COLLECTIVE SUDAN.ORG
مجموعة السودان

Sudan Supply Chain Analysis

Sorghum Supply Chains in Khartoum and South Darfur

March 2026

IMPACT
Shaping practices
Influencing policies
Impacting lives

DATAQ

Photo credit: WomenofSudan1

Executive Summary

This report presents qualitative findings from a comprehensive analysis of the sorghum supply chain, as part of a two-report series covering sorghum and laundry soap supply chains conducted by IMPACT Initiatives and DataQ Sudan. The assessment focuses on two primary market systems: Khartoum State, which functions as the central sorghum redistribution hub, and South Darfur State (Nyala Janoub), a more localised, fragmented, conflict-affected system. The analysis draws on 30 in-depth interviews with key informants and other respondents, including wholesale traders, farmers, transporters, food vendors, and households. The interviews explored transport logistics, upstream supply dynamics, and consumer experiences across the two market hubs.

Across both systems, the findings show a sorghum supply chain under severe structural stress, though with distinct dynamics in each location. Khartoum has experienced partial stabilisation following the initial shocks of conflict but continues to face persistent cost pressures, weakened financial systems, and increased market concentration at the wholesale level. South Darfur presents a more acute situation, characterised by the loss of trader capital, breakdown of brokerage networks, ongoing insecurity, and severely constrained household purchasing power.

Key Findings

- **Sorghum supply system (Khartoum):** Multi-source supply system draws from Gedaref, White Nile, Al-Jazeera and Sennar states. This likely contributed for stabilised sorghum prices at SDG 16,000–18,000/quarter (down from war peak of SDG 20,000–24,000) but remain elevated compared to pre-war levels.
- **Sorghum supply system (South Darfur):** While the sorghum supply chain is linked with local markets in Belil, Kass, Kateila and nearby areas, obstruction of intermediary networks and traders' limited access to capital were identified as the main constraints.
- **Transport:** Fuel remains the primary driver of sorghum transportation cost volatility. Across the assessed market hubs, road degradation seems to have extended sorghum transit times from 2 to 3 days, while internal Khartoum loading costs for sorghum doubled during Ramadan.
- **Sorghum storage:** Lack of finance for storage forces cash-constrained farmers and traders to sell at harvest-time low prices. South Darfur sorghum traders operate from relocated, costlier residential storage post-looting.
- **Financing:** Access to banks and financial services has become challenging for both sorghum farmers and traders across the assessed market hubs. Personal connections, rotating profits, and partial *Murabaha*[1] arrangements are the primary surviving mechanisms.
- **Price**: The price of sorghum has experienced an upward trend, making affordability challenging for vulnerable households. This is primarily due to a scant supply of sorghum resulting from the ongoing security situation and the increasing prices of other commodities, such as education and water containers.
- **Household access to sorghum (Khartoum):** Access to sorghum is limited by high prices relative to pre-war levels, though the multi-source supply provides more stability than in Darfur.
- **Household Access to Sorghum (South Darfur):** Access to sorghum in South Darfur is constrained by both limited local supply and low purchasing power, leading households to purchase in small, daily quantities. Ongoing security challenges further influence market participation and shape purchasing decisions.

[1] Murabaha: A Sharia-compliant cost-plus financing arrangement where the bank acts as an intermediary rather than a direct lender. Instead of providing cash, the bank purchases the required inputs (e.g., fuel or fertilizer) from a supplier and resells them to the farmer at a transparent, pre-agreed profit margin.

Table of Contents

Acronyms and Abbreviations

CVA – Cash and Voucher Assistance
CCS – Collective Sudan (formerly Cash Consortium of Sudan)
CWG – Sudan Cash Working Group
FEWS NET - Famine Early Warning Systems Network
FSL – Food Security and Livelihoods
JMMI – Joint Market Monitoring Initiative
KI – Key Informant
KII – Key Informant Interview
MEB – National Minimum Expenditure Basket
RNA – Rapid Needs Assessment

1. Introduction

Background

Sudan has been going through a recurring conflict in most parts of the country. The conflict has left more than 12 million people displaced and about two-thirds (30.4 million people) of the population in need of support in 2025.[2] The conflict has significantly contributed to the loss of livelihoods and the deterioration of the humanitarian situation. In response, several humanitarian agencies have sought to mitigate the crisis through market-based interventions. However, market activities have also been disrupted by the conflict, as well as by related indirect factors.

Understanding market systems in emergencies is crucial to designing proper responses and more efficient use of resources in emergencies. In particular, supply chain information enables humanitarian actors to consider a broader range of interventions, including in-kind distributions of items, cash-based assistance, local procurement, and other innovative forms of market-system support that leverage existing market actors' capacities. Therefore, understanding supply chain routes and associated barriers is essential for designing and implementing effective emergency programs.

While the Sudan Joint Market Monitoring Initiative (JMMI) includes supply chain indicators to identify sources of supply and related constraints, it does not provide comprehensive supply chain information, focusing on market mapping, market integration, and supply chain capacity. Therefore, IMPACT initiatives and DataQ, in close coordination with the Collective Sudan (CCS), conducted this assessment to fill this information gap. This assessment is designed as an iterative snapshot rather than a multi-dimensional supply chain study. It focuses on how regional contexts, and localised shocks create distinct differences in supply chain capacity and barriers, allowing us to remain agile while providing deep, context-specific insights.

This report triangulates expert knowledge, desk reviews, and primary interview data collected utilising a diversified respondent base to ensure a holistic view of the supply chain, incorporating perspectives from upstream farmers, wholesalers, transporters, and retail vendors. This multi-actor approach provides specific technical insights into logistical bottlenecks and production-level constraints that are often overlooked in standard market assessments.

Objectives of the Analysis

The overall objective of this assessment is to provide an analysis of the existing supply chain for sorghum and laundry soap in selected logistical hubs[2] of two states: South Darfur and Khartoum. This report presents the findings and analysis of the sorghum supply chain, with a focus on examining supply routes to inform market-based interventions and support the effective implementation of humanitarian responses. The primary stakeholders for this assessment include humanitarian organisations implementing Cash and Voucher Assistance (CVA), inter-agency coordination bodies (such as the Sudan Cash Working Group (CWG) and CCS), and clusters, specifically Food Security and Livelihoods (FSL). Additionally, the findings are intended to inform donor strategies and private sector partners involved in local supply chains.

[2] OCHA. Sudan Humanitarian Needs and Response Plan (2025).

The specific objectives of this analysis include:

1. To identify and map the primary sources and key transit routes for the selected items in the target hubs.
2. To understand the current capacity, functionality and roles of the main supply chain actors involved in the supply chain of the selected items in the target hubs.
3. To assess the key supply chain barriers encountered by the supply chain actors and their impact on commodity flow in the target hubs.

1. Study Background and Methodology

1.1 Study Scope

The Sorghum Supply Chain Analysis Study employs qualitative methods to garner perspectives across the sorghum value chain in Sudan, with a primary focus on Khartoum State and South Darfur (Nyala Janoub). The study also covers the Al-Qadarif/Gedaref production corridor as the principal upstream supply source feeding the Khartoum market.

The selection of sorghum as the primary commodity for this analysis is based on its widespread availability and critical significance across the assessed states. Additionally, the selection process accounted for seasonal and regional variations in consumption patterns, ensuring the identified item provides a representative baseline for the specific supply chain dynamics of the target areas.

1.2 Sampling and Data Collection:

During the scoping phase, key expert interviews were used to identify the main actors in the sorghum supply chain and define the respondent groups for the study. These groups included producers (farmers), transporters, wholesalers, retailers, with particular attention to millers, and two end-consumer groups: small traditional restaurants and households.

This assessment utilised a purposive sampling methodology aiming to ensure the inclusion of highly informed respondents and expert perspectives. This approach helps to target actors with direct and relevant knowledge of the supply chain and market dynamics. The sampling was executed in iterative waves. Following initial interviews with each respondent category, interim data reviews were conducted to identify thematic gaps, bottlenecks, and emerging areas for further exploration. This iterative process allowed subsequent sampling to be strategically directed toward the most relevant actors and specific issues identified during the analysis.

Data was collected using two tool types: Key Informant Interviews (KIIs) and vox pops (VP). Vox pops were short, structured qualitative interviews designed to capture and validate information gaps identified through the KIIs and the initial scoping phase.

Five data collection tools were developed, one for each respondent type. These tools covered the full sorghum supply chain and were structured in modular sections so that relevant parts could be administered independently where needed. All interviews were recorded, transcribed, and translated into English. In total, the study collected 13 KIIs and 17 vox pops. The table below provides a summary of the data collected across the two hubs.

Nyala Janoub, South Darfur		
Responder Type	**KIIs**	**VP**
Farmer	.	4
Transporters	2	.
Wholesalers	2	.
Retailers / Millers	1	.
Consumer	1	5
Khartoum, Khartoum State		
Responder Type	**KIIs**	**VP**
Farmer	1	3
Transporters	2	.
Wholesalers	4	.
Retailers / Millers	.	.
Consumer	.	5

Vox Pops faced specific challenges in Khartoum, as access to certain key downstream actors was constrained during data collection. Particularly, traditional restaurants, identified as important actors in the sorghum value chain due to their role in processing and serving sorghum-based products, were largely inaccessible for remote data collection during the fieldwork period. These actors typically provide valuable insights into end-user demand and consumption patterns.

In South Darfur, data collection was significantly hampered by widespread telecommunications outages and unstable internet connectivity. The absence of a reliable network created substantial communication gaps, forcing enumerators and respondents to rely on expensive, localised satellite-based hotspots. This reliance introduced several disruptions: communication remained inconsistent due to the limited number of active access points, high operational costs, and the security risks associated with respondents travelling to specific 'connectivity hubs' to sync data or participate in interviews.

1.3 Data Analysis:

Analysis followed a phased and iterative approach, with the research team initiating coding immediately after the completion of each data collection component so that emerging insights could inform subsequent analytical steps. Given the qualitative nature of the study, analysis was conducted using Atlas.ti software. An initial codebook was developed based on the early interviews and the agreed analytical framework. This codebook was treated as a living document, with codes refined, merged, and expanded as analysis progressed through the first round of coding.

Two rounds of coding were conducted, ensuring identification of key insights. The team conducted two structured rounds of coding. The first round focused on systematic coding and theme development, while the second round served as a validation and consolidation phase to ensure analytical consistency, address gaps, and reduce the risk of overlooked insights. Following coding, findings were synthesized by analytical components to support cross-component comparison and triangulation.

1.4. Challenges and Limitations

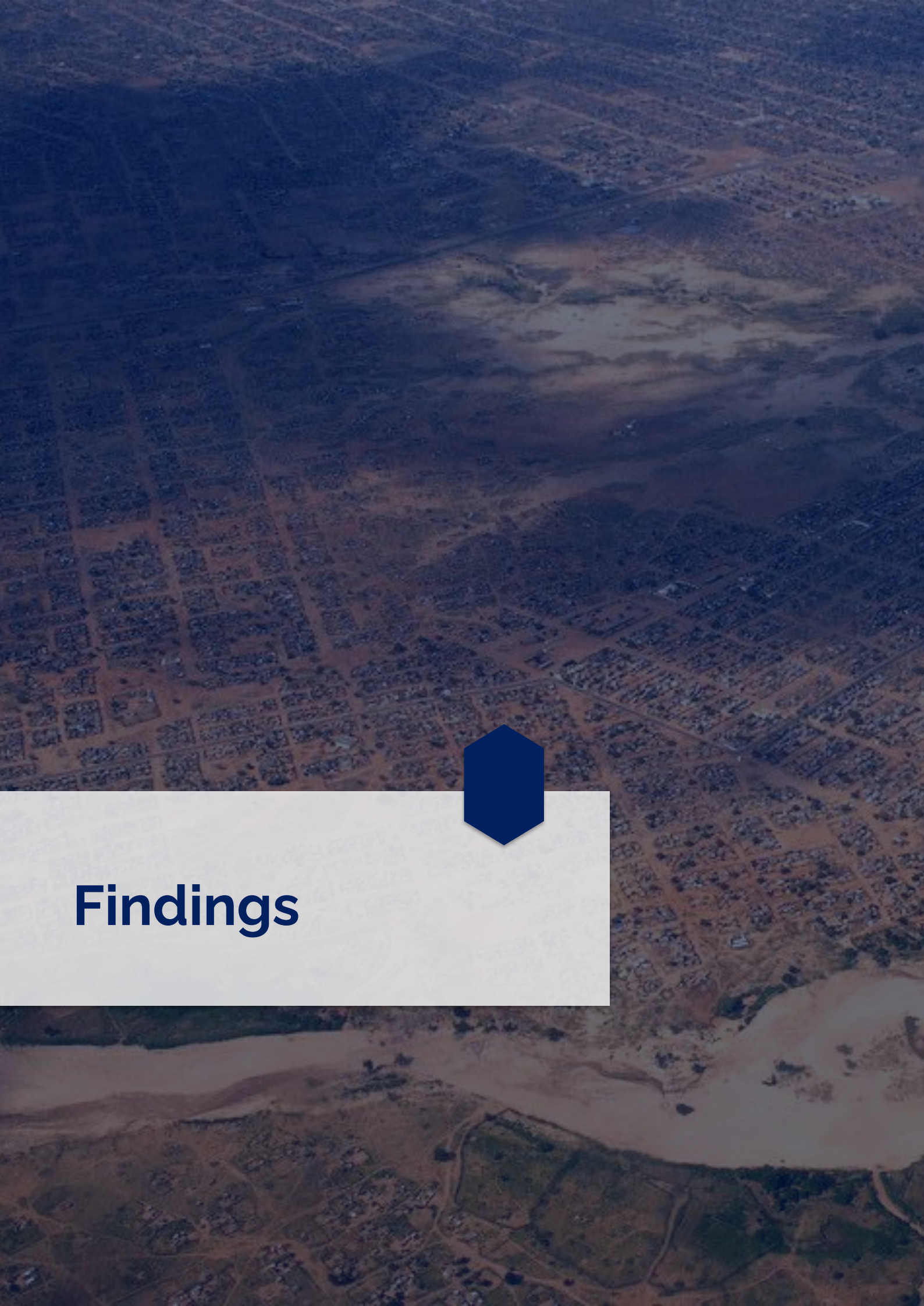
This section outlines the operational challenges encountered during the assessment and the limitations of the study design to ensure a transparent interpretation of the findings.

Challenges

- Prevailing security concerns and accessibility restrictions in various regions led to delays during data collection. Notably, obtaining necessary approvals and authorizations was hindered by the volatile situation, necessitating the transition to remote interviews to ensure field team and respondent safety.
- Data collection in South Darfur was periodically disrupted by unstable internet and telecommunication connectivity, affecting the pace and consistency of remote engagements.
- Some challenges arose from the overlapping roles of supply chain actors, particularly traders who often operate across multiple functions (e.g., wholesaler and transporter). While this made rigid categorization difficult, the research team addressed this by utilizing modular data collection tools, allowing for an adaptive interview flow based on the respondent's actual experience.
- The assessment was conducted within a highly constrained timeframe with minimal contingency, which limited the ability to follow up on secondary leads or extend data collection periods in hard-to-reach areas.

Limitations

- The findings represent a time-bound picture of the market. Given the rapid and unpredictable conflict dynamics and market adjustments in Sudan, the relevance of specific data points may diminish quickly.
- The analysis of the sorghum supply chain may not take all seasons into consideration. As availability and affordability fluctuate significantly between harvest and lean seasons, these findings should be understood within the context of the current seasonal cycle.
- While the assessment provides qualitative depth, estimating total supply chain capacity was limited by the lack of a robust quantitative component and a scarcity of recent published literature. Consequently, the analysis relies primarily on the perceptions and lived experiences of key experts and market actors.
- Findings are granular and specific to the markets assessed. They should not be generalized to the broader assessment regions, as market dynamics vary considerably across different states and localities.
- Consumer experiences regarding market access and affordability were found to vary crucially based on income levels and micro-local factors. These perspectives are therefore presented as contextual insights rather than broad, representative trends.



Findings

2. Context Overview

2.1 The Two Market Systems: Khartoum and South Darfur

The market system in Khartoum functions as a high-volume, diversified urban hub, yet it remains characterised by significant structural fragility and trader-centred architecture. According to the Sudan JMMI, Khartoum remains the primary destination for cereal flows from the eastern states, such as Gedaref and Sennar; however, conflict-driven disruptions to the Zareiba Al-Aish (Um Durman/Omdurman wholesale market) have led to asymmetric information and elevated transaction costs. These systemic shocks are exacerbated by an 18% year-on-year increase in the cost of the national Minimum Expenditure Basket (MEB) as reported by the JMMI (2025-2026).[3] This trend carries severe implications for vulnerable households' purchasing power, often forcing a reliance on negative coping strategies as affordability declines.

In contrast, the market system in South Darfur is defined by a more localised and geographically shorter supply chain, but acutely sensitive to security-related loopholes and logistical risks. Data from the FEWS NET Sudan Food Security Outlook (2026)[4] indicates that while local production in areas like Nyala Janoub provides a seasonal buffer, the overall system is undermined by a lack of liquidity and a short storage horizon that prevents market stabilisation. Furthermore, the Rapid Needs Assessment (RNA)[5] conducted by IMPACT in Central Darfur underscores that the high cost of transportation, limited operational hours, and pervasive insecurity constrain market access, commodities affordability, and supply chain continuity within Darfur, specifically Central Darfur. Similarly, results from the supply chain assessment show that the sorghum supply chain has become fragmented, which could be associated with insecurity as well as shortage and increasing cost of fuel. These factors leave local communities highly vulnerable to persistent and sudden supply shocks due to weak purchasing power, necessitating a differentiated, localised assistance framework that addresses these specific regional bottlenecks.

2.2 Conflict and Security Dynamics

Conflict affects the two systems in fundamentally different ways. In Khartoum, the war's main current effects are indirect: inflation, transport cost increases, labor shifts, and neighborhood-level access disruptions. Several actors described an initial war shock followed by partial normalisation. Wholesalers and transporters noted that security conditions had become more manageable than during the first phase of the war, and that movement within Khartoum itself was not the principal constraint. However, the impact of the conflict persists through its effects on fuel prices, the availability of spare parts, access to working capital, and the overall cost environment

In South Darfur, insecurity remains a direct and ongoing supply-chain variable. Different respondents repeatedly reported theft, unstable market access, periodic commodity unavailability, disruptions linked to conflict inside or around markets, and fear associated with movement and livelihood activities. South Darfur's sorghum market constitutes a structurally different system in which insecurity is embedded in normal market functioning, shaping both trader and household behaviour. The shift in the buying behaviour of traders and households serves as a direct multiplier effect of the prevailing security situation. In South Darfur, persistent security issues across key sorghum-producing areas[6] and a lack of formal market regulation grant traders significant leverage

[3] IMPACT Initiatives, Sudan, Joint Market Monitoring Initiative (JMMI).
[4] FEWS NET, Sudan, Sudan Food Security Outlook, February-September 2026.
[5] IMPACT Initiatives, Rapid Needs Assessment (RNA) in Hard-to-reach areas, Shamal Jabal Marrah, Um Dukhun and Zalingi (Central Darfur), January 2025.
[6] Security Council Report, February 2026 Monthly Forecast (2026).

over pricing and supply, frequently leaving households as passive price takers with minimal bargaining power. Furthermore, the conflict has severely limited the availability of millet, causing prices to skyrocket and forcing the local community to shift toward sorghum as a primary substitute. Beyond this substitution, households have adapted to the volatility by transitioning from bulk purchasing to buying in very small, daily quantities to manage limited cash flow and minimise risk. Similarly, traders have internalized the insecurity by maintaining lower inventory levels and relocating to costlier but more secure residential storage units to mitigate the threat of looting, effectively reshaping the structural functioning of the sorghum market. As for farmers, the security challenge, coupled with financial constraints, has forced many to sell their products directly in the field to secure immediate liquidity.

2.3 Policy and Regulatory Environment

The regulatory environment most visibly affects the sorghum supply chain through market exchange systems, transport documentation requirements, zakat and crop-related procedures, as well as taxation and handling fees. Transporters described formal documentation requirements, including crop procedures and security checks, that must be completed before movement on the Gedaref-linked corridor. In Khartoum's large wholesale markets, the daily exchange price imposes itself on sellers rather than emerging through open bilateral negotiation. Market activities in Khartoum are highly regulated by Trade Unions, which limit the flexibility of the system by preventing individual traders from unilaterally determining prices. This centralised oversight contributed to the relative stability of the supply chain and helped control price volatility in Khartoum in the post-war period. Comparatively, regulatory bodies are not fully functional in South Darfur, granting traders a dominant position in the supply chain. This lack of oversight allows traders to unilaterally determine sorghum prices, often leaving producers and consumers as price takers in an unregulated environment.

The most important institutional change affecting the supply chain is the collapse of formal agricultural financing. Multiple farmers and traders reported that the Agricultural Bank no longer provides sufficient direct support, and what remains is often limited to diesel or in-kind Murabaha arrangements rather than full seasonal financing. This has reshaped the entire supply chain by pushing actors toward self-financing, personal/trust networks, and informal credit, with downstream implications for timing of sales, storage behaviour, and bargaining power.

3. Supply Conditions

3.1 Khartoum Supply System

The Khartoum supply system is fed by a wide geographic network of production areas. Gedaref stands as the dominant surplus region, supported by additional inflows from White Nile, Sennar, Blue Nile, and Al-Jazeera. This multi-source structure provides resilience and ensures relatively stable supply to the capital. Wholesalers and traders in Khartoum consistently described the city as a market that does not produce sorghum itself but depends on inward supply from multiple states.

However, supply availability is not determined solely by production volumes. It is heavily shaped by farmer behaviour, which is driven by liquidity constraints. Farmers typically sell in phases, beginning with immediate post-harvest sales to cover production costs, followed by staggered sales based on household needs and availability of storage. This creates cyclical supply patterns in which periods of high availability are followed by tighter supply, contributing to price fluctuations. Supply in the system is not strategically managed but is financially driven.

Source Region	Role in Khartoum Supply System
Gedaref (Al-Qadarif)	Primary surplus producer; dominant source of white sorghum (Wad Ahmed/Akar)
White Nile	Major supplier; close to Khartoum with regular inflows
Al-Jazeera	Closest production zone to Khartoum; important for market continuity
Sennar / Blue Nile	Secondary supply source; complement to Gedaref corridor flows

3.2 South Darfur / Nyala Janoub Supply System

The South Darfur supply system differs fundamentally from the Khartoum national system. It is localised, smaller in scale, and less structured. Production is largely limited to local and peri-urban areas, and there is minimal inflow from other regions due to logistical and security constraints. Traders in Nyala Janoub source directly from farmers in nearby producing localities, bypassing structured aggregation mechanisms.

Key local supply sources and zones identified via KIIs located in the two market hubs. Additionally, cross-border supply from Chad functions as an important buffer during domestic supply shocks. South Darfur does not operate as a deficit market supplied by national flows, it is a constrained, self-reliant system with limited capacity to respond to shocks.

> *"Blabl is a nearby place, the closest you can get. It's a neighbourhood in the city, but they produce and have projects and markets. They sell on Mondays and Thursdays. Dar Ankara, Um Jifa, and Um Jan , they all come here."* — KI Wholesale Trader, South Darfur

3.3 Sorghum Varieties

The dominant varieties differ significantly by location and end use. In South Darfur, Tabat and Wad Ahmed remain the most widely cultivated and preferred household varieties. Gadam Al-Hamam and Najad are also referenced in Nyala Janoub price data.

In the Gedaref/Khartoum corridor, Wad Ahmed (locally known as Akar) and Feterita are the primary commercial varieties, Wad Ahmed for food markets, Feterita for poultry and livestock feed and as a fallback for late-season planting.

Variety	Main Market Use	Geographic Prevalence
Wad Ahmed / Akar	Primary food grain; human consumption; brown bread and soft flour; most marketable variety	Dominant in Gedaref corridor; widely preferred in Khartoum and Darfur markets
Tabat	Highly preferred household food grain; often sought for dietary and health reasons	Preferred in South Darfur households; available but sometimes scarce in Khartoum
Feterita	Secondary food grain; important feed for poultry and livestock; planted late in season	Al-Qadarif corridor; lower direct food demand but key feed market role
Gadam Al-Hamam / Najad	Household food grain; lower price tier in Nyala Janoub markets	South Darfur; traded in Nyala Janoub market alongside Tabat and Wad Ahmed
Millet	Substitute or seasonal food grain; used during Ramadan or when sorghum is unaffordable	Both systems; substitution role rather than preference

While this assessment focuses on sorghum, it is important to note the role of millet as a key substitute, particularly in Darfur. In this region, millet serves as the primary substitute for sorghum, and the two grains are often treated as a single category by both local consumers and traders. Consequently, the scarcity of millet due to current security dynamics has directly increased the pressure on sorghum supply and pricing. As indicated in the FEWS NET Sudan Food Security Outlook (2026), in the greater Darfur, millet and sorghum are the primary staples and are traditionally monitored as a single cereal group due to their high degree of substitutability. Market demand shifts fluidly between the two based on localised production shocks and relative price points.[7]

4. Supply Chain Structure

4.2 Key Supply Chain Actors

The sorghum supply chain across the assessment hubs is defined by a resilient yet strained network of actors, where primary production and wholesale functions remain operational but are heavily decoupled from pre-war efficiency. While farmers in the Gedaref corridor continue to feed the Khartoum market and smallholders persist around Nyala Janoub, they face a multi-dimensional production pressure that threatens even subsistence-level yields. In South Darfur, this manifests through restricted physical access to land due to shifting frontlines and localised insecurity, preventing critical weeding and harvesting. This is compounded by a severe input-affordability crisis and the collapse of formal agricultural credit systems, forcing smallholders to self-finance amid inflation. Consequently, many have reverted to traditional, lower-yield manual methods or are forced into the premature distress sale of stocks to meet immediate needs. This fragility is exacerbated by a labour shortage as displacement pulls able-bodied youth away, leaving a

[7] FEWS NET, Sudan, Sudan Food Security Outlook, February-September 2026.

depleted, relatively less skilled workforce to manage productive land under increasingly volatile conditions.

This fragmented landscape is most evident in the near-total collapse of the broker and intermediary class in South Darfur, a link that previously bridged the gap between rural producers and urban centres. In their absence, compounded by a lack of storage at the farmers' level, market power has consolidated among wholesalers and warehouse owners, who now maintain a significant upper hand in determining prices. In Khartoum, transporters continue to navigate long-haul corridors, though they are increasingly squeezed by volatile route security and rising operational costs driven by continuous fuel price increments. Downstream, the market is sustained by a vibrant, informal economy of processors and vendors who adapt daily to shifting dynamics. An established network of millers and some food vendors with over three decades of experience continues to transform sorghum into flour or dareesh[8] in Khartoum. This demand is further buoyed by the poultry and livestock sectors, which compete with households for lower-cost varieties like Feterita, directly influencing the price floor. Ultimately, households in both Khartoum and South Darfur have shifted toward small-scale, high-frequency daily purchases, reflecting a broader trend of diminished purchasing power and extreme adaptation.

Actor	Core Role	Status in Study Hubs
Farmers / producers	Cultivate sorghum; manage post-harvest storage; release stock in phases based on cash need	Active in Gedaref corridor (supplying sorghum to Khartoum) and around Nyala Janoub; South Darfur smallholders under production pressure
Brokers / assemblers	Aggregate sorghum from farmers; link producers to traders; extend geographic reach of trade	Largely collapsed post-war; pre-war role critical to reach of the supply chain; however, it shows no recovery signs in South Darfur
Transporters	Move sorghum between farms, markets and states; bear route and vehicle risk	Active; inter-state (long-haul) and internal Khartoum both documented; cost-squeezed
Wholesalers / warehouse owners	Hold stock; finance purchases; set timing of resale; supply downstream buyers	Key market power holders; Um Durman/Omdurman (Khartoum) more robust; Nyala Janoub more fragile and reduced
Millers	Process sorghum into flour or dareesh; serve households and traders	Visible in Khartoum urban system; limited evidence in South Darfur
Food vendors / restaurants	Transform grain or flour into ready-to-eat meals; absorb minor price shocks to retain customers	Active in Khartoum informal economy; however, limited evidence in South Darfur
Poultry and livestock users	Purchase lower-cost varieties (Feterita, dareesh) as feed; major bulk demand driver	Particularly important in Khartoum demand structure; determines price of Feterita

[8] Dareesh (or *Ad-Dareesh*) refers to cracked or coarsely ground grain, most commonly sorghum.

Households	Final consumers; adapt quantity, variety, and purchase frequency to price and income	Highly price-sensitive in both markets; small daily purchases dominant in Nyala Janoub

4.3 Supply Chain Flow

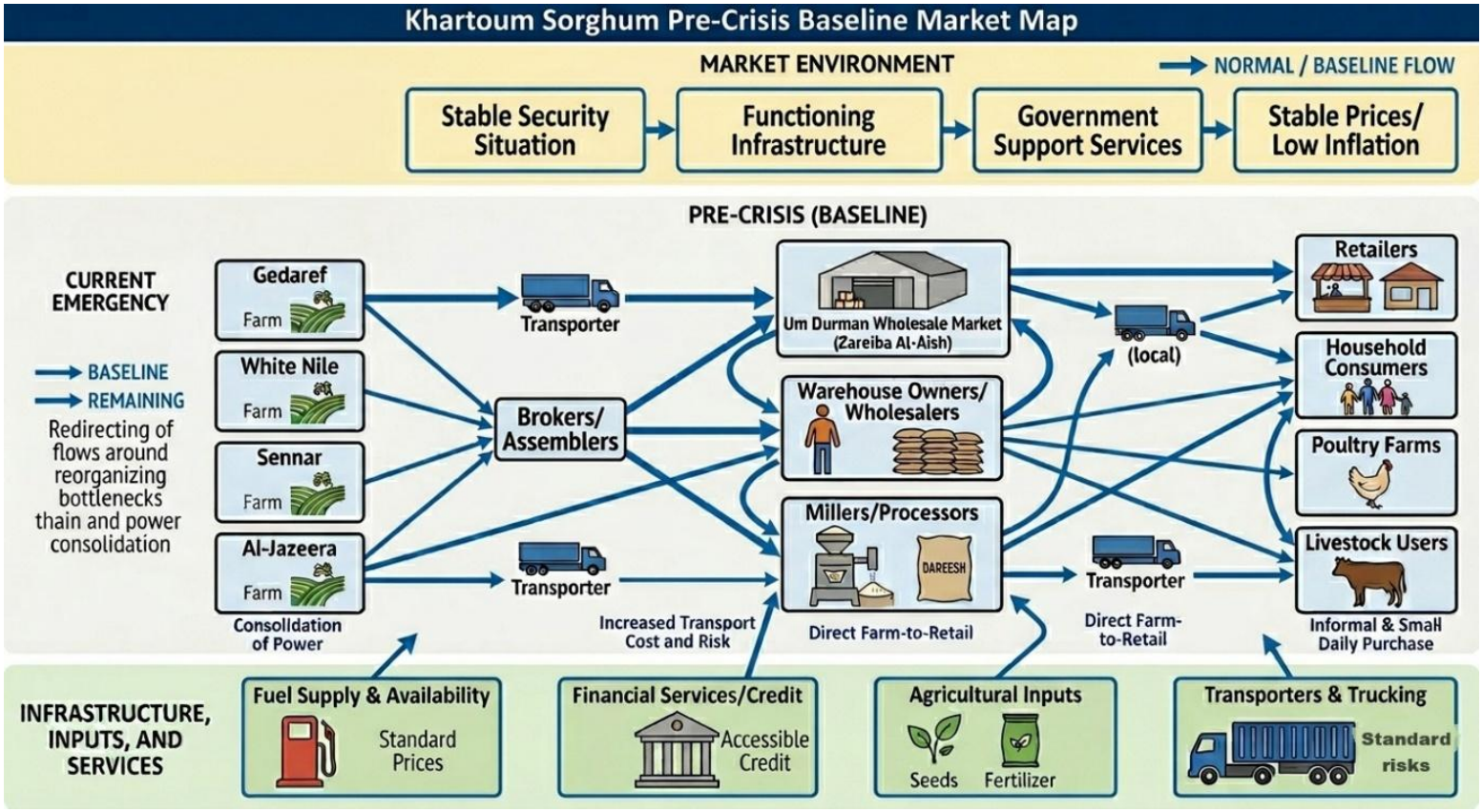
i. Khartoum Sorghum Pre-Crisis Market System

Before the crisis, the sorghum market system in Khartoum functioned within a stable and predictable environment. Security conditions were calm, major roads and bridges were intact, and government support services operated reliably. Inflation was low, and the overall price environment allowed for smooth and affordable market functioning. Under these conditions, sorghum moved efficiently from the major producing regions, Gedaref, White Nile, Sennar, and Al-Jazeera to the capital.

Farmers in these regions harvested sorghum and sold it into well-established supply chains. Transporters played a key role in linking farms with brokers and assemblers who aggregated grain for trade, benefiting from predictable transport costs and manageable operational risks. From this stage, sorghum flowed toward a range of downstream actors including warehouse owners and wholesalers, such as those operating out of the Um Durman/Omdurman wholesale market, as well as millers and processors. These market actors maintained consistent purchasing patterns, stable storage capacities, and smooth distribution channels. Millers processed raw sorghum into flour products that fed into retail markets or went directly to consumers.

Retailers across Khartoum accessed stock without major constraints and maintained regular supply to household consumers, poultry farms, and livestock users. Market linkages were robust, enabling sorghum to flow through both formal wholesale channels and direct farm-to-retail pathways. The predictable availability of agricultural inputs, particularly seeds and fertilisers, further sustained production levels, while transport and trucking services operated with minimal disruption.

Supporting services constituted the backbone of this well-functioning system. Fuel was available at standard prices, credit services were accessible to traders and processors, and storage and milling operations were adequately supplied and maintained. The baseline map represents a cohesive market system, characterised by steady flows, diversified trade relationships, and accessible sorghum for both households and commercial users. Overall, it portrays a resilient and interconnected market network capable of meeting consumer needs under normal conditions.



ii. Khartoum Sorghum Emergency Market System

In the current emergency context, the previous relatively stable sorghum market system in Khartoum has experienced significant disruption. Insecurity, recurrent conflict incidents, and damage to critical infrastructure, including roads, have contributed to a more volatile and less predictable operating environment. Government support services have weakened or collapsed, and inflation has become both high and unstable, affecting every stage of the sorghum value chain.

The crisis has fundamentally altered production dynamics in the main sorghum-producing regions. Farmers in Gedaref, White Nile, Sennar, and Al-Jazeera face displacement, insecurity, and restricted access to fields. Labour shortages and disruptions in the agricultural calendar have sharply reduced the volume of sorghum available for the market. Many farmers resort to distress sales or face constraints in transporting the limited quantities they are able to harvest. Consequently, the initial flow of sorghum into the market system has contracted significantly.

Transport, previously a reliable link between rural production areas and urban markets, has become a key constraint within the supply chain. Insecurity along major routes has increased transport risks, while fuel shortages and high prices limit the number of operational vehicles. As a result, some transporters are less able or willing to operate, reducing the volume of grain reaching brokers and assemblers. These intermediaries, who depend on aggregating supply from multiple sources, are consequently operating with reduced stock and facing ongoing access and security-related challenges.

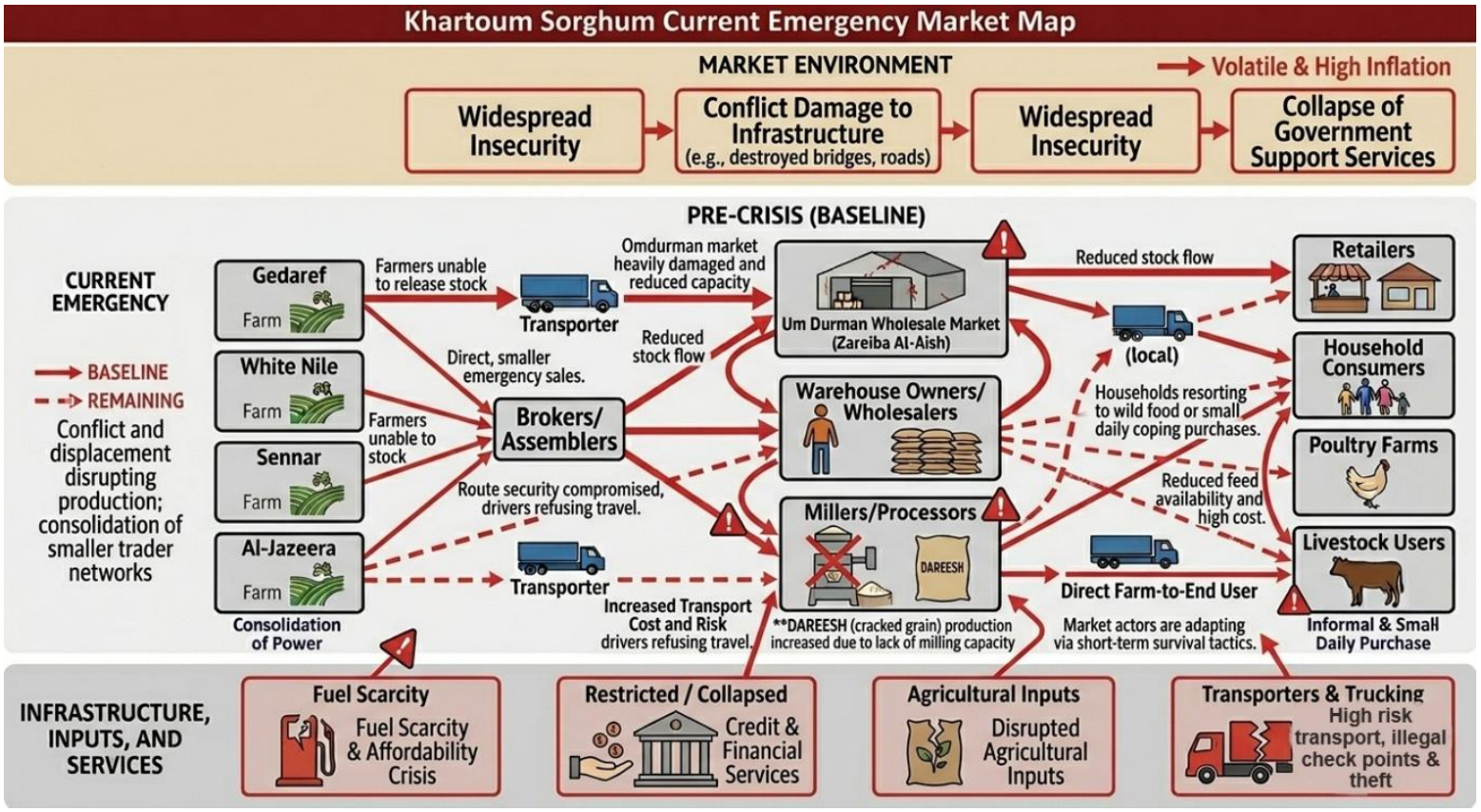
Downstream actors, wholesalers and warehouse owners in Khartoum receive far fewer deliveries, and major markets struggle with reduced operational capacity. Storage facilities are under strain due to reduced inflows and, in some cases, direct damage from conflict. Millers and processors face their own constraints, including inconsistent grain supply, high operational costs, and

shortages of essential inputs. As a result, processing capacity has fallen and the flow of flour into retail markets has shrunk accordingly. These developments have direct implications for storage capacity of farmers and exacerbate power imbalances among market actors. Those with greater financial and storage capacity can exploit the limited capacity of farmers and processors by setting prices to their own advantage, increasing their stocks, and selling sorghum at higher prices after the harvest.

Retailers feel the impact of upstream disruption most directly. Many struggle to maintain any level of stock, while others are forced out of operation entirely due to insecurity or supply shortages. Prices rise rapidly as availability collapses, pushing the cost beyond the capacity of many households. Poultry and livestock farms, which rely on sorghum-based feed, face severe reductions in stock and must scale back or liquidate animals.

Underlying these market disruptions are constraints affecting supporting services that previously sustained the system. Insecurity, fuel shortages, and high costs limit movement; access to credit has declined; agricultural input supply chains are disrupted; and transport services have become less reliable. As a result, the sorghum market is increasingly fragmented, with reduced capacity to meet the needs of consumers and livelihood actors

The emergency map illustrates a market system operating under significant stress, characterized by disrupted flows, increased risk exposure, and constrained functionality among market actors. In contrast to the baseline map, which reflects coordinated and stable linkages within the system, the current map indicates a market system affected by insecurity, reduced availability of goods and services, and broader structural constraints

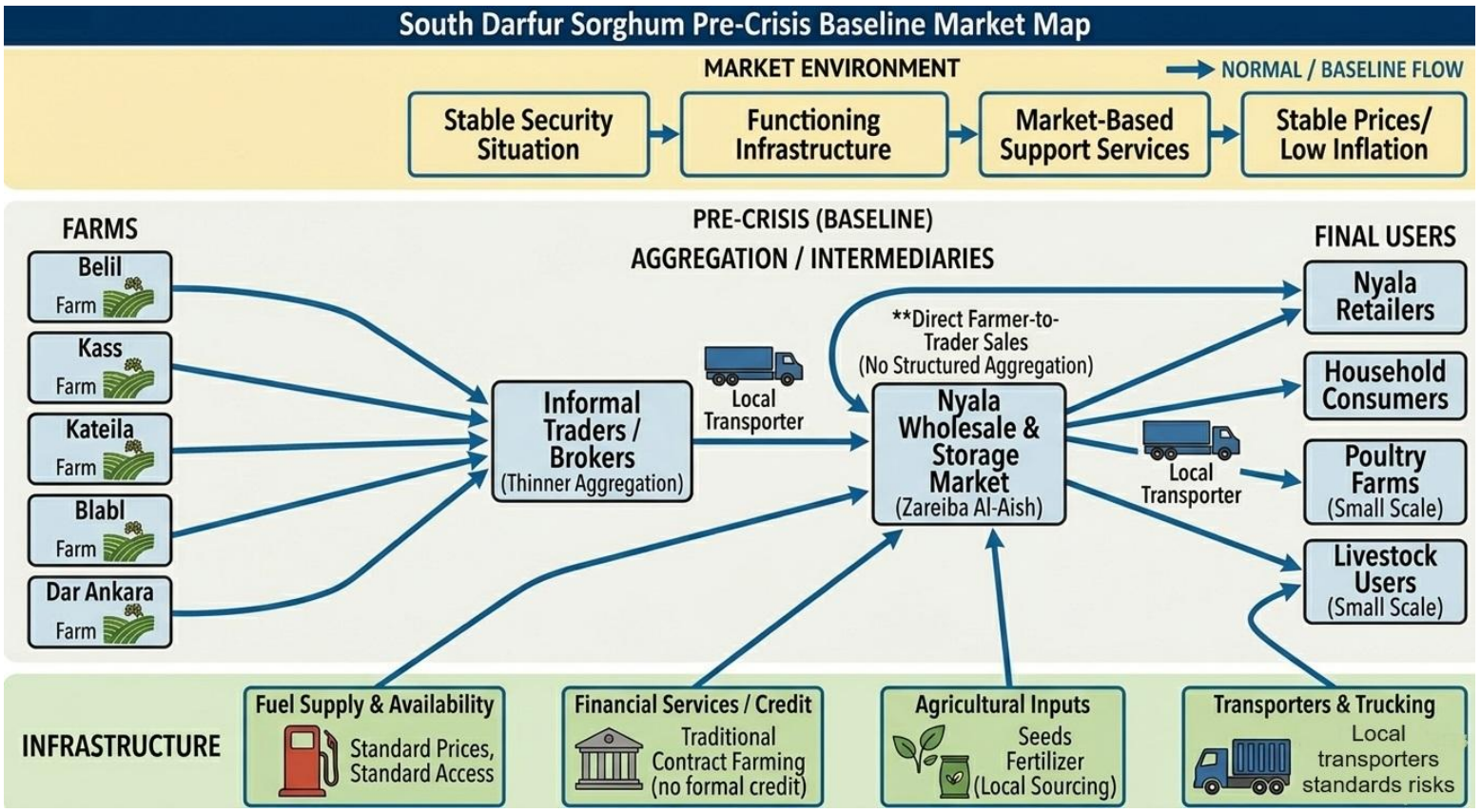


iii. South Darfur Sorghum Pre-Crisis Market System

Before the onset of the crisis, sorghum markets in South Darfur operated within a relatively stable and predictable environment. Security conditions were generally stable, transport corridors remained functional, and government services continued to support market activity. Although inflation persisted, it was comparatively more stable than in the current context. Within this environment, sorghum was produced in key farming areas such as Beili, Kass, Kateila, Blabl, and Dar Ankara, and moved through established trade channels serving Nyala Janoub and surrounding areas.

Production flowed through informal traders and brokers who aggregated grain, albeit in smaller volumes compared to larger agricultural regions of Sudan. Aggregation systems were thinner but still functional, allowing farmers to sell to traders who relied on predictable transport services. Local transporters facilitated movement from farms to Nyala Janoub's wholesale and storage market, Zereiba Al-Aish, which played a central role in receiving, storing, and redistributing sorghum. Some farmers also sold directly to traders without going through structured aggregation, reflecting a flexible and adaptive marketplace.

Once sorghum reached Nyala Janoub's wholesale market, it moved out toward a diverse set of final users. Retailers obtained stock regularly and sold sorghum grains and flour to household consumers throughout the city. Small-scale poultry and livestock farms depended on these market channels for feed. This flow of commodities was supported by stable access to fuel, functioning financial services based on traditional or informal credit systems, locally sourced agricultural inputs, and reliable local transport and trucking services. All these components together formed a cohesive and dependable market system. The baseline map illustrates a market environment where sorghum flows efficiently from farms to end-users through predictable and resilient trade pathways.



iv. South Darfur Sorghum Emergency Market System

With the escalation of conflict and insecurity in South Darfur, the sorghum market system has been significantly disrupted. The previous relatively stable environment has been replaced by heightened insecurity, recurring violence, and damage to critical infrastructure. Transport routes have become more constrained due to checkpoints, insecurity, and deterioration of road conditions. Inflation has increased, and market-based support systems have been weakened. This evolving context has affected and reduced the functionality of key components of the sorghum value chain.

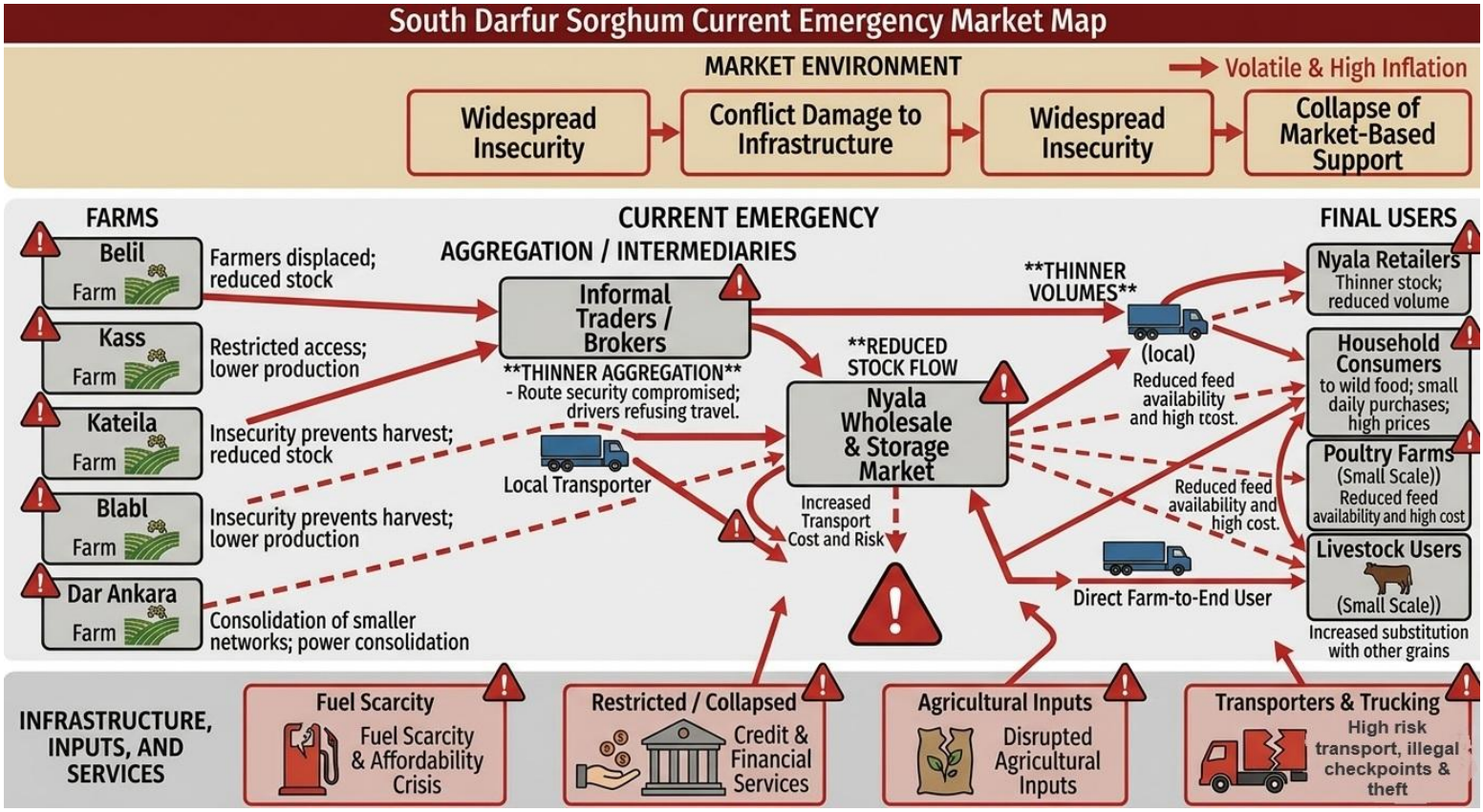
At the production level, farmers in Beili, Kass, Kateila, Blabl, and Dar Ankara face displacement, insecurity, and restricted access to farmland. Many are unable to harvest, leading to drastically reduced production and lower volumes entering the market. In some areas, small-scale producers have lost grain stocks due to looting or forced abandonment. As production falls, initial flows that once fed into trader and broker networks thin considerably.

Informal traders, who previously operated within a fragile and lightly structured aggregation system, now face increased constraints in maintaining their activities. Their ability to travel and aggregate grain is affected by insecurity along transport corridors. Many drivers and transporters are unwilling to operate, resulting in reduced trucking capacity. Consequently, the movement of sorghum into Nyala Janoub's wholesale and storage markets has declined. Volumes arriving in the city are limited and irregular, placing additional pressure on storage facilities and contributing to higher transport costs and operational risks.

Within Nyala Janoub, the wholesale and storage market receives only small and inconsistent volumes of sorghum, while operational risks and transportation costs rise significantly. Retailers face reduced availability, forcing many to downsize operations or shut down completely. Household consumers experience shrinking supplies coupled with high prices, contributing to food insecurity across the city. Poultry and livestock farmers also suffer from scarce and expensive feed, forcing them to reduce stock numbers, switch to emergency coping strategies, or exit production entirely. In some cases, direct farm-to-consumer sales occur, but even these flows are disrupted by insecurity and high transport risks.

The decline in supporting services further compounds these challenges. Fuel scarcity and high prices restrict the movement of goods. Financial services have weakened, reducing access to credit that traders and farmers previously relied on. Agricultural inputs have become less available due to disruptions in supply chains and constrained access along input routes. Transport and trucking services are increasingly affected by high-risk operating conditions, checkpoints, theft, seasonal factors, and rising costs. Together, these factors contribute to a more fragmented and less resilient market system, where sorghum flows are uncertain, irregular, and more costly.

The emergency market map depicts a system operating under significant stress, where linkages from production to consumption have been weakened. Rather than predictable and structured flows, the market is characterised by reduced volumes, increased risk, infrastructure constraints, and a diminished capacity to meet household and livelihood needs.



4.4 Market Structure and Power

Across both Khartoum and South Darfur, the sorghum supply chain exhibits a clear hierarchy of influence, with different actors holding varying degrees of bargaining power and control. Traders, brokers, and wholesalers occupy relatively influential positions as they serve as key points for the aggregation of information, liquidity, and physical stock. By managing storage, consolidating volumes, and having better access to cash and market information, these actors are generally better positioned to time sales, negotiate terms, and respond to market fluctuations than farmers or consumers. Wholesale and assembly markets such as Um Durman/Omdurman and Nyala Janoub play an important role in linking surplus and deficit-producing areas. Consistent with this, FEWS NET identifies these markets as key reference points whose price movements help shape expectations and influence trade flows across the country. [9]

In Khartoum, wholesalers consistently noted that prices are largely determined by prevailing market conditions rather than set by individual actors, reflecting the influence of supply, demand, and regulatory frameworks. In South Darfur, market structures are less formalised and more dependent on trust-based, cash-driven relationships. Market linkages in Darfur have become increasingly informal due to conflict, reduced access to inputs, and the decline of institutional credit and mechanisation. This is supported by findings from the International Food Policy Research Institute (IFPRI, 2025)[10], which indicate that sorghum markets in Darfur are sensitive to macroeconomic conditions, trade disruptions, and price divergence under conflict-related or logistical constraints. In this context, traders with access to liquidity are able to purchase grain and secure supply more readily, while those with limited cash face delays in transactions, reduced

[9] FEWS NET, Sudan Price Bulletin (2024).
[10] IFPRI, Sudan: Cereal Markets and Trade (2025).

volumes, or greater reliance on established supplier relationships. These informal and repeated interactions often substitute for formal contractual arrangements, reflecting the weakening of formal market mechanisms and the constrained capacity of traders.

Overall, market power in these supply chains is not determined solely by physical movement of goods, but by control over the conditions under which transactions occur. Aggregation and wholesale functions remain key points of influence, as these nodes bring together access to cash, storage, transport, and market information. As production declines, actors with liquidity and established operational networks tend to retain a relatively stronger position. In contrast, farmers and households increasingly function as price takers, responding to prevailing market conditions.

4.5 The Collapse of Broker Networks

One of the most significant structural changes documented in this study is the collapse of traditional broker networks across the supply chain. Before April 2023, traders, particularly in South Darfur, operated through networks of brokers who could travel to production areas with advance capital to purchase sorghum on behalf of wholesalers. This system enabled geographic reach and transaction scale that single actors could not achieve alone.

> *"Before, brokers had shops and stores, and a trader might have 1, 3, 4, 5, or 10 brokers, giving them carts to go bring produce from outside. Now, that kind of arrangement doesn't exist. You can't really go outside the city anymore."* — KI Wholesale Trader, South Darfur
>
> *"Before, it came from banks and big traders. Now, there's no financing — no one has even 100,000 or 200,000, let alone a billion to work with."* — KI Wholesale Trader, South Darfur

This collapse has shrunk the effective trading radius and reduced the volume of sorghum flowing through formal wholesale channels. Large buyers no longer come to purchase in bulk; the new normal is small-quantity transactions with local households and individual buyers. The broker system shows no signs of recovery in South Darfur. In contrast, Khartoum's broker network remains partially functional and structurally stable, with their role governed by the formal regulations of market activities. The market system is governed by trade unions that establish daily prices and oversee overall market activities, maintaining a level of institutional order. While the conflict has restricted their operations, brokers continue to facilitate the flow of sorghum from key production areas such as Gedaref and Sennar.

5. Transport, Logistics, and Market Access

5.1 Transport Routes

The Khartoum supply chain routes for sorghum represent Sudan's primary long-distance grain corridors, linking major surplus areas with the capital's wholesale and consumption markets. The core pathway, ranging from Gedaref → Wad Madani → Khartoum / Um Durman/Omdurman, functions as the country's most important sorghum artery, carrying large volumes toward the city's milling clusters and urban retail outlets. This route, however, is heavily constrained by poor road conditions, high fuel costs, and rising loading and handling fees, all of which combine with weak farmer liquidity to limit the volume that moves reliably along the corridor. Complementing this main axis are the Gedaref → Port Sudan and Gedaref → Atbara routes, which serve interstate transporters and provide alternatives based on distance and cost efficiency. Although not fully obstructed, these pathways experience significant operational pressures, for instance, road deterioration has extended the Gedaref–Port Sudan journey from roughly two days to three, forcing

transporters to continuously adjust routing strategies rather than rely on fixed patterns. Within Khartoum itself, short-haul redistribution runs from local farms and neighbourhood markets toward Bahri, Karari, Kalakla, Shambat, and key milling clusters. These urban movements are characterised by cash-based hiring and seasonal pressures, with loading and unloading costs reportedly increasing as part of the national inflation. JMMI findings for early 2026 reflect this fragmentation, with Omdurman/Um Durman continuing to draw from White Nile (Al Gitaina) to sustain urban demand amidst these logistical pressures.[11]

Regarding Nyala Janoub's sorghum supply chain routes, the focus shifts from national-scale trunk roads to the localised networks that sustain South Darfur's main urban market. Routes connecting Belil, Kass, Kateila, Um Zowefa, and Balabel into Nyala Janoub form the backbone of rural-to-urban supply, enabling smallholder production zones to feed the city's wholesale market. Yet these pathways are marked by chronic insecurity, fragmented production volumes, uneven seasonal availability, and weak purchasing power among both traders and producers. IFPRI highlights that these localised domestic routes are particularly sensitive to fuel price fluctuations; between February and September 2025, regular diesel prices rose by 34%, a trend that has continued to inflate the cost for domestic transporters moving grain from South Darfur's rural periphery.[12] Additional collection points, including Blabl, Dar Ankara, Um Jifa, and Um Jan, operate within the region's established Monday/Thursday market cycle, but their reach is limited by the absence of a structured broker network capable of aggregating volumes beyond the immediate locality. As a result, Nyala Janoub functions as a regional hub dependent on short-range, inconsistent inflows rather than stable, high-volume supply lines. The February 2026 JMMI also confirms that the core of Nyala Janoub's immediate food supply remains tied to these South Darfur domestic corridors. When viewed together, the Khartoum and Nyala Janoub route systems illustrate how Sudan's sorghum market is simultaneously shaped by long-distance national arteries and highly localised routes, each facing distinct operational pressures that influence availability, transport efficiency, and market integration across the country.

[11] IMPACT Initiatives, Joint Market Monitoring Initiative (JMMI) (February 2026).
[12] International Food Policy Research Institute (IFPRI), IPC: Famine and food insecurity spread in Sudan as humanitarian crisis worsens (2025).

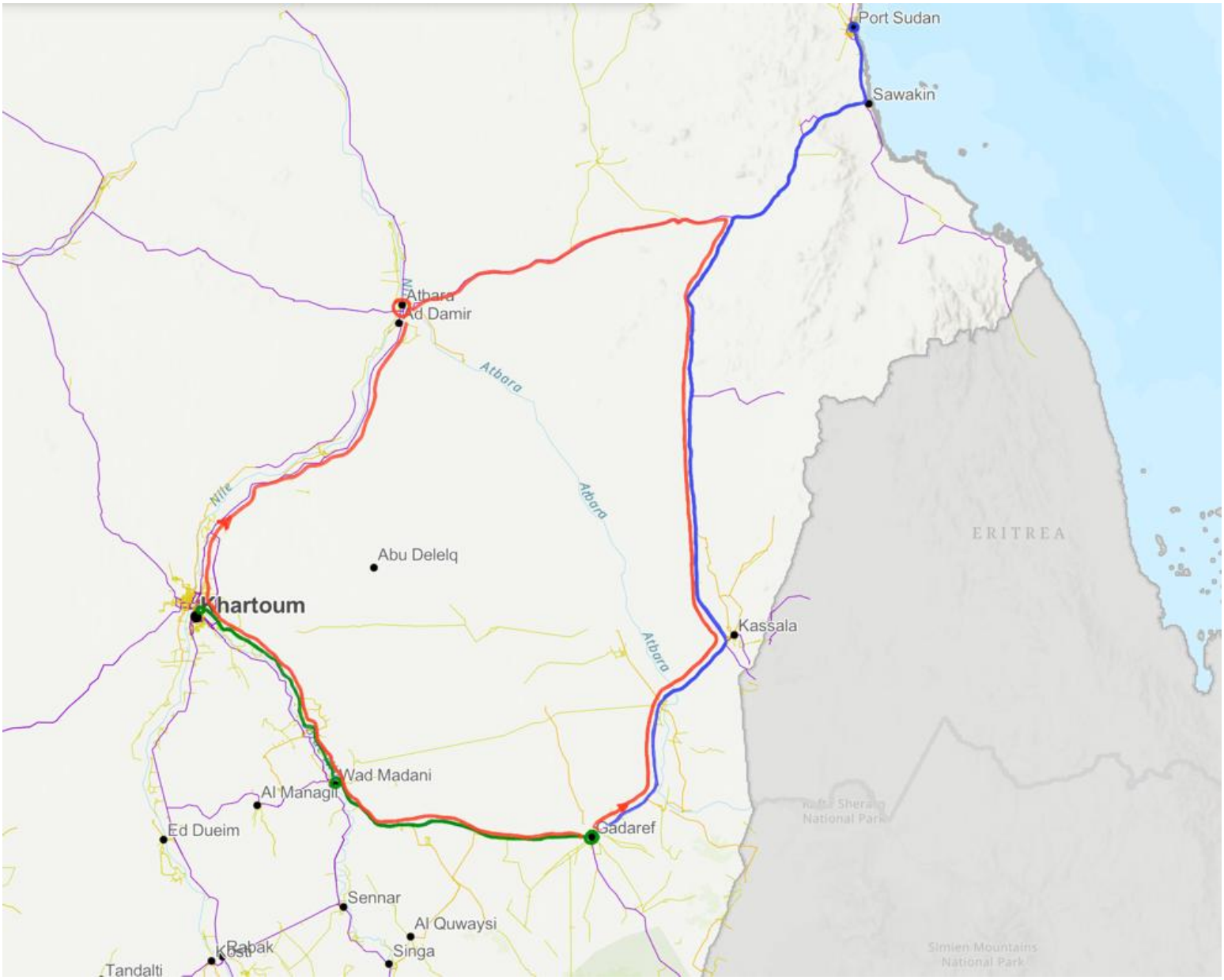


Figure 1. Khartoum supply chain routes for sorghum.

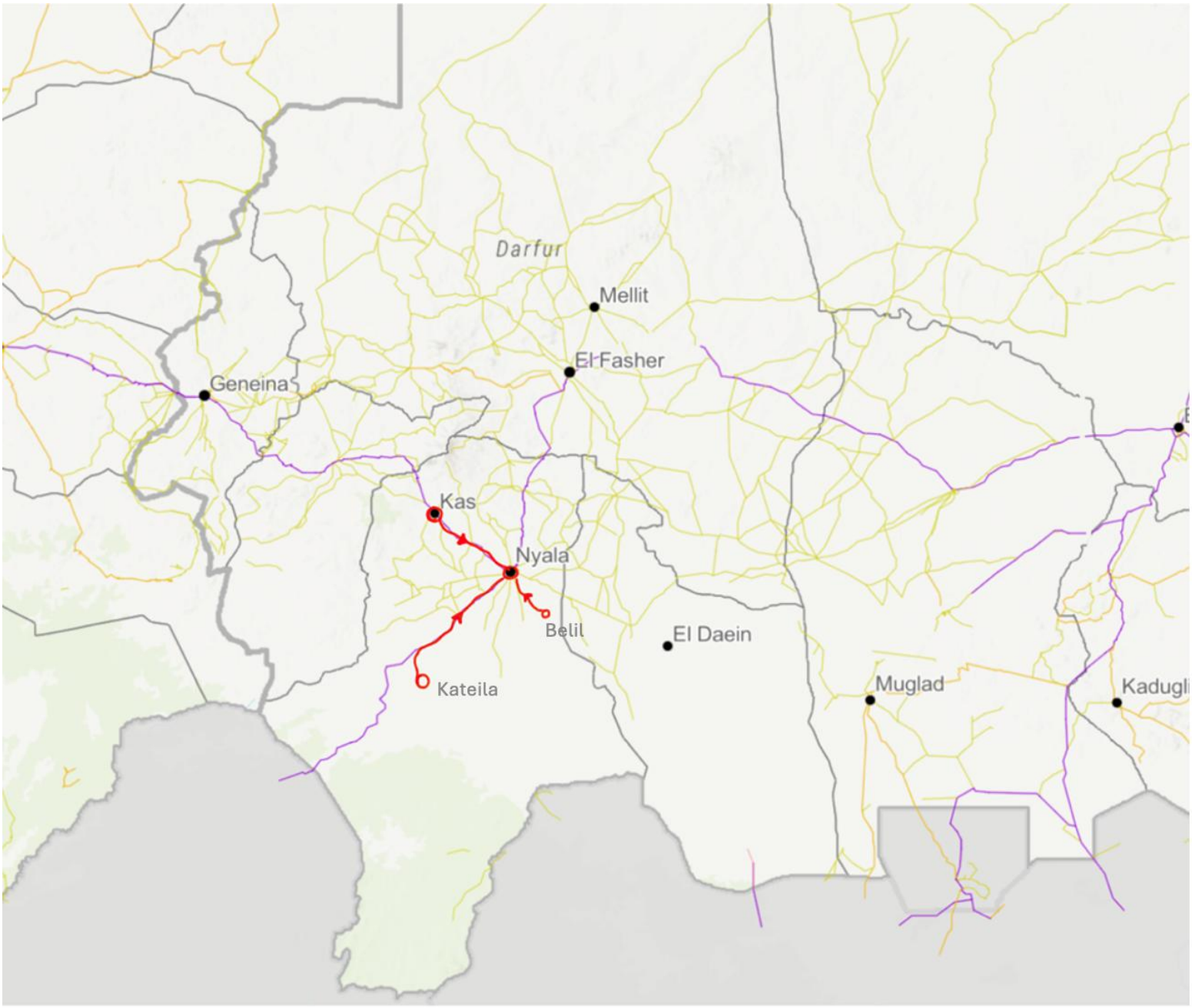


Figure 2. Nyala Janoub supply chain routes for sorghum.

Route / Pathway	Function in the Chain	Main Barrier / Pressure
Khartoum Hub		
Gadaref → Wad Madani → Khartoum / Um Durman/Omdurman	Main long-distance grain corridor feeding Khartoum wholesale and consumption markets	Poor roads; fuel cost; loading and handling fees; weak farmer liquidity
Gedaref → Port Sudan	Important route for inter-state movement and transporter activity	Road deterioration has extended travel time from ~2 days to 3 days
Gedaref → Atbara (via Khartoum or Haya)	Alternative routing chosen on distance and cost efficiency	Route choice changes with efficiency rather than complete closure
Internal Khartoum (farms / local markets → Bahri, Karari, Kalakla, Shambat, mills, farms)	Short-haul distribution to final urban users and feed buyers	Loading/unloading costs doubled during Ramadan; seasonal cash-based hiring
South Darfur, Nyala Janoub Hub		
Belil / Kass / Kateila / Um Zowefa / Balabel → Nyala Janoub	Localised feeder routes into Nyala Janoub market	Insecurity; fragmented volumes; uneven availability; low purchasing power
Blabl / Dar Ankara / Um Jifa / Um Jan → South Darfur markets	Key local collection points; Monday/Thursday market cycle	No broker network to extend geographic reach; limited volume

5.2 Fuel: As Cost Driver

Both transporters interviewed in Khartoum identified fuel as the main driver of transport cost fluctuations, which, in combination with other factors such as inflation and currency depreciation[13], determines the cost of sorghum. Additionally, challenges such as climate variability, lack of finance, and labour shortages have reduced overall sorghum production, placing further upward pressure on both total costs and the final selling price. Transportation costs are calculated per sack for standard loads, or per ton for processed sorghum. Loading and handling costs fall on the seller, while the transporter bears a 3% commission tax and local departure fees. Most of the transport costs are ultimately passed to the buyer and transmitted down the chain to the consumer.

> *"Gasoline. If gasoline increases, the cost will increase. Yeah, only fuel. Nothing else."* VP Transporter, Gedaref–Port Sudan
>
> *"Gasoline has increased, all petroleum materials, and the spare has increased. Generally, the reason for this transportation increase is inflation."* VP Transporter, Internal Khartoum

Additionally, Sudanese transport unions explicitly linked rising transport fares to escalating fuel and spare-parts prices, noting diesel prices had reached SDG 5,018 per litre during tariff calculations, making fuel the principal determinant of route pricing.[14] Sudan's Ministry of Energy similarly

[13] International Food Policy Research Institute (IFPRI), IPC: Famine and food insecurity spread in Sudan as humanitarian crisis worsens (2025).
[14] Sudan Tribune, Sudan transport unions hike bus fares as fuel costs surge (2026).

reported widespread public concern over fuel availability in March 2026, with long queues forming at petrol stations in Khartoum despite official reassurances, reflecting the system-wide sensitivity to perceived or actual changes in fuel supply.[15]

In March 2026, loading and unloading costs within Khartoum reached SDG 1,000 per sack, a hike from SDG 500 before Ramadan, partly reflecting the physical demands of fasting labour during peak movement periods. This surge is expected to be a seasonal fluctuation that may stabilise following the Eid period.

In South Darfur, the pricing of fuel and spare parts serves as the primary contributing factor to inflation within the local economy. Much like the trends observed in Khartoum, South Darfur faces a hyper-sensitive market where any fluctuation in petroleum availability or currency value triggers an immediate spike in overhead despite lack of system to dictate market activities in South Darfur. Transporters in this region are particularly vulnerable to the rising costs of fuel and mechanical components. Additionally, as the Sudanese Pound depreciates, the price of imported spare parts hike. These compounding factors ensure that fuel remains the principal determinant of route pricing, dictated not just by the pump price, but by the systemic inflation embedded in the supply chain.

5.3 Road Conditions: A Structural Bottleneck

Road quality has emerged as a significant and worsening structural constraint. On the Gedaref–Port Sudan route, road deterioration since before the war has extended transit times from approximately two days to three, increasing fuel consumption and vehicle wear. Trucks cannot move at night on this route due to safety concerns. Potholes on urban routes cause vehicle damage during loaded trips. Route quality affects both operational decisions and costs, adding to the systemic cost burden on the sorghum supply chain.

> *"Roads are very damaged, for example the Gedaref–Port Sudan route, it's very difficult. In the past the truck arrived to Port Sudan on the second day after moving, but now it takes 3 days, because the road is very bad, rough and full of potholes. And trucks can't move at night."* VP Transporter, Gedaref–Port Sudan

5.4 Checkpoints and Documentation

The checkpoint environment has become increasingly institutionalised in some areas compared to earlier stages of the conflict, though important regional differences persist. In Khartoum, long-haul transporters report that checkpoints now require complete formal documentation, including stamps from security, investigations, and intelligence services. Shipments with proper documentation generally pass without issue, while incomplete paperwork may lead to delays or further inspection. Transporters operating within Khartoum report fewer checkpoint-related constraints but note that receipt documentation is now routinely required for all shipments.

On the other hand, traders in South Darfur continue to report checkpoint fees as a significant and ongoing cost burden. Unlike the more formalised and documentation-based systems described in Khartoum, checkpoint practices in South Darfur appear less regulated and are characterised by non-standardised and often informal levies. These costs are typically incorporated into final consumer prices, indicating that checkpoints function not only as administrative controls but also as extractive cost layers within the supply chain.

[15] Sudan Tribune, Sudan denies fuel shortage as supply fears trigger queues (2026).

IFPRI's[16] report reinforces these findings, suggesting that checkpoint-related costs extend beyond transport corridors and affect multiple stages of the supply chain. In conflict-affected production areas such as Aj Jazirah, farmers have reportedly been required to pay substantial fees to access fields, transport crops, and store harvested commodities. In some cases, these interactions have also involved the looting of stored goods. Such dynamics indicate that cost extraction linked to conflict actors is embedded across production, aggregation, and distribution stages.

The variation in impact across farming systems further highlights the uneven nature of these constraints. More resilient or better-connected systems, such as semi-mechanised production areas, appear less exposed to such disruptions, while traditional rainfed systems, particularly in South Darfur, face more severe constraints. This reiterates the distinction observed in primary data: while checkpoint systems in Khartoum are becoming more formalised, in South Darfur they remain fragmented, unpredictable, and a significant driver of price inflation.

5.5 Consumer Market Access

Consumer market access remains uneven within both Khartoum and South Darfur. In Khartoum, the preferred Tabat variety of sorghum is not available in all local areas, only the Wad Aker variety is stocked at some neighbourhood mills, requiring a 20–30 minutes vehicle trip to markets such as Samrab to access Tabat. During high-price periods, transport costs compound the food access burden. In South Darfur, walking distances of 2.5 hours to market remain documented, and the markets experience security/safety issues.

6. Storage and Post-Harvest Handling

6.1 Storage Practices by Actor

Storage practices vary significantly by actor type and location. Across both systems, storage is constrained more by access to finance than by physical infrastructure or technical knowledge. Consequently, the actors most in need of holding stock, specifically farmers and downstream traders, are typically the least able to do so because they cannot afford it due to lack of finance.

Farmers in the Gedaref corridor, the primary upstream supply zone for Khartoum, practice outdoor solar drying during summer to prevent termite infestation, then move stock to warehouses or home storage before the rainy season. Storage periods cluster between three and six months. Farmers with sufficient cash to cover storage costs can hold stock through the lean season and benefit from price appreciation (August–September peak). Farmers without cash must liquidate immediately after harvest at low harvest-time prices, forfeiting the price premium. This is the financing-storage trap. At the wholesale level in Khartoum, traders operate with short turnover cycles, prioritising liquidity over long-term storage.

In South Darfur, the market warehouse infrastructure has not recovered from war-related looting. Multiple traders now operate from relocated, costlier residential storage, reducing both capacity and efficiency.

> *"It depends on your demands. If you have enough cash [to cover storage costs] you can store it until August or September. All the stored crops will be finished then you can sell in*

[16] International Food Policy Research Institute (IFPRI), War and Resilience: The multifaceted impacts of Sudan's conflict and pathways to recovery (2026).

> *retail... But if you don't have enough money you are forced to sell it even if the price is low."*
> VP Farmer, Al-Qadarif

6.2 Post-Harvest Losses

Post-harvest losses are generally manageable when storage is short-term and reasonably protected. The main documented risks are termites (arda), weevils, moisture, and humidity damage to sacks lower in the stack where moisture accumulates. In Khartoum, farmers described effective practices, including sun-drying before storage, periodic inspection, pesticide application, and careful stacking. Upper sacks typically remain undamaged, while lower sacks near the ground face greater humidity risk. Overall, sorghum stores are better than several other crops, but traditional systems still create loss within the storage window.

In South Darfur, normal natural losses are far overshadowed by war-related storage shocks, including looting, warehouse destruction, and the abandonment of storage sites. These constraints prevent commodities from being safely stored or moved, resulting in substantial unrecorded grain losses at both trader and farmer levels. Consequently, storage risks in South Darfur are shaped primarily by conflict dynamics rather than by biophysical conditions (such as pests, termites or humidity). This shift has pushed traders away from long-term holding strategies and significantly undermined market stability, as actors seek to minimise exposure to losses by reducing stock retention and accelerating sales.

6.3 Financial Challenges to Access Storage

A key structural insight from the evidence is that storage in this supply chain is fundamentally a financial function rather than a logistical one. The ability to store is determined by access to capital rather than physical infrastructure. Farmers sell when cash runs out, when labour must be paid, or when the next production cycle approaches, not because they believe the market price is attractive.

This mechanism concentrates the price-premium benefits of storage among better-capitalised actors, such as large traders and commercial farmers, and reinforces the vulnerability of smaller producers and traders. It also suggests that improvements in storage infrastructure alone are unlikely to change behaviour unless the underlying financing constraints are addressed.

7. Prices and Market Functioning

7.1 Price Formation and Trends

Price formation in Khartoum is centralized and occurs primarily in the Um Durman/Omdurman wholesale market. Prices are set daily based on supply levels, with limited influence from individual sellers, the market imposes its price and sellers must accept it. Farmers operate as price takers. A key structural dynamic is the inverse relationship between supply and prices: good harvests lead to lower market prices, undermining farmer profitability in the seasons when output is strongest. This dynamic is reinforced by the financing-storage issues, which prevent most farmers from holding their crop until prices recover. The Al-Qadarif/Gedaref production zone operates a more structured price-setting mechanism: farmers, merchants, and exchange officials convene daily to agree prices for major crops. This limits price manipulation and provides a stable reference point that is transmitted upstream to Khartoum wholesale markets. The weight of this benchmark is evident in recent trends. WFP reports that the Gedaref auction market saw a 73% price increase

between February and January 2026 as the harvest season ended, creating a national price floor that keeps domestic sorghum costs high even in localised hubs.[17]

In South Darfur, price formation is decentralised and localised. Markets are smaller, less structured, and more volatile. Prices are influenced by local supply conditions, insecurity, and household cash constraints rather than national trends. Price-setting in Nyala Janoub references multiple benchmarks: the biggest market, Al-Fasher market, and Al-Jeneina market each operate with different price levels, with commodities from the south being generally cheaper.

Item / Market	Pre-War Baseline	War Peak	Current (March 2026)
Sorghum (generic) / quarter — Khartoum	SDG 5,000–7,000	SDG 20,000–24,000	SDG 16,000–18,000
Sour sorghum / quarter — Khartoum mill	Stable	Higher	~SDG 20,000
Water tanker per barrel — Khartoum	SDG 1,000–1,500	Rising	SDG 4,000 (Ramadan)
Loading cost per sack — Khartoum	SDG 300–400	Rising	SDG 1,000 (Ramadan)
Red sorghum / quarter — Khartoum mill	Stable	Higher	~SDG 18,000
South Darfur, Nyala Hub			
Tabat variety / malwa — Nyala Janoub	Stable	SDG 5,000+	SDG 3,000–4,500
Gadam Al-Hamam variety / malwa — Nyala Janoub	Stable	SDG 4,000+	SDG 2,500–3,000
Millet / malwa — South Darfur	Stable	SDG 12,000–16,000	Recovering

According to respondents, Ramadan 2026 did not appear to trigger sorghum price increases in Khartoum, suggesting relative short-term stability in the market in the coming season. However, prices remain significantly higher than pre-war levels, and household purchasing power has not recovered proportionally.

7.2 Credit, Payment, and Financing

Cash-only transactions now dominate across the entire supply chain. In South Darfur wholesale markets, the collapse of credit has been near-total, no trader-financed purchases at scale, no advance capital to brokers. Some long-haul transporters extend post-payment terms to trusted regular clients (millers), collecting upon delivery of the final sack. Digital payments through Bankak

[17] World Food Programme (WFP), Sudan Market Monitor (March 2026).

are associated with a price premium of approximately 6–8% compared to cash transactions, which may limit their uptake.[18]

Bank financing has collapsed for both farmers and traders. What remains of agricultural bank support is typically limited to diesel or in-kind Murabaha arrangements rather than cash, and these come with bureaucratic delays that make them impractical for seasonal decision-making. Most actors now rely on personal savings, rotating profits from previous cycles, or informal personal connections for operating capital.

8. Impact of Conflict on the Sorghum Supply Chain System

8.1 Khartoum: Indirect Disruption and Partial Recovery

In Khartoum, the war's effects on the sorghum supply chain have been primarily indirect. The initial shock, movement restrictions, market closures, and acute uncertainty, was followed by partial normalization as of March 2026. Supply flows from upstream regions have resumed. Formal checkpoint procedures, while burdensome, are now predictable. The Um Durman/Omdurman wholesale market continues to function as the pricing and distribution hub. The ongoing security situation's effects are transmitted primarily through cost rather than direct disruption: fuel prices, spare parts, working capital, and the broader inflationary environment continue to increase costs at every node. The collapse of formal financing, a direct consequence of economic disruption, has structurally weakened both production capacity and trading volumes.

Reports indicate that despite a sharp national decline in sorghum production, estimated at approximately 34% below the five-year average in 2023/2024 season, relatively stable production in semi-mechanised and irrigated systems, particularly in states such as Gedaref and Sennar, has allowed supply flows to continue toward central markets.[19] This helps explain the partial recovery observed in Khartoum, where upstream supply has not collapsed entirely but is operating under reduced volumes and higher costs.

While logistics routes to the north remain active, the high-volume interstate trade that previously extended to Shendi and Atbara has not recovered to pre-war levels. This reduced market depth limits the efficiency of redistribution from Khartoum and contributes to sustained consumer price premiums in northern destination markets.

8.2 South Darfur: Direct and Acute Disruption

In South Darfur, conflict effects have been direct, severe, and structurally transformative. The war caused production declines, trader capital destruction, warehouse looting, route insecurity, and market closures, all of which constrained supply and drove prices to historic highs. Unlike Khartoum, where the war's impact was absorbed through cost increases and market adjustments, in South Darfur the market architecture itself was damaged. This result is supported by IFPRI's findings that show the scale of disruption at the production level. Nationally, sorghum production declined significantly, but the impact was disproportionately concentrated in traditional rainfed systems, which dominate in South Darfur. Consequently, the state's contribution to national sorghum production fell sharply. These trends could be considered as a reflection of widespread

[18] Rift Valley Institute, Political Economy of Cash and Markets in Sudan (2025).
[19] International Food Policy Research Institute (IFPRI), War and Resilience: The multifaceted impacts of Sudan's conflict and pathways to recovery (2026).

displacement, insecurity, and restricted access to inputs and markets, which could fundamentally weakened local supply capacity.

Trader capital destruction is the defining constraint. One trader reported losing 70% of total capital accumulated over 20 years, while others reported being forced to relocate their stock from market warehouses to residential storage at greater cost and reduced capacity. The broker system that once connected South Darfur traders to distant production areas has collapsed entirely and shows no signs of recovery. These are not temporary liquidity shortfalls; they represent structural losses that will require years to rebuild.

> *"You gather your money over 20 years, and then in just one day it's gone. It takes time to recover it again."* KI Wholesale Trader, South Darfur

8.3 Market Trajectory: Cautious Stabilisation

As of March 2026, both transporters in the Khartoum area and traders in South Darfur described sorghum supply and transport conditions as operational but fragile. Fuel and spare parts are available, and prices have shown some moderation. Traders in South Darfur anticipate relative stability into April 2026, although they note potential upward pressure on prices as farmers begin preparing for planting and draw down stored stocks.

Key risks remain, including fuel price volatility, which is quickly transmitted to transport and commodity costs; continued deterioration of road infrastructure; limited capacity to scale up trade volumes due to financing constraints; ongoing security concerns; and the lack of recovery in broker networks, which continues to constrain the geographic reach and overall volume of trade.

9. Comparative Analysis: Khartoum vs. South Darfur

The Khartoum hub operates as a multi-source, inter-state sorghum system anchored by Gedaref, complemented by White Nile, Al-Jazeera, and Sennar, giving it a broad and diversified supply base. This is supported by a robust wholesale structure in Um Durman/Omdurman's Zareiba Al-Aish, where daily, exchange-linked price setting provides centralised market signals. Although pre-war broker networks have largely collapsed, some informal aggregation persists, and processing and milling nodes remain clearly visible across the city.

For households, the main constraint is affordability and neighbourhood-level access to preferred varieties. Khartoum's price formation is centralised, reference-driven, and relatively stable, with conflict effects felt indirectly through inflation, rising operational costs, labour shortages, and financing pressure. This hub retains higher resilience due to supply redundancy, though rising costs continue to strain the system, producing a recovery trajectory marked by partial stabilisation but persistent financial gaps.

In contrast, the Nyala Janoub (South Darfur) hub is shaped by a narrow, localised supply base fed by Belil, Kass, Kateila, Blabl, and Dar Ankara, with a buffer from Chad. Its wholesale system is thinner and more fragmented, heavily reliant on trader-driven flows. Broker networks have fully collapsed with no signs of recovery, severely limiting geographic reach. Processing is far less visible, with more direct trader-to-household transactions.

Households face dual constraints of affordability and insecurity, further compounded by irregular availability of goods and reduced purchasing power. Price formation is decentralised and volatile, shaped by multiple local reference points. Here, conflict effects are direct and severe: looting, loss of capital, market disruption, and security-driven behavioural changes. As a result, Nyala Janoub's

resilience is limited, with minimal redundancy and high exposure to insecurity and local supply shocks, producing a fragile recovery trajectory marked by structural losses that remain unrecovered and the continued absence of a functioning broker system.

Dimension	Khartoum Hub	South Darfur, Nyala Janoub Hub
Supply base	Multi-source, inter-state; Gedaref dominant; White Nile, Al-Jazeera, Sennar as complements	Localized; Belil, Kass, Kateila, Blabl, Dar Ankara as primary feeder zones; Chad buffer
Wholesale structure	Robust urban hub in Um Durman/Omdurman (Zareiba Al-Aish); daily exchange-linked pricing	Thinner, fragmented local structure; smaller volumes; more trader-dependent
Broker networks	Pre-war presence; now collapsed but at larger scale; some informal aggregation persists	Fully collapsed; pre-war role critical; no recovery signs; geographic reach severely contracted
Processing / milling	Clear milling and food-vendor nodes documented; multiple end-use segments	Less visible processing evidence; more direct trader-to-household purchase
Main household constraint	Affordability and neighbourhood-level access to preferred varieties	Affordability, insecurity, irregular availability, and weaker purchasing power — dual constraint
Price formation	Exchange and wholesale market reference; centralised; daily setting	Localised; multiple reference markets; decentralised; more volatile
Conflict effects	Indirect: inflation, cost increases, labour and financing pressures	Direct: looting, capital destruction, market disruption, behaviour influenced by insecurity
Resilience to shock	Higher physical redundancy (multiple supply sources); higher absolute cost burden	Lower redundancy; narrow catchment; stronger exposure to insecurity and local supply shocks
Recovery trajectory	Partial stabilisation; operational but cost-pressured; financing gap persistent	Cautious stability; structural losses unrecovered; broker system absent

10. Household Food Security and Access

10.1 Substitutability of Sorghum

Sorghum remains the core dietary staple across all interviewed households in both Khartoum and South Darfur, consumed daily in the form of Aseeda[20], Kesra[21], Gorasa[22], and Madeeda.[23] Substitution occurs reluctantly and only under price or availability duress, households switch to wheat flour, millet, or pasta when sorghum becomes unavailable or unaffordable, not by preference. This behavioral rigidity is critical for understanding demand dynamics, because it means households absorb cost increases by reducing quantities and nutritional adequacy rather than switching to cheaper staples.

10.2 Khartoum Household Case Studies

A Khartoum household of 5 members reported purchasing approximately 2 quarters (equivalent to roughly 5.6 kg) of sorghum per month at the current price of SDG 18,000 per quarter. The household strongly prefers Tabat[24] but is constrained by local availability, only Wad Aker is stocked at nearby mills, requiring a 20–30-minute vehicle trip to access Tabat. During peak conflict, prices reached SDG 20,000–24,000 and sorghum was sometimes unavailable, forcing shifts to wheat and occasionally Feterita as last-resort substitutes.

A food vendor in Khartoum, operating for 30 years, originally displaced from El Fasher, reported using approximately one quarter of red sorghum per day for commercial food preparation in normal periods. According to the key informant, consumers substitute sorghum with millet during Ramadan for its digestive cooling and rehydration benefits. This key informant sources from a fixed, trusted mill and has never changed supplier: reliability of supply outweighs cost in her procurement decisions. She absorbs minor price increases (SDG 1,000–2,000) rather than passing them to customers to preserve her customer base.

> *"No, it's stable like normal days. In Ramadan they didn't raise the price. Actually, in Ramadan people use it more, while on normal days there isn't much use except by us restaurant people."* – VP Food Vendor, Khartoum

10.3 South Darfur Household Patterns

In South Darfur, households experience sorghum access as a dual constraint of limited supply and low purchasing power. All sorghum types may be present in the market, but households reported buying half or quarter of the amount they used to buy because cash is insufficient for larger purchases. Daily or near-daily purchasing of small quantities is the norm. Respondents described adaptation driven entirely by cash availability rather than preference, variety substitution is common and frequent.

Insecurity adds a further layer of constraint. Both market participation and household purchasing are shaped by the risk environment, not only by prices and incomes. Households may forgo market

[20] Aseeda: A thick, dough-like porridge made by cooking fermented sorghum flour in boiling water; it is a central staple usually served with stews.
[21] Kisra: A thin, fermented sourdough crepe or pancake made from sorghum batter, baked on a flat iron plate.
[22] Gurasa: A thicker, pancake-style leavened bread, often made with wheat but frequently substituted with sorghum during periods of wheat scarcity.
[23] Madida: A smooth, sweet or savory sorghum-flour pudding or porridge, often consumed as a nutritious breakfast or during Ramadan to break the fast.
[24] Tabat is a premium, white-seeded sorghum variety.

trips due to safety concerns, and the absence of large traders means that when local supply is disrupted, few alternative channels exist.

10.4 Compounding Household Pressures

Beyond sorghum prices, new interviews highlighted two additional pressure points:

- Water crisis (Khartoum): In neighborhoods such as Hatab Sharq Al-Neel, well water is reportedly bitter or salty, forcing complete reliance on water tankers. This creates a direct bottleneck for food security, as sorghum-based staples like Asida and Kisra require substantial quantities of sweet water for fermentation and boiling. Tanker prices doubled during Ramadan 2026 from SDG 2,000 to SDG 4,000 per barrel, creating an acute and predictable seasonal shock on top of food expenditure.
- Education costs: Government schools now charge fees of SDG 150,000–200,000, in addition to daily meal costs, placing additional additional financial pressure on households already constrained by food and water expenditures.

> *"The most urgent thing is that we have a water crisis. We drink from the wells, and the well water is bitter or salty and we get the sweet water by tankers and 1–2 days ago it has stopped."* VP Household Consumer, Khartoum

10.5 The Affordability-Availability Distinction

A critical analytical finding is that the chain is vulnerable not only when sorghum disappears from markets, but also when sorghum remains available while household incomes shrink. A market may appear superficially functional while still failing as a practical food access mechanism for vulnerable households. Availability of metrics alone is insufficient to assess food security; instead, they must be balanced against affordability, the capacity of a household to purchase that available stock. This distinction is particularly important in South Darfur where sorghum is present in local markets but beyond the effective purchasing reach of many households.

11. Risk and Vulnerability Analysis

11.1 Supply Disruption Categories

The study identifies three broad categories of supply disruption risk:

1. Climatic risk: Delayed rains, excessive rainfall, flooding, and land-preparation problems. Notably, excessive rainfall emerged more frequently than drought in the current evidence set, changing the common framing of sorghum risk. Farmers described production potential undermined by excessive rain, unstable timing, and the inability to convert output into reliable income.
2. Logistical risk: Fuel price increases, road damage, seasonal movement constraints, and handling costs.
3. Conflict-related risk: Theft, market insecurity, localised disruptions, and interrupted access to supply areas.

In Khartoum, these risks are transferred primarily through cost and timing. The conflict has disrupted the traditional seasonal flow of goods, leading to delayed arrivals and a shortened trading window as actors prioritise rapid turnover to maintain liquidity. In South Darfur, however, these risks are more severe due to direct market fragility and the physical disruption of household access to food.

11.2 Structural Bottlenecks

Across the full body of evidence, seven interlocking structural bottlenecks define system performance. These do not operate in isolation — they reinforce each other in ways that systematically concentrate risk upstream and value downstream.

- *Financing collapse:* Farmers and traders lack working capital; distress sales are the result of this shortfall, not a preference of the farmers.
- *Financing-storage trap:* Small-scale producers who rely on seasonal price increases for a better income are the ones with the least financial flexibility to delay their sales. Price benefits accrue to better-capitalised actors and are inaccessible to those without preexisting capital.
- *Transport cost transmission:* Fuel and road costs are fully passed down the chain to final consumers.
- *Broker network collapse:* Trading radius has contracted; market depth and geographic reach have both diminished.
- *Wholesale market dominance:* Centralised price-setting in Khartoum leaves farmers and small traders as price-takers.
- *Labour market pressure:* Gold mining competes for agricultural labour, affecting harvest capacity.
- *Weak household purchasing power:* Both in Khartoum and especially in South Darfur, income levels cannot absorb price increases.

11.3 Vulnerability by Actor Group

Across the Khartoum sorghum supply chain, vulnerability is distributed unevenly among actor groups, with the highest pressure falling on small and medium farmers along the Gedaref corridor. These farmers face a structurally persistent financing gap, rainfall volatility, and storage–liquidity issues that force premature sales whenever cash is short. Labour competition from gold mining further constrains capacity, leaving them exposed to production and price shocks.

Wholesalers experience moderate vulnerability as they generally hold better control over stock but are increasingly affected by market stagnation, rising operational costs, and tightening financing conditions.

Transporters also sit in the medium-vulnerability tier, as their ability to function hinges heavily on fuel prices, road conditions, and seasonal cost spikes, especially during Ramadan, yet they continue operating as long as documentation and demand are intact.

Food vendors face medium-to-high vulnerability because they depend on stable small-scale sourcing and often absorb price volatility to retain customers, many operate without assistance after displacement.

Households occupy the highest vulnerability category in Khartoum, facing affordability pressures, added burdens from water and education expenses, neighbourhood-level access gaps, and a growing reliance on assistance that remains insufficient.

In South Darfur's Nyala Janoub hub, the vulnerability structure is similarly stratified but shaped more directly by insecurity and market fragmentation. Small and medium farmers in this state face high vulnerability driven by insecurity and mobility constraints, limited access to inputs and finance, seasonal pressures, high transport costs, and the absence of structured broker networks, all of which restrict their ability to move grain or benefit from market opportunities.

Large commercial farmers experience medium vulnerability, as they continue to face labour shortages, rising input prices, limited access to fuel and spare parts, and persistent insecurity that undermines operational reliability.

Traders and wholesalers also face medium vulnerability, shaped by market fragmentation, weak brokerage systems, insecurity along feeder routes, high transport costs, and limited access to finance, which collectively reduce their ability to stabilise supply or hold stock.

Households remain highly vulnerable, with affordability constraints, displacement, and inconsistent access to functioning markets leaving them highly exposed to price shocks and availability gaps.

Actor Group	Vulnerability Level	Primary Drivers
Khartoum Hub		
Small and medium farmers (Gedaref corridor)	High	Financing gap, rainfall instability, financing-storage issues; labour competition from gold mining
Wholesalers	Medium	Better stock control; exposed to market stagnation, rising operating costs, financing constraints
Transporters	Medium	Fuel and road costs high; work continues while demand and documentation are present; Ramadan cost spikes
Food vendors	Medium–High	Dependent on stable small-scale sourcing; absorb price shocks to retain customers; displaced vendor without assistance
Households	High	Affordability pressure; compounding water and education costs; neighbourhood-level access gaps; assistance gaps
South Darfur, Nyala Janoub Hub		
Small and medium farmers	High	insecurity and mobility constraints, limited access to agricultural inputs, limited access to finance, seasonal factors, high transport costs, and the absence of structured broker networks
Large commercial farmers	Medium	Labour shortages, rising input costs, limited access to fuel and spare parts, and insecurity
Traders/wholesalers	Medium	Market fragmentation, the lack of a structured brokerage system, high transport costs, insecurity along feeder routes, and limited access to finance
Households	High	Affordability issues, displacement, and inconsistent market access

12. Recommendations

12.1 Short-Term Actions

Findings suggest immediate priorities to stabilise market functioning and improve the effectiveness of cash-based responses under current constraints in both Khartoum and South Darfur.

- **Adaptive transfer value calibration linked to liquidity and price dynamics:**
  Rapid price fluctuations and reported liquidity constraints, including informal banking surcharges (15–20%), indicate that cash transfer effectiveness may be increasingly constrained by both inflation and transaction frictions. The CWG could consider integrating a liquidity adjustment factor into the MEB, alongside more frequent (monthly) reviews of prices, fuel costs, and transaction fees. This would help ensure transfer values better reflect not only market prices but also the cost of accessing liquidity in practice.
- **Context-specific modality diversification:**
  Market disruptions differ significantly across locations, suggesting the need for differentiated response modalities. In Khartoum, where milling and wholesale infrastructure in key markets (e.g. Um Durman/Zareiba Al-Aish) has been significantly disrupted, hybrid approaches combining cash with in-kind or subsidised inputs for staple foods may be more appropriate in the short term. Cash assistance could remain targeted toward non-food essential needs where markets remain functional.
- **Targeting of liquidity and price disconnected areas:**
  Areas identified as having physical availability of sorghum but weak integration into national pricing systems may represent priority entry points for targeted liquidity support to traders. These locations could serve as early intervention points for stabilising local price formation and reducing extreme intra-regional price divergence.
- **Support for emerging direct procurement pathways:**
  Households and livestock owners are reportedly bypassing traditional wholesale channels due to high transaction costs and transport constraints. Humanitarian actors could explore support to community-level aggregation or grain storage mechanisms (e.g. community grain banks) to formalise and stabilise these emerging direct farm-to-consumer pathways, particularly where intermediaries' costs are elevated due to fuel scarcity and insecurity.
- **Dual demand monitoring (food and livestock feed markets):**
  Emerging evidence suggests increasing competition between household consumption and livestock/poultry feed demand. Monitoring both segments simultaneously may help identify when non-food demand pressures begin to significantly affect staple affordability.

12.2 Medium to Long Term Structural Interventions

- **Restoring liquidity within fragmented trading networks:**
  Evidence from both states suggests that liquidity constraints among traders and brokers are a key mechanism linking supply chain disruption to reduced market functioning. In particular, the contraction of intermediary finance appears to be limiting traders' ability to aggregate and move stock from producing areas (e.g. Sennar and Al-Jazeera). Working capital support, low-interest credit mechanisms, or structured value chain finance could help restore liquidity among smaller assemblers, reduce market concentration, and support more competitive price formation.
- **Rehabilitation of storage and processing infrastructure:**
  In South Darfur (Nyala Janoub), limited storage capacity and weak processing infrastructure appear to constrain market throughput. Prioritising rehabilitation of wholesale markets,

storage facilities, and decentralised milling capacity (including renewable-energy solutions such as solar milling) could help re-establish aggregation functions and reduce reliance on fragmented direct sales.

- **Addressing structural cost drivers (fuel and credit constraints):**
  Persistent fuel scarcity, high transport costs, and restricted access to credit are reportedly the key drivers of final commodity prices increase. Potential complementary interventions include cash-for-work programmes focused on rehabilitation of key transport corridors, as well as the expansion of Village Savings and Loan Associations (VSLAs) or similar informal financial mechanisms to partially substitute for collapsed formal credit systems.
- **Spatially targeted market functionality monitoring:**
  The mapping of supply chain hubs highlights significant variation in market integration, liquidity, and price transmission. Establishing a monitoring system that tracks transport costs, checkpoint risks, and price divergence across corridors could support more adaptive programming, including real-time adjustment of transfer values and modality decisions by CWG and FSL partners.

13. Conclusion

The assessment results show that while the Sudanese sorghum supply chain exhibits notable operational persistence, its resilience appears structurally fragmented and inequitably distributed.

In Khartoum, the system appears to be transitioning toward a centralised but fragile redistribution hub. While basic market activity persists, it is characterised by complex intermediary networks, elevated transaction costs, and constrained financial liquidity. These factors are likely to limit the ability of smaller traders and retailers to participate effectively in the market, with potential implications for price formation and access. In South Darfur, the supply chain appears more fragmented and locally constrained, with indications of weakened trading networks, reduced capital availability, and greater sensitivity to infrastructure and security disruptions. Market functioning in this context may depend heavily on a small number of actors and highly localised trading systems.

Across both hubs, the supply chain appears constrained by critical bottlenecks, including storage limitations and liquidity constraints that appear to restrict procurement volumes. These issues are further compounded by rising logistical overhead, driven by fuel volatility and security-related transit fees, which tend to inflate final consumer prices and erode the already weakened purchasing power of households.

Consequently, while CVA remains a critical response modality, its effectiveness appears increasingly sensitive to underlying market liquidity conditions, transport costs, and price instability. This suggests that maintaining the real value of transfers may require not only adjustments to price monitoring systems, but also complementary interventions that support trader liquidity and reduce structural bottlenecks in supply chains.

Acknowledgement

We gratefully acknowledge the support of Ahmed Suliman for his contribution to this report. Mr. Suliman is a development professional with over 12 years of experience in programme design, management, and analysis, specializing in value chain and supply chain analysis, market systems development, and evidence-based programming in fragile and conflict-affected contexts. He has worked with UN agencies, international organizations, and research institutions on agriculture, food security, and livelihoods programming.

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.

ABOUT DataQ

DataQ is a Sudanese research and advisory firm dedicated to inclusive participation in Research and MERL processes as a pathway to more participatory and locally led humanitarian systems. DataQ's approach focuses on leveraging local capacities and resources while equipping communities with the tools and platforms they need to shape the policies and programs that impact their lives. Since its' establishment DataQ has supported over 45 local and international partners through tailored research, MEAL, and capacity-building services.

Annex A: Thematic Coding Summary (Initial Study)

The following table presents all thematic codes applied during qualitative analysis of the initial 12 interviews, with quotation counts per code. Codes with more than 10 quotations represent the most analytically saturated themes.

Thematic Code	Quote Count	Primary Domain
Basic Demographics	29	Context
Household Sorghum Use	24	Demand
Price Determination	23	Pricing
Source of Sorghum	17	Supply
Insecurity Impact	16	Conflict
Grain Substitution	15	Demand
Storage Losses	14	Storage
Customer Demand	14	Demand
Main Buyers	13	Supply Chain
Preferred Sorghum Type	13	Demand
Reason for Preference	11	Demand
Market Availability	11	Markets
Sorghum Types	11	Production
Storage Type	10	Storage
Cultivated Area	10	Production
Current Price	9	Pricing
Substitutes	9	Demand
Spending Priorities	9	Households
Storage Duration	8	Storage
Historical Price Comparison	8	Pricing
Quantity Purchased Change	8	Demand
Prices Information	8	Pricing
In-Kind Assistance	7	Aid

Storage Capacity	7	Storage
Suggested Improvements	7	Recommendations
Supplier Type	6	Supply Chain
Supply Change	6	Supply
Input Access	6	Production
Cultivation Financing	6	Production
Trader-Farmer Relations	6	Supply Chain

Annex B: New Interview Summary — March 2026

The following table summarises key thematic contributions from each new interview conducted in March 2026. Note: Al-Qadarif farmer interviews are included as upstream supply context for the Khartoum market.

Code	Respondent Type	Key Themes
KIIWSSRSD4	Wholesaler, South Darfur	Broker network collapse; cash-only trade; local supply from Blabl/Dar Ankara; warehouse looting; 20-year capital loss in one day
VPTRSRKH5	Transporter, Gedaref–Port Sudan	Fuel as sole cost driver; road degradation (2→3 days); formal checkpoints; seller bears loading costs; 3% commission tax
VPTRSRKH2	Transporter, internal Khartoum	Inflation driving all costs; SDG 1,000/sack loading (vs. SDG 500 pre-Ramadan); checkpoint receipt requirements; seasonal demand peaks
VPFRSRKH6	Farmer, Al-Qadarif, medium-scale (upstream context)	Wad Ahmed preferred; war increased farm labour via IDPs; exchange-based pricing; personal financing only; fuel/seeds as top needs
VPFRSRKH4	Farmer, Al-Qadarif, large-scale ~1,500 feddans (upstream)	Akar + Feterita; bank financing collapsed; humid/termite storage risks; government input support needed; labour post-IDP return
VPFRSRKH1	Farmer, Al-Qadarif, mid-scale ~700–800 feddans (upstream)	Wad Ahmed + Feterita; agricultural bank inadequate; personal connections for financing; dams and heavy rains as climate risks
VPFRSRKH10	Farmer, Al-Qadarif, small-scale 5 feddans (upstream)	Wad Ahmed/Akar preferred; cash/pesticide/fuel as critical needs; termite storage risk; cultivated areas expanded
VPLRSRKH3	Food Vendor, Khartoum, 30 years (displaced from El Fasher)	1 quarter/day consumption; sour millet in Ramadan; stable prices SDG 18,000–20,000; absorbs price increases; no assistance received
VPCSRKH9	Household, Khartoum, 5 members	2 quarters/month at SDG 18,000; Tabat preferred but unavailable locally; severe water crisis (tanker doubled to SDG 4,000); no assistance; hybrid modality preferred