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# Supply-Chain Disruption and Food Price Inflation in Sudan:Evidence from Five Sudanese Urban Wholesale Markets

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# Supply-Chain Disruption and Food Price Inflation in Sudan: Evidence from Five Sudanese Urban Wholesale Markets

**Running Title: Wartime Food Prices and market Regimes in Sudan**

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## Abstract

This paper examines food-price dynamics across five Sudanese urban markets — Port Sudan, Khartoum, Gezira, Nyala, and Al Fasher — between January and May 2026, using original monthly wholesale price observations for wheat, rice, vegetable oil, and sugar alongside diesel and petrol price data. Adopting a rapid operational market analysis approach appropriate to a conflict-affected, data-constrained environment, the study identifies three structurally distinct market regimes as its central contribution. First, the integrated northern corridor (Port Sudan, Khartoum, and Gezira) displayed synchronised price trajectories consistent with a common import-cost shock transmitted through a shared distribution network: vegetable oil followed an identical monthly path across all three cities and wheat rose uniformly by +47.4 per cent, tracking sharp diesel price increases (+94.1 per cent in Port Sudan). Second, Nyala — a cross-border market in South Darfur dependent on alternative wartime supply systems — exhibited a structurally elevated diesel baseline (44 per cent above northern cities from January) and commodity-differentiated inflation: wheat rose +116.7 per cent whilst rice, already at three times the Port Sudan level, increased only +8.3 per cent, consistent with a purchasing-power price-ceiling effect. Third, Al Fasher displayed prices indicative of supply collapse rather than inflationary transmission: wheat reached Sudanese Pound (SDG) 55,000/kg in May (19.6 times the Port Sudan price) and rice — priced at SDG 80,000/kg in April — became entirely unavailable by May. The findings demonstrate that regional market structure, diesel supply geography, and conflict intensity interact to produce fundamentally different food-price mechanisms across Sudan, with distinct policy implications for each regime.

**Keywords:** *food security; supply-chain disruption; Sudan; market fragmentation; conflict economics; spatial price analysis*

## 1. Introduction

Food price inflation in conflict-affected economies rarely operates uniformly across space. Whilst macroeconomic pressures — currency depreciation, fuel price increases, and supply-chain disruption — affect an entire country, their transmission to local markets is shaped by geography, market connectivity, and conflict intensity. Sudan provides a compelling setting for examining these dynamics. Since the outbreak of armed conflict between the Sudanese Armed Forces (SAF) and the Rapid Support Forces (RSF) in April 2023, the country has experienced one of the most severe economic dislocations in its modern history, with cascading consequences for food availability and affordability across its regionally heterogeneous markets.

The macroeconomic context is severe. Sudan's real GDP contracted by approximately 29 per cent in 2023 and a further 13.5 per cent in 2024 (World Bank, 2025, pp. 9–10). Inflation reached 170 per cent year-on-year in

2024, driven by rising costs in food, transportation, and housing, whilst the Sudanese Pound (SDG) depreciated by 233 per cent against the US dollar in official markets between April 2023 and December 2024 (World Bank, 2025, p. 24). By March 2026, the parallel market rate stood at SDG 3,625 per US dollar (WFP, 2026, p. 1). Diesel and fuel costs in relatively stable Sudanese states rose 30–60 per cent over the 2025 agricultural season, with costs doubling or becoming prohibitive in conflict-affected areas (FAO, 2026, pp. 22–23). These conditions contributed to acute food insecurity affecting approximately 61.7 per cent of the population — an estimated 28.9 million people (FAO, 2026, p. 6). Cereal production in 2025 stood at 5.2 million tonnes, 22 per cent below the previous year (FAO, 2026, p. 1).

Against this backdrop, the spatial fragmentation of food markets has emerged as a defining feature of Sudan's food-security crisis. The conflict severely disrupted trade and transport between western and eastern Sudan, producing sharply differentiated market conditions across regions (Siddig et al., 2026, Chapter 5; World Bank, 2025, p. 22). The SAF's consolidation of control over Port Sudan amplified the centrality of the eastern corridor for commodity imports, whilst the isolation of Darfur markets from that corridor created structurally divergent price regimes that aggregate national statistics cannot capture. Understanding these regime differences is essential both analytically and for the design of targeted food-security interventions.

This paper asks: *how did supply-chain structure, diesel price dynamics, and regional market integration shape food price trajectories across Sudanese urban markets between January and May 2026?* The study identifies three structurally distinct market regimes as its main empirical contribution: (i) an integrated northern corridor exhibiting synchronised, diesel-cost-push price transmission; (ii) a cross-border peripheral market with commodity-differentiated inflation; and (iii) a conflict-isolated market exhibiting supply collapse. Section 2 reviews the relevant literature; Section 3 describes the regional market structure; Section 4 presents data, methodology, and limitations; Section 5 reports fuel and food price trajectories; Section 6 discusses the findings; Section 7 concludes with policy implications.

## 1.2. Literature Review

### 1.2.1 Diesel and Fuel-to-Food Price Transmission

The relationship between fuel prices and local food prices operates primarily through transportation and distribution costs. Dillon and Barrett (2016), in a study of East African markets, demonstrate that global oil price increases transmit significantly to local food prices via freight costs, with the magnitude of transmission varying by market remoteness and road infrastructure quality. In food distribution systems dominated by road transport — as across Sudan's overland supply corridors — diesel prices constitute the critical cost driver, since commercial freight vehicles rely on diesel rather than petrol. A sharp diesel price increase directly raises the per-tonne cost of moving commodities from Port Sudan to inland markets, producing a predictable food price response in well-connected markets. This distinction between diesel (freight) and petrol (private vehicles) is analytically important and shapes the emphasis throughout this study.

The literature on spatial price transmission distinguishes between markets that are cointegrated — where price shocks in one market propagate predictably to others — and markets that are structurally disconnected (Fackler & Goodwin, 2001). Integration depends on physical infrastructure, information flows, trader behaviour, and the absence of barriers to arbitrage. In practice, integration is not binary: markets may be partially integrated, with transmission occurring above certain price-gap thresholds (Minot, 2011). Conflict introduces a specific form of structural disconnection — not merely elevated transaction costs, but physical barriers, security risks, and the collapse of trade networks — that standard integration models were not designed to capture.

### 1.2.2 Conflict, Market Fragmentation, and Spatial Divergence

Research on market behaviour in conflict settings documents a consistent pattern: markets in conflict-exposed zones decouple from regional and national price systems, displaying dynamics driven by local supply conditions rather than trade arbitrage (Porteous, 2019). Supply-chain disruption in conflict generates costs beyond standard transaction costs — informal checkpoint taxation, convoy-protection fees, and the rerouting of trade to more expensive paths — embedding structural cost baselines that persist even when upstream commodity prices stabilise.

Recent analysis of Sudan's conflict economy provides direct grounding for the present study. Siddig et al. (2026) document how the SAF–RSF conflict fundamentally fragmented Sudan's commercial and transport networks, producing sharply differentiated conditions between western and eastern Sudan. Their simulation analysis demonstrates that disruptions to transportation and regional trade significantly reduced wheat consumption in western Sudan; had regional wheat markets remained integrated, consumption in western Sudan could have been up to 16 percentage points higher (Siddig et al., 2026, Chapter 5). The SAF's control of Port Sudan enabled continued commodity flows through the eastern corridor, whilst RSF control of Darfur severed those regions from the import network. This territorial division is directly reflected in the market price patterns examined in this study.

In Darfur specifically, trade rerouting through cross-border channels elevated logistics costs substantially, whilst the near-total disruption of formal supply chains in besieged areas produced conditions more analogous to humanitarian supply collapse than standard market-based inflation (FAO, 2026, pp. 7–8; Siddig et al., 2026, Chapter 5). Existing documentation records prices in Al Fasher exceeding 200 times pre-conflict levels during the siege (FAO, 2026, pp. 7–8). The transition from physical cash to digital bank transfers in Al Fasher (FAO, 2026, p. 41) further signals the breakdown of institutional conditions for ordinary market function. The present study contributes original wholesale price evidence that operationalises these documented conditions across five contemporaneous markets.

## 1.3. Background and Regional Market Structure

Since April 2023, Sudan's economic geography has been substantially redrawn. National cereal production in 2023 fell approximately 46 per cent below the five-year average, with declines estimated at 80 per cent below

average in Kordofan and Darfur (World Bank, 2025, p. 22), increasing Sudan's dependence on imported commodities and making supply-corridor integrity a critical determinant of food-price dynamics. Table 1 summarises the characteristics of the five cities examined in this study.

**Table 1. Regional Market Characteristics of Selected Cities**

| City | Market Type | Supply Structure | Main Price Drivers | Data Coverage |
|---|---|---|---|---|
| Port Sudan | Integrated import hub | Port/import corridor; national redistribution network (~800 km to Khartoum) | Diesel/fuel costs; import prices; exchange rate depreciation | January–May 2026 |
| Khartoum | Central domestic market | National supply network; Omdurman wholesale district (~200 km from Gezira) | Fuel; transport costs; national inflation | January–May 2026 |
| Gezira | Agricultural hub and IDP destination | Wad Madani wholesale market; connected to northern corridor | Fuel; distribution costs; displacement demand | January–May 2026 |
| Nyala | Cross-border peripheral market | Alternative wartime supply systems; cross-border trade (Chad/South Sudan); structurally separate from northern corridor | Checkpoint fees; exchange rate pressure; cross-border logistics costs | January–May 2026 |
| **Al Fasher** | Conflict-fragmented market | Severely disrupted; near-absent formal supply; post-siege conditions; cash-circulation collapse | Extreme scarcity; physical isolation; digital-only transactions | **April–May 2026** |

*Source: Authors' own elaboration based on field observations, FAO (2026), WFP (2026), and Siddig et al. (2026). Approximate distances: Port Sudan to Khartoum 800 km; Khartoum to Gezira (Wad Madani) 200 km. Nyala and Al Fasher are in south-western Sudan, outside the northern supply corridor.*

**Port Sudan** anchors the northern corridor, redistributing imported goods inland. **Khartoum** is represented by the Omdurman wholesale district, the metropolitan distribution hub. **Gezira** (Wad Madani, approximately 200 km south of Khartoum) is connected to the northern corridor and serves as a major destination for internally displaced persons. These three cities share commodity supply chains with broadly comparable product specifications, supporting cross-city comparison of price trajectories.

**Nyala** and **Al Fasher** are in south-western Sudan and are structurally disconnected from the northern corridor. Nyala relies primarily on cross-border trade involving Chad and South Sudan, with commodity flows arriving through routes subject to checkpoint fees, security costs, and cross-currency conversion. Crucially, the brands, origins, and quality specifications of commodities reaching Nyala differ systematically from those in northern markets: wheat grades sourced through cross-border channels, rice varieties from alternative regional suppliers, and vegetable oil products do not match the standardised import-grade products distributed through Port Sudan and Khartoum. Cross-city comparisons involving Nyala should therefore be interpreted as indicators of supply-chain structure and market access rather than strict quality-adjusted commodity equivalence. Al Fasher experienced near-total disruption of formal supply chains, severe liquidity shortages, and forced reliance on digital bank transfers in the absence of physical cash (FAO, 2026, p. 41). Reliable wholesale price data for Al Fasher were available only from April 2026.

# 2. Materials and Methods

Reliable market monitoring in active conflict settings is severely constrained by insecurity, disrupted communications, population displacement, and restricted physical access to markets. Systematic data collection infrastructure — price surveys, trader networks, market-monitoring systems — frequently breaks down in precisely the areas where price information is most urgently needed (IPC, 2026, pp. 3–4). Under such conditions, systematic price observations across five geographically distinct Sudanese markets constitute an operational dataset capturing diverse supply-chain environments during an ongoing conflict period.

## 2.1 Market Data Collection

This study uses original monthly wholesale price observations collected from five Sudanese urban markets between January and May 2026. The dataset covers wheat, rice, vegetable oil, and sugar — commodities that are widely consumed, heavily traded, and sensitive to transportation costs, import conditions, and supply-chain disruption — alongside diesel and petrol prices. Food prices are recorded per kilogram (wheat, rice, sugar) or per litre (vegetable oil); fuel prices are per gallon, all denominated in Sudanese Pounds (SDG).

Data collection relied on two independent field-monitoring channels: one dedicated to wholesale food prices and another to fuel prices. Food-price observations were collected monthly through direct communication with wholesale traders operating in each city's principal market. In Port Sudan, Khartoum, and Gezira, prices were obtained from ten randomly selected wholesalers per observation period. In Nyala, where wholesale markets are smaller, observations were collected from three randomly selected wholesalers. Fuel prices were recorded independently from three petrol stations in Port Sudan, Khartoum, and Gezira. In Nyala, where formal fuel stations were largely absent or inconsistently operational, fuel prices were obtained from available fuel wholesalers.

Across observation rounds, sampled traders within each market consistently reported identical prevailing wholesale prices for equivalent commodities. This uniformity is consistent with the structure of wholesale markets in which shared import batches and common acquisition costs compress trader-level price variation. Commodity observations were standardised by product characteristics: identical brand, origin, package size, and quality specification were used within each city wherever possible.

The prices recorded therefore represent prevailing wholesale transaction values rather than individual trader quotations. This approach captures the modal market price most directly shaped by supply-chain conditions, transportation costs, and market access constraints. Retail prices paid by households are expected to be higher because of retailer margins, last-mile transport costs, and local scarcity premiums.

Product specifications were broadly comparable across Port Sudan, Khartoum, and Gezira because these markets are supplied through the same northern import corridor. In Nyala and Al Fasher, commodities originated from structurally different supply systems and may differ in variety, grade, or source. Comparisons involving these markets should therefore be interpreted primarily as indicators of supply-chain structure and market access rather than strict quality-adjusted commodity equivalence.

Reliable observations from Al Fasher before April 2026 were unavailable because prolonged conflict conditions, siege-related disruption, and communication constraints severely limited market access. Available

April–May observations were obtained remotely through mobile-phone communication with a local retailer operating under extreme market conditions.

## 2.2 Analytical Approach

The study employs descriptive and comparative methods: percentage-change analysis across monthly observation periods, cross-city price-level and trajectory comparison, and co-movement assessment of diesel and food price dynamics. This constitutes a rapid operational market analysis — an approach appropriate to conflict-affected, data-constrained environments where formal econometric methods are precluded by short time series and fragmented data conditions (Minot, 2011; Fackler & Goodwin, 2001). The descriptive operational approach is consistent with applied market-monitoring practice in fragile settings (Porteous, 2019) and provides field-level evidence that can complement formal analyses as longer time series become available. The analytical framework assumes two core transmission pathways: (i) in integrated markets, diesel price increases raise distribution costs at each supply-chain stage, producing broadly parallel food price increases; (ii) in fragmented or conflict-isolated markets, supply disruption, insecurity, informal taxation, and physical access restrictions produce food-price dynamics that diverge from standard cost-push transmission.

## 2.3 Ethical Considerations

Market observations relied on direct communication with traders, operational wholesale-market monitoring, and, in the case of Al Fasher, remote mobile-phone communication under siege-related conditions. No personal identifiers were collected from traders or market participants. Data collection prioritised participant safety and avoided requests for politically sensitive, trader-identifying, or operationally confidential details.The study involves no human subjects research requiring institutional ethical approval under standard research ethics frameworks.

## 2.4 Limitations

Five limitations should be acknowledged. First, the five-month observation window reflects operational constraints inherent to market monitoring under active conflict and does not support estimation of long-run price transmission elasticities or formal market integration tests; findings are interpreted as indicative of short-run dynamics and structural market differences. This constraint is characteristic of conflict-affected research environments, where monitoring systems frequently break down in the areas where data are most urgently needed (IPC, 2026, pp. 3–4). Second, observed changes cannot be formally attributed to individual causal factors — diesel prices, exchange-rate movements, seasonal patterns, and conflict-related disruptions operated concurrently throughout the observation period. Third, some portion of food price increases may reflect seasonal tightening associated with the transition from post-harvest to lean-season conditions. Fourth, product specification differences between northern markets and Nyala and Al Fasher introduce a caveat to strict cross-city comparisons, as discussed in Section 4.1. Fifth, Al Fasher data cover only two months (April and May 2026), precluding percentage-change calculation from a January baseline. Sixth, wholesale observations reflect prevailing market-clearing prices rather than trader-level dispersion, limiting analysis of within-market price

heterogeneity. These limitations are inherent to the conflict context and constrain causal inferences but do not diminish the analytical value of the price evidence documented.

# 3. Results

## 3.1 Diesel and Fuel Price Trajectories, January–May 2026

Table 2 and Figure 1 present monthly diesel and petrol prices. Diesel is reported first as the primary driver of freight and food distribution costs across Sudan's road network. Two distinct fuel regimes are immediately apparent.

**Table 2. Monthly Fuel Prices by City (SDG per gallon), January–May 2026**

| Diesel (SDG/gallon) | Jan | Feb | Mar | Apr | May | Jan–May |
|---|---|---|---|---|---|---|
| Port Sudan | 17,000 | 17,000 | 18,000 | 22,000 | 33,000 | **+94.1%** |
| Khartoum | 17,000 | 17,000 | 18,000 | 22,000 | 33,000 | **+94.1%** |
| Gezira | 18,000 | 18,000 | 19,000 | 23,000 | 33,000 | **+83.3%** |
| Nyala | 25,000 | 25,000 | 30,000 | 38,000 | 42,000 | **+68.0%** |

| Petrol (SDG/gallon) | Jan | Feb | Mar | Apr | May | Jan–May |
|---|---|---|---|---|---|---|
| Port Sudan | 18,000 | 18,000 | 19,000 | 21,000 | 27,000 | **+50.0%** |
| Khartoum | 18,000 | 18,000 | 19,000 | 21,000 | 26,500 | **+47.2%** |
| Gezira | 19,000 | 19,000 | 20,000 | 22,000 | 27,000 | **+42.1%** |
| Nyala | 26,000 | 26,000 | 29,000 | 35,000 | 40,000 | **+53.8%** |

*Notes: Diesel listed first as primary freight fuel; petrol included for reference. All prices in SDG per gallon. No formal fuel market data available for Al Fasher. Diesel cumulative changes: Port Sudan and Khartoum +94.1%; Gezira +83.3%; Nyala +68.0%. Petrol cumulative changes: Port Sudan and Khartoum +50.0%; Gezira +42.1%; Nyala +53.8%. Source: Authors' primary market observations.*

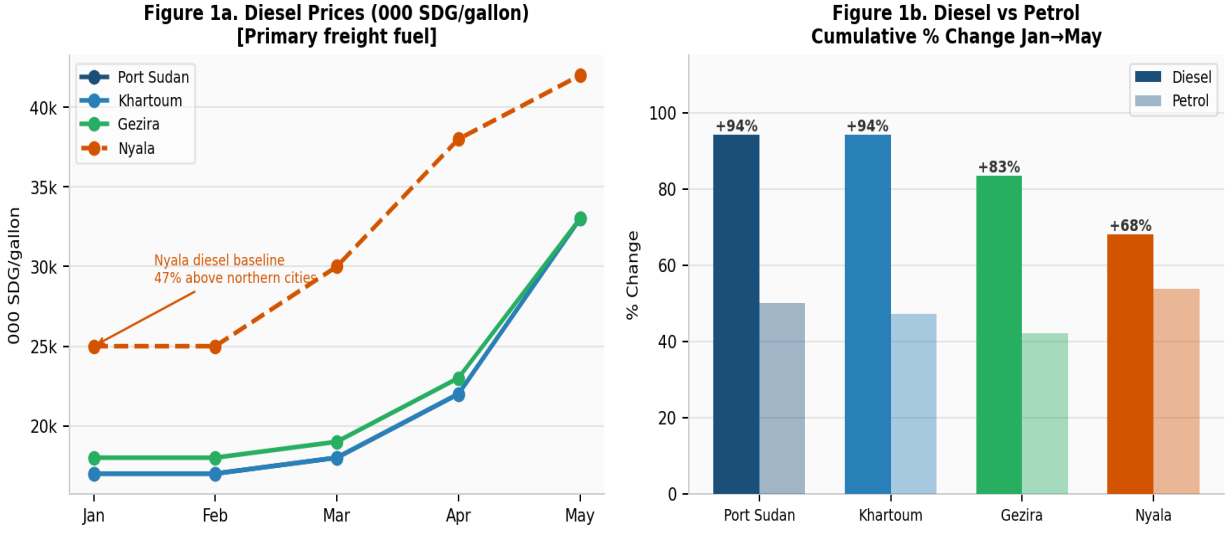



*Figure 1. Left panel: Diesel price trajectories by city, January–May 2026 (000 SDG/gallon). Right panel: Cumulative percentage change compared, diesel (solid bars) and petrol (light bars). Nyala shown as dashed line. Source: Authors' primary market observations.*

In the northern corridor, diesel prices followed a consistent path: Port Sudan and Khartoum rose from SDG 17,000/gallon in January–February to SDG 18,000 in March, SDG 22,000 in April, and SDG 33,000 in May — a cumulative increase of +94.1 per cent. Gezira followed the same pattern, reaching SDG 33,000 in May (+83.3 per cent). The April-to-May surge was particularly pronounced: diesel in northern cities rose approximately 50 per cent in a single month, sharply raising freight costs along all supply routes. Petrol rose by +50.0 per cent in Port Sudan and Khartoum and is less directly relevant to food distribution costs, which depend on commercial freight vehicles running on diesel.

Nyala's diesel prices were structurally elevated throughout the observation period. Diesel opened at SDG 25,000/gallon in January — approximately 47 per cent above the SDG 17,000 recorded in Port Sudan and Khartoum at the same date — and reached SDG 42,000 by May (+68.0 per cent). This persistent baseline premium reflects the higher cost structure of cross-border supply systems: longer effective routes, checkpoint and informal taxation costs, and cross-currency conversion. Whilst Nyala's cumulative diesel increase (+68.0 per cent) was broadly comparable to northern cities, its *absolute* diesel price level exceeded northern markets at every time point throughout the period, embedding a structural logistics cost disadvantage that compounded into food prices.

## 3.2 Food Price Trajectories, January–May 2026

Tables 3a–3d present monthly wholesale food prices for all four commodities. Figures 2–5 illustrate key price dynamics, and Table 4 with Figure 6 summarise cumulative percentage changes.

**Table 3a. Monthly Wholesale Wheat Prices by City (SDG/kg), January–May 2026**

| Wheat (SDG/kg) | Jan | Feb | Mar | Apr | May |
|---|---|---|---|---|---|
| Port Sudan | 1,900 | 1,900 | 1,900 | 2,200 | 2,800 |
| Khartoum | 1,900 | 1,900 | 1,950 | 2,250 | 2,800 |
| Gezira | 1,900 | 1,950 | 2,000 | 2,250 | 2,800 |
| Nyala | 3,000 | 3,000 | 3,500 | 4,000 | 6,500 |
| **Al Fasher** | — | — | — | **50,000** | **55,000** |

*Source: Authors' primary market observations.*

**Table 3b. Monthly Wholesale Rice Prices by City (SDG/kg), January–May 2026**

| Rice (SDG/kg) | Jan | Feb | Mar | Apr | May |
|---|---|---|---|---|---|
| Port Sudan | 2,000 | 2,000 | 2,100 | 2,400 | 3,100 |
| Khartoum | 2,100 | 2,100 | 2,200 | 2,500 | 3,200 |
| Gezira | 2,200 | 2,200 | 2,250 | 2,600 | 3,300 |
| Nyala | 6,000 | 6,000 | 6,000 | 6,200 | 6,500 |
| **Al Fasher** | — | — | — | **80,000** | — |

*Source: Authors' primary market observations.*

**Table 3c. Monthly Wholesale Sugar Prices by City (SDG/kg), January–May 2026**

| Sugar SDG/kg) | Jan | Feb | Mar | Apr | May |
|---|---|---|---|---|---|
| Port Sudan | 2,600 | 2,600 | 2,650 | 2,900 | 3,380 |

*Source: Authors' primary market observations.*

**Table 3d. Monthly Wholesale Vegetable Oil Prices by City (SDG/L), January–May 2026**

| Vegetable Oil (SDG/L) | Jan | Feb | Mar | Apr | May |
|---|---|---|---|---|---|
| Port Sudan | 7,000 | 7,000 | 7,000 | 8,000 | 9,000 |
| Khartoum | 7,000 | 7,000 | 7,000 | 8,000 | 9,000 |
| Gezira | 7,000 | 7,000 | 7,000 | 8,000 | 9,000 |
| Nyala | 5,000 | 5,000 | 5,200 | 5,800 | 6,200 |
| **Al Fasher** | — | — | — | **50,000** | **50,000** |

| Sugar SDG/kg) | Jan | Feb | Mar | Apr | May |
|---|---|---|---|---|---|
| Khartoum | 2,700 | 2,700 | 2,700 | 3,000 | 3,400 |
| Gezira | 2,800 | 2,800 | 2,800 | 3,100 | 3,500 |
| Nyala | 3,200 | 3,200 | 3,300 | 3,400 | 4,500 |
| **Al Fasher** | — | — | — | **85,000** | **85,000** |

*Notes: Wheat, rice, and sugar in SDG/kg; vegetable oil in SDG/L. (—) = not available. Al Fasher data available from April 2026 only; May rice data absent (commodity entirely unavailable). Al Fasher values in bold red indicate supply-collapse conditions. Product specifications differ between northern markets and Nyala/Al Fasher; cross-city comparisons are indicative of supply-chain structure and market access rather than strict quality-adjusted equivalence. Source: Authors' primary market observations.*

## 3.3 Integrated Northern Markets: Port Sudan, Khartoum, and Gezira

The clearest signal of northern market integration is found in vegetable oil (Figure 2): all three cities followed the identical monthly sequence — SDG 7,000/L in January through March, rising to SDG 8,000 in April and SDG 9,000 in May — a uniform +28.6 per cent increase. This precise replication across cities separated by up to 800 km is consistent with a single import-price shock transmitted through a shared distribution network, and would be highly improbable if local supply and demand conditions were the primary price-forming mechanism in each city independently.

**Figure 2. Vegetable Oil Wholesale Prices (000 SDG/L) — Northern Integration Signal**

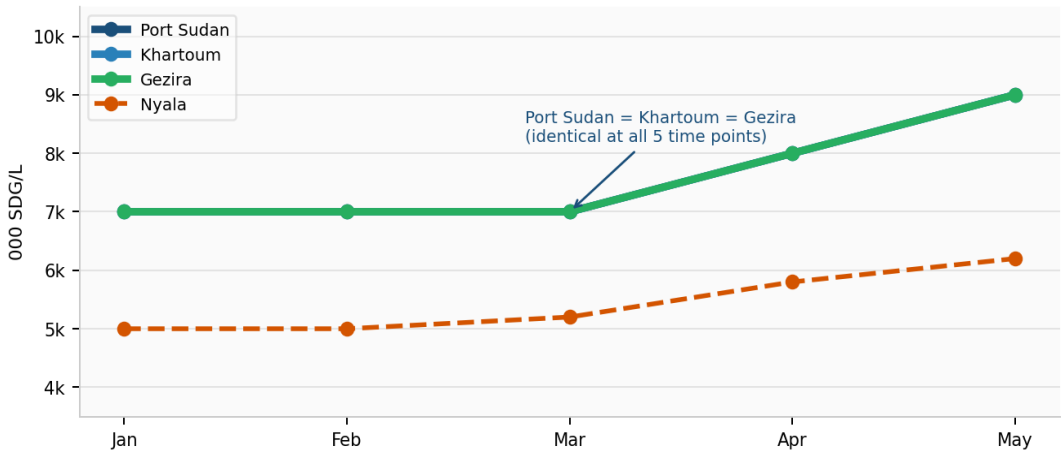



*Figure 2. Vegetable oil wholesale price trajectories (SDG/L), January–May 2026. Identical monthly path across Port Sudan, Khartoum, and Gezira indicates strong market integration. Source: Authors' primary market observations.*

Wheat prices converged to SDG 2,800/kg across all three northern cities in May, a +47.4 per cent increase in each (Figure 3). The timing of price acceleration tracked the diesel trajectory closely: prices were broadly stable from January through March whilst diesel increased modestly, then rose sharply in April and May as diesel costs surged. In Port Sudan, wheat rose from SDG 1,900/kg in March to SDG 2,200 in April (+15.8 per cent) and SDG 2,800 in May (+27.3 per cent), temporally consistent with the northern diesel increase of approximately 50 per cent over the April–May period. Rice increased by +55.0, +52.4, and +50.0 per cent in Port Sudan, Khartoum, and Gezira respectively. Sugar rose 25–30 per cent across the three cities.

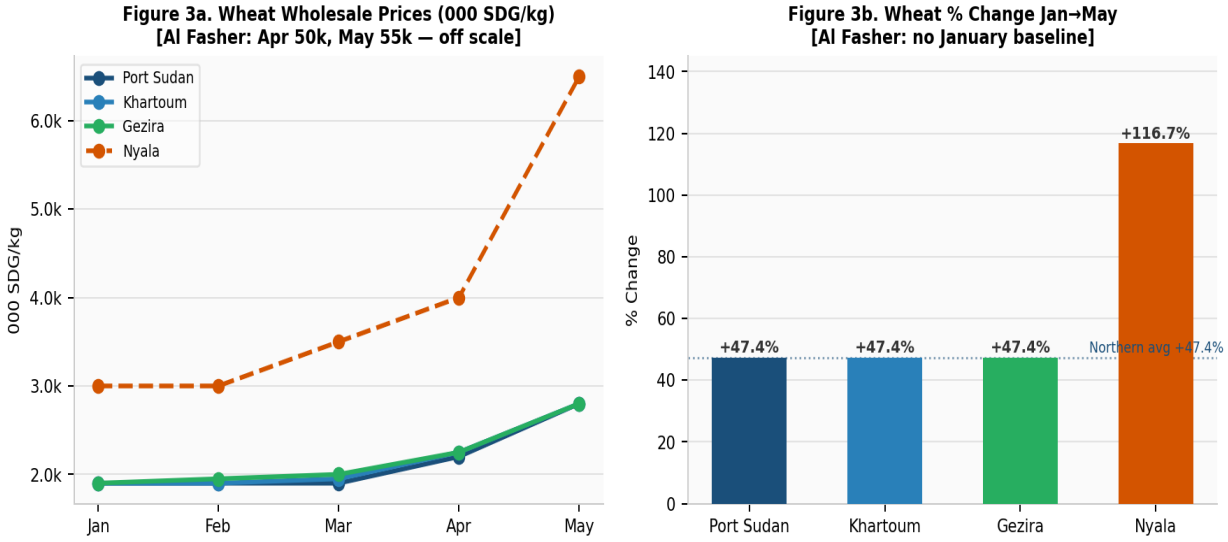



*Figure 3. Wheat wholesale price trajectories and cumulative percentage changes, January–May 2026. Al Fasher values noted in callouts (April: SDG 50,000; May: SDG 55,000/kg) — off scale. Source: Authors' primary market observations.*

### 3.4 Nyala: Commodity-Differentiated Inflation in a Cross-Border Market

Nyala's food-price dynamics diverged substantially from the northern corridor. Wheat increased by +116.7 per cent — from SDG 3,000 to SDG 6,500/kg — exceeding the rate of increase in all three northern cities and approaching double their rate (Figure 3). Acceleration was concentrated in May: wheat rose from SDG 4,000 in April to SDG 6,500 in May (+62.5 per cent in a single month), consistent with the sharp diesel surge over the same period amplified through a more expensive cross-border logistics network. This pattern is consistent with Dillon and Barrett's (2016) finding that fuel price shocks transmit to local food prices primarily through freight costs, with transmission amplified in markets bearing higher baseline logistics costs — as documented for Sudan's western markets by Siddig et al. (2026).

Rice increased by only +8.3 per cent — from SDG 6,000 to SDG 6,500/kg (Figure 4). This muted response reflects a price-ceiling effect: Nyala's rice was already three times the Port Sudan wholesale price in January (SDG 6,000 vs SDG 2,000), reaching a level at which further proportional increases encounter effective demand destruction limits. The commodity-specific sourcing differences further complicate interpretation: Nyala's rice arrives through cross-border channels and may carry different variety characteristics and quality specifications from standardised imported rice distributed through Port Sudan. Its elevated baseline price likely reflects both the structural cost of the alternative supply chain and potentially different product characteristics, underscoring

the importance of treating cross-city comparisons as indicative of supply-chain structure rather than strict equivalence. Wheat, beginning at a lower relative premium (58 per cent above Port Sudan rather than 200 per cent for rice), retained more room for price adjustment as logistics costs rose. Sugar increased +40.6 per cent — above all three northern cities — whilst vegetable oil rose +24.0 per cent, slightly below the northern uniform of +28.6 per cent.

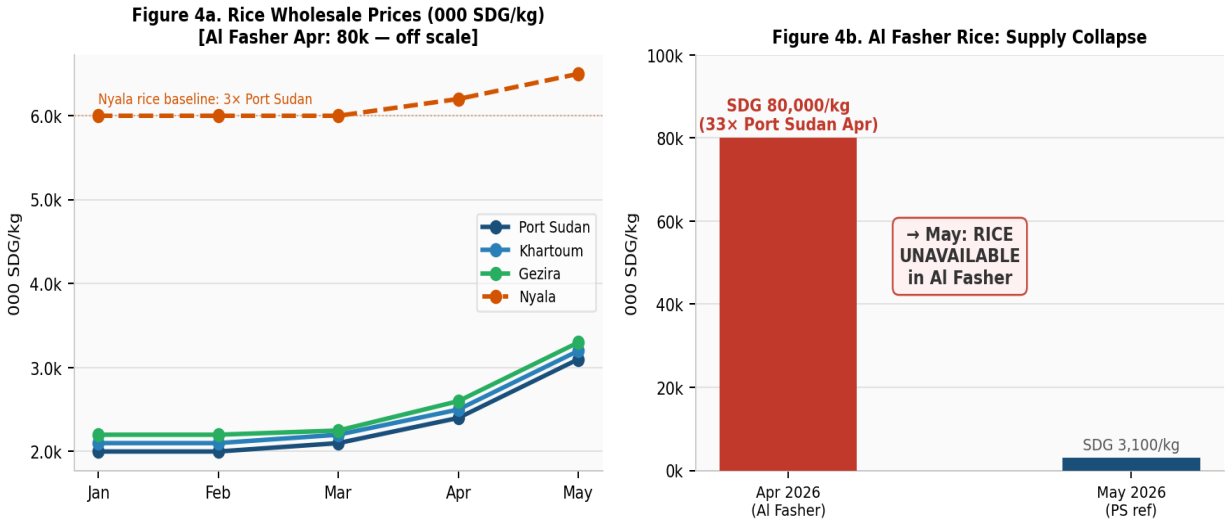



*Figure 4. Rice wholesale price trajectories (left) and Al Fasher supply collapse sequence (right). Al Fasher rice: SDG 80,000/kg in April → entirely unavailable in May. Source: Authors' primary market observations.*

### 3.5 Al Fasher: Supply Collapse

Al Fasher's observations occupy a different analytical category. In April 2026, wheat was priced at SDG 50,000/kg — 22.7 times the Port Sudan price of SDG 2,200 at the same date and 12.5 times the Nyala price. Rice at SDG 80,000/kg was 33.3 times the Port Sudan April equivalent. By May, wheat had risen to SDG 55,000/kg (+10.0 per cent from April), whilst rice had disappeared from wholesale markets entirely — not merely prohibitively expensive, but physically unavailable. Vegetable oil held at SDG 50,000/L (5.6 times Port Sudan May) and sugar at SDG 85,000/kg (25.1 times Port Sudan May).

The sequential pattern of extreme prices in April followed by commodity unavailability in May for rice is the observable signature of supply collapse: as remaining stocks are exhausted, prices first spike to extreme levels before the commodity disappears from markets. The near-absence of physical cash — with transactions relying on digital bank transfers (FAO, 2026, p. 41) — further disrupts the institutional mechanisms through which markets function, compounding supply disruption with liquidity disruption. These conditions are consistent with FAO's independent documentation of El Fasher prices exceeding 200 times pre-conflict levels during the siege (FAO, 2026, pp. 7–8).

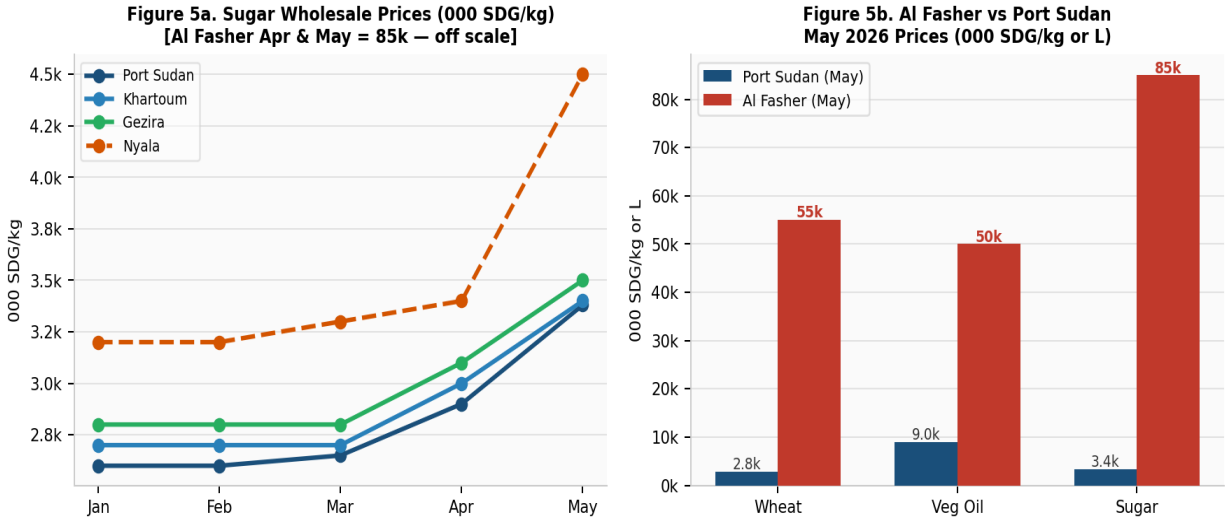



*Figure 5. Sugar wholesale price trajectories (left) and Al Fasher vs Port Sudan commodity-level comparison, May 2026 (right). Source: Authors' primary market observations.*

**Table 4. Cumulative Wholesale Price Changes by City and Commodity, January–May 2026 (%)**

| City | Wheat | Rice | Veg. Oil | Sugar |
|---|---|---|---|---|
| Port Sudan | +47.4% | +55.0% | +28.6% | +30.0% |
| Khartoum | +47.4% | +52.4% | +28.6% | +25.9% |
| Gezira | +47.4% | +50.0% | +28.6% | +25.0% |
| Nyala | +116.7% | +8.3% | +24.0% | +40.6% |
| **Al Fasher** | — | — | — | — |

*Notes: Percentage changes calculated as (May − January) / January × 100. Al Fasher: only April–May comparison available (Wheat +10.0%; Rice unavailable in May; Vegetable Oil and Sugar unchanged April–May). (—) No January baseline; (—) Commodity unavailable in May. Colour coding: dark red ≥100%; red ≥40%; amber ≥25%; yellow ≥10%; green <10%. Source: Authors' calculations from primary observations.*

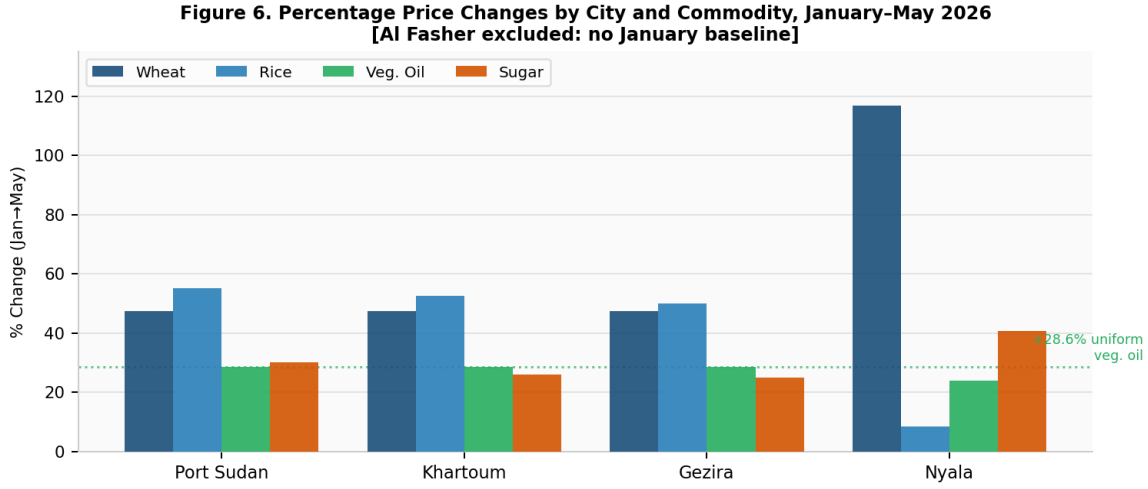



*Figure 6. Percentage wholesale price changes by city and commodity, January–May 2026. Dotted line marks +28.6% uniform vegetable oil increase across northern cities. Al Fasher excluded (no January baseline). Source: Authors' calculations.*

# 4. Discussion

The findings demonstrate that food-price dynamics in Sudan between January and May 2026 operated through three empirically distinguishable mechanisms, shaped by the interaction of shared macroeconomic pressures with locally differentiated supply-chain structures. These represent structurally different forms of food-price formation rather than regional variants of the same process.

In the northern corridor, the synchronised price trajectories across Port Sudan, Khartoum, and Gezira are consistent with integrated supply chains and standard diesel-cost-push transmission. The identical vegetable oil sequence provides the strongest integration signal: precise replication across cities separated by up to 800 km would be highly improbable if local conditions were the primary price-forming mechanism. The observed within-market price uniformity is consistent with wholesale markets dominated by common import batches and highly synchronised acquisition costs, reducing scope for trader-level price variation. The temporal alignment of food-price acceleration with the April-to-May diesel surge is consistent with Dillon and Barrett's (2016) framework, in which fuel cost shocks propagate to local food prices primarily through freight costs. Wheat's +27.3 per cent increase in Port Sudan in May tracked a northern diesel increase of approximately 50 per cent over the April–May period. Exchange rate depreciation amplified this transmission: the parallel market rate of SDG 3,625 per US dollar (WFP, 2026, p. 1) raised import costs for wheat and vegetable oil, consistent with the World Bank's attribution of Sudanese inflation primarily to transportation and food costs (World Bank, 2025, p. 23).

Nyala's dynamics illustrate how supply-chain geography fundamentally alters inflation mechanisms. The 68 per cent diesel baseline premium reflects the accumulated costs of cross-border logistics documented in the Sudan conflict literature — longer effective routes, informal checkpoint taxation, convoy-protection arrangements, and cross-currency conversion (Siddig et al., 2026, Chapter 5). The commodity-differentiated inflation pattern — wheat at +116.7 per cent, rice at +8.3 per cent — cannot be explained by a single transmission mechanism but rather by the interaction of different starting baselines, different cross-border sourcing arrangements, and the binding purchasing-power constraint that price-ceilings rice at an already extreme level. Nyala is not experiencing a dampened version of northern inflation but a structurally different form of it.

Al Fasher requires a different analytical frame entirely. The distinguishing characteristic is not the extreme price level but the transition from price to unavailability: rice was priced at SDG 80,000/kg in April and absent in May. This sequence is the observable signature of stock exhaustion — a supply-collapse dynamic rather than an inflationary one. FAO's independent documentation of El Fasher prices exceeding 200 times pre-conflict levels during the siege (FAO, 2026, pp. 7–8) provides external corroboration. The cash shortage forcing reliance on digital bank transfers (FAO, 2026, p. 41) compounds supply disruption with liquidity disruption, further undermining the institutional conditions for market function.

A distinction of kind rather than degree separates the three regimes: integrated markets experiencing cost-push inflation mediated by diesel price transmission (northern corridor); a structurally elevated cross-border market

with commodity-differentiated dynamics shaped by alternative supply-chain economics (Nyala); and a conflict-isolated market exhibiting supply collapse (Al Fasher). The wholesale prices documented here underestimate household-level food costs: retail margins, last-mile transport, and localised scarcity premiums add substantially to what consumers actually pay, with the gap widest in conflict-affected areas.

## 4.1. Conclusion

The findings are consistent with recent evidence highlighting the fragmentation of commercial and transport networks between western and eastern Sudan (Siddig et al., 2026; World Bank, 2025). The integrated northern corridor displayed synchronised food-price trajectories tracking diesel cost increases through the shared Port Sudan supply network. Nyala exhibited wheat inflation of +116.7 per cent — nearly two and a half times the northern rate — driven by a structurally elevated diesel baseline and amplified logistics costs, whilst rice showed a price-ceiling response at an already extreme baseline. Al Fasher's sequential progression from extreme prices in April to commodity unavailability in May signals supply collapse rather than inflationary transmission.

## 4.2. Policy Implications

Policy implications follow directly from these regime distinctions. In the integrated northern corridor, containing food price inflation requires addressing upstream drivers: diesel cost reduction through fuel subsidies or import support; road corridor rehabilitation; commercial transport capacity; and exchange-rate stabilisation to limit import-price pass-through. In Nyala and south-western markets, the challenge is structurally different: cross-border trade corridor stabilisation, reduction of informal taxation and checkpoint costs, and exchange-rate management. Standard market-support tools calibrated for integrated markets will be insufficient in this context. In conflict-isolated markets such as Al Fasher, conventional price-stabilisation measures become largely irrelevant once supply collapse occurs. Policy priorities shift towards restoring safe humanitarian and commercial access routes, protecting market infrastructure, facilitating emergency commodity inflows, supporting liquidity mechanisms, and safeguarding civilian movement necessary for livelihood recovery. Without restoration of physical access and market function, inflation-management approaches alone cannot prevent further deterioration in food availability. The IPC Famine Review Committee has independently confirmed that in such settings bureaucratic impediments and insecurity are the primary barriers to alleviating acute food insecurity, underscoring the primacy of access restoration over price-based tools (IPC, 2026, pp. 3–4).

Future research should pursue longer time series, incorporate additional regional markets, collect household-level retail prices, and apply formal price transmission modelling as conditions allow. The present study provides an empirical foundation for understanding how supply-chain structure, diesel price dynamics, and conflict intensity interact to produce divergent food-price mechanisms — a contribution of both analytical and immediate policy relevance for Sudan and comparable conflict-affected settings.

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## Author contributions

The corresponding author is the sole author of this manuscript, and was entirely responsible for the study conception, design, methodology development, data analysis and the writing and preparation of the final text

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