

Market Fragility and Price Transmission in Sudan

Assessing Sudan's Vulnerability in the Context of Global Fuel Supply Uncertainty

May 2026 | Sudan

Key messages

- **Darfur states appear particularly exposed to fuel-related price dynamics**, with strong and repeated influence of fuel prices, particularly month-on-month price spikes, on broader food and non-food market prices.
- **Parallel fuel markets, particularly diesel, act as the main channel through which changes in input costs are transmitted to food and non-food prices in the most affected states**, where reliance on informal supply channels is highest.
- **In Central and Eastern states, exchange rate dynamics are a key driver of price changes**, indicating that currency depreciation, alongside fuel price fluctuations, contributes to increases in food and non-food prices.
- **In most states, the transmission of changes in fuel prices and the exchange rate to food and non-food prices is rapid (within 0–2 months)**, limiting the time available to anticipate price increases and highlighting the need for close, real-time market monitoring.
- **Parallel fuel prices exceed official levels, with the average premium reaching up to 66%, with the largest gaps observed in Khartoum**, suggesting significant supply constraints in formal markets and an increasing reliance on parallel market channels.

Context & Rationale

Sudan is facing a severe and protracted crisis marked by conflict, economic collapse, and disruptions to trade and supply chains. Since 2023, conflict has weakened markets, infrastructure, and governance, while restricting movement along key trade routes.¹ This has led to high inflation, currency depreciation, and widespread shortages of essential goods, placing significant pressure on households and markets.² At the same time, insecurity and supply constraints have increased transport costs and driven up fuel prices, particularly in conflict-affected areas where formal markets are less accessible.³

These internal pressures are further compounded by global energy dynamics, including recent tensions affecting the Strait of Hormuz, a critical oil transit route, which have contributed to uncertainty in fuel supply and upward pressure on international prices.^{4,5} For import-dependent economies such as Sudan, this adds further strain on already fragile fuel markets.

Fuel shortages and rising prices have become a key stressor, especially in regions where informal markets dominate supply.⁶ Given fuel's central role in transport, food distribution, and basic services, price volatility has significant implications for market functioning and

household purchasing power.⁷

This analysis provides evidence-based insights into how fuel price dynamics and parallel market activity are evolving across Sudan, and how these trends are associated with changes in food and non-food prices. Using joint IFPRI and IMPACT data from February 2025 to April 2026, it aims to inform monitoring and operational decision-making in a highly volatile context.

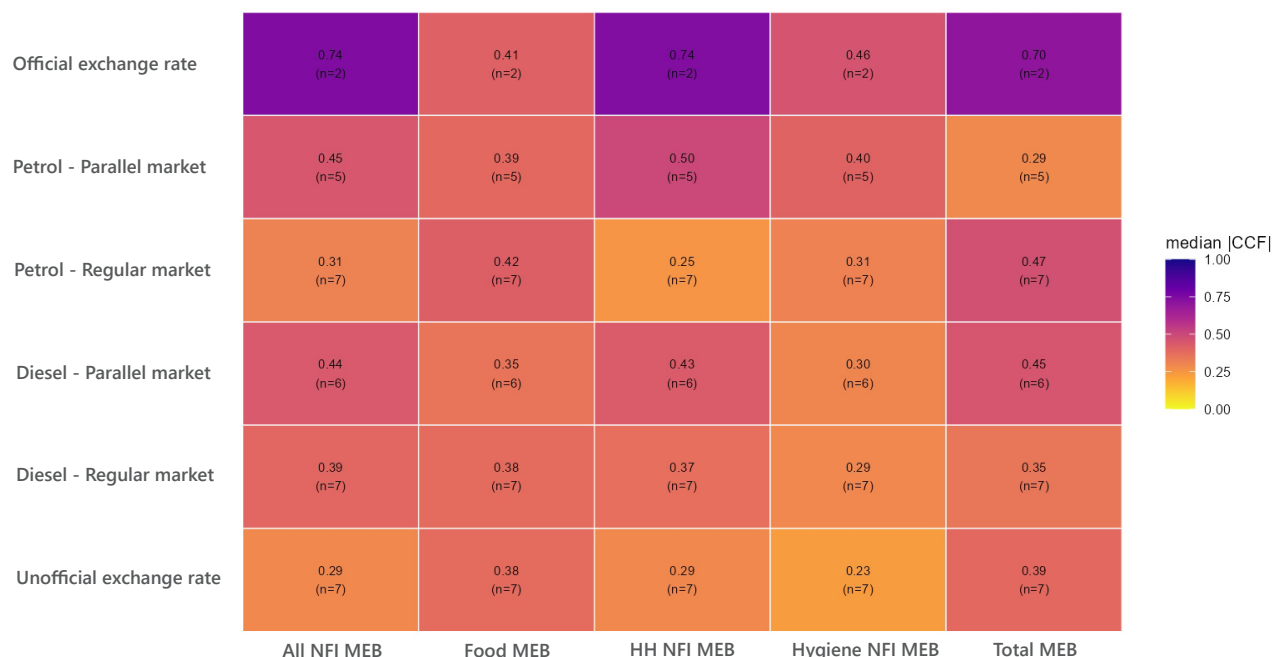
Analysis overview

The analysis combines fuel prices, exchange rate data, and market price information to examine how changes in key drivers are reflected in prices across Sudan.

First, it identifies key price drivers using cross-correlation analysis, assessing the influence of fuel (both formal and parallel markets) and exchange rate movements on Minimum Expenditure Basket (MEB) components. Second, it evaluates market volatility through month-on-month (MoM) price changes, highlighting states experiencing frequent spikes ($\geq 15\%$) and unstable dynamics. Third, it analyses lagged effects by estimating the delay between changes in key drivers and their transmission to prices, providing insights to support market monitoring.

National Overview of Price Drivers

Figure 1. Influence of drivers on MEB components



Parallel fuel prices for both diesel and petrol emerge as important drivers of Minimum Expenditure Basket (MEB) costs across states ($|CCF| \approx 0.40\text{--}0.50$), although their influence is not systematically stronger than that of regular fuel markets across all components. This indicates a significant, but not dominant, role of informal fuel supply channels in shaping price dynamics.

The official exchange rate exhibits relatively strong correlations with total MEB and household non-food components ($|CCF| \approx 0.70\text{--}0.74$). However, the limited number of observations ($n = 2$) constrains the robustness of these results.

Regular fuel markets show weaker and less consistent relationships with MEB components, suggesting a more variable role in price formation, potentially linked to heterogeneous access and availability across states.

Food price dynamics display weaker and less consistent associations with both fuel and exchange rate variables compared to non-food components. This likely reflects the relatively localized nature of food supply chains and their lower exposure to exchange rate effects and fuel-driven cost transmission.

Reading Guide for Figure 1

The cross-correlation function (CCF) measures how closely two variables move together over time. The median $|CCF|$ represents the typical strength of this relationship across states. Values closer to 1 indicate a stronger association.

How to read the heatmap:

- **Rows:** Key drivers (IFPRI data)
- **Columns:** Price components (JMMI data)
- **Cell values:** Median $|CCF|$ showing the strength of the relationship between each driver and price component
- **n:** Number of states included in each calculation

Spatial differentiation of drivers

Map 1: Driver categories by state

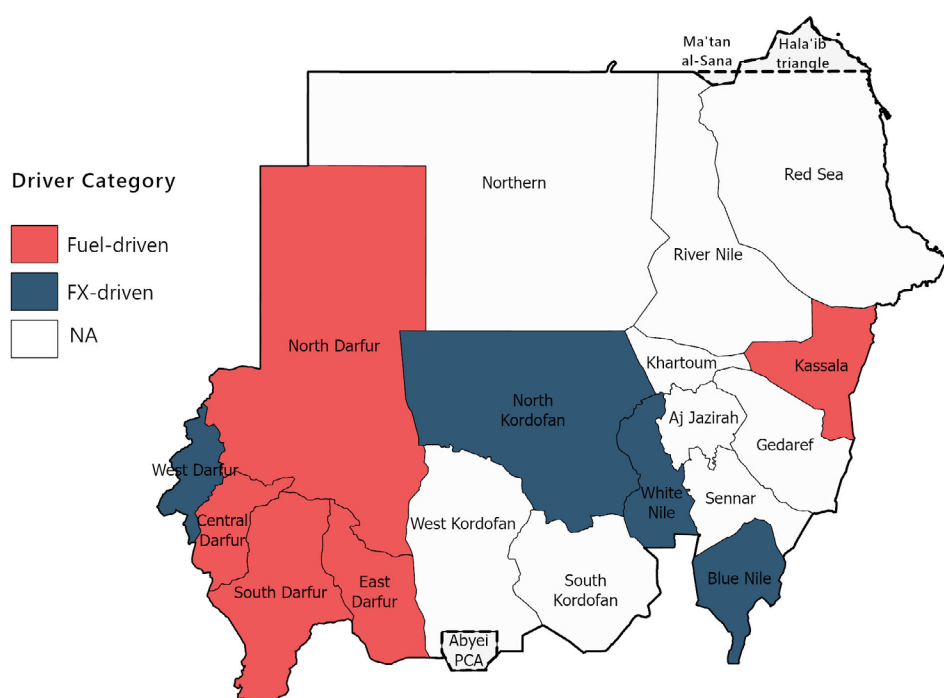
Price transmission in Sudan is not uniform, with spatial distribution of driver categories highlighting a clear geographic divide across Sudan. Two broad clusters are identified- In western states, particularly across Darfur, MEB component prices are predominantly driven by fuel dynamics, indicating that fuel price variations play a central role in shaping overall price trends in these areas.

In contrast, in several central and southeastern states, including Blue Nile, White Nile, and North Kordofan, exchange rate dynamics emerge as the primary driver of MEB component prices. This suggests that exchange rate movements—particularly in parallel markets—constitute the main channel of price transmission in these regions.

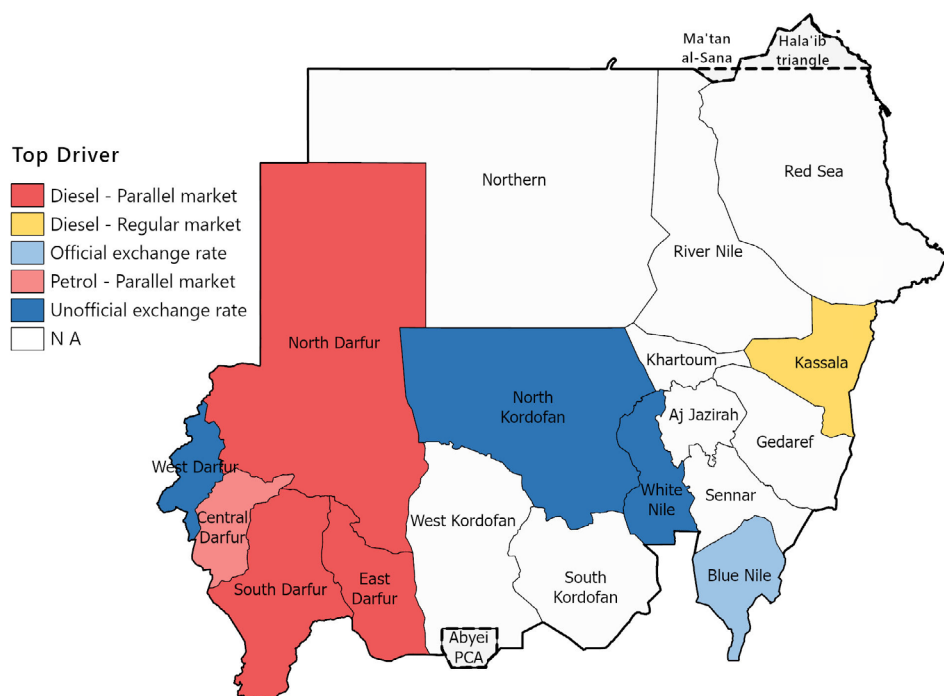
Zooming into the specific dominant driver per state, parallel fuel prices, particularly diesel, are the primary driver across much of Darfur (North, South, and Central Darfur). This reinforces the strong reliance on informal fuel supply channels in these regions.

In contrast, unofficial exchange rate movements dominate in central and southeastern states, including North Kordofan, White Nile, and Blue Nile, confirming the importance of currency dynamics in driving price changes in these areas.

Kassala stands out as an exception, where regular diesel prices emerge as the primary driver, indicating relatively stronger linkage to formal fuel supply channels compared to other states.



Map 2: Top driver by state



Market volatility and instability

Fragile fuel systems: pre-existing volatility increases exposure to shocks

Figure 3. Petrol vs Diesel price trends and spikes: North Darfur

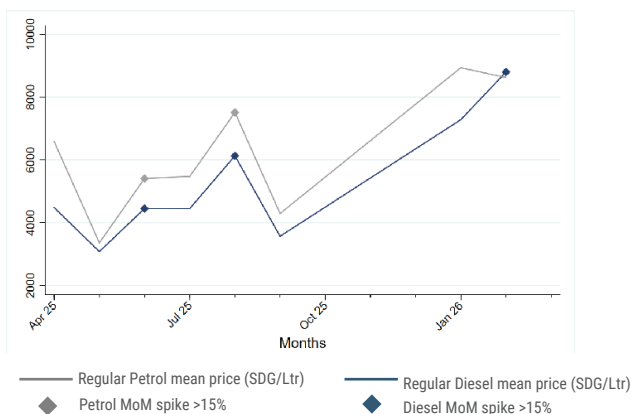
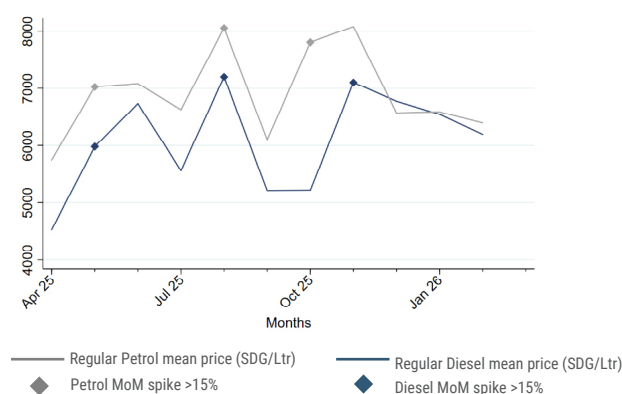


Figure 4. Petrol vs Diesel price trends and spikes: West Darfur



Darfur states are characterized by fragile fuel supply chains and high exposure to external shocks, making them a key focus for understanding market volatility.

In West Darfur, prices are characterized by frequent month-to-month (MoM) fluctuations, with repeated spikes and corrections in both diesel and petrol, indicating a market driven by episodic supply disruptions. This pattern may be linked to irregular cross-border trade flows with neighbouring Chad, where fluctuating inflows contribute to unstable fuel availability.

In contrast, North Darfur shows a transition toward more sustained and consistent price increases, with both diesel and petrol rising to similarly high levels over time. This suggests a shift from short-term volatility to persistent structural pressure on fuel supply.

Together, these patterns highlight how neighbouring states can experience different price dynamics depending on market integration and supply chain conditions.

Parallel market premiums and supply stress

Widening black market premiums as warning signs of formal supply networks under stress

Figure 5. Average Black market (BM) fuel premiums

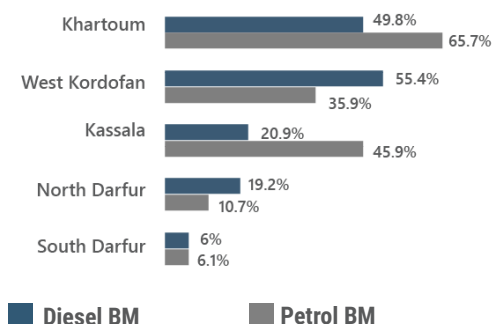
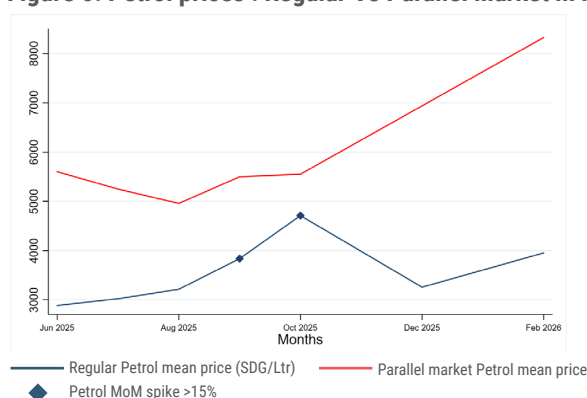


Figure 6. Petrol prices : Regular Vs Parallel market in Khartoum



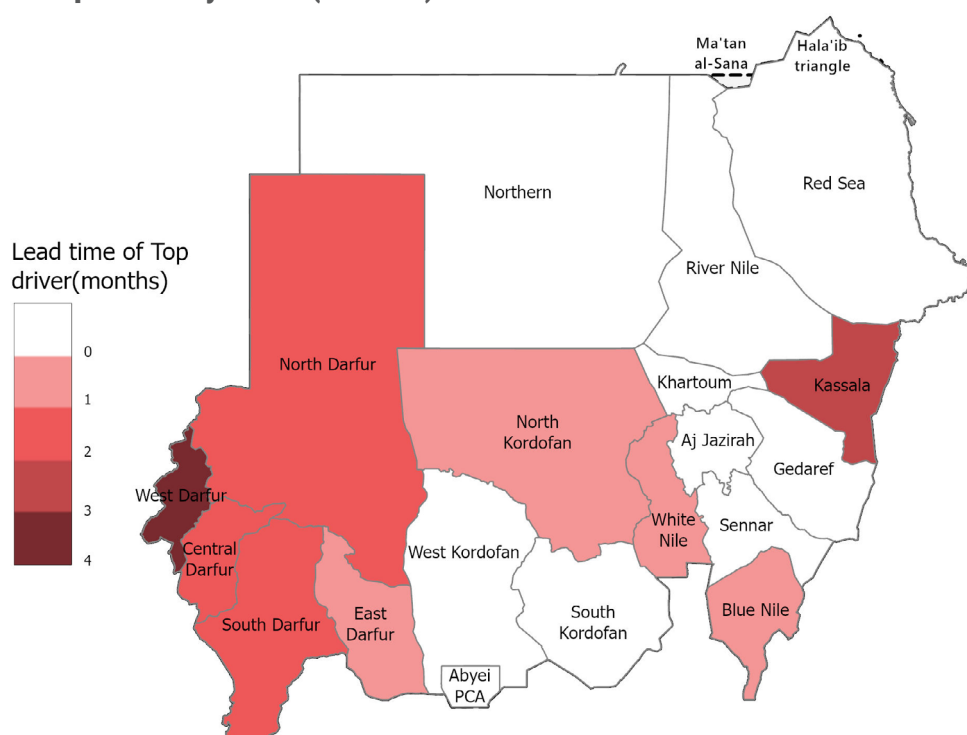
Large gaps between official and parallel fuel prices are a key indicator of disruption in formal supply chains and increasing reliance on informal markets.

Fuel price dynamics in **Khartoum** show consistently high and widening gaps between regular and parallel market prices. Petrol prices in the parallel market in **Khartoum** follow a steady upward trajectory while regular market prices remain significantly lower and more volatile, including a notable spike in **October 2025**.

This sustained divergence translates into substantial premiums, with average petrol prices reaching approximately 65.7% above official levels, and diesel premiums around 49.8%. While Khartoum records the highest petrol premium among all states, diesel premiums are slightly higher in **West Kordofan** (55.4%).

Price transmission timing

Map 3. Lead time of top driver by State (months)



This analysis examines the timing of price transmission from key drivers to market prices, assessing how quickly changes in fuel prices and exchange rates are reflected in MEB components across states. Lead time is defined as the delay (in months) between changes in these drivers and their observed impact on market prices.

Transmission timing varies significantly across states. In western Sudan, most Darfur states (North, Central, and South Darfur) exhibit short lead times (generally 0–1 months), indicating relatively rapid transmission of changes in key drivers to prices. In contrast, West Darfur stands out as a clear outlier, with a lead time of 4 months, suggesting a markedly delayed pass-through. This likely reflects significant frictions in transmission, including disrupted supply chains, limited market integration, and reliance on informal distribution networks.

Several central and southern states, including North Kordofan and parts of the central belt, also show short or near-zero lead times, indicating an immediate response of prices to underlying drivers. While this may reflect more direct transmission channels, it also suggests a high degree of exposure to external shocks, with limited capacity to absorb or delay price increases.

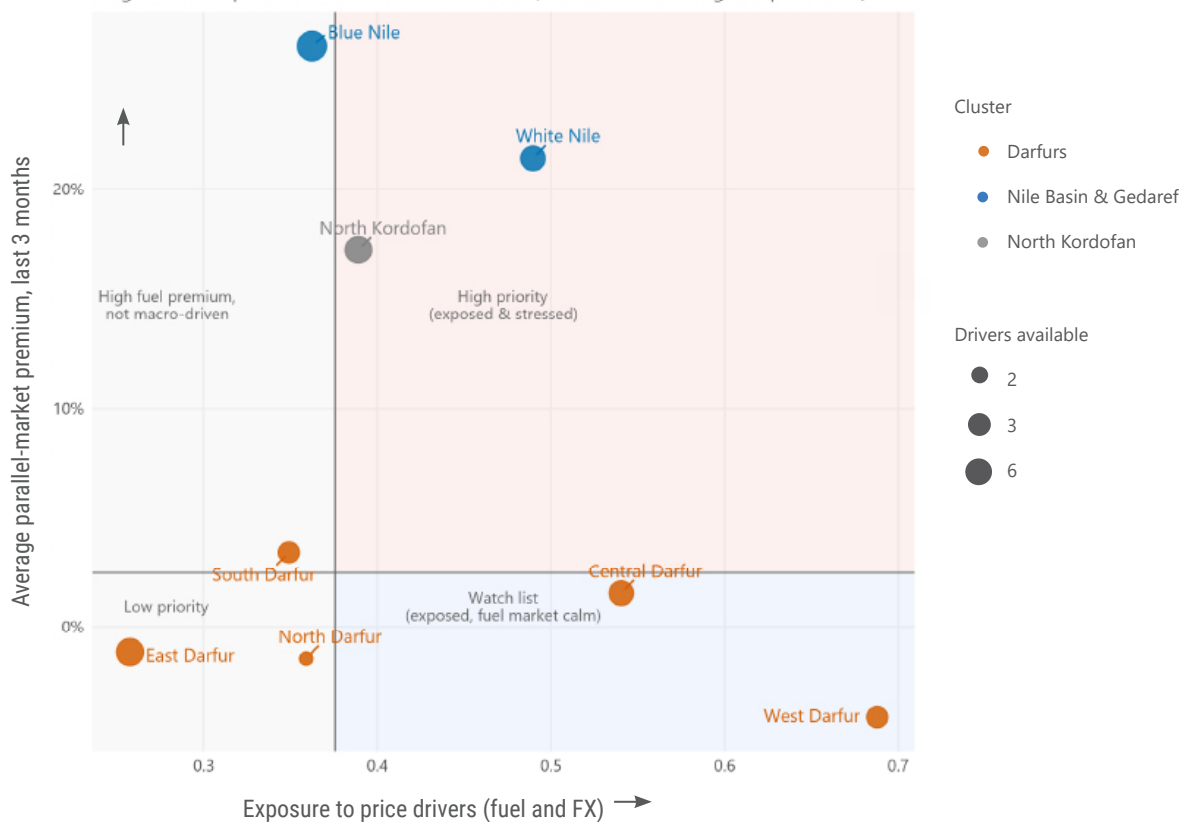
Kassala shows a comparatively longer lead time than neighbouring eastern states, which may point to partial buffering or frictions in transmission despite stronger links to formal fuel supply systems.



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Monitoring priorities and risk classification

Figure 7. State risk matrix : exposure to price drivers vs fuel market stress



This analysis combines two complementary dimensions to identify priority areas for monitoring:

- **Structural exposure to price drivers**, measured by the average strength of the relationship (mean absolute cross-correlation, |CCF|) between MEB prices and key drivers, such as fuel prices and exchange rates. This reflects how strongly local markets respond to underlying shocks.
- **Recent fuel market stress**, measured by the average gap between parallel and regular fuel prices over the last three months. This captures short-term disruptions in fuel supply and serves as an indicative proxy for market stress.

The use of parallel fuel premiums reflects market realities in Sudan, where access to fuel through official channels is often constrained. As a result, many traders and transporters rely on parallel markets to source fuel, meaning that parallel fuel prices more closely reflect the effective costs passed through to supply chains and ultimately to consumers.

States are classified within a two-dimensional framework based on these indicators. Thresholds separating quadrants are defined relative to the distribution of observed values across states, allowing for a comparative assessment of exposure and stress levels rather than an absolute ranking of vulnerability.

Reading Guide for Figure 7

This matrix compares states based on two dimensions: exposure to price drivers and fuel market stress.

- **Horizontal axis:** Exposure to price drivers (fuel and exchange rate), measured as the median |CCF| across drivers. Higher values indicate stronger influence of these drivers on prices.
- **Vertical axis:** Fuel market stress, measured as the average parallel fuel price premium (Jan–Apr 2026). Higher values indicate greater stress.
- **Top-right quadrant:** High exposure and high stress — highest priority for monitoring.
- **Bottom-right quadrant:** High exposure but lower current stress — structurally exposed (watch list).
- **Top-left quadrant:** High stress but lower exposure — localised fuel pressure with limited broader transmission.
- **Bottom-left quadrant:** Low exposure and low stress — lower priority.

It is important to note that this framework is designed to support short-term monitoring prioritization, and does not measure overall structural vulnerability or conflict severity. As such, results may differ from broader humanitarian risk assessments or from patterns described in previous sections.

White Nile emerges as the highest priority state, combining relatively high exposure to underlying drivers (around 0.5) with elevated fuel market stress (above 20%). This indicates that both structural sensitivity and recent fuel-related pressures are reinforcing each other, increasing the likelihood of sustained price impacts.

Blue Nile also shows high levels of fuel market stress, but with slightly lower exposure, suggesting that current pressures are pronounced but less fully embedded in overall price dynamics.

North Kordofan sits in an intermediate position, with moderate exposure and relatively high premiums, pointing to mixed dynamics driven by both macroeconomic factors and fuel-related cost pressures.

In contrast, Darfur states (West, Central, and South Darfur)

exhibit high exposure to price drivers but relatively lower observed fuel market stress, placing them in a “watch list” category. While this may appear counterintuitive given the high levels of fragility identified in previous sections, it is likely linked to the timing of price transmission. In contexts with weaker market integration and longer transmission timelines, the effects of external shocks—including recent global fuel price increases—may not yet be fully reflected in observed price dynamics.

East and North Darfur show lower exposure to key price drivers and relatively moderate recent fuel stress, indicating lower priority within this specific framework. However, persistent price volatility and upward trends suggest that additional factors—beyond fuel and exchange rate dynamics—are contributing to market instability, particularly in North Darfur.

These findings therefore reflect differences in the current stage and speed of transmission rather than differences in underlying vulnerability. States currently classified as lower priority may experience increasing pressure as external shocks continue to propagate through market systems over time.

Recommendations

Strengthening monitoring systems requires a dual focus on fuel price volatility and supply chain stress, particularly in conflict-affected areas.

In Darfur, where markets show the highest volatility, continuous tracking of fuel prices, especially diesel, is critical. Monitoring month-on-month price changes of 15% or more can serve as an early signal of emerging supply disruptions, and this should be complemented with real-time and granular price monitoring, including information on access constraints and transport disruptions.

Tracking parallel market fuel premiums should be assessed as a proxy indicator of projected market stress. Regular monitoring of the gap between official and informal fuel prices can provide a proxy for supply chain disruptions and market fragmentation.

Particular attention should be given to Khartoum, where premiums are highest, as well as to states such as West Kordofan and Kassala, where moderate but persistent gaps indicate underlying stress. Monitoring trends over time can provide an indication of evolving market stress and potential downstream impacts on prices.

Targeted monitoring and early warning systems should be geographically differentiated. White Nile should be prioritized due to the combination of high exposure and current fuel market stress, indicating a high risk of sustained price instability.

In North Darfur, rising prices that are not fully explained by fuel or exchange rate dynamics suggest the need for

complementary monitoring of local market constraints.

Meanwhile, central and eastern states, including Blue Nile, require continued attention to exchange rate movements, particularly for non-food price dynamics.

These combined indicators of market stress and price transmission should be closely monitored to anticipate potential impacts, using a geographically differentiated approach tailored to regional market dynamics.



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Methodology Overview

This analysis examines how variations in key market drivers—namely fuel prices and exchange rate dynamics—are reflected in food and non-food prices across Sudan. It identifies patterns of price transmission, market exposure, and volatility across states, with the aim of informing monitoring and operational decision-making in a highly volatile context.

The analysis combines two complementary datasets produced by IMPACT Initiatives and the International Food Policy Research Institute (IFPRI):

- **JMMI (Joint Market Monitoring Initiative – IMPACT)** provides monthly market price data for the Minimum Expenditure Basket (MEB) across localities in Sudan, based on multiple vendor observations.
- **SPAM (Sudan Prices and Availability Monitoring Survey – IFPRI)** provides high-frequency data across 36 markets nationwide and is used to extract key driver variables, including fuel prices (diesel and petrol in regular and parallel markets) and exchange rates (official and unofficial). In Sudan, exchange rate data reflects locally observed rates, which may vary across states rather than representing a single uniform national rate.

The analysis covers the period February 2025 to April 2026, corresponding to the availability of overlapping JMMI and SPAM data.

Fuel prices and exchange rates are selected as primary drivers due to their central role in shaping market prices in a context of economic instability and supply disruption. Fuel costs directly affect transport and distribution, making both regular and parallel fuel prices critical for capturing differences between formal and informal supply systems.

Given constraints in accessing official fuel, many market actors rely on parallel markets, meaning these prices better reflect effective costs transmitted through supply chains. Exchange rate dynamics—captured through official and unofficial rates—reflect broader macroeconomic pressures, including currency depreciation and constraints on access to foreign exchange, particularly relevant for imported goods and non-food items.

The analysis integrates these data through complementary steps, including cross-correlation to assess associations between drivers and prices, month-on-month price changes to capture volatility, and lagged analysis to estimate transmission timing (lead times). These outputs are combined to identify patterns of exposure, market stress, and price transmission across states.

Limitations

- Data coverage is constrained, as fuel price data is only available from February 2025 to April 2026, limiting the ability to assess longer-term trends and historical comparisons.
- There are gaps in JMMI data for several key states, including Al Jazirah, Khartoum, River Nile, and Sennar. Missing or inconsistent data across states reduces both the availability of key drivers and the robustness of the statistical analysis.
- Khartoum and West Kordofan has been specifically excluded from the analysis of drives impacting MEB, since the data points fell just below the mi observation short of the minimum to be included.
- The findings do not establish causal relationships between fuel prices and broader market outcomes and should be interpreted as identifying associations and co-movements, particularly in relation to MEB costs.

Endnotes

¹ IFPRI (2025). [Coping with crisis: Livelihood vulnerabilities and food insecurity in Sudan's current conflict](#).

² ACAPS (2024). [Sudan Food Security Situation Brief](#).

³ IFPRI (2025). [Sudan Market Prices and Availability Report](#).

⁴ U.S. Energy Information Administration (EIA), [Amid regional conflict, the Strait of Hormuz remains critical oil chokepoint, 2025](#).

⁵ Congressional Research Service, [Iran Conflict and the Strait of Hormuz: Impacts on Oil, Gas, and Other Commodities, 2026](#).

⁶ *Ibidem*

⁷ FEWS NET (2026). [Sudan Food Security Outlook Update](#).

ABOUT IFPRI

The International Food Policy Research Institute (IFPRI) is a leading research and policy organization generating evidence to inform policy and programming worldwide. Through its Sudan Strategy Support Program (SSSP), IFPRI delivers data and analysis on food security, markets, livelihoods, and economic resilience in Sudan, including through the Sudan Price and Availability Monitoring System (SPAMS). Since the onset of the conflict in 2023, the program has produced timely evidence on the impacts of the crisis on households, markets, agriculture, and the broader economy to inform humanitarian and recovery efforts.



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ABOUT IMPACT

Founded in 2010 and headquartered in Geneva, IMPACT Initiatives is a leading applied research organization and the largest independent provider of data in crisis-affected contexts. Through our initiatives we enable humanitarian and other aid actors to make better, evidence-based decisions by delivering timely, relevant, and methodologically rigorous data and analysis. Our extensive presence across crisis-contexts allows us to collect data directly from crisis-affected people wherever needed, including among the most vulnerable and hard-to-reach.



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