

Impacts of the 2014-16 drop in oil prices on child poverty in Chad and options for a policy response:

Analysis using a recursive dynamic CGE model with fully integrated microsimulations

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Context and Objectives

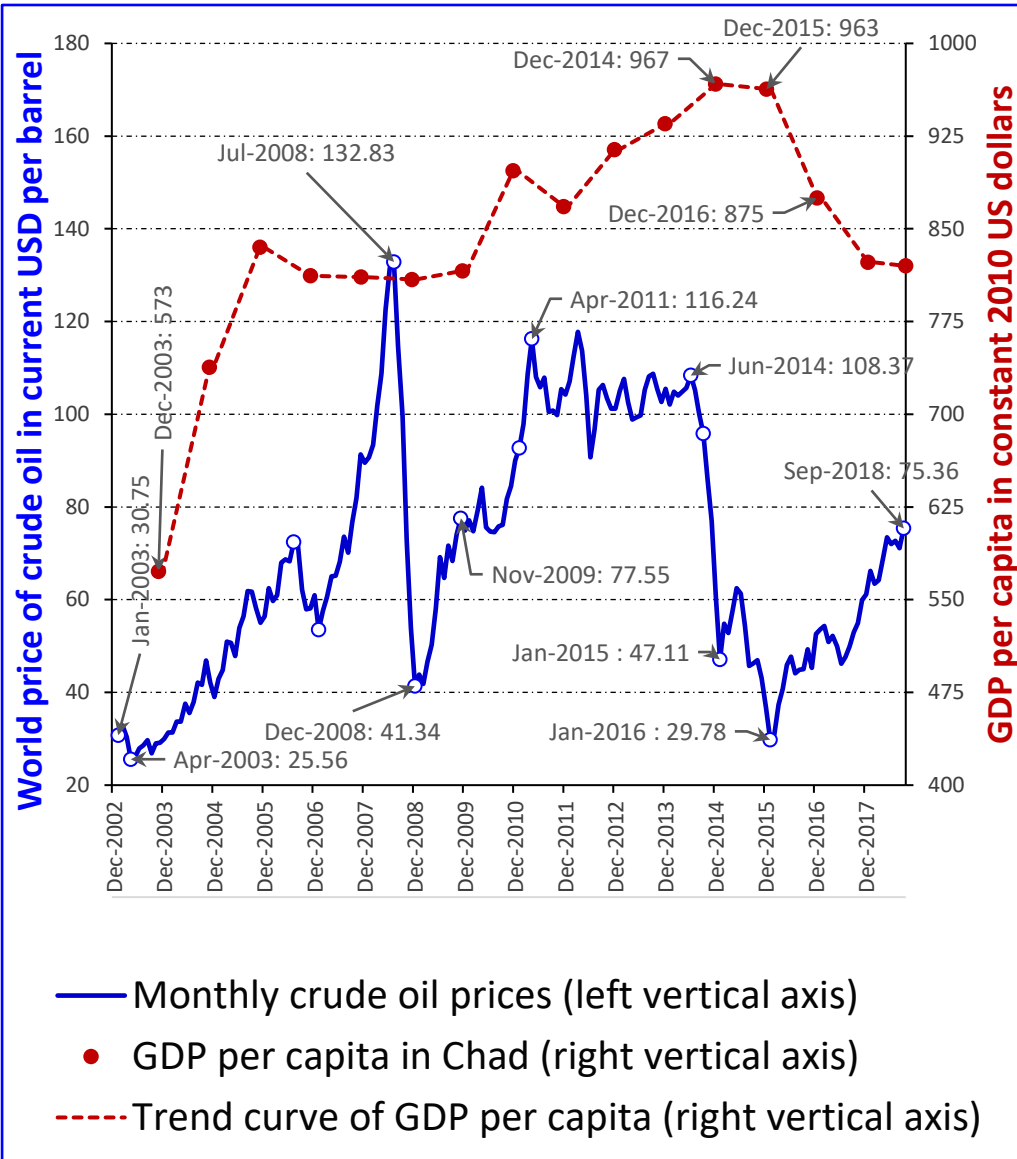
Context and Objectives

- In 2003, Chad became a producer and exporter of crude oil.
- From then until 2014, despite the various oil price swings and, even, notwithstanding the global financial and economic crisis of 2008/2009, the country has witnessed an era of oil boom.
- The positive impact of this glorious decade has been reflected through most economic and socio-economic indicators.
- The country's annual real GDP growth, negative in 1999 and 2000, became positive again with the beginning of oil related activities and reached a peak of 33.63% in 2004.
- Its Human Development Index raised from 0.299 in 2000 to 0.403 in 2014.
- The poverty headcount ratio decreased from 54.80% in 2002 to 46.67% in 2011, consistent with the 67% increase in GDP per capita during the same period.



Context and Objectives

Two major oil shocks suffered by Chad, from the start of its oil exploitation to year 2018



- However, the drastic drop in oil prices of around 80% between June 2014 and January 2016, have heavily impeded growth and poverty alleviation efforts.
- Chadian economy thus entered a recession: a decline in GDP per capita from 2015, a negative real GDP growth in 2016 (-6.26%) and 2017 (-2.95%)
- While child FGT_0 is already very high (48.93% in 2011), above that of adults (43.52%).
- This study therefore aims to assess impacts of the said crisis on child monetary poverty and explore some policy responses that would specifically reduce poverty amongst children.

Methodology

- *We refer here to Article 1 of the International Convention on the Rights of the Child (ICRC):*
 - o “a child means every human being below the age of 18 years unless, under the law applicable to the child, majority is attained earlier”



Methodology

Dimension and Measurement of child poverty

- *This study focuses on the monetary dimension of child poverty.*
- *A child here is monetarily poor if he/she is part of a household which is poor in monetary terms.*
- *We use the poverty indicators of class P_α by Foster, Greer and Thorbecke (1984), applied to a given population of children*

$$P_\alpha = \frac{1}{\sum_{i=1}^n w_i} \left(\sum_{i=1}^q w_i \left(\frac{z - y_i}{z} \right)^\alpha \right)$$



- *A recursive dynamic CGE model with fully integrated microsimulations.*
- *Based on the **PEP-1-t model** by Decaluwé et al. (2013) which is an archetype without microsimulations.*
- ***“Fully integrated”** microsimulations approach:*
 - o Directly incorporating into the CGE model, a large number or all the households in a survey. Neither **simple representative** categories of households nor **Top-Down/Bottom-Up** approaches.
 - o In this study: **all the 9259 households** surveyed in 2011, which encompass the whole population in Chad, were individually incorporated.
 - o For several CGE practitioners, a fully integrated approach should be preferred when the ultimate goal is to **get a fully coherent macro-micro framework** or, in other words, if the objective is to **assess poverty impacts while starting from the strongest possible basis of micro-observations** (Bourguignon, Bussolo and Pereira da Silva, 2008b, p. 18-20).



Methodology

Two main sets: SAM and Household Survey

- **SAM:** built using mainly the 2011 Supply and Use Table of Chad.
- **Data for microsimulations:** Databases of results from the *Third Survey on Consumption and Informal Sector in Chad* (ECOSIT3) carried out in 2011.
- All data are from the National Institute of Statistics and Economic and Demographic Studies of Chad (INSEED).
- **Year 2011:** base year for SAM and for the start of the dynamic model, in order to use the genuine 2011 poverty rates as benchmarks in the analysis.
- *Industry/product accounts of the SAM suitably mapped with the product nomenclature used in the ECOSIT3 household survey.*



Methodology

Seven scenarios were simulated

1. Business-as-Usual or “Crisis-Free” scenario: *to generate the trend that the economy would have followed if the crisis had not occurred and, therefore, without subsequent policy response.*

a. Yearly population growth rate: 3.6%

a. Real GDP growth rates:

- o Actual: 8.88% in 2012 and 5.70% in 2013*
- o Simulated: 7.75% in 2014 and 5.58% in 2015*
- o Assumed as an average growth rate of the last 10 years before the crisis, from 2016 on: 5.5%*



Methodology

Seven scenarios were simulated

2. Crisis scenario: consists in applying changes in crude oil prices, as recorded from 2014 to 2018.

	2013	2014	2015	2016	2017	2018	From 2018
Crude oil world price index, Base 2013=100	100	92	49	41	51	65	65
Annual change in the average oil price (percentage)	-	- 8	- 47	- 16	+ 23	+ 27	0

Calculations based on simple averages of three crude oil spot prices: dated Brent, West Texas Intermediate, and Fateh Dubai (The World Bank, 2018b).



Methodology

Five Policy Response Scenarios

- 3. Pilot social safety net programs:** consist of allocating cash transfers to some poor households, with the support of World Bank and some other Technical and Financial Partners.
- a. A basis for a more consolidated countrywide system of social safety nets in the future*
 - b. Three components:*
 - o The first, which is evaluated in this study: unconditional cash transfers and cash-for-work activities, implemented in 3 pilot regions.*
 - o Two others: institutional and management tools to facilitate and make effective the implementation of the first component.*



Methodology

Five Policy Response Scenarios

3. Pilot social safety net programs (cont'd)

c. Key figures:

	N'Djamena	Barh-El-Gazel	Western Logone	Average all three Regions
Yearly increase in per capita income thanks to pilot programs (in euro)	15.3	32.8	24.6	20.2
Share of the 2018 Poverty Gap, filled by pilot transfers (%)	14.8	13.5	7.9	10.8
% of individuals living in households benefiting from pilot social safety nets, compared to total number of poor in the Region	70.3	17.8	8.8	19.3
% of individuals living in households benefiting from pilot social safety nets, compared to the total number of poor in Chad	1.4	0.2	0.8	2.4

Methodology

Five Policy Response Scenarios

4. *Cancellation of tariffs on food imports*

- o *Untargeted response policy*
- o *Its cost in terms of customs revenue lost: 0.50% of the total state budget and 0.15% of GDP in 2018.*

5. *Cancellation of VAT levied on food products*

- o *Untargeted response policy*
- o *Its cost in terms of state revenue losses: 0.36% of the total state budget and 0.11% of GDP in 2018.*

Scenarios 6 and 7: Cash transfers Programs extended to all households whose children were predicted to be poor in 2018:

- o *Fixed amount allocated for each poor child : transfers received by a household is proportional to the number of poor children it houses*

Scenarios 4 to 7 assumed to have been implemented as from 2019



Methodology

Five Policy Response Scenarios

Scenarios 6 and 7: Cash transfers Programs extended to all households whose children were predicted to be poor in 2018:

KEY FIGURES

Scenario 6	Scenario 7
1%	3%
12%	36%
31 €	93 €
19 €	57 €

Overall budget of cash transfers allocated in 2019, in percentage of the 2018 GDP

Share of the 2018 Poverty Gap filled by extended cash transfer programs

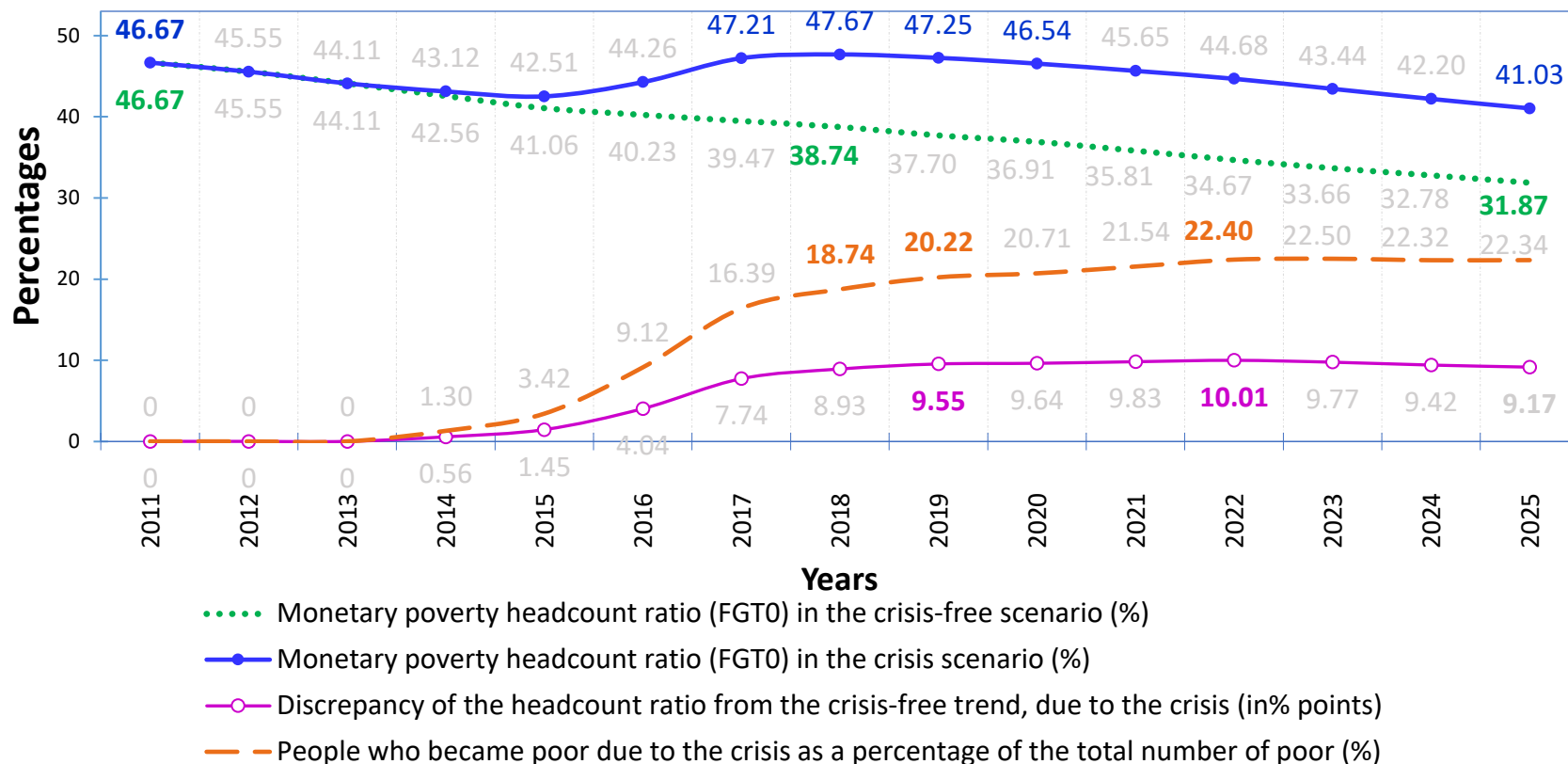
Amount allocated to each poor child per year

Implicit average amount allocated to each individual within households housing poor children per year

Simulation Results

Poverty Impacts of the Crisis

For the entire Chadian population

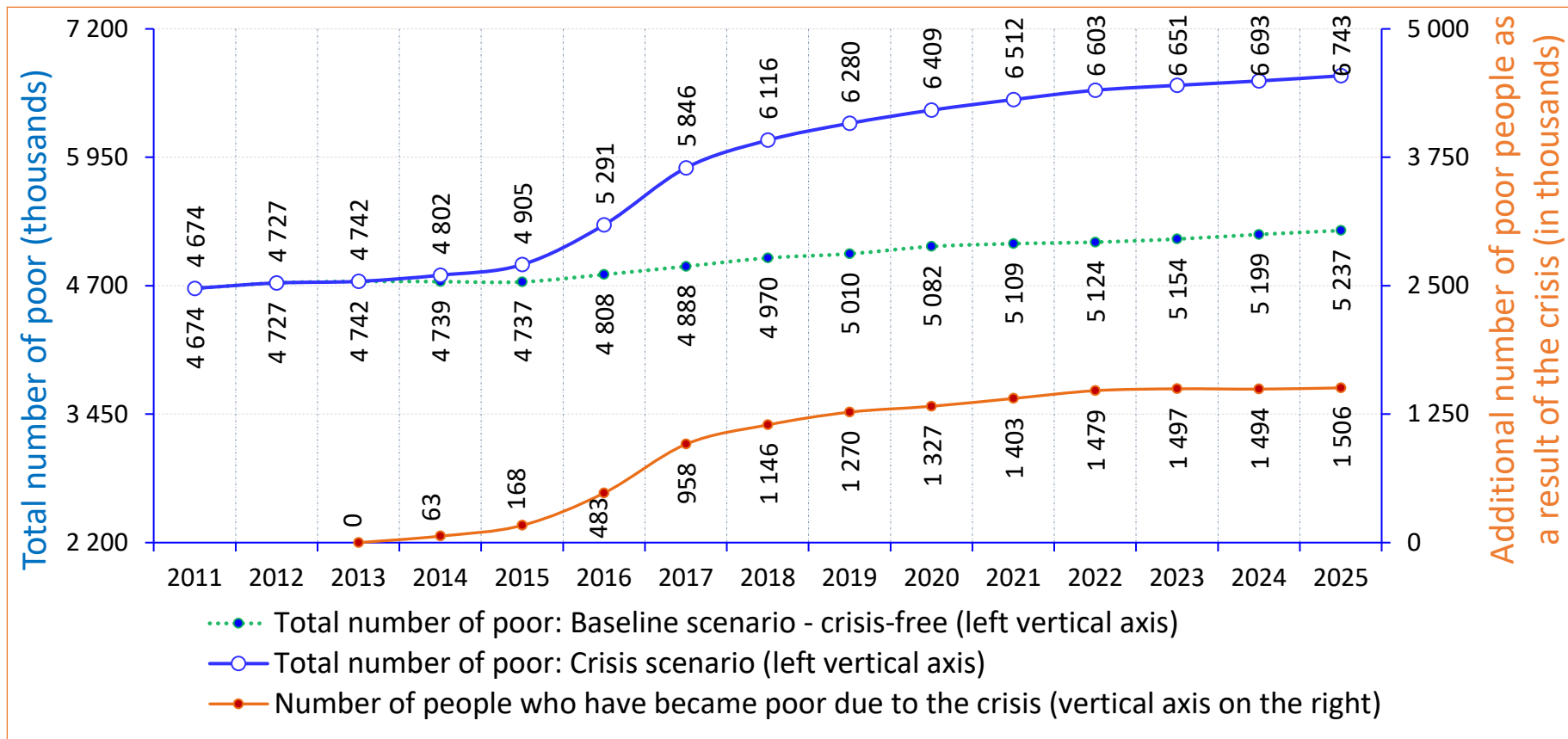


- If the crisis had not occurred, the national poverty headcount ratio would have declined from 46.67% in 2011 to 38.74% in 2018, and further down to 31.87% in 2025.
- But because of the crisis, the poverty headcount have substantially deviated from this promising trajectory with around 10 percentage points from 2019 on
- As from 2017 to 2020, it would had returned to around its 2011 level : which implies a lost decade
- Of the people living in poverty **in 2018, 18.74%** were poor due to the crisis; **in 2019: 20%**; **from 2022: more than 22%.**



Poverty Impacts of the Crisis

For the entire Chadian population

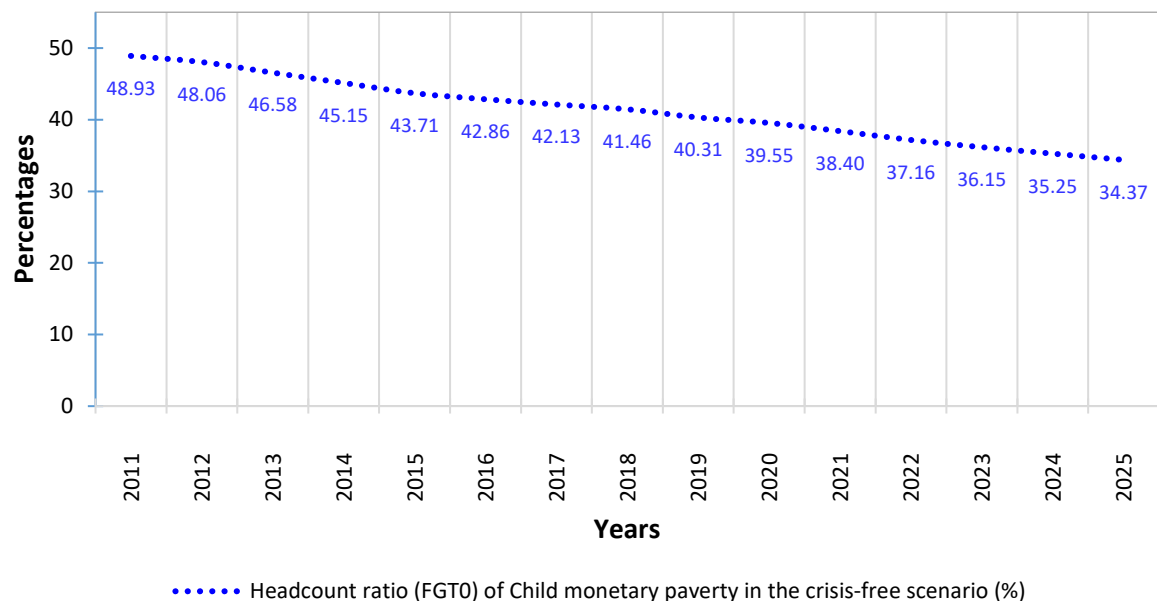


- The critical situation is more obvious if one considers the trends in poverty in terms of number of poor.
- Even with decreasing headcount ratio in crisis-free scenario, the total number of poor people continues to grow as the population increases more
- The crisis deteriorates the country's poverty status so that the additional number of poor people due to crisis is estimated to 1.3 millions in 2020 and would further climb up to 1.5 millions in 2025



Poverty Impacts of the Crisis

Trends in child poverty

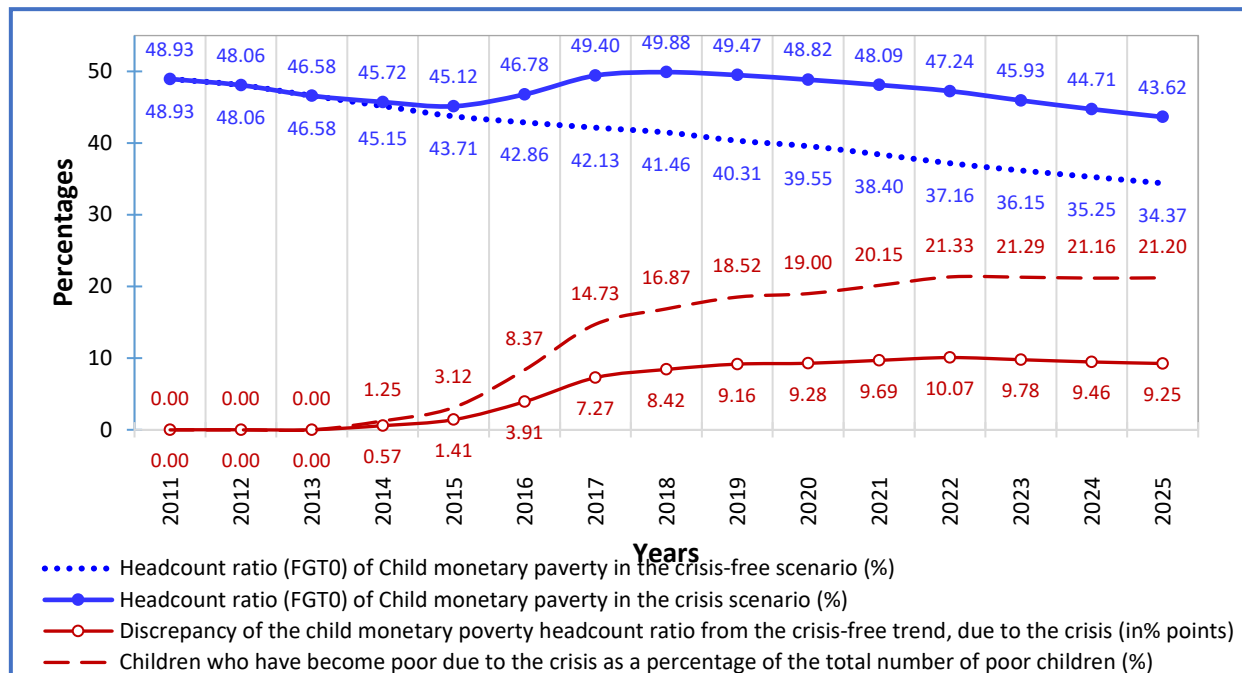


- As for the whole population, the share of poor children out of the total population of children decreases from year to year in the crisis-free scenario.
- However, structurally, not only is child poverty higher than the national average, but also, even with positive economic growth, it tends to decrease less quickly if no or insufficient policy measures target specifically children.

	Adults	Children
FGT ₀ in crisis-free scenario in 2011 (%)	43.52	48.93
FGT ₀ in crisis-free scenario by 2025 (%)	28.39	34.37
Decline in headcount ratio by 2025 in crisis-free scenario (percentage points)	15.13	14.56

Poverty Impacts of the Crisis

Trends in child poverty



- In the crisis scenario, among poor children, the share of those having this status due to the crisis gradually increases from year to year, up to a bit more than 21% as from 2022.
- Which is very dramatic, compared to adults, given the larger initial proportion of children in the total population (58.2%).

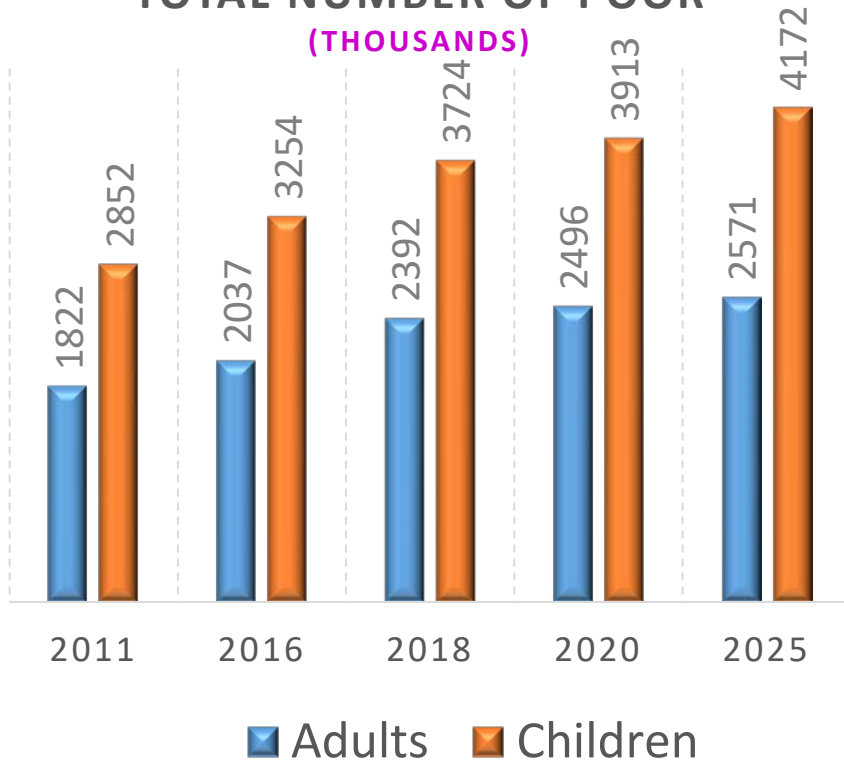


Poverty Impacts of the Crisis

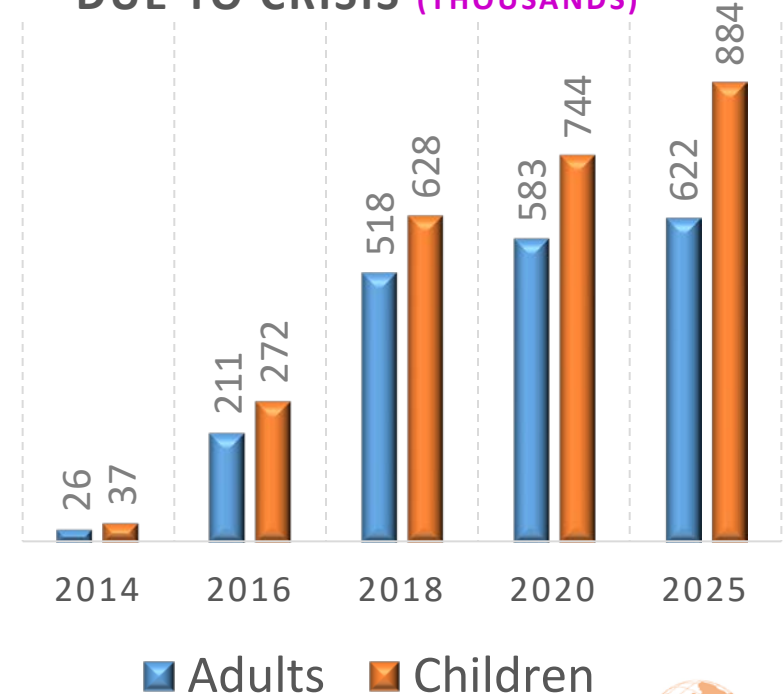
Trends in child poverty

The crisis is pernicious for everyone, but hits children harder than adults, especially in terms of people who became poor because of it

**TOTAL NUMBER OF POOR
(THOUSANDS)**



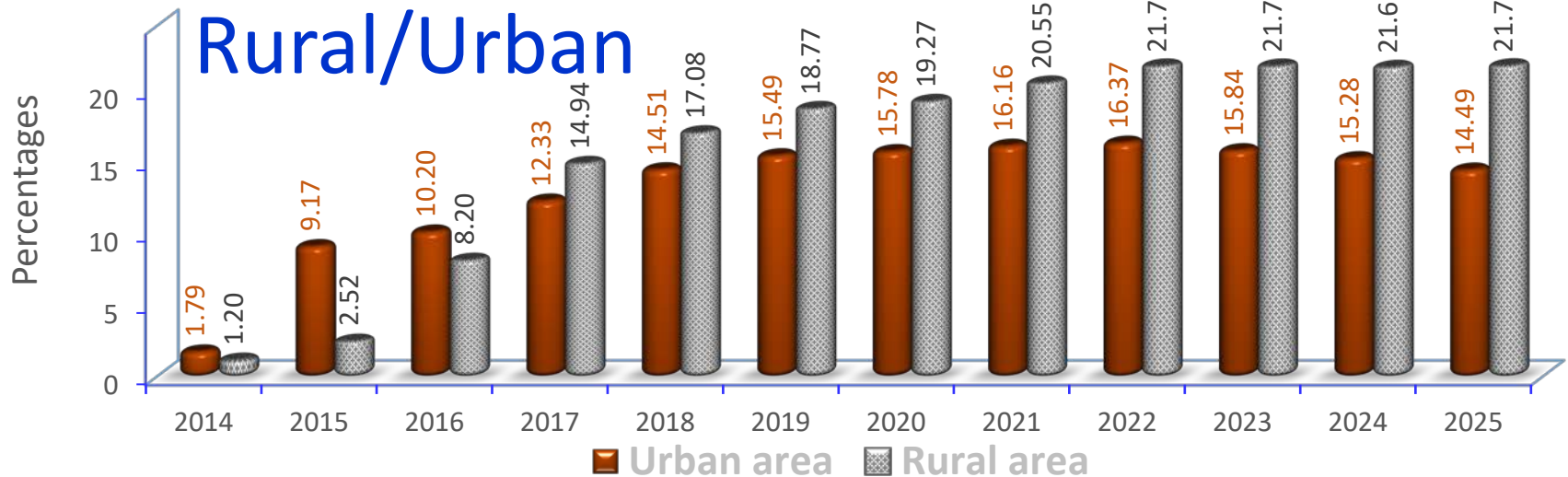
**PEOPLE WHO BECAME POOR
DUE TO CRISIS (THOUSANDS)**



Poverty Impacts of the Crisis

Trends in child poverty

Children living in poverty due to the crisis as a % of total number of poor children in an area



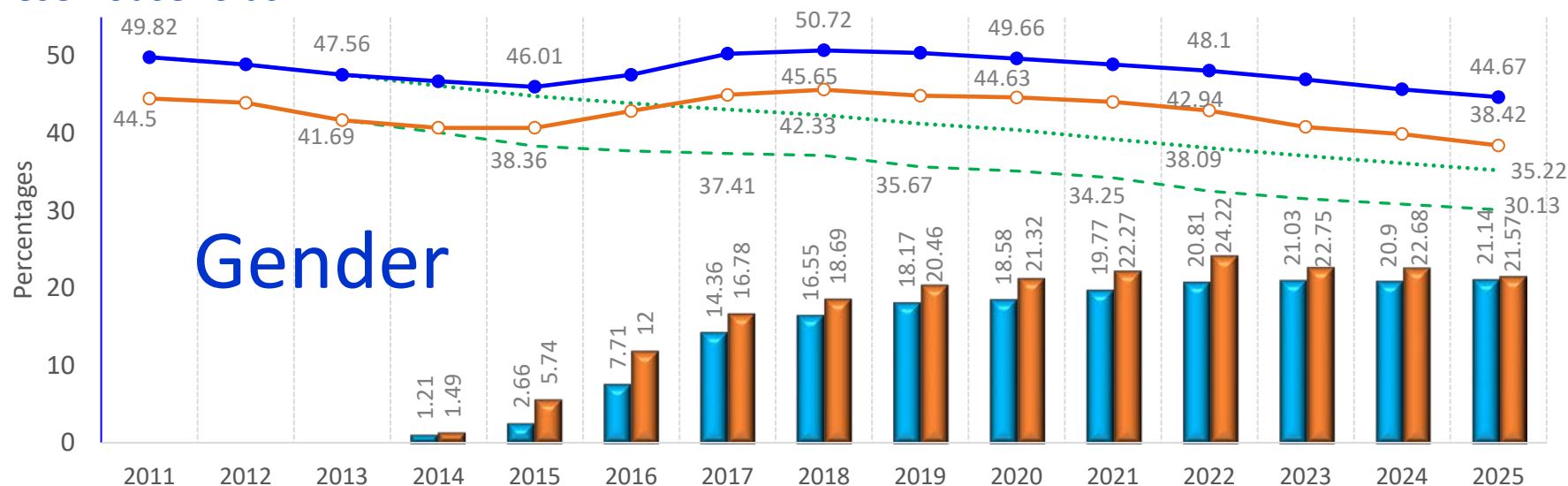
- Crisis increased poverty in both urban and rural areas.
- The effects were comparatively worse in urban areas during the first three years (2014-2016), but from 2017 the situation became more dramatic in rural areas.
- This reflects a widening impoverishment of children in general, but even more dramatically in rural localities of which the contribution to child poverty was already preponderant in 2011 (92.11% of poor children lived in rural areas where the FGT0 was 54.49%, while in urban areas the FGT0 was 22.32%).



Poverty Impacts of the Crisis

Trends in child poverty

- The crisis had hit children regardless of the gender of the head of household. However...
- In female-headed households, the share of children who become poor due to crisis is a bit higher.
- But in terms of contribution to child poverty, male-headed households still occupy the first place, because a very high share of the total population of children in Chad (about 83%) live in these households.



- Male-headed households: Share of children who have become poor because of the crisis, as a percentage of the total number of poor children (%)
- Female-headed households: Share of children who have become poor because of the crisis, as a percentage of the total number of poor children (%)
- Male-headed households: Headcount ratio of child monetary poverty (FGT0) in the crisis-free scenario (%)
- Male-headed households: Headcount ratio of child monetary poverty (FGT0) in the crisis scenario (%)
- - - Female-headed households: Headcount ratio of child monetary poverty (FGT0) in the crisis-free scenario (%)
- Female-headed households: Headcount ratio of child monetary poverty (FGT0) in the crisis scenario (%)



Poverty Impacts of the Crisis

Trends in child poverty

- A deep contrast between impacts in households headed by an individual with a vocational training or higher education level on the one hand and in other households on the other hand
- In the first group of households, poverty indicators are practically insensitive to changes in the economic environment, whether it is favorable or not, while the poverty effects in the rest of households are more conventional.

Education level	FGT0 in 2011 (%)	FGT0 in 2018 (%)		FGT0 in 2025 (%)	
		Crisis-free	Crisis	Crisis-free	Crisis
Vocational training	8.63	8.55	9.45	8.53	8.53
Higher education	9.27	9.27	9.53	8.75	8.75
Uninstructed	50.29	43.24	51.32	35.56	45.14
Koranic school	37.25	31.89	38.25	26.93	32.37
Primary education	54.98	46.07	55.56	38.86	49.44
Scondary education	36.42	28.31	37.73	23.39	30.06

Poverty Impacts of the Crisis

Trends in child poverty

- **In case of GDP growth**, the inertia in the first group can be explained by the fact that poor children in those households live in an extreme poverty so severe that the GDP growth alone is insufficient to get them out of it.
- **In the case of the crisis**, this inertia would reflect greater resilience of non-poor among those households, or the fact that the less wealthy of non-poor children living in the said households enjoy expenditure level sufficiently above the poverty line

Education level	FGT0 in 2011 (%)	FGT0 in 2018 (%)		FGT0 in 2025 (%)	
		Crisis-free	Crisis	Crisis-free	Crisis
Vocational training	8.63	8.55	9.45	8.53	8.53
Higher education	9.27	9.27	9.53	8.75	8.75
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Poverty Impacts of the Crisis

Trends in child poverty

- However, children who are living in such a bubble that isolates them from effects of the changes in economic environment account for only 1.6% of total number of children in Chad.
- Whatever the scenario, between 63 and 64% of poor children live in households whose head has no education. The cumulative contribution to child poverty, for households headed by uneducated individual or a person with koranic or primary education, stayed around 92% throughout the modeling period.

Education level	FGT0 in 2011 (%)	FGT0 in 2018 (%)		FGT0 in 2025 (%)	
		Crisis-free	Crisis	Crisis-free	Crisis
Vocational training	8.63	8.55	9.45	8.53	8.53
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Primary education	54.98	46.07	55.56	38.86	49.44
Scondary education	36.42	28.31	37.73	23.39	30.06

Poverty Impacts of the Crisis

Trends in child poverty

- Thus, as far as alleviating poverty in general and child poverty particularly is concerned, education level of the head of household matters.

Education level	FGT0 in 2011 (%)	FGT0 in 2018 (%)		FGT0 in 2025 (%)	
		Crisis-free	Crisis	Crisis-free	Crisis
Vocational training	8.63	8.55	9.45	8.53	8.53
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Scondary education	36.42	28.31	37.73	23.39	30.06

Effects of Cash Transfers under the Pilot Social Safety Nets

Analysis regardless of age

Of the three recipient regions, pilot programs have reduced poverty only in the nation's capital, N'Djaména

Individuals lifted out of poverty account for 3.4% of poor in recipient households of the region and 52.43% of their members who became poor due to crisis

Poverty indicators by 2025	N'Djamena	Barh El-Gazel	Western Logone	Entire Chadian Population
Change in FGT ₀ due to Pilot social safety nets compared to crisis scenario (percentage points)	-0.28	0	0	-0.02
Number of people out of poverty due to Pilot social safety nets	3 747	0	0	3 747
Percentage of people out of poor in region's recipient households	3.40	0	0	-
% of people out of poverty compared to the number of people who became poor due to crisis	52.43	0	0	 0.25

Effects of Cash Transfers under the Pilot Social Safety Nets

Analysis regardless of age

But this poverty alleviation is very weak, mainly when we consider all the regions: Individuals escaping poverty represent only a 0.25% drop in total number of people who became poor due to the crisis, for the whole country.

Poverty indicators by 2025	N'Djamena	Barh El-Gazel	Western Logone	Entire Chadian Population
Change in FGT ₀ due to Pilot social safety nets compared to crisis scenario (percentage points)	-0.28	0	0	-0.02
Number of people out of poverty due to Pilot social safety nets	3 747	0	0	3 747
Percentage of people out of poor in region's recipient households	3.40	0	0	-
% of people out of poverty compared to the number of people who became poor due to crisis	52.43	0	0	 0.25

Effects of Cash Transfers under the Pilot Social Safety Nets

Impacts on child poverty

Effects on child poverty are broadly like those estimated regardless of age

Children lifted out of poverty represent:

- 2.7% of poor children in beneficiary households in N'Djamena,
- 54.1% of children who became poor due to the crisis in these households,
- 0.2% of all children nationwide who have become poor as a result of crisis

Poverty indicators by 2025	N'Djamena	Barh El-Gazel	Western Logone	Entire Chadian Population
Change in FGT ₀ due to Pilot social safety nets compared to crisis scenario (percentage points)	-0.28	0	0	-0.02
Number of people out of poverty due to Pilot social safety nets	1 796	0	0	1 796
Percentage of people out of poor in region's recipient households	2.69	0	0	-
% of people out of poverty compared to the number of people who became poor due to crisis	54.13	0	0	 0.20

Effects of Cash Transfers under the Pilot Social Safety Nets

Impacts on child poverty

From all the above, it therefore arises that Pilot Social Safety Net programs are not effective enough in mitigating the adverse effects of the crisis.

Poverty indicators by 2025	N'Djamena	Barh El-Gazel	Western Logone	Entire Chadian Population
Change in FGT ₀ due to Pilot social safety nets compared to crisis scenario (percentage points)	-0.28	0	0	-0.02
Number of people out of poverty due to Pilot social safety nets	1 796	0	0	1 796
Percentage of people out of poor in region's recipient households	2.69	0	0	-
% of people out of poverty compared to the number of people who became poor due to crisis	54.13	0	0	 0.20

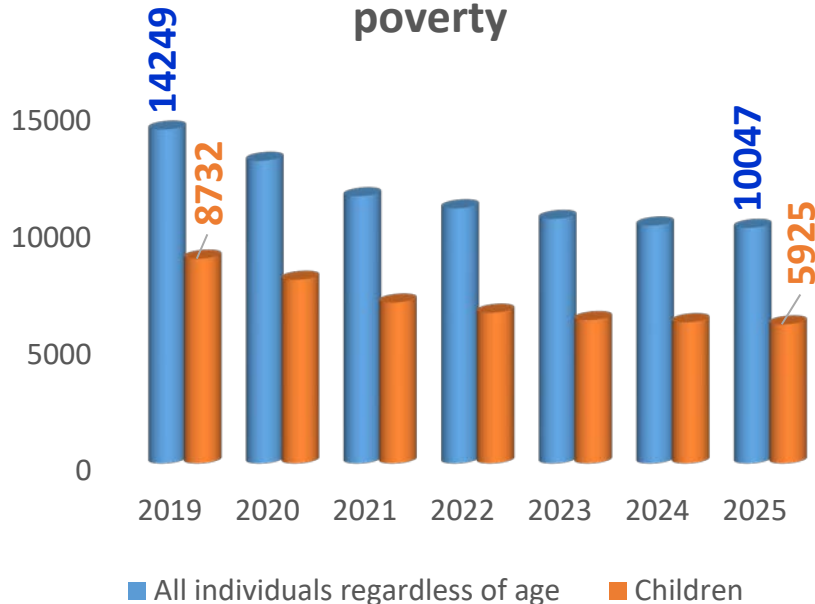
Effects of a total removal of import tariffs levied on food products

Poverty impacts

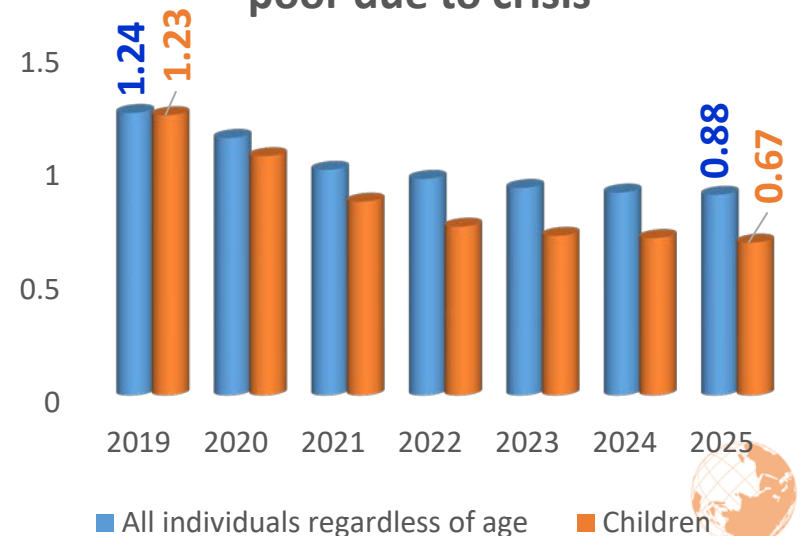
This policy response has a positive but timid and declining effect on poverty alleviation over the time

The number of individuals lifted out of poverty is decrescendo. This is true in absolute terms, but also as a percentage of the number of people who became poor due to crisis.

Number of people escaping from poverty



People lifted from poverty as a % of the number of people who became poor due to crisis

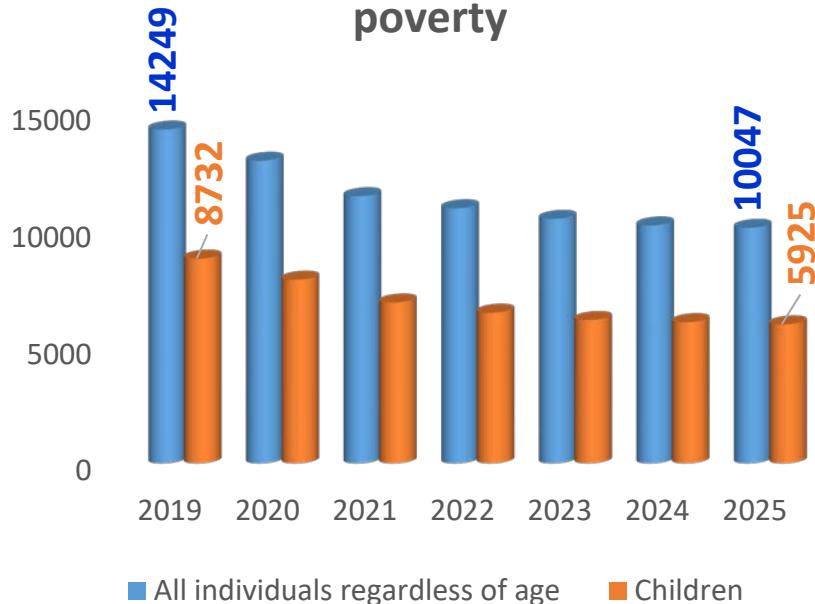


Effects of a total removal of import tariffs levied on food products

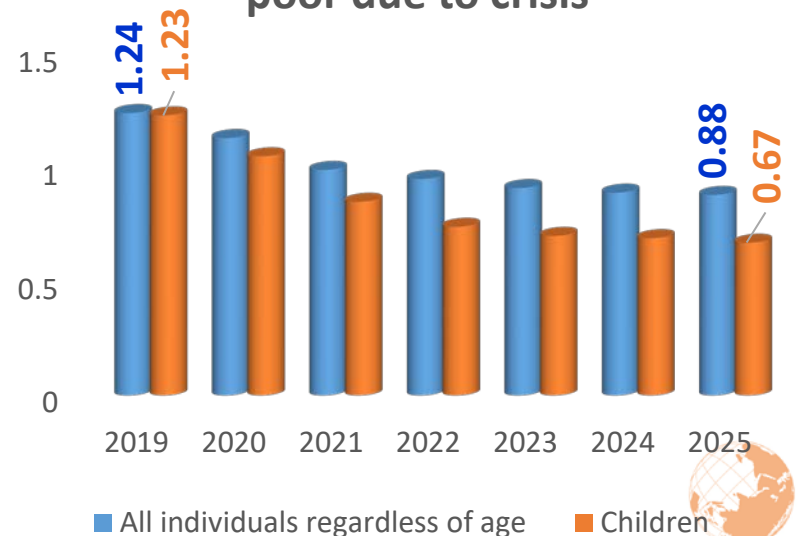
Poverty impacts

These vanishing effects reflect the fact that some people freed from poverty at the beginning of the implementation of the policy plunge again into poverty during following years.

Number of people escaping from poverty



People lifted from poverty as a % of the number of people who became poor due to crisis



Effects of a total removal of import tariffs levied on food products

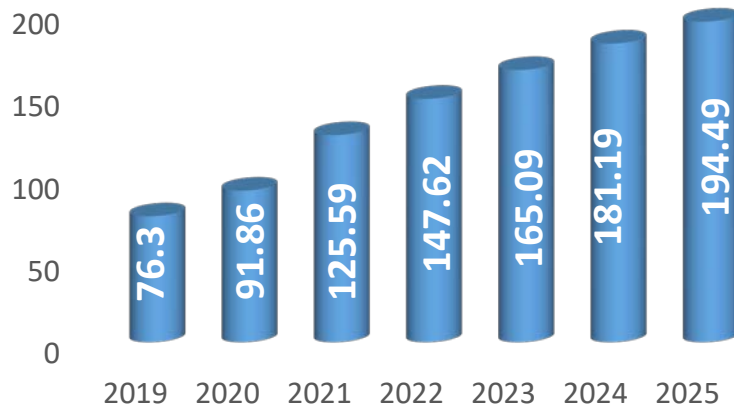
Cost-Benefit Analysis

This policy is initially less costly than the pilot social safety nets, until 2020. But beyond 2020, it becomes more expensive.

For instance, its unit cost is 0.76 times that of the pilot safety nets in 2019 but gradually increases up to almost twice in 2025.

On another hand, it appears that non-poor households benefit more from this policy than poor households do.

Average cost per month to lift one individual out of poverty as a % of the average cost in the pilot safety nets scenario



In fact, the additional per capita amount spent in non-poor households as a result of this policy, in real terms, is about 9.5 times that of poor households.

In brief, although importing food duty-free is more effective policy in terms of number or percentage of people lifted out of poverty, compared to the social safety nets pilot programs, it is however more costly and remain far from mitigating the adverse effects of crisis

Effects of cancelling VAT levied on foods

Poverty impacts

Exemption from VAT is **relatively** pro-poor compared to duty-free imports of food products

This begins with the slight growth in per capita real consumption of poor, in percentage terms: more than twice the change in per capita real expenditure among non-poor.

In monetary terms, the additional real consumption for non-poor is still higher than that of poor: 1.66 times higher in 2019 and gradually down to 1.39 times in 2025.

However, this ratio becomes relatively low compared to the duty-free scenario where the gain of the non-poor is 9.5 times that of the poor.

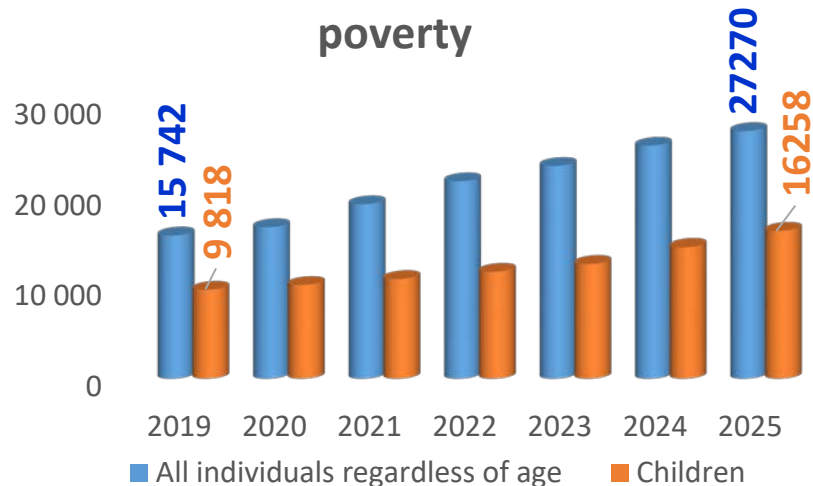


Effects of cancelling VAT levied on foods

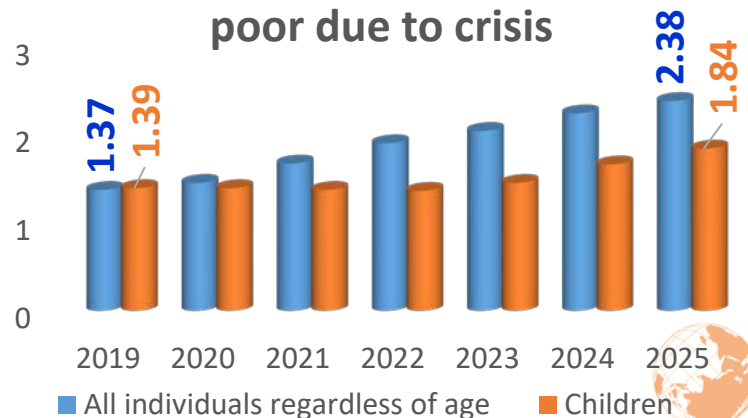
Poverty impacts

- An increasing number of people exit poverty from year to year.
 - From almost 16,000 in 2019 to more than 27,000 individuals in 2025, regardless of age
 - From almost 10,000 children in 2019 to more than 16,000 in 2025
- This reflects a still small, but growing mitigation rate of adverse poverty impacts of the crisis.

Number of people escaping from poverty



People lifted from poverty as a % of the number of people who became poor due to crisis



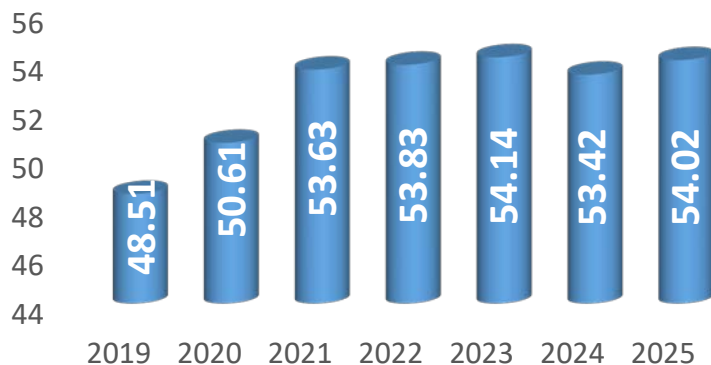
Effects of cancelling VAT levied on foods

Cost-Benefit Analysis

This policy response is relatively more effective and efficient than both duty-free policy and social safety net pilot programs.

- o With a cumulative implicit cost (for the simulation period) equal to only 73% of that incurred in duty-free scenario, the VAT policy applied here allows to exit 2.7 times more people from poverty.
- o The average cost of lifting an individual out of poverty in the VAT-based scenario is only around half the cost incurred in pilot safety net programs.

Average cost per month to lift one individual out of poverty as a % of the average cost in the pilot safety nets scenario



However, although the results of this scenario are better than those of the previous two, they remain very far from wiping out the additional poverty engendered by the crisis.

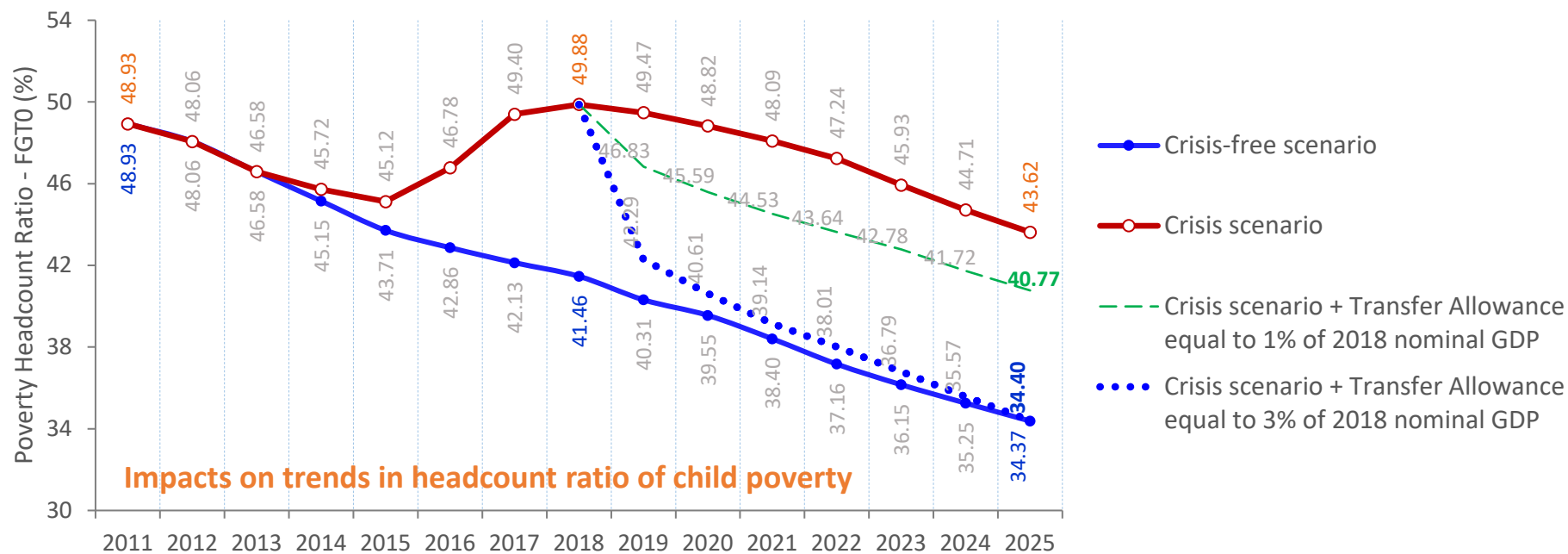


Impacts of broadening the scope of cash transfers to all households sheltering poor children

Budget of 1% vs. 3% of GDP

With a budgetary allocation equal to 1% of GDP, the FGT0 ratio for child poverty decreases by around 3 percentage points each year, compared to the values in the crisis scenario.

If the total cash transfers budget is equal to 3% of GDP, child poverty drops more substantially. By 2025, after implementing the program for 7 years, the low level this ratio would have reached if crisis had not occurred is recovered.

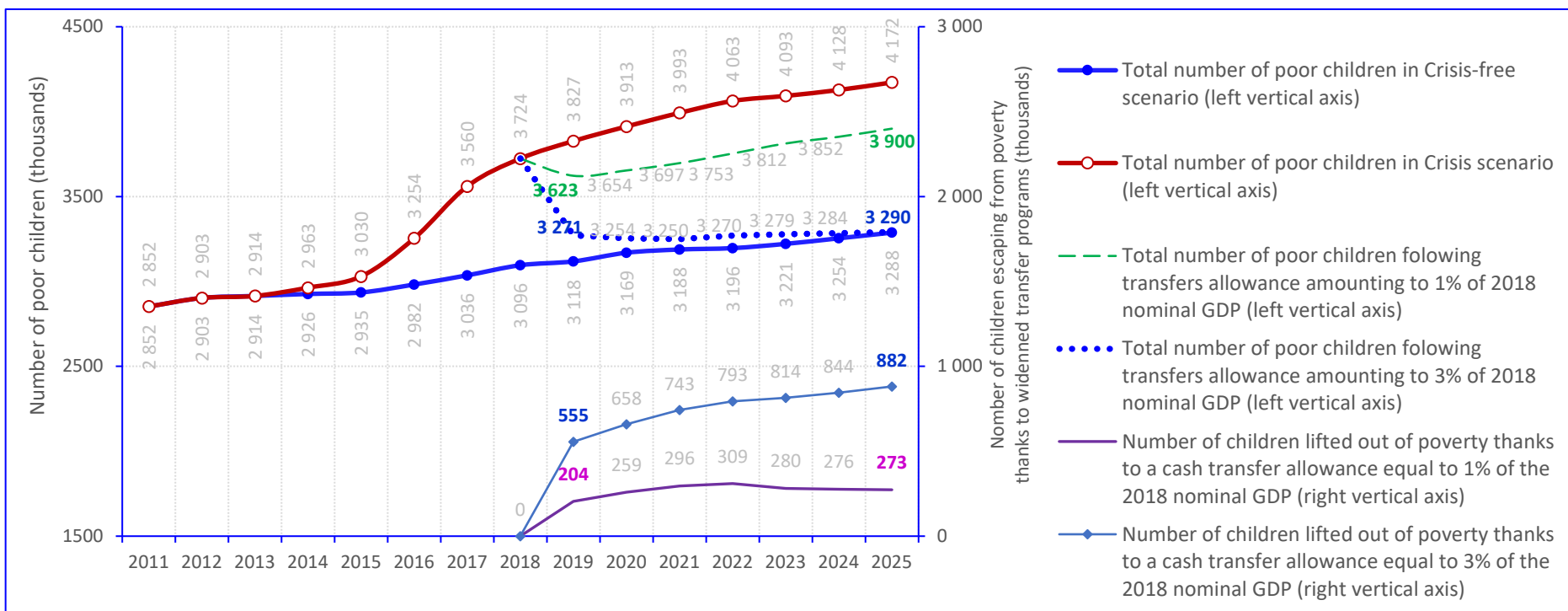


Impacts of broadening the scope of cash transfers to all households sheltering poor children

Budget of 1% vs. 3% of GDP

273,000, i.e. just under a third of the children plunged into poverty by the crisis, would come out of it by 2025 if the total cash transfers budget is 1% of GDP.

In the event this budget amounts 3% of GDP, about all the children that the crisis has plunged into poverty (882,000) are delivered from it as of 2025, and the number of poor children remain almost constant to 3.3 millions each year.



Impacts of broadening the scope of cash transfers to all households sheltering poor children

Budget of 1% vs. 3% of GDP

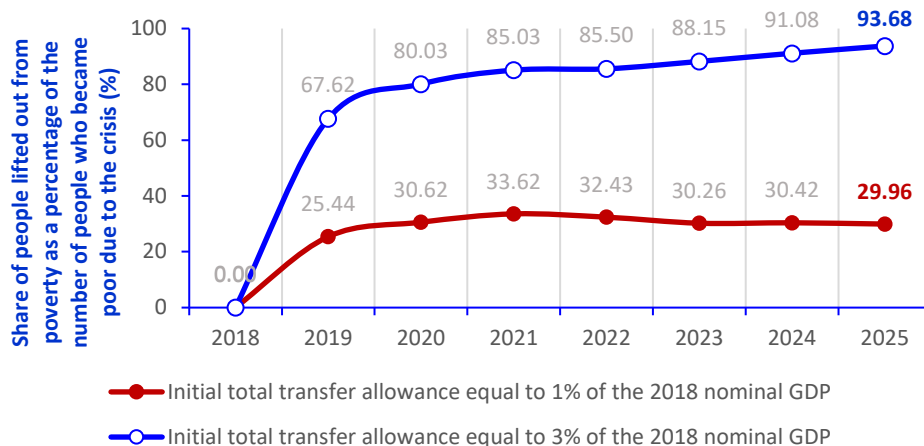
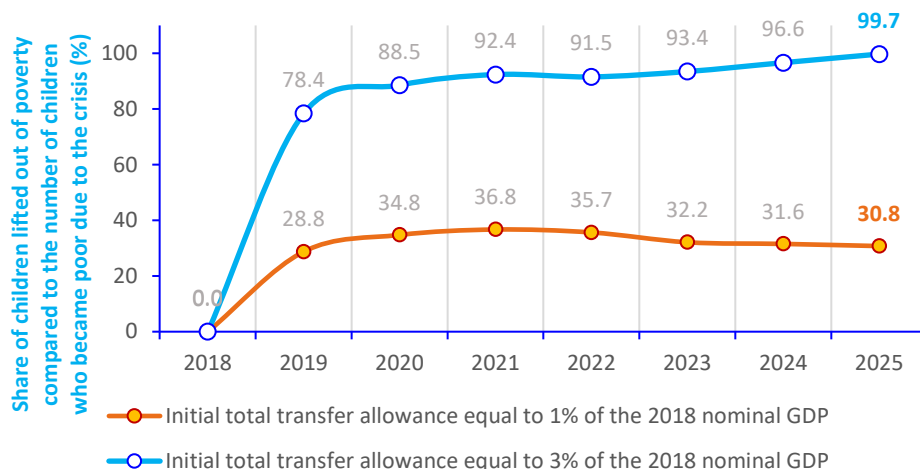
In other words, by 2025, the mitigation rate of the adverse effects of the crisis on child poverty actually reaches 100% with a budget of 3% of GDP and 31% if that budget amounts to 1% of GDP.

Improvement generated by extended cash transfer programs benefits to the Chadian population as a whole

The programs would lift out of poverty 30% or 94% of citizens who have become poor because of the crisis, respectively in 1%GDP or 3%GDP-transfer program.

These mitigation rates are slightly lower compared to the case of child poverty considered alone.

Which is normal, since, households which do not house poor children do not benefit directly from transfers.



Conclusion and Expected Implications for Policy

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The results of this study show that:

- The effects of the economic crisis induced by the collapse of oil prices from mid-2014, were very harmful for the Chadian economy in general and particularly in worsening child poverty.
- Among the policy options simulated, extensive cash transfer programs to households that house poor children are found to be the most effective and efficient to really mitigate adverse effects of the crisis.
- Transfers should be distributed to households proportionately to the number of children living in them and considering population growth over the years, so that to maintain the same amount of allowance per child from one year to another.
- An efficient targeting device should be designed, to make implementation as easy as possible.



Conclusion and Expected Implications for Policy

- Government would work to design a domestic financing to put in place beyond the probationary period during which cash transfers are financed by its international development partners.
- In this vein, emphasis should be placed on empowering the recipients to become independent after the probationary startup period, to favor their exit from the program in the future with a low probability of seeing them plunge again into poverty.
- Education level matters in alleviating poverty: the higher the level of education of the head of the household or of a spouse, the better the standard of living of the household members.
- Government and its partners are encouraged to boost their efforts in promoting education up to higher level, to motivate citizens to complete at least secondary education level, to promote and diversify vocational and technical training.



Thank you !

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