total impact on the nonoil sectors is therefore estimated at over CFAF 120 billion (US$240 million), or 3.6 percent of GDP. Given that oil production represents over 20 percent of GDP, the sector's direct influence on the Chadian economy is very small in comparison to its economic size.

[10] The secondary sector is dominated by agriculture and is highly dependent on weather conditions.
[11] This is a matter of voluntary corporate policy, not an official requirement.

Figure 3.2: Growth in the Non-Oil Primary, Secondary and Tertiary Sectors



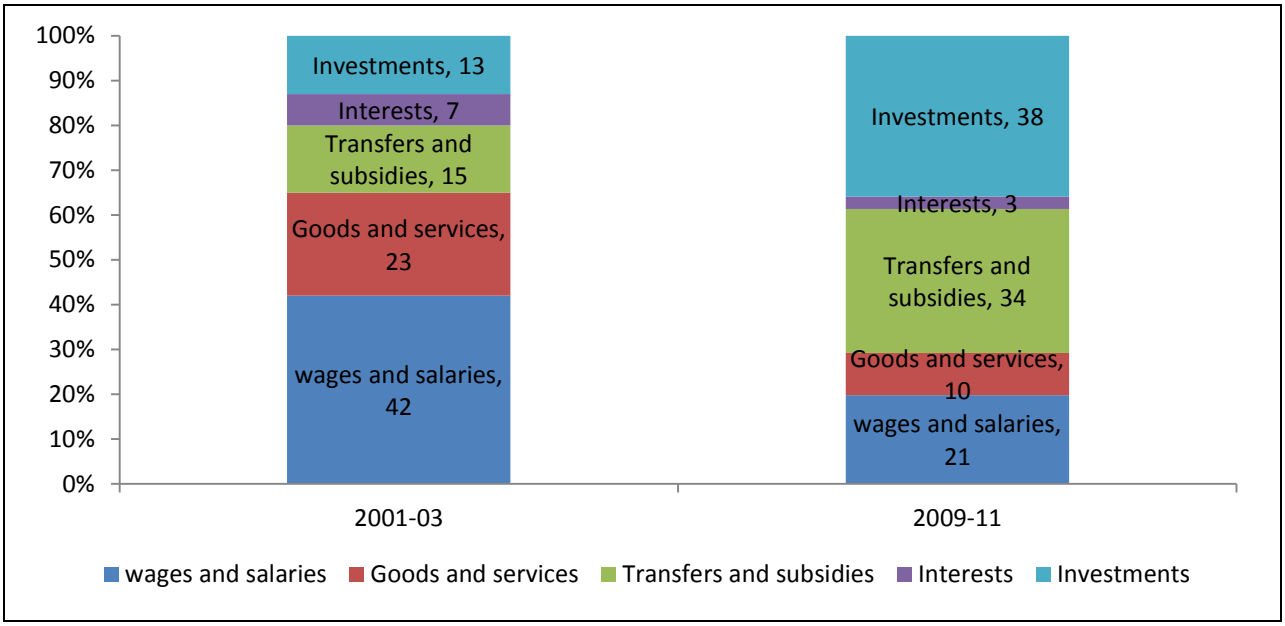
Source: IMF

3.6 **The oil sector does, however, have the potential to exert a powerful economic influence through its effects on government revenue and public investment.** As oil revenues represent more than 70 percent of total public revenues, the main channel by which the oil sector reaches the poor is through public spending. Given Chad's very limited infrastructure stock, an effective public investment program could have a highly positive impact on productivity and create incentives for private capital accumulation. Countries with a low overall capital stock can greatly benefit from investments that increase the returns to private investment (Takizawa, Gardner and Ueda 2004). In some cases the economic returns to these investments could be higher than what the country would receive if its revenues were invested in the financial market; this type of investment may also may yield positive productivity externalities and help to jump-start growth (Mohado et al. 2009).

3.7 Public investment in Chad is dominated by spending on physical infrastructure. Figure 3.3, below, shows that public investment accounted for approximately 38 percent of the total budget in 2009-2011, while Figure 3.3 the growing importance of investments in the total budget since the beginning of oil production. As a result of high sustained investment levels, improvements in the country's infrastructure have been significant. In 2004 only about 700 km of Chad's roadways were paved (less than 2 percent of the total road network).[12] By 2012 about 1600 km of its roadways had been paved, including most major roads in N'Djamena and roads connecting major cities.

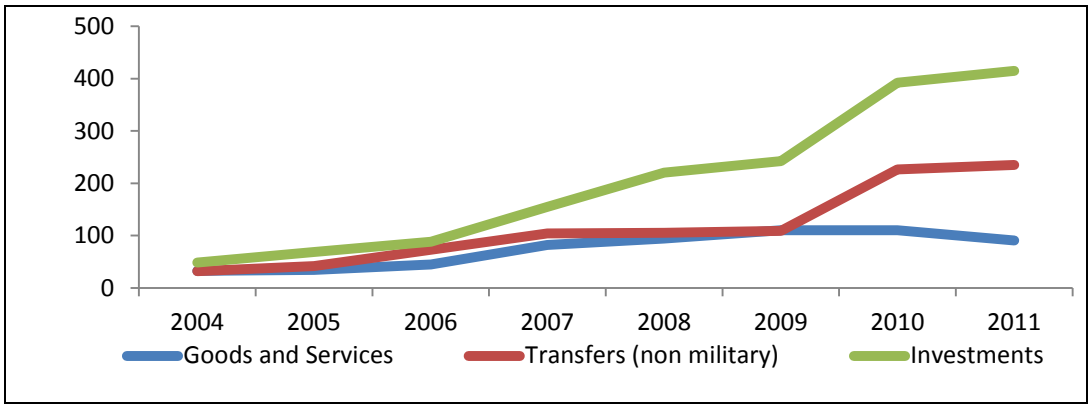
[12] *Chad - Trade and transport facilitation audit (*English) World Bank Working Paper, 2004.

Figure 3.3: Composition of Government Spending, 2001-11 (% of Total Expenditures)



Source: IMF

Figure 3.4: Trends in Selected Public Spending Categories (billions of CFAF)



Source: IMF

3.8 **Public investment in health and education also increased substantially during the oil era.** Investments in these key social sectors make up about 13 percent of the overall budget. Spending on public healthcare infrastructure more than doubled from CFAF 6.4 billion in 2005 to CFAF 13.7 billion in 2011. Similarly, investment in the education sector increased from about CFAF 5.2 billion to about CFAF 11.2 billion in 2011. Greater social spending is certainly justified, given Chad's extremely low social indicators and serious observed weaknesses in basic service delivery; however, this rapid expansion in investment spending has occurred without close collaboration between the Ministries of Health and Education, which are responsible for service delivery, and the Ministry of Infrastructure, which implements the investment projects. This has made the operationalization of new investments problematic.

3.9 **While a full cost-benefit analysis is beyond the scope of this Poverty Note, a simple assessment of unit costs shows that Chadian investment spending in recent years has not been efficient.** As indicated in Table 3.1, below, the unit costs of constructing both classrooms and health centers in Chad are far above the regional average. While it is reasonable to assume that unit costs in a remote landlocked country will be relatively high, the differences are remarkable even by comparison to similar countries. Chad has by far the most expensive unit costs for classrooms in SSA—more than 4 times higher than those of neighboring Niger, the next-highest country in the region. There are also significant regional variations within Chad. Costs for constructing health centers range from CFAF 120 million to CFAF 256 million (about US$230,000-US$480,000), with costs in the upper end of the range being about 60 percent higher than the average and costs in the lower end about 25 percent below it.

Table 3.1: Comparison of Unit Costs for the Construction of Health Centers and Classrooms

	Chad	Chad	Niger	Senegal	Nigeria	DR Congo	Africa Average
	(2009)	(2003)	(2007)	(2005)	(2004)	(2005)	
Classroom13 (US$/unit)	$57,229	$16,737	$13,962	$9,701	$4,875	$,9500	$6,740
Classroom (US$/m2)	$741	--	--	--	--	--	$119

Source: The World Bank

3.10 **Budget allocations for public-sector payrolls, procurement and other operating expenses have not kept pace with investment spending, and as a result many of the government's investments are not operational.** During the period recurrent expenditures on education and health services rose by about 156 percent, while domestically financed investment spending rose by 270 percent.[14] This mismatch has prompted concerns over the ability of the government to meet the day-to-day funding needs of the newly built schools and healthcare facilities. The World Bank's 2009 Public Expenditure Review (PER) revealed that many of the newly constructed social-service buildings stand empty, without an adequate budget to ensure their operation.

[13] These figures are for primary school classrooms constructed with cement.

[14] Externally financed investment dropped by about 30 percent over the same period, partially offsetting the increase in domestic public investment.

4. Poverty Reduction and the PRSP Series

4.1 **Chad's First Poverty Reduction Strategy (PRSP I) was adopted in June 2003.** Although designed to organize development-policy priorities and increase the coordination and efficiency of public expenditures, its implementation was undermined by persistent internal conflict, weak governance, and a lack of political commitment to the strategy. As a result, the extraordinary opportunity for broad-based poverty reduction provided by Chad's oil wealth was largely missed during the implementation of the PRSP I. A second strategy, the PRSP II, was adopted in April 2008, but its implementation was similarly hampered by inadequate ownership of the reform program and limited administrative capacity, as well as an overall climate of continued insecurity. Despite higher-than-expected oil revenue during its implementation period, the PRSP II achieved very limited progress on its core objectives.

4.2 **The PRSP I was the Government of Chad's first full-fledged strategy for poverty reduction and economic growth.** The document assesses the extent of poverty in Chad, defines its causes, outlines a strategy to eradicate it, and describes the plan for implementing that strategy. The PRSP I was intended to set the country on course to reduce poverty to below half of its estimated 1995 level by 2015, in line with the Millennium Development Goals (MDGs). In particular, the PRSP I aimed to: (i) improve political, judicial, economic and social governance; (ii) ensure strong and sustained growth; (iii) improve human capital, including HIV/AIDS prevention and mitigation; (iv) improve the living conditions of vulnerable groups; and (v) restore and safeguard fragile ecosystems. The PRSP I was designed to be the first of three medium-term strategies to be implemented between 2003 and 2015.

4.3 **The PRSP II (2008-2011) was the government's successor strategy for promoting growth, poverty reduction and the achievement of the MDGs.** It provided a common basis for the planning of both government spending and externally funded donor activities. The strategic axes of the PRSP II included: (i) good governance; (ii) robust and diversified growth; (iii) sustainable rural development; (iv) improvements in infrastructure; and (v) investment in human capital. The PRSP II employed a medium-term expenditure framework to set required budget allocations for financing the government's ambitious development program. The budget estimates were elaborated on the basis of the sectoral priority action plans, which were then adapted to fit the constraints of the macro framework. This design should have contributed to better public financial planning, but its success was limited by the absence of sector-specific strategies at the ministry level.

4.4 **Total budget allocations for priority sectors have remained lower than envisaged in the strategy, with significant differences between sectors.** During the PRSP II implementation period allocations to non-security priority sectors accounted for about 46 percent of the total budget (after debt service), compared with the 58 percent target set out in the PRSP II. While budgetary allocations to infrastructure (16 percent) were slightly higher than anticipated in the PRSP II (13 percent), allocations for rural development (6.5 percent) amounted to just half of what the strategy called for. The share of the budget devoted to security spending once again turned out to be much higher than projected at approximately 26 percent, far above the 15 percent outlined in the PRSP II.

A. Factors that Limited the PRSP Series' Impact on Poverty Reduction

4.5 **Chad's internal instability has repeatedly erupted into violent conflict, taking a heavy toll on government revenues and severely undermining efforts at poverty reduction.** The destruction of infrastructure has entailed major economic and fiscal costs, while protracted instability has prompted many educated Chadians to leave the country. The loss of physical and human capital has reduced the government's ability to operate schools and healthcare facilities, and it has negatively affected all areas of public administration. Consequently, both weak governance and inadequate social-service delivery remain major contributors to poverty.

4.6 **Violence within the country and along its borders has displaced a significant share of the population, while crises in neighboring countries have pushed large numbers of refugees into Chad.** Recent or continuing conflicts in Libya, Sudan and Central African Republic have resulted in widespread internal displacement, as well as creating a sizeable refugee population in a country that already faces massive challenges. Chad's precarious humanitarian situation has greatly contributed to perpetuating poverty, food insecurity, and low levels of social development, especially in the most severely affected areas.

4.7 **In addition, Chad has one of the highest population growth rates in the world.** Chad's annual population growth rate is 3.5 percent, and its population is expected to continue growing rapidly due to the country's young age structure, high fertility rates and low levels of contraceptive use. Sustainable long-term poverty reduction may not be possible in the absence of a clear strategy to manage demographic pressures. While Chad's mortality rate has fallen significantly over time, its birth rate yet to follow suit. In fact, the country's overall fertility rate has increased in recent years, from an average of 6.5 to 7 children per woman. Achieving broad improvements in economic and social indicators in this context will be extremely challenging for Chad, especially the demands of delivering quality healthcare and educational services to an ever-increasing population.

B. Poverty and Social Spending

4.8 **Fiscal policy is one of the most effective tools to promote economic equity and reduce poverty.** In Chad, fiscal priorities are laid out explicitly in the PRSPs, but are not linked to the annual budget. The share of budgetary allocations devoted to priority sectors is estimated to have reached 48 percent of total spending in 2011, up from 41 percent in 2010. This section analyzes the distributional effects of public education and healthcare expenditures in Chad by focusing on the progressivity and pro-poor orientation of social spending.

4.9 **This analysis uses traditional benefit-incidence techniques to explore how the welfare impacts of public education and healthcare expenditures are distributed across the population.** Benefit incidence analysis (BIA) is used to estimate how much of a given expenditure (or tax) is received by (or imposed on) a particular socioeconomic group or geographical area (Wagstaff 2011). The following presents a description of education and health spending followed by a BIA examining how much the poor receive through public spending on the social sectors.

C. HEALTH SPENDING

4.10 **Since 2005 the Ministry of Public Health and its partners have pursued an ambitious reform program.** A 2009-2012 national health development plan was elaborated with the primary objective of ensuring that the entire population would be able to access basic health services. This strategy was part of a coordinated effort to accelerate the reduction of nationwide mortality and morbidity and achieve the MDGs by 2015. The public health system is organized around three levels. The first level, primary care, is provided at the local level by district hospitals, health centers and health posts. Secondary care consists of the larger provincial general hospitals. These hospitals both provide care directly and receive referrals from first-tier institutions, treating patients in need of more sophisticated care. Tertiary care is offered by national and specialized hospitals, the highest-level referral hospitals in Chad, which focus on patients with rare conditions or in need of complex treatments.

4.11 **Public health financing in Chad is derived from three major sources: (i) the domestic resources of the state, (ii) the external resources of donors, and (iii) private payments from patients and their families.** Quality healthcare is regarded by the Chadian government as a top priority for promoting poverty reduction. Consequently public health should be among the country's best-funded sectors. However, according to the 2011 PER the resources allocated to both healthcare and social protection (7 percent of the budget) amounted to only half of what was called for in the PRSP II.

4.12 **Public health spending remains low, particularly in light of the country's poor performance on almost all public-health indicators.** Nevertheless, some progress has been made over the course of the past four years in increasing the budget allocation to the health sector. Between 2008 and 2011 domestic health spending roughly doubled, from CFAF 35.5 billion to CFAF 67.3 billion. However, actual expenditures by the Ministry of Public Health remained below the budgeted amounts (CFAF 30.5 billion in 2008 and CFAF 63.8 billion in 2011), with the exception of spending on the wage bill and the investment budget.

4.13 **The execution of the non-wage recurrent budget remains particularly weak.** In 2011 the low execution rate for procurement of goods and services (72 percent) meant that the Ministry of Health's community health centers and hospitals lacked the finances necessary to purchase, electricity, medicines and other critical inputs, and many of these centers are now in arrears with their suppliers. The 2011 PER shows that the level of spending on the maintenance of medical equipment and for procuring medications is extremely low; this affects the ability of health centers and district hospitals to function and is detrimental to the quality of care. Meanwhile, the capital-investment budget represented nearly 46 percent of the overall health-sector budget for 2011.

D. EDUCATION SPENDING

4.14 **In November of 2000 at a conference in Bamako, Mali, the Government of Chad confirmed its commitment to strengthen its education system in order to reach the educational access targets of the MDGs by 2015.** The specific objectives set forth by the government are integrated into the National Action Plan for Education for All, which outlines its efforts to provide free, universal and quality education for all Chadians, with a special emphasis

on girls and disadvantaged children. The government recently prepared an Interim Strategy for Education and Literacy covering the period from 2013 to 2015, which addresses issues of access and quality. The education system in Chad is divided into early childhood education, six years of primary education, four years of lower secondary education, three years of upper secondary education, and higher education.

4.15 **Much like the public health system, education financing in Chad comprises three major sources: (i) the domestic resources of the state, (ii) the external resources of donors, and (iii) private fees paid by households.** Over the past 10 years only 2.5 percent of GDP, 10.3 percent of the state budget, was allocated to education. Most of the education budget is used to cover salaries. Salaries and other recurrent expenditures represent 85 percent of all sector resources, with the remaining 15 percent dedicated to capital investment. The share of current expenditures in education spending varies from 96 percent for early childhood education to 73 percent for higher education. Education expenditures have grown by nearly 7 percent annually since 2001. The share of expenditures going to primary education was 38 percent in 2010, 90 percent of which was devoted to the wage bill and other recurrent expenditures. The overall proportion of non-salary recurrent expenditures remains high for all sub-sectors, with a sector-wide average of 50 percent.

E. THE EVOLUTION OF HEALTH AND EDUCATION INDICATORS SINCE THE ADVENT OF OIL PRODUCTION

4.16 **As shown in table 4.1 below, there was no significant improvement in health indicators from 2003-2011 despite the government's considerable investments in infrastructure.** Indeed, the overall morbidity rate increased during the period, rising from 22.4 percent in 2003 to 27.9 percent in 2011. According to the most recent Multiple Indicator Cluster Survey (MICS) in 2010, under-five mortality is estimated at 180 deaths per thousand live births, down marginally from the 191 recorded in the 2004 Demographic and Health Survey (DHS). Over the past 15 years child mortality has remained between 150 and 200 deaths per thousand live births. According to the 2010 MICS only 12 percent of women gave birth in healthcare facility, and only 5 percent of children were completely immunized.

Table 4.1: The Evolution of Public Health Indicators

Indicators	**2003**	**2011**
Morbidity rate	22.4	27.9
Access to a health center (Km)	14.4	10.1
Household health expenditures (% of total expenditures)	4.5	3.1

Source: ECOSIT 3

4.17 **The building of new health centers has, however, boosted access to healthcare services.** The average distance to the nearest public health facility dropped by 30 percent. While this has not yielded any meaningful improvement in health indicators, it does have a positive welfare impact. Similarly, the proportion of health expenditures paid by patients and their families decreased from 4.5 percent to 3.1 percent of total spending.

4.18 **The emphasis on investment has raised concerns regarding the government's ability to meet the recurrent spending needs generated by its new healthcare facilities.** In 2010 only 73 percent of healthcare facilities were operational. Recurrent funding to the health sector has remained roughly constant since 2003, and between 2009 and 2010 health-sector funding actually decreased by 3 percent. In order to achieve a sustainable improvement in public health indicators the government must make sure its investments are fully functional, and it can only do this by through a permanent increase in recurrent expenditures.

Box 4.1: Chad's Health Indicators Are among the Worst in the World

(i) Child mortality in Chad is higher and is decreasing more slowly than in other Sub-Saharan African countries. With child and infant mortality ratios in 2010 estimated at 171 and 98 deaths, respectively, per thousand live births, the MDG for child mortality will not be achieved by 2015. Common causes of death for children under 5 years old include malaria (20%), acute respiratory infections (19%), and diarrheal diseases (14%). Malnutrition accounts for more than one third of child mortality in Chad.

(ii) Child malnutrition has increased since 1997. In 2010, 39 percent of Chadian children suffered from chronic malnutrition, 30 percent showed signs of "wasting" (low weight for height), and 16 percent showed signs of "stunting" (low height for age); these were all significantly higher than in 2000, when they were estimated at 28 percent, 28 percent and 12 percent, respectively. Contributors to malnutrition include meningitis and measles epidemics, failed agricultural development campaigns in 2011 and 2012, and an increase in cereal grain prices in the region (UNICEF, 2012). Malnutrition can also be exacerbated by poor hygiene. In Chad, few people have access to improved water sources (39 percent) or sanitation facilities (7 percent) and few are aware of the importance of hand washing.

(iii) Chad's maternal mortality rate, estimated at 1,100 per 100,000 live births in 2010, is the highest among Central African countries and is four times higher than its relevant MDG target. An overall lack of health facilities and financial obstacles among the poor inhibit access to healthcare during pregnancy and childbirth. As in other developing countries the lack of skilled doctors and nurses in many health centers also discourages women from accessing them and reduces the quality of care.

(iv) Only 2 percent of women use a modern contraceptive method, which greatly contributes to Chad's high fertility rate. Early marriage practices combined with low contraceptive prevalence and inadequate resources for family planning make pregnancy among young women common, increasing the risk of death. Adolescent pregnancy not only affects the health of young women and their children, but also their long-term education and employment prospects. Early childbearing is prevalent throughout Chadian society, and especially among the poor.

(v) Though annual HIV incidence rates have stabilized since 2005, HIV prevalence is still at 3 percent among Chadians aged 15-49. While the testing rate remains very low there have been significant improvements since 2004, when just 0.9 percent of women had taken an HIV test in the previous 12 months.

(vi) High mortality due to malaria can be largely explained by limited prevention. In 2010 only 10 percent of children and 10 percent of pregnant women were sleeping under an insecticide-treated mosquito net.

4.19 **The education sector faces a similar situation.** Due to high levels of public investment the total number of primary schools has more than doubled over the last ten years, from 4,028 schools in 1999/2000 to 8,786 in 2010/2011. The two ECOSIT surveys indicate that despite the dramatic increase in the number of schools there was no change in gross enrollment, which remained constant at 74.9 percent from 2003 to 2011.[15] Net enrollment increased slightly from 41.2 percent to 43.7 percent, but all other indicators remained unchanged. Nevertheless, the increased number of schools did reduce school travel time by 18 percent.

Table 4.2 Evolution of Education Indicators

Indicators	2003	2011
Gross enrollment rate (%)	74.9	74.9
Net enrollment rate (%)	41.2	43.7
Access to a school (minutes)	52.2	43
Household education expenditures (% of total expenditures)	0.7	1.2

Source: ECOSIT 3

4.20 **The inability of current expenditures to keep pace with new investments led to a lack of basic classroom supplies such as desks and textbooks, as well as dearth of qualified teachers and other core staff.** In order to be effective the education system requires a better coordination, matching improvements in access with improvements in educational quality and enrollment capacity.

4.21 **In addition to structural improvements in the supply of both education and healthcare services demand-side stimulus is a top priority.** Cultural factors exert a deeply negative influence over health and education outcomes, particularly for women and girls. While female school attendance has increased, women are still frequently expected to assume domestic responsibilities rather than entering the formal workforce. Teenage girls are often occupied by housework at the expense of their studies and are frequently pressured into marriage at a young age, with negative consequences for their health and education. In order to ensure gender parity in education and improve maternal and child health indicators, more must be done to revise traditional attitudes towards the role of women in the family and in society.

F. BENEFIT INCIDENCE ANALYSIS IN THE HEALTH SECTOR

4.22 The public health section of the ECOSIT3 records health-status information for each household member during the 30 days prior to the survey. The information reported in the survey is for 2011, the year the survey was collected. However, 2010 is the most recent year for official information on the number of public healthcare beneficiaries (patients/visits) and for government expenditures on: (i) health posts and clinics (primary care), (ii) provincial hospitals (secondary care), and (iii) national and specialized hospitals (tertiary care). Ideally, the BIA would obtain data on each member's number of visits to public health facilities during the year and then combine that information with official expenditure reports. However, this is not possible with the

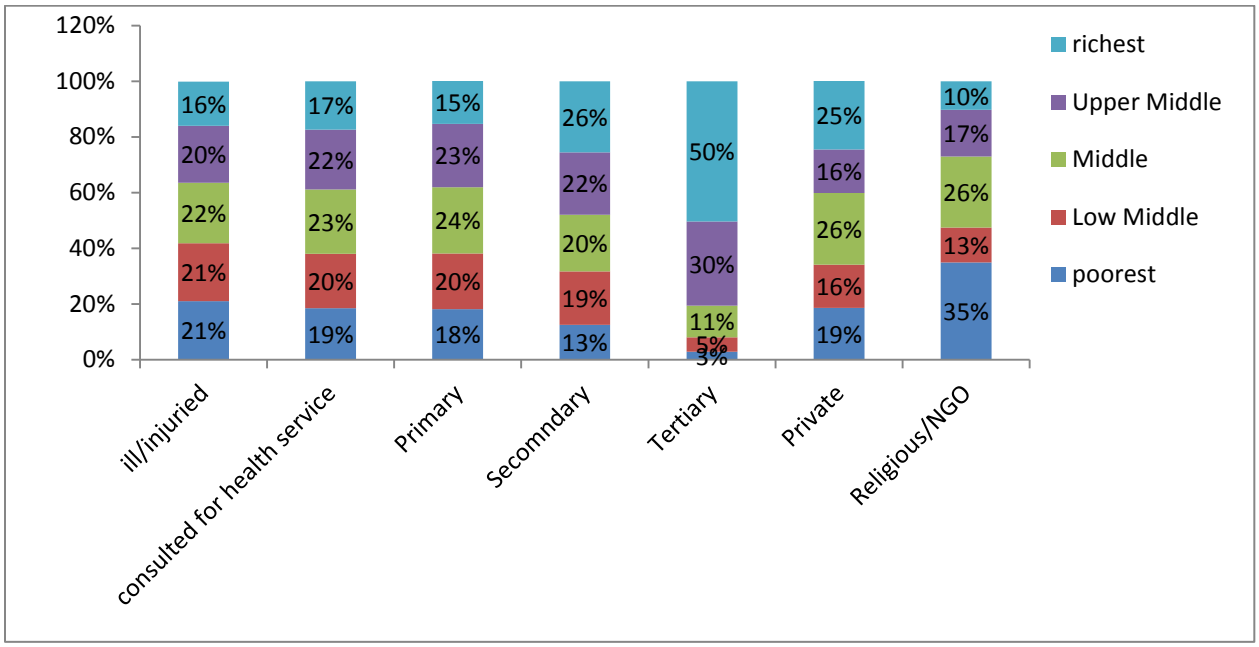
[15] According to the government's official statistics the gross enrollment rate increased from 68 percent in 2000 to 94 percent in 2010.

ECOSIT3, which reports only visits within the last 30 days. Given that the survey was held in May 2011, while the start of the annual operating budget begins in April, using 2011 expenditure data was not appropriate; 2010 expenditure data have been substituted and a monthly spending average is used. Information on healthcare utilization by subsector for each household member and an income proxy (consumption per capita) for each household member are recorded in the survey. The survey does not allow for distinguishing between inpatient and outpatient visits. The assumption of constant unit funding has been used to compute the BIA via ADePT.[16]

Beneficiary Participation: Healthcare

4.23 **Individuals who reported being ill or injured during the 30 days before the survey do not follow a uniform distribution across socioeconomic groups, though incidence of illness and injury appears least common among the wealthiest respondents.** For a more detailed look at the distribution see "Ill or Injured" in Figure 4.1, below. A similar pattern can be observed among those visiting a health facility for consultation. However, the distribution of beneficiaries visiting secondary care centers and especially tertiary hospitals follows an uneven pattern, with significant variations in the top and bottom quintiles. In secondary health centers the share of patients from the wealthiest quintile is double that of the poorest quintile, while the opposite is the case for religious- and NGO-hospital attendance. 50 percent of patients in tertiary care centers are from the richest quintile. Figure 4.1 indicates that NGO hospitals tend to serve the poorest populations, while the higher levels of the public health system are dominated by beneficiaries from the wealthiest income groups.

Figure 4.1: Distribution of Beneficiaries, Healthcare



Source: ECOSIT 3

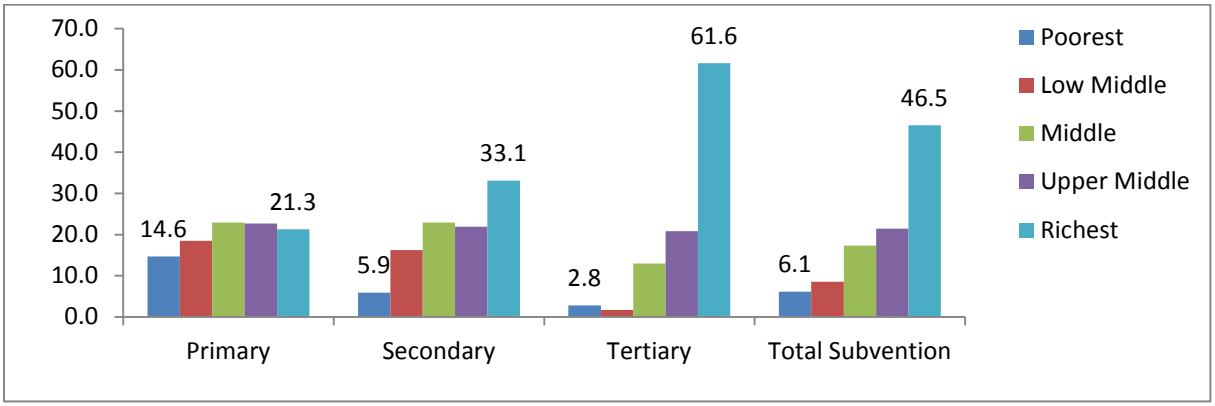
[16] Software Platform for Automated Economic Analysis, developed by the World Bank.

Analysis of Benefits: Healthcare

4.24 **The distribution of public health resources in Chad is not pro-poor.** Beneficiaries in the poorest quintile received only 6 percent of total public healthcare spending, while the richest captured a remarkable 46.5 percent. Beneficiaries from the richest quintile use secondary or tertiary hospitals (rather than primary care facilities) at 5 times and 22 times the rate of the poorest quintile, respectively. These results cannot be explained by a significantly lower incidence of illness among the poor, as they consulted for health services at roughly the same rate as other consumption groups (see Figure 4.1).

4.25 **This apparently regressive and pro-rich distribution appears to be the result of public healthcare spending not being targeted to the poor in any particular way.** Without effective targeting, circumstantial factors tend to bias spending in favor of wealthier beneficiaries. The bulk of public healthcare expenditure goes to tertiary care, which is inherently more expensive than primary care, though not necessarily more effective. Since 95 percent of the poorest Chadians live in rural areas, where primary care facilities are relatively common and tertiary care is nonexistent, while only 1 percent of the poorest live in N'Djamena, where the country's tertiary health centers are located, physical proximity would appear to play a significant role.

Figure 4.2: Healthcare Funding, Constant Unit Cost Assumption



Source: ECOSIT 3

4.26 **Two caveats to these conclusions should be noted.** First, mistakes from annualizing sporadic visits may be larger for primary care than they are for tertiary, since hospital visits are typically associated with more severe conditions (World Bank 2012). Second, those visiting hospitals may have previously visited clinics or health posts, but these visits may not be reported as the individual is asked only to identify the facility from which services were received.

G. Benefit Incidence Analysis in the Education Sector

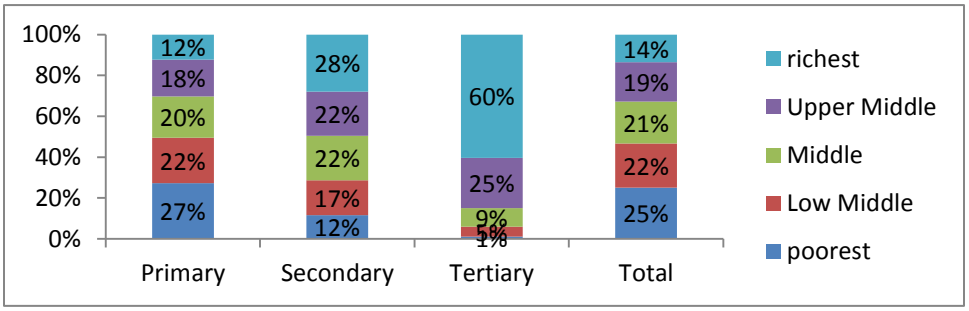
4.27 **As part of the ECOSIT3 households were asked about education enrollment.** Answers report the total amount spent by the household on the education of all its members in 2011. The operating budget takes effect in April, but the survey was conducted in May 2011; as a

result using 2011 expenditures data is not appropriate and 2010 expenditure data have been substituted. Measures of the utilization of education services by subsector for each household member and an income proxy (consumption per capita) for each household member were taken from the survey. The assumption of constant unit funding is used to compute BIA via ADePT.

Beneficiary Participation: Education

4.28 **Overall access to public education in Chad is moderately progressive at the primary level, but deeply regressive at the secondary and tertiary levels.** In the education system as a whole beneficiary shares decline gradually as consumption levels increase; 25 percent of students come from the poorest quintile, while only 12 percent come from the richest. This distribution is almost the same at the primary level, reflecting the very large number of primary school students relative to secondary and tertiary students. However, at the secondary and tertiary levels beneficiary shares increase rapidly with consumption level. For tertiary education, the vast majority of beneficiaries, over 60 percent, come from the wealthiest quintile (see Figure 4.3, below).

Figure 4.3: Distribution of Beneficiaries, Education

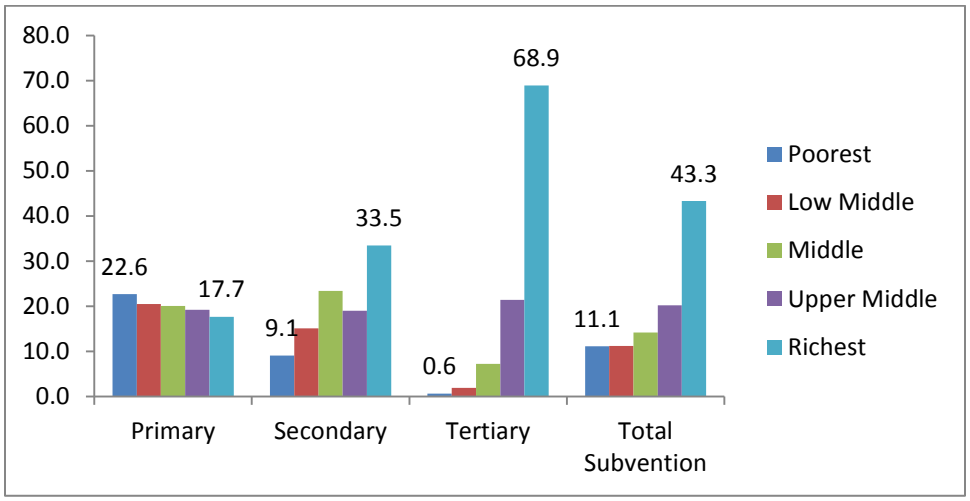


Source: ECOSIT 3

Analysis of Benefits: Education

4.29 **Due to regressive education access at higher consumption levels, total public spending on education is clearly pro-rich.** When education spending is considered in aggregate terms—that is, without differentiating by education level (see Figure 4.4 below)—per capita education expenditures are nearly flat across the first two quintiles, but then rise sharply in the upper quintiles. Results by educational level confirm that the distribution of tertiary education benefits drive the trend for aggregate education spending. Only in the primary sector is the distribution of benefits broadly pro-poor. In the secondary sector benefits begin to become very regressive, and the trend is clearly confirmed in the tertiary sector, which is dominated by the wealthiest consumption groups.

Figure 4.4: Education Funding, Constant Unit Cost Assumption



Source: ECOSIT 3

4.30 **This regressive and pro-rich distribution is the result of the dramatic overrepresentation of the top quintile in tertiary education.** Students from the top quintile constitute about 60 percent of total enrollment in tertiary education, compared to 28 percent of total enrollment in secondary education and just 12 percent in primary. As tertiary education entails far higher marginal costs than primary school, regressive access to higher education skews the distribution of resources in favor of wealthier beneficiaries. In other words, regressive benefits are driven by inequality of access, not necessarily by the allocation of public spending itself.

5. Conclusion

5.1 **The Chadian economy has experienced major macroeconomic changes since the emergence of the oil sector in the early 2000s, yet the returns to oil-sector growth have largely failed to reach the poor.** The monetary poverty rate declined by an average of 1 percentage point per year between 2003 and 2011. However, due to rapid population growth the declining poverty rate was not sufficient to reduce the total number of Chadians living in poverty, which rose from 4.1 million in 2003 to 4.7 million in 2011. Literacy rates, access to clean water and sanitation, electrification, housing quality and other dimensions of nonmonetary poverty present a mixed picture, with gains in some areas offset by losses in others. Key health indicators such as infant and maternal mortality remain bleak, with few significant improvements observed during the period, and only modest progress has been made in increasing school enrollment.

5.2 **Chad's poverty headcount rate stood at 47 percent in 2011, and poverty remains a predominantly rural phenomenon.** The incidence of monetary poverty is over twice as high in rural areas as it is in urban centers, and because Chad's population is overwhelmingly rural, the countryside is home to the vast majority of the nation's poor. Poverty in Chad is correlated with the education level of the head-of-household, the number of children in a household, and the overall the size of households. The distribution of monetary poverty across the country reveals large regional disparities, with the lowest level observed in N'Djamena and the two highest in Moyen-Chari/Mandoul and Logone Occidental.

5.3 **The direct impact of the oil sector on the domestic non-oil economy appears quite limited.** The oil sector is capital-intensive and import-dependent, and as a result its effects on domestic employment and production in other sectors are relatively weak, though not insignificant. However, oil-related investment, both public and private, has generated a boom in the construction sector, which in turn has spurred an influx of rural Chadians to N'Djamena and other major cities. Rural-urban migration in a context of rapid urban job growth has helped to cut poverty rates, though the shifting population also appears to be straining the infrastructure and administrative capacity of the cities.

5.4 **Large-scale oil revenues have enabled the government to increase its expenditures in the public health and education sectors, though its emphasis on capital investment has not been matched by a commensurate increase in recurrent spending.** The total number of health and education facilities each more than doubled between 2003 and 2011, as the government ramped-up public investment in the social sectors. Yet recurrent funding for social services either held constant as a share of the budget or marginally declined during the same period. Unless the government progressively increases its expenditures on personnel and procurement, the education and healthcare systems will remain unable to effectively utilize their new facilities, many of which will likely fall into disrepair.

5.5 **Finally, the results of the benefit incidence analysis clearly show that overall public health and education spending in Chad is neither pro-poor nor progressive.** However, while this is true for the system as a whole it is not true for all of its parts. Access to education is broadly progressive at the primary level, but becomes severely regressive at the secondary and tertiary levels. Similarly, public health access is either flat or modestly progressive for primary care, but access to more sophisticated health services is profoundly regressive and pro-rich. The government should consider taking steps both to increase overall social spending and ensure that social infrastructure targets the poorest and most vulnerable.

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Appendix A: Multidimensional Poverty Index Methodology[17]

The Multidimensional Poverty Index (MPI) is a measure of acute global poverty developed by the Oxford Poverty and Human Development Initiative (OPHI) for the United Nations Development Program's Human Development Report (see for details, Alkire and Santos 2010, 2013; Alkire et al. 2011; UNDP 2010). The index belongs to the family of measures developed by Alkire and Foster (2007, 2011). In particular, it is an application of the adjusted headcount ratio, M0. This methodology implies determining the unit of analysis (i.e. person or household), identifying the set of indicators in which they are deprived at the same time and summarizing their poverty profile in a deprivation score. They are identified as multidimensionally poor if their deprivation score exceeds a cross-dimensional poverty cutoff. The number of poor people and their deprivation score (i.e. the 'intensity' of poverty or percentage of simultaneous deprivations they experience) become part of the final poverty measure. A more formal explanation of the methodology is presented in Alkire and Santos (2010).

The MPI uses information from 10 indicators which are organized into three dimensions: health, education and living standards, following the same three dimensions as the Human Development Index (HDI). Each individual is identified as deprived in each dimension based on a deprivation cutoff (more details in Alkire and Santos 2010). Then, each person's deprivation score is constructed based on a weighted average of the deprivations they experience using a nested weight structure: equal weight across dimension and equal weight for each indicator within dimensions. Finally, a poverty cutoff of 33% identifies as multidimensionally poor those people whose deprivation score meets or exceeds this threshold.

Thus the MPI reflects both the incidence or headcount ratio (H) of poverty – the proportion of the population that is multidimensionally poor – and the average intensity (A) of their poverty – the average proportion of indicators in which poor people are deprived. The MPI is calculated by multiplying the incidence of poverty by the average intensity across the poor (H*A). A person is identified as poor if he or she is deprived in at least one third of the weighted indicators. Those identified as 'Vulnerable to Poverty' are deprived in 20% – 33% of weighted indicators and those identified as in 'Severe Poverty' are deprived in 50% or more of the indicators.

[17] Source: Alkire and al., 2013, Multidimensional Poverty Index 2013: Brief Methodological Note and Results, Oxford Poverty and Human Development Initiative, University of Oxford.

Appendix B: Benefit Incidence Analysis Methodology[18]

The goal here is to work out how much each person gains from government spending, and compare the distribution of this spending with a point of reference such as the distribution of per capita consumption; Demery (2000) provides an excellent survey. Although some types of government spending—health, education, and social subsidies—can easily be attributed to beneficiary households, almost half of government spending cannot be so allocated. It is difficult, perhaps impossible, to determine who benefits most from spending on such items as the army, police, diplomatic service, judicial system, or pensions for public servants.

The first step in benefit incidence analysis is to estimate the value of unit subsidies: how much does the government subsidize each high school pupil, each visit to a rural health clinic, each recipient of school meals, and so on? This information is not to be found in household survey data, except perhaps for some direct social subsidies to households. It is important to base the measures of unit subsidies on actual rather than budgeted spending, and even then some digging may be required.

The second step is to identify the coverage of the government services or subsidies and impute it to users. In this case, household survey data are needed to provide information on how many household members go to school and at what level, how many people visited a health clinic during the year, and so on. There are two main problems at this stage—poor recall and rare events. Households tend to understate their use of government services, just as they understate income and consumption levels. For instance, in 1992 there were 73,800 in-patient visits in the Greater Accra area, but household survey data implied 8,500 visits, just 12 percent of the official figure (Demery 2000, 8). Furthermore, in any given year, few people are hospitalized or attend university. Thus, these events appear infrequently in survey data, and so inferences about the incidence of such spending are highly imprecise.

The third and final step is to aggregate and present the results in a useful way.

[18] Source: Jonathan Haughton and Shahidur R. Khandker (2009) Handbook on Poverty and Inequality, Washington DC: The World Bank.

Appendix C: Statistical Tables

Appendix Table C.1: Urban-Rural Poverty Decomposition

	Absolute change	Percentage change
Change in poverty (P0)	-8.14	100.00
Total intra-sectoral effect	-5.63	69.20
Population-shift effect	-2.69	33.09
Interaction effect	0.19	-2.29

Source: Authors' calculations based on data from ECOSIT2 and ECOSIT3

Appendix Table C.2: Estimated Poor Population by Regions, 2003 and 2011

Region	2003	2011
Batha	233,100	169,288
Borkou/Ennedi/Tibesti/Wadi-Fira	175,659	222,863
Chari-Baguirmi/Hadjer-Lamis	375,294	511,859
Guéra/Salamat	316,613	464,637
Bahr-el-Gazel/Kanem/Lac	358,444	341,446
Logone Occidental	301,427	452,651
Logone Oriental	377,687	394,289
Mayo-Kebbi-Est	644,378	587,909
Moyen-chari/Mandoul	608,853	755,930
Ouaddaï/Sila	257,649	320,991
Tandjilé	344,048	362,333
N'Djamena	117,859	89,707
Total	**4,111,011**	**4,673,903**

Source: Authors' calculations based on data from ECOSIT2 and ECOSIT3

Appendix Table C.3: Average real Consumption and Gini Coefficient by Region, 2003 and 2011

	Average Consumption		Gini Coefficient	
	2003	2011	2003	2011
Batha	177,118	199,110	0.321	0.350
Borkou/Ennedi/Tibesti/Wadi-Fira	181,361	268,400	0.379	0.447
Chari-Baguirmi/Hadjer-Lamis	193,001	207,983	0.375	0.440
Guéra/Salamat	143,526	146,541	0.316	0.408
Bahr-el-Gazel/Kanem/Lac	162,984	208,038	0.371	0.377
Logone Occidental	176,366	135,386	0.417	0.424
Logone Oriental	139,380	173,966	0.381	0.367
Mayo-Kebbi	135,810	204,221	0.392	0.379
Moyen-Chari/Mandoul	138,443	128,686	0.390	0.404
Ouaddaï/Sila	216,489	230,810	0.327	0.374
Tandjilé	166,295	154,557	0.411	0.441
N'Djamena	306,274	349,460	0.376	0.332
Total	**175,826**	**199,795.3**	0.394	0.421

Source: Authors' calculations based on data from ECOSIT2 and ECOSIT3

Appendix Table C.4: Significance Test on Poverty Changes (0.95)

Region	Z	P>|z|
Batha	1.45	0.148
Borkou/Ennedi/Tibesti/Wadi-Fira***	10.57	0.000
Chari-Baguirmi/Hadjer-Lamis***	5.67	0.000
Guéra/Salamat**	2.12	0.034
Bahr-el-Gazel/Kanem/Lac***	11.96	0.000
Logone Occidental***	-7.17	0.000
Logone Oriental***	13.45	0.000
Mayo-Kebbi***	31.12	0.000
Moyen-Chari/Mandoul**	2.05	0.040
Ouaddaï/Sila	-0.87	0.386
Tandjilé***	-2.74	0.006
N'Djamena***	11.25	0.000
National* **	**24.04**	**0.000**

Source: Authors' calculations based on data from ECOSIT2 and ECOSIT3

Appendix Table C.5: MPI Indicators of Deprivation, 2003 and 2011

	Literacy		Child School Attendance		Nutrition		Electricity		Adequate Sanitation		Source of Drinking Water		Cooking Fuel		Flooring (Housing Quality)		Asset Ownership	
	2003	2011	2003	2011	2003	2011	2003	2011	2003	2011	2003	2011	2003	2011	2003	2011	2003	2011
National	**32.5**	**45.1**	**49.8**	**45.1**	**55.2**	**54.8**	**96.3**	**96.6**	**87.5**	**92.7**	**71.4**	**60.8**	**89.1**	**98.3**	**93.9**	**92.8**	**65.7**	**34.8**
Type of Settlement																		
Urban	10.1	21.8	22.6	31.0	34.5	34.3	83.5	83.1	61.3	73.2	25.9	39.2	89.7	92.5	77.5	73.1	32.0	14.1
Rural	35.1	50.3	52.9	48.3	57.6	59.4	97.8	99.6	90.5	97.1	76.7	65.7	89.1	99.6	95.9	97.3	69.6	39.5
Region																		
Batha	29.5	53.4	54.2	43.3	41.3	52.3	96.6	98.0	84.1	96.0	73.9	83.2	86.7	99.7	97.4	96.9	56.8	44.8
Borkou/Ennedi/Tibesti/Wadi-Fira	26.2	61.3	69.8	56.8	44.7	45.1	97.3	96.3	91.8	91.5	94.6	93.5	92.4	98.5	96.2	97.6	71.6	35.9
Chari-Baguirmi/Hadjer-Lamis	50.4	74.8	62.2	65.2	46.7	50.4	98.4	99.8	89.0	95.5	63.7	19.0	87.3	99.4	99.1	95.3	64.9	22.9
Guéra/Salamat	29.5	52.0	57.7	45.8	60.9	69.3	97.9	98.1	92.6	97.5	85.4	61.8	89.8	99.7	86.9	97.3	72.9	48.8
Bahr-el-Gazel/Kanem/Lac	60.5	76.0	57.0	62.7	47.9	48.0	97.6	98.7	93.3	94.2	57.5	24.4	93.0	99.1	94.8	97.5	80.9	31.5
Logone Occidental	22.5	39.4	41.6	27.0	65.0	77.1	96.6	97.5	82.1	93.3	58.1	78.6	85.9	98.8	87.7	89.8	49.0	42.0
Logone Oriental	28.7	26.7	43.7	35.4	65.3	56.0	98.7	98.5	93.2	96.6	81.5	84.1	92.0	100.0	99.1	95.2	76.7	37.2
Mayo-Kebbi	23.7	23.4	44.6	42.5	70.7	53.1	97.8	98.9	94.0	94.1	80.0	69.2	89.0	99.9	95.2	93.2	71.6	29.0
Moyen-Chari/Mandoul	35.4	30.0	44.7	35.0	72.1	72.0	96.8	98.9	84.3	95.3	77.5	75.8	80.6	99.6	96.2	93.5	74.1	47.5
Ouaddaï/Sila	31.2	60.7	60.3	54.4	33.1	42.3	98.0	97.7	90.4	94.8	93.6	73.3	95.2	99.6	98.0	97.7	72.1	50.4
Tandjilé	30.3	35.9	45.6	37.3	69.5	70.9	97.4	99.0	89.0	96.6	68.5	74.5	91.5	99.2	90.7	93.3	54.1	30.6
N'Djamena	11.3	18.3	22.6	28.1	32.5	24.2	80.8	75.1	62.6	66.2	22.8	29.2	90.1	84.8	80.9	67.4	31.5	6.4
Gender of Household Head																		
Male	29.8	43.0	50.2	45.6	55.9	55.6	96.3	96.6	87.9	93.1	71.5	61.1	88.9	98.4	93.8	92.7	63.8	31.1
Female	48.9	56.1	47.3	42.4	51.0	50.3	96.6	96.5	84.9	90.7	71.1	59.4	90.4	97.8	94.8	93.4	77.1	55.0

Source: Authors' calculations based on data from ECOSIT2 and ECOSIT3

Appendix Table C.6: Population Share, Multidimensional Poverty (MPI, H, A) and Contribution to MPI by Sub-Groups of Population, 2003 and 2011

	Population Share (%)		MPI		H		A		Contribution to MPI (%)	
	2003	2011	2003	2011	2003	2011	2003	2011	2003	2011
National	100.0	100.0	0.569	0.562	0.860	0.842	0.662	0.668	100.0	100.0
Type of Settlement										
Urban	10.5	18.4	0.281	0.332	0.513	0.585	0.548	0.568	5.2	10.9
Rural	89.5	81.6	0.603	0.614	0.901	0.900	0.669	0.683	94.8	89.1
Region										
Batha	6.5	3.7	0.505	0.591	0.801	0.875	0.631	0.676	5.8	3.9
Borkou/Ennedi/Tibesti/Wadi-Fira	4.3	5.6	0.585	0.608	0.901	0.901	0.649	0.674	4.4	6.1
Chari-Baguirmi/Hadjer-Lamis	10.1	11.8	0.599	0.625	0.908	0.926	0.659	0.675	10.7	13.1
Guéra/Salamat	6.8	7.8	0.615	0.656	0.903	0.925	0.681	0.709	7.3	9.0
Bahr-el-Gazel/Kanem/Lac	8.8	8.4	0.627	0.624	0.937	0.931	0.669	0.670	9.7	9.3
Logone Occidental	7.0	6.8	0.547	0.623	0.852	0.902	0.643	0.691	6.7	7.5
Logone Oriental	7.8	8.1	0.611	0.529	0.891	0.824	0.686	0.642	8.4	7.6
Mayo-Kebbi	12.0	13.8	0.615	0.495	0.884	0.750	0.695	0.660	12.9	12.2
Moyen-Chari/Mandoul	11.8	11.3	0.636	0.602	0.910	0.875	0.699	0.688	13.2	12.1
Ouaddaï/Sila	10.0	9.1	0.543	0.594	0.904	0.890	0.601	0.667	9.5	9.6
Tandjilé	7.4	5.5	0.599	0.602	0.858	0.876	0.698	0.688	7.8	5.9
N'Djamena	7.6	8.2	0.273	0.252	0.500	0.494	0.546	0.511	3.6	3.7
Gender of Household Head										
Male	85.7	84.4	0.566	0.559	0.857	0.836	0.660	0.669	85.3	83.9
Female	14.3	15.6	0.588	0.579	0.876	0.871	0.671	0.665	14.7	16.1

Source: Authors' calculations based on data from ECOSIT2 and ECOSIT3