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What Are the Economic and Poverty Implications for Sudan If the Conflict Continues through 2024?

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ABSTRACT

The conflict in Sudan, which started in April 2023, has led to severe economic repercussions, sharply reducing the country's Gross Domestic Product (GDP), employment, and household incomes and increasing the prevalence of poverty. Using an updated economywide database for Sudan, we ran an analysis of the likely economic impact of a continuation of the conflict through to the end of 2024 using two scenarios of extreme and moderate reductions in overall GDP. These reductions are triggered mainly by the ongoing conflict, which is causing additional cuts in the operations of business services and continuing disruptions to wholesale and retail services and manufacturing.

The results of the analysis show a 47 percent decline in Sudan's GDP under the extreme reduction scenario and a 13 percent decline under the moderate scenario relative to 2022 before the conflict began. Under the extreme scenario, the agrifood system GDP falls by 26 percent and employment by 50 percent, with non-farm jobs being more adversely affected. Household incomes decline significantly across all quintiles and in both rural and urban areas, with urban and richer households facing slightly higher reductions. Less-educated labor categories are severely affected, while tertiary-educated labor shows relative resilience. Poverty rates have surged, particularly in rural areas and among women, with the national poverty rate estimated to have increased by 21 percentage points under the extreme reduction scenario.

To mitigate the widespread adverse impacts of the conflict on the Sudanese economy and foster long-term resilience, policies and interventions should prioritize the restoration of economic productivity, provide support for the agrifood system and employment recovery strategies, and ensure that social protection measures are accessible to all households facing increased deprivation.

Keywords: Sudan conflict, poverty, employment, agrifood system.

1) INTRODUCTION

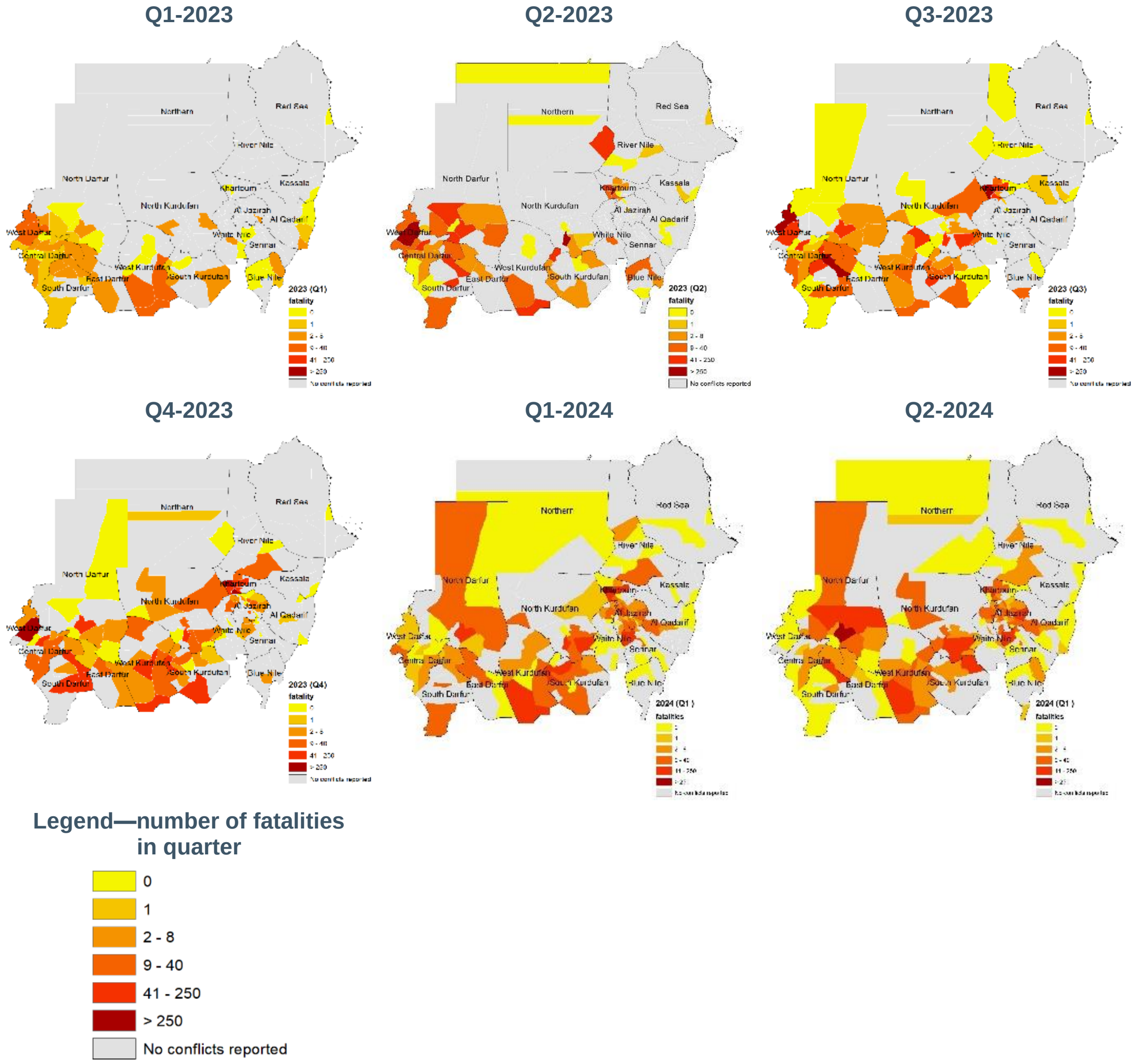
On April 15, 2023, fighting erupted between the Sudanese Armed Forces (SAF) and the Rapid Support Forces (RSF), escalating the struggle for control over Sudan. This continuing conflict has not only led to significant displacement of the population but also has caused extensive damage to Sudan's already fragile productive infrastructure. Escalating hostilities and a deteriorating security landscape have displaced approximately 23 percent of the Sudanese population. As of July 2024, almost 8 million persons were estimated to have been displaced within Sudan and 2.2 million forced into adjacent countries. Vulnerable groups have been particularly impacted—it is estimated that 53 percent of the displaced are female, and more than half are children under the age of 17 years (IOM 2024).

The conflict has progressively intensified with widespread violence and significant fatalities across the country. Figure 1.1 shows a substantial escalation in conflict-related deaths as the conflict has continued, particularly in Darfur in the west and in Khartoum. As of mid-July 2024, over 18,500 individuals were reported to have been killed.

The conflict in Sudan has severely disrupted public services, especially health and education. Fifteen million people are estimated to now be without access to healthcare, and around three-quarters of all health facilities are reported as being inoperative (OCHA 2024). This has exacerbated health crises across the country—in early May 2024, the Federal Ministry of Health documented over 11,000 cases of acute watery diarrhea with over 300 fatalities (WHO 2024). In the education sector, over 10,000 schools have shut down in regions ravaged by conflict, resulting in about 19 million children being deprived of schooling (UNESCO 2024). There is an urgent need for interventions to restore and stabilize these critical social service sectors across Sudan.

Similarly, amid the escalating conflict, food security and nutritional conditions in Sudan have worsened significantly. Integrated Food Security Phase Classification (IPC) analysis forecasts that from June to September 2024, 25.6 million people, 54 percent of Sudan's population, will experience high levels of acute food insecurity (IPC phase 3 or above), with 8.5 million of them in a state of emergency (IPC Phase 4) and 0.8 million facing catastrophic conditions (IPC phase 5) (IPC 2024). The conflict has restricted movements of food and other goods, interfered with the provision of services of all kinds, disrupted markets, hindered agricultural production activities, and prevented humanitarian access, thus severely reducing the availability and access to food for millions of Sudanese (Siddig and Vos 2024).

Figure 1.1 Fatalities due to conflict in Sudan, Q1-2023 to Q2-2024



Source: ACLED (2024).

While the social and humanitarian impacts of the conflict are clear, the nuanced ramifications of the ongoing strife on Sudan's economy have not been comprehensively assessed. In examining the economic fallout from the conflict, projections by major international financial institutions have highlighted significant contractions in the country's Gross Domestic Product (GDP) (Siddig and Basheer 2024). The International Monetary Fund projected that Sudan's GDP would shrink by 18 percent in 2023, with a modest recovery of 0.6 percent anticipated in 2024 (IMF 2023). Conversely, the World Bank's forecast is a 12 percent decrease in 2023, with a further decline of 3.7 percent in 2024 (Ezemenari et al. 2023). Other analyses suggested that Sudan's GDP could plummet by over 40 percent in 2023 (Siddig et al. 2023). Reinforcing these assessments, Sudan's Minister of Finance reported in November 2023 that the war had resulted in economic losses exceeding USD 26 billion, or more than half of the nation's total GDP in 2022 (Sudan Akhbar 2023).

The conflict in Sudan has not only resulted in vast humanitarian challenges but also inflicted profound economic damage. While various reports and projections capture the immediate broad impacts, the deeper economic consequences of the conflict, especially on livelihoods, income, and poverty, remain insufficiently explored. This gap underscores the need for a thorough assessment that integrates updated economic models of the Sudanese economy to gauge the conflict's economic impact comprehensively.

This study aims to comprehensively analyze the effects of the ongoing conflict in Sudan on the economy, household livelihoods and incomes, and poverty. It utilizes an updated social accounting matrix (SAM) for Sudan that reflects the state of the economy in 2021, calibrated to a SAM multiplier framework in which the macro-level data are updated to reflect the state of the economy of Sudan in 2022, the year prior to the eruption of conflict. The framework and data, together with the simulations, allow us to assess the ramifications of the conflict at the economic sector level. The goal of this exercise is to offer insights into the direct and indirect economic shocks caused by the conflict and suggest potential strategies for economic recovery and stabilization.

The study addresses several key research questions: What are the impacts of the conflict on the different sectors of the Sudanese economy, and which are being affected the most? How has the conflict been affecting employment, income, and poverty levels across different demographic categories? How has Sudan’s agrifood system been affected by and reacted to the conflict?

The paper is organized as follows: This section 1 introduces the context and motivation. Section 2 uses recent literature to outline the broad impact of the war in Sudan. Section 3 outlines the analytical approach used and describes the data and the simulations. Section 4 presents the results and discusses them in light of current economic theories and practices. Finally, Section 5 concludes by providing recommendations for policy and future research.

2) BROAD IMPACTS OF THE CONFLICT

The ongoing conflict in Sudan presents a complex interplay of historical, socioeconomic, and political factors that have broad implications for the country's stability and development. This literature review aims to dissect these multifaceted impacts by examining a wide array of studies that discuss conflict dynamics within Sudan.

Civil conflicts over the centuries have shaped Sudan's social and political landscapes. These conflicts, among the most severe in Africa, have both emerged from and contributed to deep-rooted ethnic and social fragmentation. The country endured Africa's longest civil war in south Sudan, lasting from 1983 to 2005, a conflict primarily fueled by ethnic divisions and disparities. The civil war in south Sudan increasingly targeted civilians, their lands, and their assets (Elnour 2008). The civil war ended with the Comprehensive Peace Agreement, which gave the south Sudanese the right to self-determination. This later led to the secession from Sudan of the Republic of South Sudan in 2011, fundamentally altering the political and social fabric of Sudan.

Ascribing the prevalence of civil wars in Sudan and Africa in general to ethnic and religious diversity is not wholly correct. Analyzing data from 161 countries from 1960-1999, Elbadawi and Sambanis (2000) argue that Africa's frequent conflicts stem more from economic dependency on natural resources, poverty, and weak political systems rather than ethnolinguistic divisions. The authors suggest that democratic reforms might enable countries in Africa to better manage their societal challenges effectively. They also assert that ethnic diversity may foster more sustainable political and developmental outcomes through the inter-group negotiations necessary to address societal challenges.

Ali (2012) quantified the economic costs of the Darfur war, estimating that the devastation from 2003 to 2009 caused approximately USD 24 billion in economic losses. Despite minimal spending on health and education, the author found that up to 23 percent of GDP annually was allocated to war efforts, highlighting the economic irrationality of the conflict and its short- and long-term ramifications on Sudan’s economic and human development.

Due to the significant impacts of the Darfur war on the Sudanese economy and society, the transitional government, established after the December 2018 revolution that ousted the Bashir regime, prioritized national peace building efforts. Through its efforts, the Juba Peace Agreement was developed. The Agreement was signed by various armed movements in Darfur, who then became part of the transitional government, remaining in the government even after the October 2021 military coup.

On April 2023, the conflict between the SAF and RSF, who were part of the transitional government, erupted. It was driven by more than just political aspirations, but stemmed also from intense competition over economic resources, particularly gold and livestock. The rivalry extended to control over significant economic institutions and infrastructure, influencing Sudan's macroeconomic stability and productive capacities. Guo et al. (2023) highlight how these economic factors, coupled with commercial interests in vital sectors, are central drivers of the ongoing conflict, affecting Sudan’s broader economic landscape and its development trajectory. Recent research suggests that the current conflict might evolve into a prolonged civil war with severe economic ramifications. Scenarios for the period from 2024 to 2037 run using the World Bank's Long-Term Growth Model suggest drastic economic downturns in coming years depending on the policy responses to the current crisis that are put in place (Elbadawi et al. 2023). In a scenario with robust reforms, a prolonged civil conflict might cost around USD 195 billion, potentially restoring Sudan’s pre-conflict economic levels by 2047. Conversely, with limited reforms, the cost could rise to USD 236 billion, with no convergence to pre-conflict economic levels even by 2100. These analyses highlight the profound long-term stakes of the ongoing conflict for the economy of Sudan and the welfare of its people.

An assessment of economic activity just after the start of the conflict used satellite data to gauge the impact of the conflict (Guo et al. 2023). Remotely sensed data showing changes in nitrogen dioxide (NO_2) emissions were used. Those emissions served as a proxy for human and economic activity. Notable decreases in NO_2 levels were shown for Khartoum, suggesting a sharp reduction in economic activities. Conversely, cities like Port Sudan and Sawakin showed increased NO_2 emissions, possibly reflecting shifts in economic activity and internal displacements to those cities from Khartoum and other conflict-affected areas.

Using an online survey for large agrifood industry firms in Sudan, Kirui et al. (2023a) detail the profound disruptions faced by Sudan's agrifood processing sector due to ongoing armed conflict, noting significant closures and damage to facilities—two-thirds of surveyed firms were temporarily or permanently closed and most had experiencing severe damage to their facilities. The study highlighted the need for resilient supply chains and recovery strategies, including substantial investments in rebuilding and modernizing physical assets, alongside innovative financial services to support the recovery of Sudan’s agrifood processing sector and to ensure its continuity amidst the challenges brought by the conflict.

The conflict also has profoundly impacted smallholder farmers, disrupting their agricultural activities and economic stability significantly. Kirui et al. (2023b) report that nearly 30 percent of farmers have been displaced, making it difficult for most to prepare their fields and plant in the upcoming main cropping season of 2024, with financial constraints being a major barrier. Market access has become inconsistent, with a substantial minority of farmers facing closed markets. Moreover, the prices of essential commodities, including livestock, crops, bread, sugar, and cooking oil, had soared, further straining the livelihoods of farmers already struggling with reduced agricultural output and displacement. Together, these factors threaten the subsistence and economic viability of smallholder farmers across the country.

IFPRI and UNDP (2024), conducted a national rural household survey in late 2023 to assess the socioeconomic impacts of the conflict on rural households in Sudan. The findings revealed a drastic situation for rural households as a result of the conflict. Sixty percent of households reported significantly reduced incomes since the conflict began. Notably, 21 percent of rural households reported having lost all income, especially in Khartoum and Aj Jazira, where the conflict has been most intense. Moreover, there has been a significant shift in household income sources, with many moving from salaried non-agricultural jobs to unemployment. There also has been a slight increase in agricultural wage work. The decline in non-agricultural income highlighted the extensive damage to industrial, service, and public sectors. Remittances as the primary income source reported by households increased from 1 percent to 4 percent, reflecting a growing dependency of households on external financial support. This economic shift has led to 15 percent of households transitioning from employment to unemployment, underscoring the conflict's harsh impact on job security and economic stability.

Siddig et al. (2023) utilized a 2019 SAM multiplier modeling framework that was integrated with Sudan's 2021 national accounts and additional data to evaluate the sectoral and economywide impacts of the conflict in Sudan. The results revealed drastic sectoral disruptions. They estimated that the conflict halved the national economy, leading to approximately USD 14.6 billion in losses by December 2023. Moreover, their simulations show that job losses are particularly severe in the industrial sector with a potential loss of 80 percent of industry jobs, significantly impacting household welfare in urban areas. Additionally, the poverty rate was estimated to have risen by nearly 5 percentage points, adding 1.8 million people to the country’s impoverished population. This detailed analysis highlighted the urgent need for targeted interventions to curb the economic and social fallout of the conflict.

While Siddig et al. (2023) provided valuable insights using the 2019 SAM, our research utilizes a more recent 2021 SAM, updated with data from just before the conflict began in 2022. The current study also draws from the 2022 Sudan Labor Market Panel Survey, providing updated labor market analysis. Moreover, the research considers the economic impact of the conflict on several demographic disaggregations, areas not covered by Siddig et al. (2023). Finally, we update the poverty estimates in our poverty module using the latest government estimates from the 2021 poverty strategy paper for Sudan, enhancing the relevance and accuracy of our socioeconomic impact assessment.

3) SIMULATION APPROACH AND SCENARIOS

3.1 Sudan's social accounting matrix (SAM) multiplier framework

We use an updated version of the 2019 SAM for Sudan (Randriamamonjy et al. 2023) detailing transactions across 77 activities, 79 commodities, and ten household groups (categorized by rural and urban status and per capita expenditure quintiles). Production factors in the SAM include labor, capital, and land. Labor is further classified by rural and urban location, by male and female, and by unskilled, semi-skilled and skilled labor, based on the level of education required. Land and capital factors are left without further disaggregation. The SAM accounts for transaction costs and indirect taxes on marketed commodities and separates accounts for government, investment, and the rest of the world.

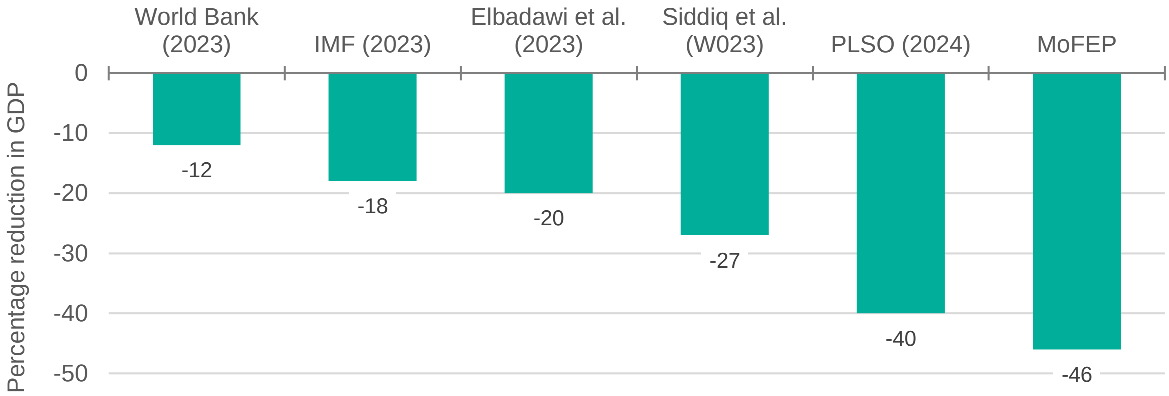
The 2019 SAM was updated using data for 2021, the latest published national account statistics for Sudan prior to the conflict. In addition, the 2021 SAM is upscaled to 2022 with macroeconomic data and is used as the base for the conflict impact assessment. The data were obtained from domestic sources—the Central Bureau of Statistics (CBS) for household and enterprise information and the Ministry of Finance and Economic Planning (MoFEP) and the Central Bank of Sudan (CBoS) for national and governmental accounts (CBS 2022a, 2022b, 2022c; CBoS 2022; MoFEP 2023). Data from international institutions were also integrated (IMF 2022; FAO 2022). In addition, the Sudan Labor Market Panel Survey (SLMPS), collected in 2022 just before the conflict began, was used to provide a comprehensive view of the labor market conditions (ERF and CBS 2022).

We updated the poverty module in the multiplier framework to align with the official poverty estimates released by the government of Sudan in 2021. The data used to estimate the poverty rate in Sudan is from the 2014/2015 National Household Budget and Poverty Survey. While the survey permits an extensive poverty analysis, the data are somewhat outdated. Consequently, the World Bank and the Sudanese government updated and revised the poverty estimates to factor in the effects of COVID-19. Simulations were employed to adjust the poverty rate to 61 percent for the year 2021(World Bank 2021). We integrated these revised estimates into the poverty module of the multiplier framework to represent the current economic situation in Sudan more accurately.

3.2 Description of the simulation scenarios

Several institutions have endeavored to quantify the impact of the conflict in Sudan on the national economy (Figure 3.1). That of the World Bank (2023) is a low-intensity estimate, while that reported by the Minister of Finance and Economic Planning (MoFEP) is severe (Sudan Akhbar, 2023). Other evaluations by the IMF, the International Food Policy Research Institute (Siddig et al. 2023), El Badawi et al. (2023), and the Partner Liaison Security Operation (PLSO) (2024) provide varied perspectives on the economic impact of the conflict that fall in between the estimates of the World Bank and MoFEP.

Figure 3.1 Summary of estimates of the impact of the conflict on the size of the Sudanese economy in 2023 relative to 2022



Source: Authors' calculation based on a desk review of available literature.

The World Bank's Macroeconomic and Fiscal Model predicts a substantial economic downturn for 2023, estimating a 12 percent contraction in GDP in 2023 due to the conflict. Within their forecast period to 2028, subsequent years are expected to show tentative recovery, with GDP contraction slowing to 3.7 percent and 0.7 percent in 2024 and 2025, respectively, followed by modest growths of 1.2 percent in 2026 and 3.2 percent by 2027, suggesting a gradual path towards economic stabilization post-conflict (Ezemenari et al. 2023).

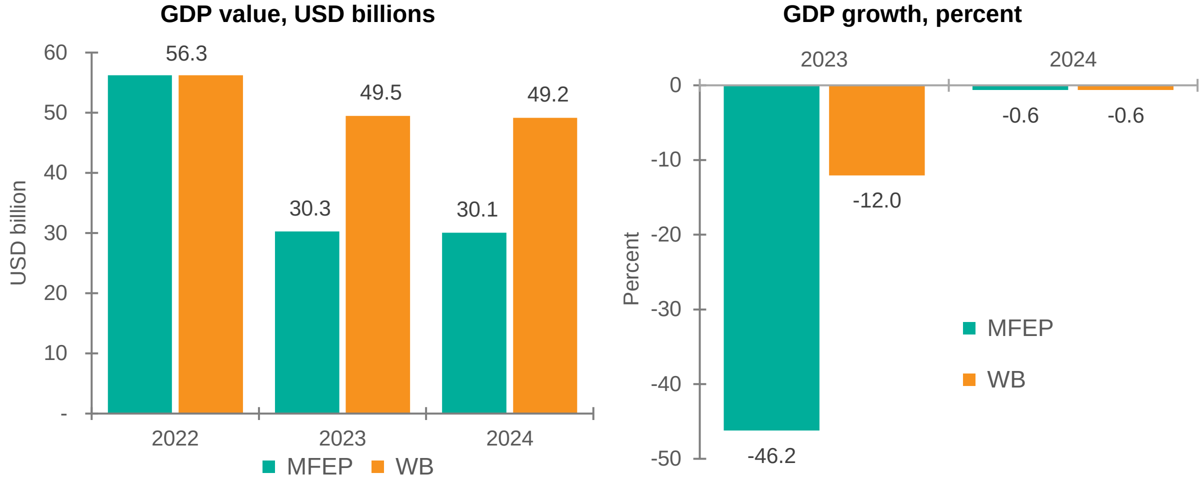
On the other hand, the World Economic Outlook estimate of the IMF predicts a higher contraction in 2023 and a faster recovery compared to the World Bank's forecast. The IMF anticipates an initial steep decline in GDP of 18 percent in 2023, followed by a rapid recovery phase where growth rebounds to 0.4 percent in 2024 and 7 percent in 2025. The growth rate stabilizes at around 4.5 percent in the years after that, suggesting a quicker return to economic stability. Overall, the IMF modeling suggests an optimistic view of Sudan's capacity for economic resilience and recovery post-conflict (IMF 2023).

Other analyses present a more pessimistic assessment of the conflict's economic toll. Siddig et al. (2023) project a dramatic contraction of 48 percent in Sudan's GDP for 2023. Correspondingly, the estimates of PLSO (2024) align with this view, estimating a contraction of 40 percent for 2023 with a further decline of 28 percent in 2024. These estimates suggest that Sudan will face substantial and continuing economic challenges as it grapples with the adverse economic effects of the ongoing conflict.

The statement of the Minister of Finance is the most pessimistic assessment of the economic losses Sudan faces due to the conflict—losses reaching USD 26 billion as of November 2023, not accounting for additional economic losses due to missed opportunities (Sudan Akhbar 2023). The Minister's estimate for the change in Sudan's GDP represents a reduction of approximately 46 percent compared to 2022.

This study updates and extends these earlier assessments of the adverse impacts of Sudan's conflict on its economy utilizing both a moderate, more conservative scenario, similar to that used by the World Bank, and an extreme scenario more aligned with the numbers quoted by the Minister of Finance (Figure 3.2). The motivation for utilizing estimates from two different scenarios is to encompass a broad spectrum of potential economic impacts stemming from Sudan's conflict.

Figure 3.2 Estimates by the World Bank and the Minister of Finance of the reduction in Sudan's GDP due to the conflict, 2022 to 2024



Source: World Bank (2023), Sudan Akhbar (2023).
Note: MFEP = Minister of Finance and Economic Planning; WB = World Bank.

This study employs a SAM multiplier framework, incorporating empirical observations across different sectors to assess the economic impacts of the conflict through the end of 2024. Two distinct scenarios are employed to capture the aggregate reductions in GDP in 2023 and 2024 due to the conflict. Both assume, the conflict will continue at least until the end of 2024.

- Moderate Reduction: This scenario is based on the estimates of GDP growth in 2023 and 2024 of the World Bank as reported in the October 2023 update of the World Development Indicators (World Bank 2023).
- Extreme Reduction: This scenario is based on the estimates of the Sudanese Minister of Finance and Economic Planning for the GDP reduction in 2023, estimated as USD 26 billion. In addition, this scenario uses the same reduction in GDP in 2024 as projected by the World Bank that is used in the other scenario.

While separate results are obtained in the analyses for 2023 and 2024, only aggregate results through the end of 2024 are reported here. This is done for ease of interpretation and to simplify the discussion.

3.3 Translating observed changes into simulations

This section delves into the simulated economic impacts of the conflict at the sectoral level in the agricultural, services, and industrial sectors. The following analysis draws upon available data and information for the years 2023 and 2024, examining sectoral outputs and the overarching assumptions that underpin expectations for recovery and resilience within these sectors in 2024.

According to FAO (2024), the ongoing conflict in Sudan has significantly disrupted agricultural activities, resulting in widespread declines in key crop production measures—in both areas planted and harvested for several major crops, contributing to substantial decreases in production and yields (Table 3.1). Millet and cotton production have been severely affected—millet shows a drastic drop in production and yield. Cotton, despite a paradoxical yield increase, shows massive declines in area planted and harvested. Farmers may be selectively prioritizing which crops they harvest, possibly only harvesting safely accessible fields. Sunflower and groundnut also saw major production losses, reflecting the broader impact of the conflict on both staple and cash crops. Sorghum's slight increase in planting area contrasts sharply with its reduced harvested area and yield, potentially indicating mid-season crop failure or abandonment. Wheat and sesame, although less dramatically affected, still show significant declines, underscoring the pervasive negative impact of the conflict across different crop types.

Table 3.1 Change in crop area planted, area harvested, production, and yield of major crops in Sudan between 2022/23 and 2023/24, percent

	Area planted ('000 ha)			Area harvested ('000 ha)			Production ('000 mt)			Yield (mt/ha)		
	22/23	23/24	% change	22/23	23/24	% change	22/23	23/24	% change	22/23	23/24	% change
Millet	4,809	3,869	–19.5	3,773	2,972	–21.2	1,904	684	–64.1	0.5	0.2	–54.4
Cotton	514	199	–61.3	409	101	–75.3	308	118	–61.6	0.8	1.2	55.6
Sunflower	163	149	–8.7	127	77	–39.4	78	40	–48.4	0.6	0.5	–14.9
Groundnut	3,617	3,587	–0.8	3,073	3,014	–1.9	2,642	1,386	–47.5	0.9	0.5	–46.5
Sorghum	9,727	9,860	1.4	7,243	5,987	–17.3	5,248	3,055	–41.8	0.7	0.5	–29.6
Wheat	193	179	–7.1	189	161	–14.5	476	378	–20.7	2.5	2.3	–7.2
Sesame	3,744	2,978	–20.5	2,663	2,426	–8.9	742	600	–19.1	0.3	0.2	–11.2

Source: FAO (2024).

These observations indicate two important points. First, the degree of impact of conflict on crop production is closely related to the severity of the conflict in the regions where these crops are cultivated. For example, millet, the most affected food security crop, is primarily produced in the Darfur and Kordofan regions, which have been severely impacted by conflict. In contrast, sesame, which is predominantly grown in North Kordofan and Gedaref, was the least affected. Although North Kordofan was affected by conflict, sesame production in Gedaref increased significantly in 2023/24 compared to 2022/23 (FAO 2024), effectively compensating for the reduction in production in North Kordofan.

Secondly, the production of wheat appears to be relatively less affected by conflict. This can be attributed to wheat primarily being grown in the safer parts of the country, particularly the Northern, Central, and Eastern regions, which contributes to its resilience. Additionally, wheat is a winter crop, with cultivation starting in November, which was six months after the onset of the conflict. This longer period before planting likely allowed wheat producers to adapt or adjust to the wider impacts of the conflict for greater resilience, compared to what adjustments producers of crops grown in the main summer season could make. This may suggest that, with any prolongation of the conflict, farmers may become more resilient as they adapt further to the changed economic situation under conflict, thereby maintaining crop production.

Looking ahead, our simulations assume that those commodities which either sustained a positive change in yields or saw below-average reductions during the conflict so far are likely to experience a recovery in production. This assumption is based on observed crop subsector performances during 2023/24 and an inherent expectation of adaptability within these sub-sectors.

Sudan's industrial sector has been significantly affected by the conflict. The Minister of Industry reported that much of the industrial sector had suffered total and systematic destruction, with losses exceeding 90 percent (Tasamuh News 2024). The simulations consider the high centralization of Sudan's industry in Khartoum. The conflict introduces significant challenges to the rehabilitation and reorganization of industrial activities, especially in safer states that are less exposed to conflict. The logistical and supply chain disruptions imposed by the conflict make the potential for industrial recovery tenuous and slow-paced.

In contrast, Sudan's services sector is projected to experience a marginal recovery in 2024 compared to 2023. The inherent flexibility and adaptability of services allow for a more dynamic and rapid response to the conditions imposed by the conflict. Although the services sector was significantly affected by the conflict in 2023, certain sub-sectors demonstrated positive impacts due to increased demand resulting from large-scale displacement and continuous movement during the first year of the conflict. The escalation of conflict into new areas also drove demand for specific services. Overall, in 2024, the services sector is expected to see an increase in demand, particularly for services that address the immediate needs of internally displaced persons and migrants in safer states.

In 2023, exports across most sectors suffered due to diminished production capacities because of the conflict. However, there are noteworthy exceptions that suggest more diverse and nuanced market reactions to the conflict. Crude oil and certain livestock segments exhibited increases in exports by the end of 2023. Sectors that are expected to show a recovery in production in 2024 are also expected to see increases in exports. On the other hand, imports present a stark contrast with almost across-the-board contraction in 2023. The decline in imports reflects a beleaguered economy with significantly constricted purchasing power and disrupted supply chains. Imports for a few sectors increased in 2023—notably oil products and other manufactured products to supply the ongoing military operations. However, the sharp reduction in imports signifies enforced austerity. The inability to procure from abroad due to declines in income also signifies a decrease in the consumption levels of Sudanese households.

Household remittances increased in 2023, likely as a strategic response by the Sudanese diaspora to the conflict-induced economic downturn in the country. Their increased remittances were aimed at buttressing household economies back home in Sudan. A nationwide rural household survey revealed an increase in the rural households that depended on remittances as their main income source from 1 percent before to 5 percent after the start of the conflict (IFPRI and UNDP 2024).

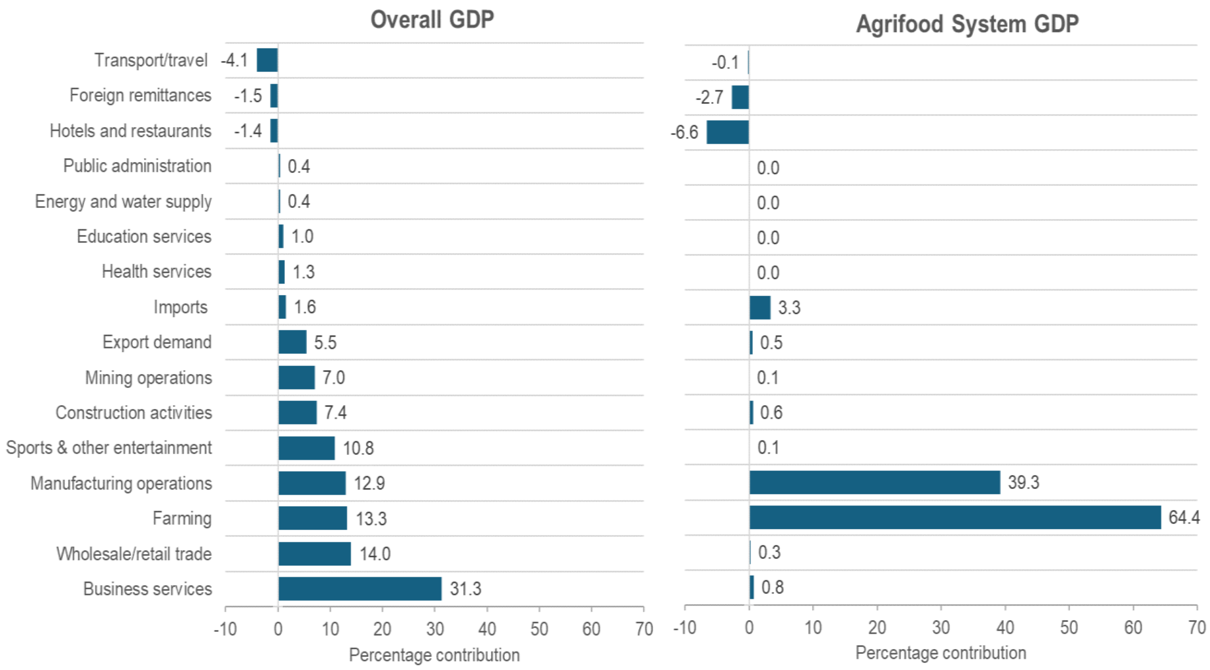
4) RESULTS AND DISCUSSION

The database for our analytical framework reflects the state of Sudan's economy in 2022, the year before the start of the conflict, so 2022 serves as the baseline for the analysis. The state of the economy in two scenarios capturing the impact of the conflict—the extreme and moderate scenarios—are contrasted to the baseline conditions in 2022. This section reports the cumulative aggregate impact for 2023 and 2024 of the two scenarios, focusing on different economic indicators.

4.1 Contribution of different impact channels to the overall reduction

Figure 4.1 depicts the contribution of various impact channels to changes in overall GDP and agrifood system GDP triggered by the conflict. In the left panel, we observe that the closure of business services contributes the most to the reduction in overall GDP, followed by disruptions in wholesale and retail services and manufacturing activities. Business, trade, and manufacturing activities were predominantly concentrated in the capital, Khartoum, with some also in other urban areas also affected by the conflict, such as Kordofan and Darfur. Farming also is an important impact channel, primarily through the conflict reducing farmers' access to inputs and heightened uncertainty in agricultural markets. All these sectors play integral roles in economic activities in Sudan and have extensive linkages to other sectors.

Figure 4.1 Contribution of different impact channels to overall changes in overall and agrifood system GDP in Sudan due to conflict



Source: Authors' compilation based on Sudan's SAM Multiplier model.

Three components of the economy were found to reduce the shock of the conflict on the overall economy— transport and travel, foreign remittances, and hotels and restaurants. The transport and travel sector had the most significant impact, reducing the overall economic shock by 4.1 percentage points. This substantial reduction can be attributed to the large-scale displacement of households and individuals from conflict-affected states to other safe states (Siddig et al. 2023). Similarly, foreign remittances, which contributed 1.5 percentage points to reducing the shock, reflect the increase in income sent to households from family members and others residing abroad, thus increasing financial inflows that support domestic consumption. This finding is in line with the study by IFPRI & UNDP (2024), which found that rural households increasingly depended on remittances after the conflict began. Lastly, the hotels and restaurants sector contributed 1.4 percentage points. This likely reflects economic patterns linked to displacement similar to those for transport and travel.

The right panel of Figure 4.1 highlights the substantial contributions of direct restrictions on farming and the manufacturing activities to the reduction in the agrifood system's GDP. Intuitively, the disruption of farming contributed the most to the reduction in the agrifood system GDP, accounting for a decline of 64.4 percentage points.

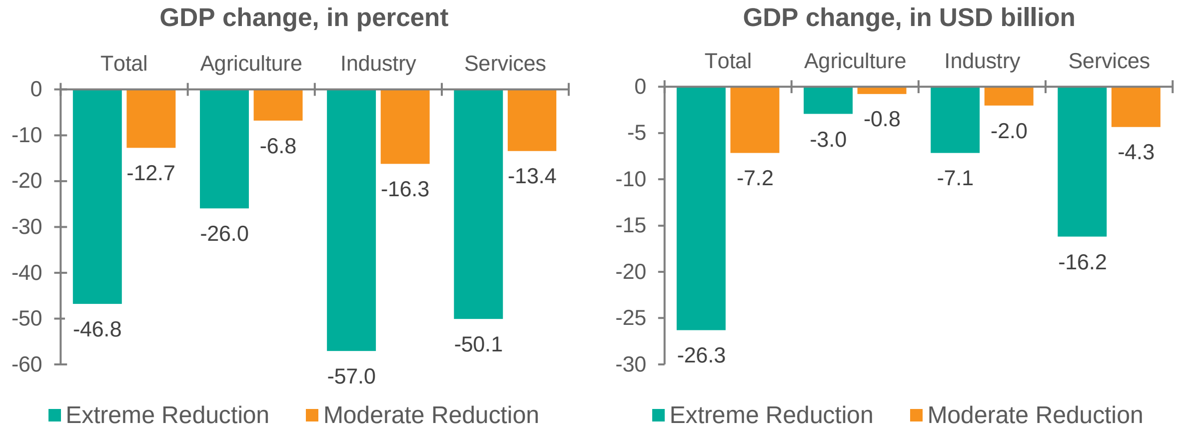
Manufacturing and, especially, agrifood processing firms faced serious disruptions to their operations (Kirui et al. 2023a). As a result, adverse shocks of the conflict on manufacturing operations contributed 39.3 percentage points to the reduction in Sudan's agrifood system GDP. Khartoum was heavily impacted by the conflict, so, with the concentration of manufacturing there, especially agrifood processing, the conflict has disrupted production and the broader supply chains providing raw materials to agrifood processing establishments there. The result has been an intensification in the economic decline of the agrifood sector.

On the other hand, as was seen for overall GDP, several components of the economy made positive contributions to the performance of the agrifood system, reducing the impact of the conflict on it. These supportive components include foreign remittances and the hotels and restaurants sector.

4.2 Impact on GDP by sector and the loss in agrifood system GDP

Figure 4.2 shows the impact of the two economic scenarios on GDP by sector, both as a percentage change and in USD billion values. Under the extreme reduction scenario, total GDP experiences a decline of 46.8 percent, equivalent to a loss of USD 26.3 billion. This scenario reveals the severe economic repercussions of the conflict, with the services sector bearing the brunt of the impact, showing a 50.1 percent decline or USD 16.2 billion loss. This substantial decline underscores the extensive disruptions to business services, retail, and other service-oriented activities.

Figure 4.2 Change in GDP by major economic sector under the conflict scenarios, in percent and USD billion



Source: Authors' compilation based on Sudan's SAM Multiplier model.

The industrial sector also suffers considerably, with a 57.0 percent reduction, amounting to a USD 7.1 billion loss, highlighting its vulnerability due to reliance on stable manufacturing and production conditions. Meanwhile, the agricultural sector, although less severely impacted, is still estimated to see a 26.0 percent decrease, translating to a USD 3.0 billion loss. This is due to disruptions in agricultural activities because of the high prices of inputs, disruptions to agricultural market, a general lack of financing for agricultural production, and adverse climate-associated factors, among other challenges (Kirui et al. 2023a).

In the moderate reduction scenario, the overall GDP decreases by 12.7 percent, which, although less severe than the extreme scenario, remains significant. The relative impact of the moderate reduction scenario is similar to that seen with the extreme reduction scenario. The services sector continues to be heavily affected with a 13.4 percent decline, reflecting ongoing challenges in service-oriented activities. The industrial sector faces a 16.3 percent reduction under the moderate scenario, higher than that estimated for the services sector, indicating sustained difficulties for the sector even if the impact of the conflict is moderated overall. In contrast, the agricultural sector demonstrates relative resilience in the moderate scenario, suggesting that agricultural activities, while impacted, can better withstand the conflict if the impacts of the conflict are less intense. These results underscore the varying degrees of vulnerability to conflict across the different economic sectors, with the services and industry sectors being more susceptible to conflict-related disruptions. This is partly due to the conflict being some concentrated in urban centers, where firms in the services and industry sectors are also concentrated.

Table 4.1 highlights the conflict's impact on the GDP of Sudan’s agrifood system under both the extreme and the moderate reduction scenarios. Under the extreme reduction scenario, the agrifood system GDP declines by 25.8 percent, translating to a USD 4.7 billion reduction. Within this system, agriculture experiences a 26.0 percent decrease, agro-processing sees a 40.4 percent decline, and food trade and transport show a 28.0 percent reduction. Food services register a positive change, increasing by 26.2 percent and adding USD 0.2 billion to the agrifood system GDP due to the high influx of displaced households into safe states across the country. Outside of the agrifood system, GDP falls by 56.9 percent.

Table 4.1 Estimated impact of the conflict on Sudan’s agrifood system GDP at the end of 2024 under the extreme and moderate reduction scenarios

	Extreme reduction		Moderate reduction	
Sector	Percent	USD billions	Percent	USD billions
Total	-46.8	-26.3	-12.7	-7.2
Agrifood system	-25.8	-4.7	-6.9	-1.3
Agriculture	-26.0	-3.0	-6.8	-0.8
Agro-processing	-40.4	-1.0	-11.3	-0.3
Food trade and transport	-28.0	-1.0	-7.3	-0.3
Food services	26.2	0.2	7.2	0.1
Outside the agrifood system	-56.9	-21.6	-15.6	-5.9

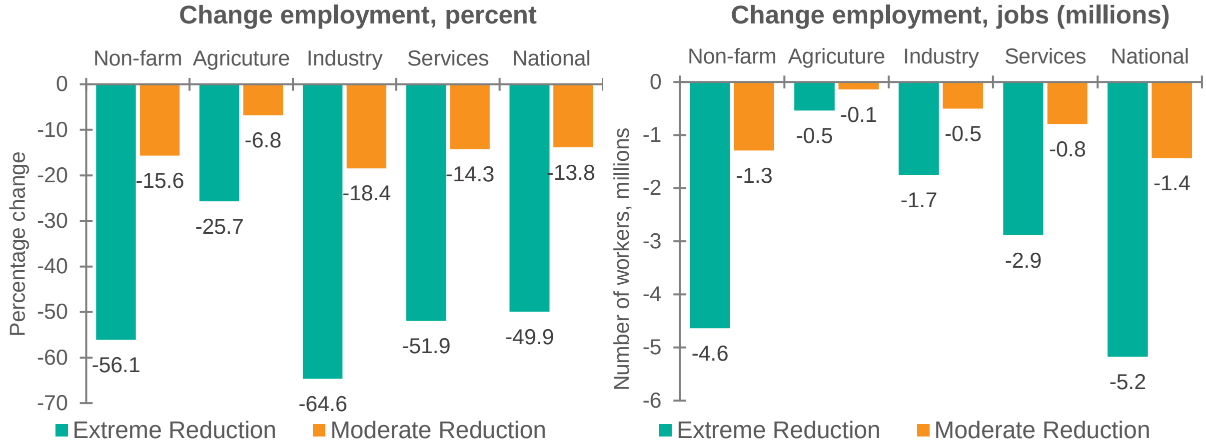
Source: Authors’ compilation based on Sudan’s SAM Multiplier model.

In the moderate reduction scenario, the agrifood system GDP decreases by 6.9 percent, with agriculture experiencing a 6.8 percent reduction in GDP. The relative declines in the sub-components of the agrifood system under the moderate scenario are similar to those seen under the extreme scenario. GDP for the rest of the economy is estimated to decline by 15.6 percent under the moderate scenario.

4.3 Impact on employment and household incomes

Under the extreme reduction scenario, the total national employment declines by 49.9 percent, corresponding to a loss of 5.2 million jobs (Figure 4.3). This dramatic decrease in employment reflects the severe contraction in economic activities across all sectors due to the conflict. The agriculture sector experiences a 25.7 percent reduction in employment, equating to a loss of 0.54 million jobs. This significant job loss is in line with the 26.0 percent reduction in agricultural GDP, highlighting the sector's vulnerability to disruptions in inputs and increased uncertainty. The industrial sector faces the highest percentage reduction in employment with a 64.6 percent decline, resulting in 1.7 million jobs lost. This mirrors the 57.0 percent decline in industrial GDP, emphasizing the severe impact of the conflict on manufacturing and production activities. The services sector sees a 51.9 percent decrease in employment, corresponding to a loss of 2.9 million jobs.

Figure 4.3 Change in employment by major economic sector under the conflict scenarios, in percent and by jobs lost



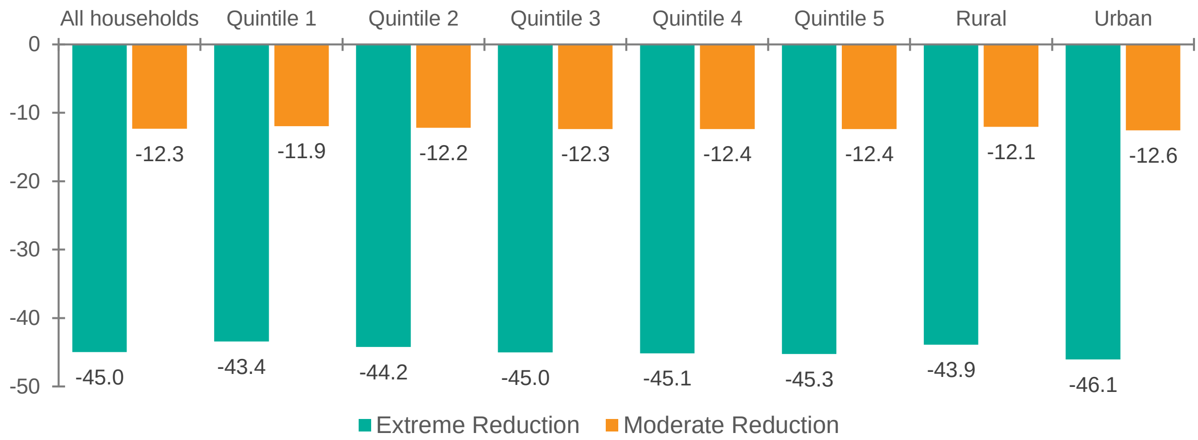
Source: Authors' compilation based on Sudan's SAM Multiplier model.

In the moderate reduction scenario, the total national employment decreases by 13.8 percent, equating to a loss of 1.4 million jobs. The agriculture sector sees a 6.8 percent reduction in employment, consistent with the 6.8 percent decline in agricultural GDP. The industrial sector experiences an 18.4 percent decline in employment, which correlates with the 16.3 percent reduction in industrial GDP. The services sector faces a 14.3 percent decrease in employment, aligning with the 13.4 percent decline in services GDP.

The employment losses in both scenarios parallel reductions in GDP across sectors, demonstrating the direct relationship between economic output and job creation. However, we see in both scenarios that job losses are coming predominantly from the non-farm sector. In the extreme reduction scenario, 4.6 million out of the 5.2 million jobs lost are non-farm jobs, while in the moderate scenario 1.3 million out of the 1.4 million jobs lost are non-farm. This shows the relative resilience of farm jobs to conflict.

Figure 4.4 illustrates the estimated changes in household income due to the conflict, broken down by income quintile and rural versus urban areas under both the extreme and the moderate reduction scenarios. Under both scenarios, all households experience a significant decline in income, averaging 45.0 percent and 12.3 percent under the extreme and moderate reduction scenarios, respectively. This severe income loss is relatively uniformly distributed across all income quintiles, from the lowest (quintile 1) at 43.4 percent and 11.9 percent to the highest (quintile 5) at 45.3 percent and 12.4 percent under the extreme and the moderate reduction scenarios, respectively. This indicates that households all across the income spectrum are profoundly affected by the conflict. Both rural and urban households experience similar reductions in income, with rural households facing 43.9 percent and 12.1 percent decreases and urban households slightly higher decreases of 46.1 percent and 12.6 percent under the extreme and moderate reduction scenarios, respectively.

Figure 4.4 Change in incomes of Sudanese households under the conflict scenarios, by income quintile and rural/urban residence, percent change



Source: Authors' compilation based on Sudan's SAM Multiplier model.

The consistent pattern of income reduction across all income levels and for both rural and urban households in both scenarios emphasizes the extensive reach of the conflict's economic consequences. However, we see that income losses are slightly higher in urban areas and for higher-income households, which aligns with the fact that the conflict is particularly intense in urban centers. It also suggests that wealthy households are no more resilient to the economic impacts of the conflict than are poorer ones.

Figure 4.5 shows that less educated labor are likely to be more severely affected by income declines under the conflict, with uneducated labor estimated to lose the largest share of their income among the labor categories. Specifically, under the extreme reduction scenario, uneducated labor faces a 53.1 percent decline, while primary-educated labor faces a 45.7 percent decrease. In contrast, tertiary-educated labor is relatively less impacted with a 37.2 percent reduction, indicating that higher education provides some economic resilience. In the moderate reduction scenario, uneducated labor experiences a 14.9 percent decline, while tertiary-educated labor faces a 10.2 percent reduction, further underscoring the protective effect of higher education.

Among capital categories, livestock shows greater resilience compared to crops and mining, with the latter suffering the most significant declines. Under the extreme reduction scenario, livestock capital declines by 18.6 percent, whereas crops face a 35.6 percent reduction and mining capital faces an 85.8 percent decrease. In the moderate reduction scenario, livestock capital falls by 4.0 percent, crops by 10.7 percent, and mining by 24.9 percent. Land income is less affected than non-land capital, with declines of 34.2 percent under extreme reduction and 9.8 percent under moderate reduction, highlighting its relative stability.

Figure 4.5 Change in income for labor and value of different categories of capital under the conflict scenarios, percent change

Source: Authors' compilation based on Sudan's SAM Multiplier model.

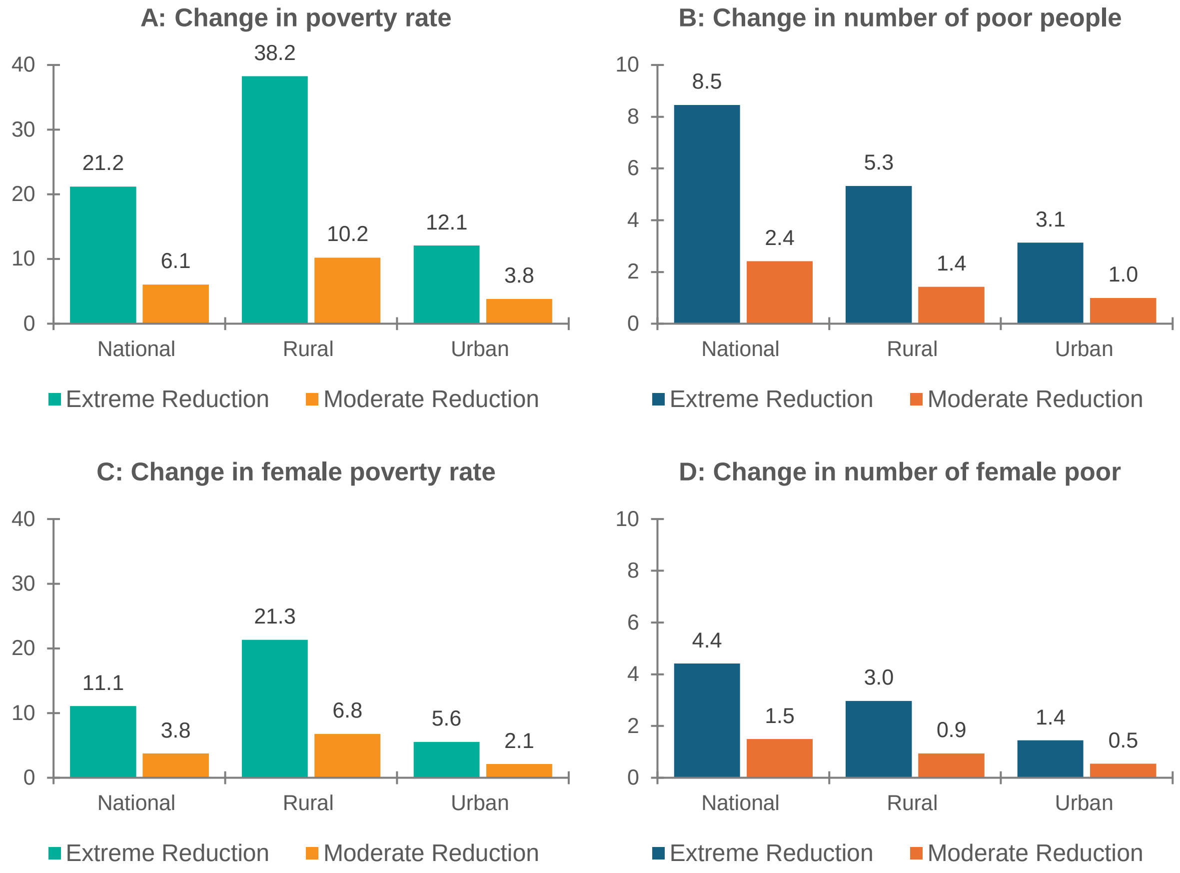
Comparing all labor to all capital categories, labor experiences slightly greater overall declines. Under the extreme reduction scenario, incomes for all categories of labor decrease by 49.3 percent, compared to a 44.9 percent decrease for all capital. In the moderate reduction scenario, labor income decreased by 13.7 percent, while capital income decreases by 12.0 percent. This comparison indicates that labor, particularly less educated labor, is more vulnerable to income losses during conflict compared to capital owners. However, within capital, certain types of capital, such as livestock, demonstrate considerable resilience.

4.4 Impact on poverty

Before the start of the conflict, poverty rates at the national level in Sudan were already high, but with notable differences between rural and urban areas and between men and women. The national poverty headcount rate stood at 61.1 percent, with urban poverty at 48.8 percent and rural poverty at 67.6 percent (World Bank 2021).

As shown in panels A and B of Figure 4.6, under the extreme and the moderate reduction scenarios, respectively, the national poverty rate increases by 21.2 and 6.1 percentage points, adding 8.5 and 2.4 million people to the poor population in Sudan. In rural areas, the poverty rate jumps by 38.2 and 10.2 percentage points under the extreme and the moderate reduction scenarios, respectively. Urban populations also see a significant rise in poverty, with a 12.1 and 3.8 percentage point increase under the extreme and the moderate reduction scenarios, respectively. However, the increase in poverty is much less than that seen in the rural population.

Figure 4.6 Change in national and female poverty under the conflict scenarios, change in poverty headcount (percentage point) and in number of poor (millions)



Source: Authors' compilation based on Sudan's SAM Multiplier model.

The impact of conflict on female poverty, particularly in rural areas, is pronounced. As shown in panels C and D of Figure 4.6, the national female poverty rate increases by 11.1 and 3.8 percentage points, adding 4.4 and 1.5 million women to the poor population under the extreme and the moderate reduction scenarios, respectively. In rural areas, the female poverty rate jumps by 21.3 and 6.8 percentage points under the extreme and the moderate reduction scenarios, respectively. Urban areas see lower 5.6 and 2.1 percentage point rises in female poverty, under the extreme and the moderate reduction scenarios, respectively,

These findings are in line with the World Bank (2021), which found that a 1.0 percent increase in conflict events correlated with a 0.04 percentage point reduction in the rate of growth of per capita consumption and a 1.0 percent rise in the poverty rate. These effects are statistically significant, highlighting the negative impact of conflict on household economic well-being. Despite urban areas in Sudan being severely impacted by the violence and destruction of the conflict, substantially higher increases in poverty rates are seen in rural areas. One explanation for this pattern is that since urban households initially had higher income levels compared to their rural counterparts, even significant income reductions for urban households due to the conflict might not push as many urban households below the poverty line. In contrast, rural households, with lower incomes at the start of the conflict were more susceptible to even relatively smaller reductions in income, which could push a large proportion of rural households below the poverty line. Before the conflict began, it was estimated that 48.8 percent of the urban population and 67.6 percent of the rural population of Sudan were poor.

These results also underscore the greater vulnerability of women to economic shocks, especially in rural settings. This finding is in line with those of the study by IFPRI and UNDP (2024), which found that females and female-headed households were relatively more adversely impacted by the conflict than males and male-headed households.

It is important to note two caveats to this analysis which may result in the actual observed impact of the conflict on Sudan's economy in the future being less severe than projected.

- The role of the informal economy in mitigating the magnitude of the conflict's shock on the economy is not considered in the analysis here. The informal sector often provides crucial employment and income-earning opportunities during economic downturns, potentially cushioning households from the full brunt of conflict-induced economic disruptions.
- The lack of behavioral assumptions in the analysis prevents any accounting of the adaptive strategies that individuals and businesses might employ to cope with the adverse economic conditions confronting them. These adaptations could include shifting to different economic activities or altering consumption patterns, both of which can help mitigate the adverse impact of the conflict on overall production and household poverty levels.

These factors may contribute to reductions in GDP, employment, and household incomes and increases in poverty that are somewhat lower than the estimates provided under the two scenarios considered in this analysis.

5) CONCLUSIONS

The conflict in Sudan has led to severe economic repercussions, profoundly impacting the country's GDP, employment, income, and poverty rates. Using a SAM multiplier framework with data capturing the state of the Sudanese economy in 2022 before the conflict started, we quantitatively estimated the likely impact of the conflict on the performance of the economy. The two scenarios we analyzed—extreme and moderate reductions in economic performance in Sudan due to the conflict—reveal significant declines across various economic indicators. In these two scenarios, we assume that the conflict in Sudan will continue at least until the end of 2024.

The closure of business services and disruptions in wholesale and retail services and manufacturing activities are shown to contribute substantially to the overall reduction in GDP. These impacts have resulted in a 46.8 percent decline in GDP under the extreme reduction scenario in 2024 compared to 2022. Within this, the services sector experiences a 50.1 percent decline, the industrial sector a 57.0 percent decline, and the agricultural sector a 26.0 percent decline. Under the moderate reduction scenario, GDP is expected by 2024 to decrease by 12.7 percent from its level in 2022. The conflict has also severely affected the GDP of Sudan's agrifood system, with a 25.8 percent decline in the extreme scenario. Agriculture, agro-processing, and the food trade and transport sectors have seen significant declines, whereas food services registered a positive change due to increased demand from displaced households. In the moderate scenario, the agrifood system GDP was estimated to decrease by 6.9 percent, with similar trends observed in the individual components of the agrifood system.

Employment also has fallen drastically with a 49.9 percent reduction under the extreme reduction scenario, equating to 5.2 million jobs lost. The industrial sector saw the highest percentage reduction in employment. Non-farm jobs were most affected, indicating the relative resilience of farm jobs to the conflict. Nonetheless, the incomes of all households declined significantly, with an average reduction of 45.0 percent under the extreme scenario and 12.3 percent under the moderate reduction scenario. This income loss is uniformly distributed across all income quintiles and is seen in both rural and urban areas, although urban and richer households are estimated to have faced slightly higher income reductions. Less educated labor categories have been more severely affected by income declines during the conflict, with uneducated labor experiencing the highest reductions. Tertiary-educated labor is relatively less impacted, indicating that higher education levels provide some economic resilience. Among capital categories, livestock shows greater resilience to the adverse economic impacts of the conflict compared to crops and mining, with mining suffering the most significant declines.

Poverty rates have surged, particularly in rural areas and among women. The national poverty rate increased by 21.2 percentage points under the extreme reduction scenario, adding 8.5 million people to the poverty population. Rural poverty rates soared by 38.2 percentage points, while urban poverty rates rose by 12.1 percentage points. Female poverty rates saw significant increases, with the national female poverty rate rising by 11.1 percentage points, adding 4.4 million women to the poor population.

Interventions to mitigate the sharp fall in the performance of the Sudanese economy due to the conflict should prioritize the restoration of business services, the wholesale and retail sectors, and manufacturing activities to revive economic productivity. Additionally, support for the agrifood system is crucial, focusing on rebuilding agricultural production, agro-processing, and the infrastructure needed for efficient food trade while leveraging the relative resilience of the agricultural sector through direct support to farmers. Employment recovery strategies should include vocational training and education programs to enhance the economic resilience of less educated labor and support the re-entry of displaced individuals into the workforce. Social protection measures are essential to alleviate the income losses faced by households, particularly among the poor and vulnerable groups, including women, to reduce poverty and foster long-term economic resilience for affected households.

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