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Under the Gun

Military and Paramilitary Actors in Sudan's Agri-food System

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Abstract

Armed actors, including militaries and paramilitaries, are heavily entrenched in the agrifood systems of several low- and middle-income countries, often resulting in negative implications for both agricultural transformation and democratic transitions. However, the role of armed actors is overlooked in the scholarship on the governance of agricultural value chains. To address this gap, this paper focuses on the role of the Sudanese Armed Forces (SAF) and Rapid Support Forces (RSF) in Sudan's agrifood system. Through over 50 semi-structured interviews with key stakeholders, the paper traces how the SAF and RSF initially gained their foothold in the agrifood system and how they interact with each other, and the private sector across diverse value chains. We argue that these actors decide to pursue investments in certain value chains depending on the extent to which the private sector is already involved and the degree of technical complexity required to attain more profitable product upgrading. Based on these considerations, we uncover four strategies used by SAF and RSF in different value chains: exclusive capture and rent-extraction, competition through biased licensing and quota allocations, acquiescence to existing private competitors when value-addition is too complex, and innovation when potential is high and the private sector is absent. We show how these strategies manifest across value chains as diverse as livestock, wheat, gum Arabic, and horticulture, with secondary applications to other commodities. Given that economic competition between SAF and RSF was a major factor in the outbreak of the 2023 armed conflict, identifying how these strategies emerged and manifested not only contributes to the literature on business-state relations but also expands insights about the political economy antecedents of large-scale conflict.

Keywords: Agricultural transformation, food systems, military, paramilitary, political economy, state-business relations, Sudan, value chains

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Table of Contents

Introduction	1
Strategies of Armed Actors across Agricultural Value Chains	2
<i>Literature review</i>	2
<i>Argument</i>	5
Methodology	7
The Emergence of SAF and RSF as Business Actors	8
<i>Historical background</i>	8
<i>SAF’s Agricultural Business Empires</i>	9
<i>RSF’s Agricultural Businesses</i>	12
Agrifood System Strategies Adopted by Armed Actors	14
<i>Capture – Livestock</i>	14
<i>Compete – Wheat milling</i>	16
<i>Cede - Gum Arabic</i>	18
<i>Innovate – Horticulture</i>	20
Summary and Discussion	22
Conclusions	23
References	24
Table 1: Characteristics of Key Informants	7
Figure 1: Potential Strategies for Armed Actors in Agrifood Value Chains	6
Figure 2: Landscape of SAF Companies	10
Figure 3: Geographical Distribution of Business Dominance: SAF and RSF in Sudan	12
Figure 4: Landscape of RSF Companies	13
Figure 5: Examples of Agrifood Value Chains for each Strategy	22

Introduction

In recent years, militaries have gained a greater role in various political systems around the world. As of 2023, the Varieties of Democracy project identified 42 countries where the military is the most important group for keeping the political regime in power.¹ Violent, non-state actors (VNSA)—inclusive of criminal gangs, militias, terrorist groups, and vigilantes—have also proliferated (Dowd 2015). Worryingly, this latter category of actors has become more durable as they find ways to adapt, evolve, and survive despite sanctions or counterinsurgency measures by the international community (Vasseur et al. 2022).

The impacts of military dominance and VNSAs on democracy and governance as well as economic development are the subject of a dense range of scholarship (Bove, Rivera, and Ruffa 2020; Brömmelhörster and Paes 2003; Bunte 2022; Furlan 2020; Izadi 2022; Mani 2007; Siddiqa 2016). There are strong interconnections with countries' democratic trajectories: access to economic resources enables these armed actors to increase their political leverage and, at the same time, they are more likely to resort to violence and political instability to avoid losing their lucrative business enterprises. Myanmar's military, known as the Tatmadaw, represents a quintessential example of this dynamic; their extensive reach into the country's economy is represented by hundreds of companies under two conglomerates, the Myanmar Economic Holdings Ltd (MEHL) and Myanmar Economic Corporation (MEC). The 2021 coup was viewed as an attempt by the military to prevent a civilian-led government from administering greater regulations and oversight on their activities (Mayberry 2021). In Pakistan, the country's two largest business conglomerates are owned by the military, Fauji Foundation and the Army Welfare Trust, and the military plays a critical role in determining which civilian leaders are permitted or sanctioned to run for office (Siddiqa 2016; Staniland, Naseemullah, and Butt 2020). Similarly, in Egypt, the military is involved in almost every sector of the economy and even has a monopoly over the production of school meals (Sayigh 2021).

This study delves into the political economy of military and paramilitary actors in the agrifood system, with a focus on Sudan. The agrifood system refers to the set of institutions, practices, infrastructures, and crops that collectively shape food production, trade, and consumption patterns (McGreevy et al. 2022). Such systems are critical for promoting food security, dietary diversity, environmental sustainability, and job creation through the addition of greater value to agricultural commodities. In Sudan, where approximately two-thirds of the population depend on agriculture for their livelihoods (World Bank 2020), enhanced agrifood systems are critical for addressing chronic food insecurity and unemployment, both of which became worse in the wake of the 2023 conflict (Kirui et al. 2024). Over several decades, the Sudanese Armed Forces (SAF) created a vast enterprise with several agribusiness operations due to concessions provided by the now-ousted former president, Omar al-Bashir, and his National Congress Party (NCP). The Rapid Support Forces (RSF), a paramilitary group that evolved from the Janjaweed nomadic militias based in the Darfur region, leveraged its control of Sudan's gold trade to expand into the agrifood system. This was catalyzed by its growing political influence in the

¹ This is based on V-Dem's question on "Which groups does the current political regime rely on in order to maintain power?" (v2regsupgroup).

political arena during Omar Al-Bashir reign and continued until the inception of the April 2023 conflict.

By drawing on more than 50 semi-structured interviews with knowledgeable stakeholders, we trace how the SAF and RSF gained a foothold in different sectors of the agri-food system and gained ownership over land and water resources in different parts of the country. We further highlight how four key strategies appear to explain the armed actors' primary operating approach in different value chains. The first strategy involves capturing the most rents possible with the minimal amount of investment in technical upgrading in order to extract the most revenue to finance armed actors' fighting capabilities and grow their businesses. The second strategy utilizes unfair market advantages to compete against the private sector. Acquiescence is an example of the third strategy, whereby private sector techniques at value-addition are too complex to be copied by armed actors and they in turn cede the market to their private sector competitors. The fourth and rarest strategy is for armed actors to identify areas of potential innovation where the private sector has been less active.

This analysis makes several key contributions. First, while previous studies have examined the economic networks of the SAF and RSF, (Baldo and Mailey 2021; Hoffmann and Lanfranchi 2023), we focus specifically on their role within Sudan's agrifood system. Our findings highlight that powerful actors may resist reforms aimed at making food systems healthier and more sustainable (Fanzo et al. 2021), as these reforms threaten their interests. Second, unlike much of the military commercialism literature, which suggests a uniformly undifferentiated approach of rent extraction by armed actors, we provide a more nuanced perspective that shows armed actors' strategies vary across different segments of agricultural value chains. In this way, the research contributes to the literature on global value chains, which has long been criticized for overlooking political economy and governance factors that affect value chain investments (Alford and Phillips 2018; Behuria 2020; Horner 2017). Finally, we expand the state-business relations scholarship (Leftwich 2009; Pritchett, Sen, and Werker 2018) by incorporating military and VNSAs, therefore making it more relevant to conflict- and fragile-affected settings.

Strategies of Armed Actors across Agricultural Value Chains

Literature review

Four sets of scholarship inform the potential roles and strategies that armed actors play in agricultural value chains. The first is the broader literature on economic upgrading, which involves companies and countries adopting new skills, knowledge, technologies, and market linkages to enhance their competitiveness (Giuliani, Pietrobelli, and Rabellotti 2005). According to Kaplinsky et al. (2002), there are four main pathways of upgrading. The first is *process upgrading*, which entails the adoption of cutting-edge technologies to produce outputs more efficiently. The second is *product upgrading*, which involves introducing a new product or improving older products faster than a firm's competitors. In *functional upgrading*, firms are moving into new activities that add value to their final product by shifting the mix of activities that they conduct and improving their knowledge about market demand while *chain upgrading*—the fourth pathway—entails moving to an entirely new value chain (Humphrey and Schmitz 2000).

The second body of literature is value chain governance, which historically focused on the relations between producers and suppliers and among firms. Due to the expansion of economic globalization and export-led growth in the early 1990s, many scholars focused on the primacy of global firms shaping development outcomes and thereby relegated the role of the state and the

institutional structures that shape value chain governance (Bair 2005; Horner and Alford 2019; Mayer and Phillips 2017). Yet, with the resurgence in interest in industrial policy and structural transformation, the state has gained renewed attention as being at the forefront of addressing market failures. Such failures can be mitigated by state actions to solve coordination externalities of upstream and downstream investments, addressing self-discovery externalities (i.e. learning which new products can be profitably produced in a country and how), and providing missing public inputs, such as transport, legislation, and research and development (Hausmann, Rodrik, and Sabel 2008). From this perspective, the state plays several roles in value chains governance. As Horner (2017) highlights, these roles include acting as a regulator through price controls, quota systems, and trade policies, a producer via operating state-owned firms, and a buyer through public procurement processes.

Given that both firms and states are equally relevant in shaping the opportunities for transformation and value chain development, a third relevant set of scholarship focuses on business-state relations. The nature of these relationships can be the basis for either economic transformation or stagnation, corruption, and decline (Schneider 2013). Synergistic “growth coalitions” between the state and businesses emerge when both sets of actors see the mutual benefits from investing in public goods that promote technological innovation and productivity (Leftwich 2010). In this scenario, the state and the private sector communicate frequently to address market, coordination, and government failures (Lemma and Willem te Velde 2017). This approach depends on trust, reciprocity, and transparency between public and private agents (Maxfield and Schneider 1997).

Collusive relationships between state and business, however, can lead to particularistic benefits rather than broad social goods and services and typically involve certain business being favored over others through biased policy instruments (Maxfield and Schneider 1997). For example, in many countries, selective businesses benefit from foreign exchange concessions, procurement contracts, tax exemptions, and privatization initiatives due to their close relations with the state or contributions to politicians’ electoral campaigns (Adetayo 2020; Canen, Ch, and Wantchekon 2023; Lavers 2012). At the most extreme is rent-seeking, which refers to profit or income in excess of what would be acquired in a fully competitive market and can be pursued through ownership of scarce natural resources, specialized knowledge, or monopoly businesses as well as via bribery and smuggling (M. Khan 2000). A hallmark of rent-seeking is that participants increase their own wealth without generating additional benefits to the broader society (Carey and Nasir 2019).

However, both states and businesses are heterogeneous, and the nature of business-state relations can vary substantially across sectors and sub-sectors. Indeed, bringing in the lens of political settlements, Whitfield et al. (2015) illustrate differential state-business relations in agribusiness between sugar and fish in Mozambique. Similarly, Kjaer (2015) examines varying political support by the Ugandan government for the dairy industry and fisheries. Chinsinga and Naess (2022) review case studies from six African countries to show how the importance of certain crops to political elites explains why commercialization occurs for some value chains and not others. Several studies on the diversity of Asia’s economic development highlight that both growth and collusive coalitions can co-exist in the same country, leading to transformation in some sectors and predation in others (Lim, Gomez, and Wong 2021). Pritchett et al. (2018) argue that these relations are also determined by whether industries are domestic or export-oriented and whether they have characteristics that make them more likely to generate profits through rents controlled by politicians or through market competition.

Militaries and VNSAs occupy a unique and underexplored position in the landscape of state-business relations. Consequently, a third body of scholarship we consider focuses on military commercialism, which refers to the pursuit of entrepreneurial activities for the personal benefit to the military fraternity, inclusive of war veterans and retirees, that are often outside of the defense budget and therefore not subject to any accountability mechanisms (Brömmelhörster and Paes 2003; Siddiqa 2016). As a result, military commercialism can siphon off much needed resources for economic and social development investments by being outside the remit of ministries of finance (Moyo 2016; Siddiqa 2016). This is an important distinction between state-owned enterprises and military-owned ones, with larger governance implications. As Brömmelhörster and Paes (2003: 4) note, business empires controlled by the armed forces “differ from ordinary state industries in that the military not only oversees the production and sale of goods but controls the use of revenue as well. This source of income, which in most cases is not subject to government scrutiny, allows the armed forces a degree of economic and political independence from their civilian paymasters, thereby undermining state control over the military and changing the nature of civil-military relations.”

Such commercialism tends to be more prominent in countries where there has been a history of efforts at self-sufficiency through import-substitution industrialization and in closed, socialist regimes (Brömmelhörster and Paes 2003). These settings encouraged an insular perspective initially focused on building up domestic arms industries, which provided the basis for subsequent expansion into other industries.

Whether military-owned businesses can stimulate or depress development is debated. On the one hand, Moyo (2016) suggests that military officers’ training in discipline and combat does not translate well into business, which requires marketing skills, networking, and adaptability. Moreover, many military businesses are focused on natural resource extraction in the minerals and timber industries, typifying rent-seeking strategies (Goh and Muravska 2012; Moyo 2016). In addition, the siphoning off of resources from the public sector to military coffers diminishes resources for social service provision (Siddiqa 2016). At the same time, military involvement may erode professional ethics of officers by transforming them into business contractors (Izadi 2022). Moreover, military commercialism reinforces collusive business-state relations when the state provides the military with favorable policies that ensure loyalty but also undermine the legitimate private sector (Mora and Wiktorowicz 2003). Indeed, Sayigh (2021) argues that the military in Egypt rarely competes with the private sector but instead poaches government procurement contracts from civilian private firms.

On the other hand, some claim that the military typically has better capacity than other public institutions and that their discipline and organization is an asset for meeting time-constrained business targets (Janowitz 1988). In Bangladesh, Husain (2022) finds that military-run businesses—ranging from small and medium enterprises to large-scale private sector ventures—are among the country’s most efficient and transparent operations. In Rwanda, Behuria (2020) highlights how the military, in concert with the ruling Rwandan Patriotic Front, has been instrumental in the country’s coffee upgrading and expansion into specialty coffee retail chains overseas.

The business activities of VNSAs have received less attention in the military commercialism literature because VNSAs are distinct from the military in several ways. For instance, unlike regular militaries, which are built by training diverse recruits to work together, paramilitaries are drawn from distinct political groups, creating ethnically, tribally, or geographically based units (Dasgupta 2003).

Since they are officially not part of the state in the same way as the military, they often are much more likely to thrive on illicit profits, such as illegal natural resource extraction of precious metals, diamonds, natural gas, and timber as well as other types of criminal activities (Johnston et al. 2023). Importantly, however, as VNSAs age, they amass more diverse sources of revenue based on adaptation, organizational learning, and expanding networks with transnational actors (Johnston et al. 2023).

Argument

Drawing on the above schools of thought, we argue that the strategies used by military and paramilitary actors in agricultural value chains are based on calculations about the degree of economic benefits that can be extracted in a relatively short time frame. For military actors, the off-budget profits from their economic activities may be quickly needed for purchasing weapons and machinery or for dispensing patronage to retain support from the rank-and-file. For paramilitary actors, their extra-legal existence necessitates immediate and reliable sources of off-budget financing. However, time-horizons might shift over the years as military and paramilitary actors grow their business empires, allowing for risk taking and enabling more established enterprises to make up resource shortfalls.

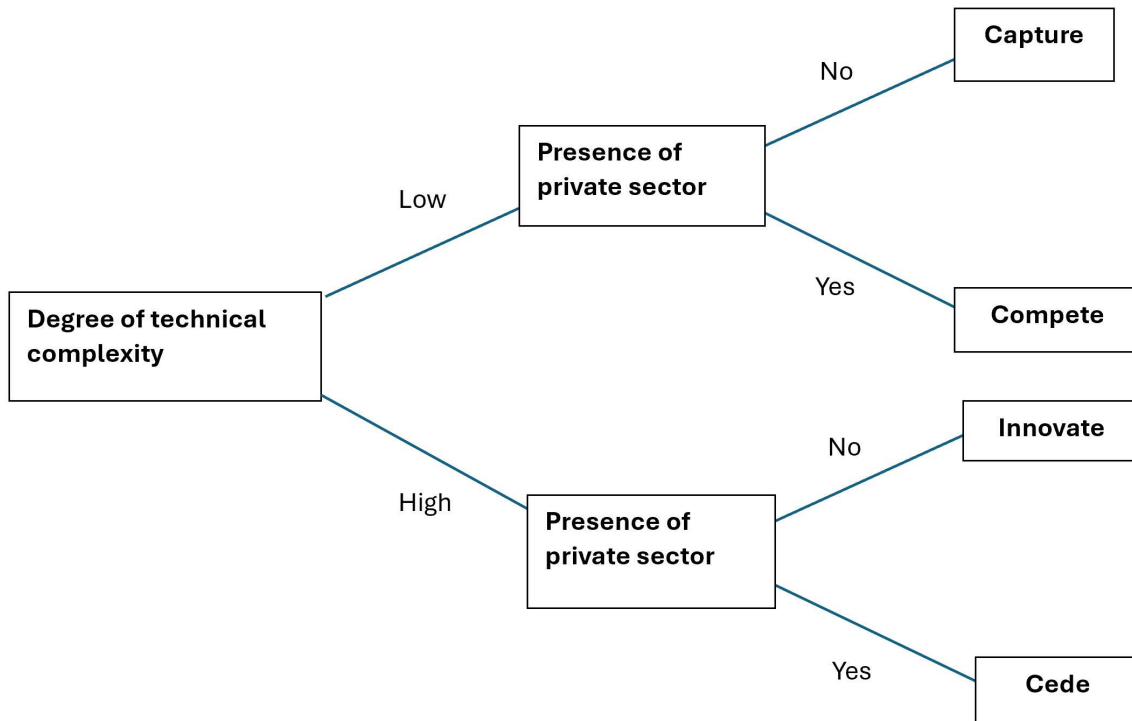
These calculations of benefits will therefore depend on two considerations. The first is the degree of technical complexity required to generate a profit from an agricultural commodity. As noted by Gereffi et al. (2005), a substantive amount of learning is needed to gain the capabilities for engagement with certain value chains, which may be too difficult, expensive, or time-consuming for firms—or military and paramilitary-owned enterprises—to acquire. The types of required capabilities depend on the context and the commodity. For instance, functional upgrading for a greater return on investment may require specific machinery and specialized knowledge to ensure quality control and consistency to meet buyers' expectations. A broad set of networks can enable sourcing relevant materials, expertise, and resources. In the case of chain upgrading, research and development into new agricultural product varieties involves long-term commitment, awareness of biophysical conditions, and appropriate breeding techniques. By contrast, retail or wholesale trade in unprocessed or minimally processed agrifood products involves a much lower level of technical complexity.

The second consideration is whether the private sector is already active in the sector. If so, time-constrained military and paramilitary actors are less likely to invest in gaining the requisite capabilities for more technical agrifood products. In this scenario, the returns on investment are quite low because of not only the need to acquire the necessary skills and resources but also because the private sector has a competitive advantage by being the first mover. Consequently, we would expect armed actors to *cede* involvement. However, if the private sector is not involved, this creates the opportunity for armed actors to establish their own first-mover advantage and, due to the higher returns and greater market opportunities from newer or upgraded products, provide an incentive to acquire the needed capabilities. This can lead armed actors to *innovate*.

By contrast, in contexts where engagement in a value chain requires minimal to no upgrading, such as retail or wholesale trade in raw or minimally processed products, the level of technical complexity is much lower. If the private sector is also absent in the value chain, armed actors can *capture* the market and engage in extensive rent-seeking, gaining excess income because there are fewer investments needed to sustain the business. This is especially true if they further benefit from exclusive monopsony or monopoly powers that disincentivize additional outlays of resources to improve or upgrade products to expand market shares. Collusive relations

between the state and armed actors prevail even when the private sector is present in low complexity value chains. In this scenario, armed actors *compete* on an unlevel playing field by ensuring that laws and policy instruments—from licensing, trade, taxes, and input access—are biased in their favor and against that of the private sector. Figure 1 illustrates the pathways of these four strategies.

Figure 1: Potential Strategies for Armed Actors in Agrifood Value Chains



Using the case of Sudan, we find that in livestock trade, where the private sector is largely absent, both the SAF and RSF have captured the market through exporting live animals and meat to Egypt and the Gulf states. There has been minimal attention to improving animal breeds or their health, which has limited Sudan’s ability to expand its market potential. Profits from the Al-Kadaru Slaughterhouse, owned by the SAF, remained with the military rather than going to the Ministry of Finance (Gallopín 2020). For minimally processed foods that are produced by private sector companies, such as wheat flour, armed actors have tried to compete based on biased market access rather than improved productivity. This has often led to a difficult operating environment for major private sector companies. Gum Arabic, a highly profitable commodity essential to the confectionary and pharmaceutical industries, represents an example where armed actors ceded market involvement. To be used industrially, the gum Arabic must be spray dried, which requires high technical skills and cutting-edge machinery. SAF originally tried to imitate private sector companies that functionally upgraded to spray drying, but they had minimal success and eventually aborted this effort. Finally, there have been notable cases of innovation through chain upgrading. In particular, Zadna, one of SAF’s main companies, has worked with foreign partners to develop new horticultural varieties amenable to Sudan’s agro-ecological context, demanded by domestic consumers, and thus far overlooked by the domestic private sector.

Methodology

To demonstrate our argument, we employ a nested, qualitative comparative analysis in a single case study. Single case studies are useful when they represent a “typical” case of a particular phenomenon (Seawright and Gerring 2008) and thereby, through in-depth analysis, can offer insights into other similar settings. Sudan represents a typical case of the larger set of countries where armed actors are a veto player in the political sphere and play an important role in the economy (Basedau 2020). At the same time, within Sudan, we look at several different sets of value chains where the dynamics of the military and paramilitary’s activities can be better understood. By choosing several sets of paired value chains that alternatively vary on one set of independent variables—technical complexity or private sector engagement—we can uncover the factors that best contribute to the overarching business strategy that is employed.

To uncover strategic dynamics in different value chains, we conducted semi-structured interviews using purposive and snowball sampling methods to ensure validity and reliability (Marshall 1996; Palinkas et al. 2015). The sample included 50 key informants, interviewed in-person or virtually between August 2021 and September 2024. These informants included agri-food experts knowledgeable about the production and marketing structures of the agri-food value chains of interest and political economy experts with insights about the SAF and RSF’s roles in the economy. These criteria allowed us to capture a broad spectrum of information on state-business relations in Sudan's agrifood system. The distribution of key informants is highlighted in Table 1 below. For reasons of confidentiality, respondents are identified by their corresponding key informant interview (KII) number in the remainder of the paper.

Table 1: Characteristics of Key Informants

Affiliation	Share of sample
Agriculture - Private Sector	30%
Unions and Associations	16%
Government and Public Sector	26%
NGOs, INGOs, and Civil Society	24%
Agricultural Finance	4%

Note: Agricultural Private Sector includes a broad range of large agri-food processors, input suppliers and logistics companies, and agri-food start-ups. Government and public sector informants are former government officials who served during the transitional period before the cabinet was dissolved following the 2021 military coup.

We acknowledge several limitations in our approach. First, the use of snowball sampling carries the risk of selection bias, potentially excluding perspectives from affiliates of the military and VNSAs, which may result in missing key details about their strategic motivations. Additionally, the opaque nature of military and VNSA involvement in the economy, particularly through hidden assets and subsidiaries, makes it difficult to capture a comprehensive view of their activities. To mitigate this, we focused on information confirmed by multiple respondents and supported by secondary sources that have mapped SAF and RSF companies (Cartier, Kahan, and Zukin 2022; Hoffmann and Lanfranchi 2023).

Furthermore, it's important to note that our discussion of the private sector is mainly focused on large, often family-owned corporations, as opposed to smaller actors like traditional or survivalist entrepreneurs, whose scale of influence is limited in transforming Sudan's agrifood system (Hoffmann and Lanfranchi 2023). Such corporations include the DAL Group, CTC, Maghoub Sons, Wheata, Moawia ElBerier Group, Haggar Group, Kerry Taste and Nutrition, and the SAY Group. Given the significant power wielded by SAF and RSF, we believe focusing on large-scale corporate entities offers the most relevant comparison. Despite these caveats, this paper offers the first in-depth examination of how armed actors engage in agrifood value chains in Sudan.

The Emergence of SAF and RSF as Business Actors

Historical background

Between 1989 and the December Revolution of 2019, Sudan's political power was concentrated within the National Congress Party (NCP), led by Omar Al-Bashir. Al-Bashir led a personalist autocratic regime whereby he weakened challenges to his rule by fragmenting the security forces, creating overlapping responsibilities among them, and undermining their lines of communication to forestall their ability to engage in a coup against him (Hassan and Kodouda 2019). The key security actors he empowered were the SAF, the secret police under the label of the National Intelligence and Security Service (NISS), and a variety of regional militias, including the Janjaweed in Darfur. By 2008, Al-Bashir had regularized NISS' role as a paramilitary fighting force (Hassan and Kodouda 2019). NISS had benefitted greatly from Sudan's petrodollars prior to the secession of South Sudan, which it invested in its fighting and cyber surveillance capabilities as well as in assets in the agricultural sector (Verhoeven 2023), including Seen flour milling company (Gizouli 2020; Thomas and Gizouli 2020). When Al-Bashir transformed in 2013 factions of the Janjaweed into an official paramilitary group, known as the Rapid Support Forces (RSF), they were originally placed under the control of the NISS (Kurtz 2024). Similarly, when Al-Bashir reshuffled his military in 2015, many of those in NISS were given positions within the SAF command, further blurring the lines between the two entities (Institute for Security Studies 2015).

To retain the loyalty of these different armed factions, Al-Bashir provided them with significant patronage, directing much of the budget toward the security apparatus (Hassan and Kodouda 2019). He provided these actors access to lucrative economic resources, such as the export of gold, gum Arabic, sesame, and weapons, as well as the import of fuel, wheat, vehicles, real estate, aviation, and construction (Gallopín 2020). The RSF was also hired by Saudi Arabia and the UAE to fight in Yemen (Hassan and Kodouda 2019). In the wake of South Sudan's secession in 2011 and the loss to Sudan of the oil reserves there, access to foreign exchange through these activities became especially critical to the survival of the political settlement. Both the SAF and RSF benefitted immensely under Al-Bashir's regime and gradually transformed their political influence into business empires via their privileged access to financial resources from commercial banks, tax exemptions, special rules and regulations, foreign exchange, and access to land (KII 41).

After the 2019 revolution that ousted al-Bashir, a transitional civilian-led government was established, comprising Prime Minister Abdalla Hamdok, SAF's General Abdel Fattah Al-Burhan, and RSF's Mohamed Hamdan Dagalo "Hemedti." During this period, both the SAF and RSF took control of many companies previously run by the NCP and NISS, further expanding their business empires.² The IMF's efforts to work with Hamdok's administration to audit and divest these companies from security services became a major catalyst for the October 2021 coup that ousted

² The NISS became the General Intelligence Service and placed within the Ministry of the Interior.

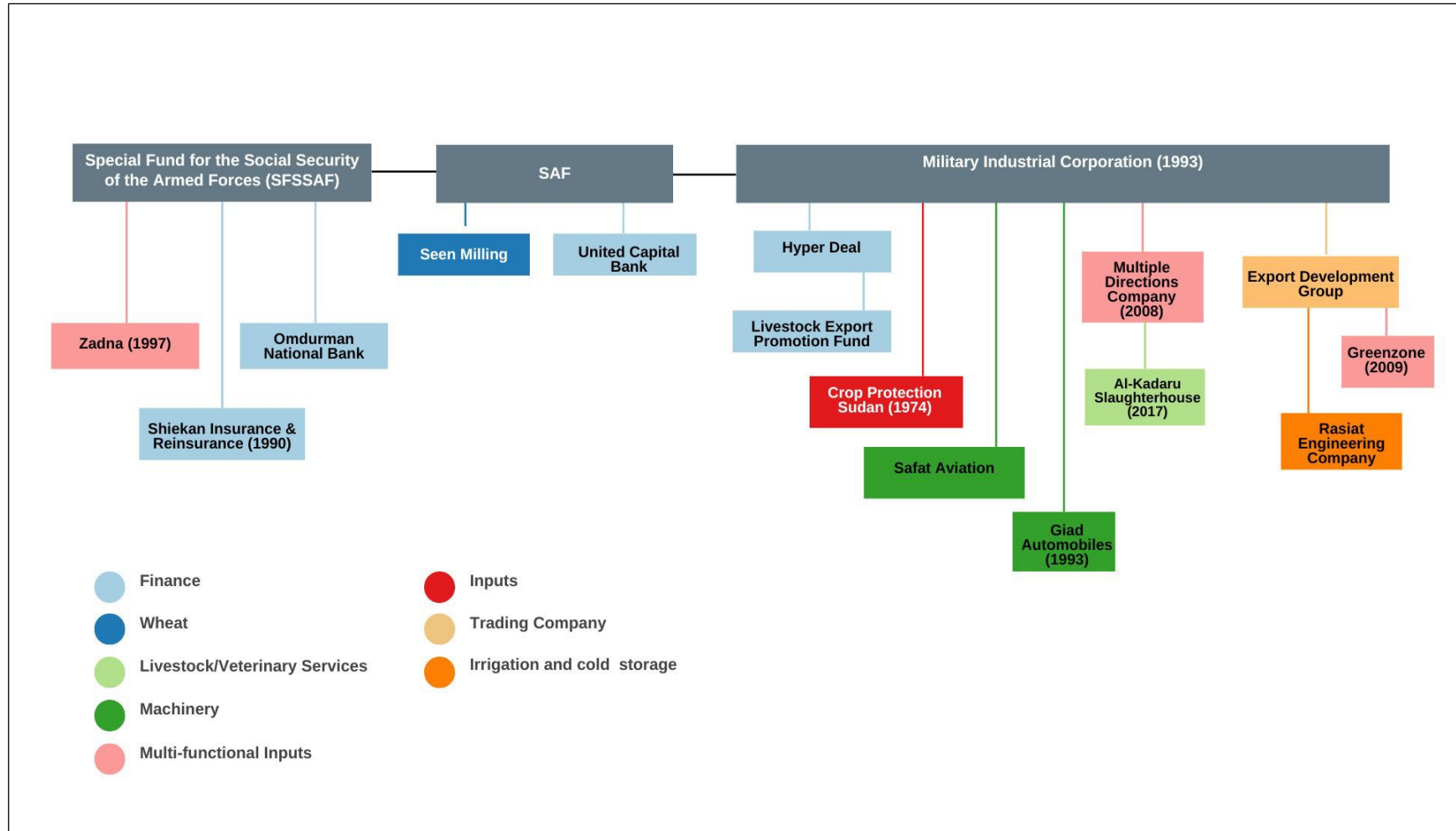
Hamdok. Tensions grew as both SAF and RSF saw each other as threats to their influence, commercial interests, and control over their combatants, particularly amid attempts to integrate the RSF into SAF's command. These escalating tensions eventually led to a power struggle between Al-Burhan and Dagalo, culminating in the outbreak of the devastating war in April 2023.

The SAF and the RSF have adopted parallel yet distinct approaches to building and sustaining their economic and commercial power (Abushama et al. 2023; Baldo 2021). Both groups have leveraged their ownership of commercial enterprises across various sectors, through domestic and international connections, driven by shared political and economic interests, to generate significant economic profit (Verhoeven 2023). However, the structure of their business operations varies, with RSF having a more fragmented business model that is largely controlled by different segments of the Dagalo family, while the SAF has a more structured business model. Moreover, the geographic concentration of their agricultural interests also varies.

SAF's Agricultural Business Empires

The foundation of SAF's business empire dates back to the 1970s during the nationalization wave under Sudan's Jaafar Nimeiri, president from 1969-1985. During this period, several companies were transferred to military control (KII38). However, the significant expansion of SAF-owned businesses occurred during the 1990s under Al-Bashir when international sanctions motivated the military to develop its own economic resources (KII38). Figure 2 highlights the major agrifood companies under SAF's control, which range from finance, livestock, machinery, irrigation, and inputs.

Figure 2: Landscape of SAF Companies



Source: Authors' compilation from interviews, Cartier et al. (2022) and Hoffmann and Lanfranchi (2023). Years in parentheses indicate year of establishment, where available.

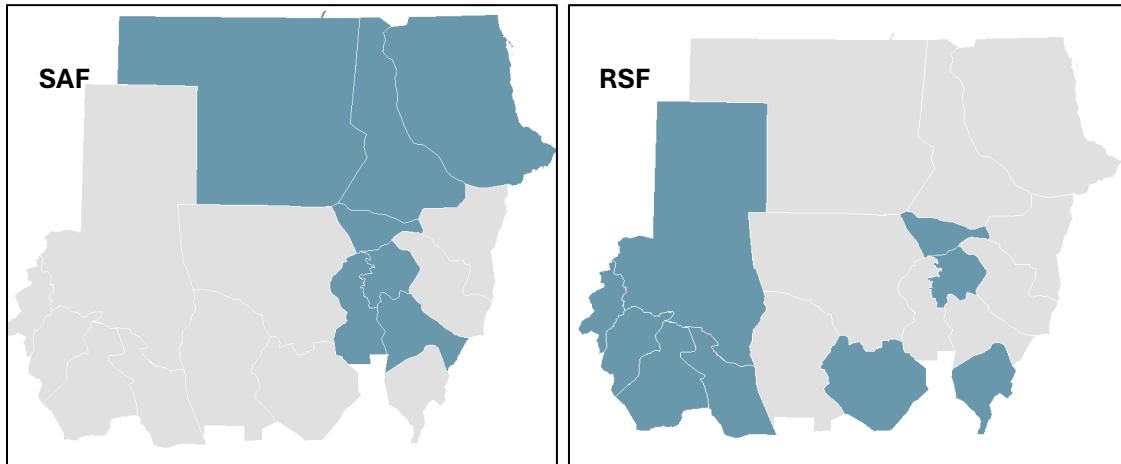
The Military Industrial Corporation (MIC), launched in 1993 and also known as the Defense Industrial System, is considered the crown jewel of SAF's economic empire. It was originally established as a defense manufacturer, automobile, and small electronics company to protect against potential sanctions and disruptions in imports from Western countries (El-Battahani 2016; KII49). Over the years, the institution has evolved to include many different subsidiaries, including in agriculture, that collectively make it a major revenue-generating arm for the SAF. Prior to the 2023 war, it operated based on a five-year strategy that was updated based on the status of the current business. Each of its business have their own boards that would consist of both SAF people and civilians with technical expertise (KII49).

Zadna International Company, an agricultural and construction conglomerate that includes large pivot irrigation schemes in the Northern State, imports chemicals and fertilizers, and exports live animals and other crops. It was previously also under the MIC but moved to the Special Fund for the Social Security of the Armed Forces (SFSSAF), an ostensible charity investment arm of SAF, to shield it from civilian oversight (USG 2024). Interestingly, Zadna is the only institution where representatives of both the SAF and the RSF serve on the company's board (Cartier et al., 2022). The company was targeted with sanctions by the US and EU at the start of the 2023 war as it is considered a vehicle for military money laundering (USG 2024). Beyond Zadna, there are strong clientelist linkages between the agricultural state-owned enterprises (SOEs), the Agricultural Bank, Omdurman National Bank, and the SAF, through SAF institutions and/or members of the NCP closely associated with the SAF (Cartier et al., 2022).

SOEs often benefit from unique regulatory advantages and government support that are not extended to private sector companies, including subsidies, tax breaks or exemptions, in-kind advantages like subsidized or fixed-price inputs, and access to favorable financing terms and guarantees (Hansen et al. 2022). Likewise, the SAF has developed a highly structured business model, capitalizing on its extensive ties with the government. Entities such as the Seen Milling Company and Zadna Trading play pivotal roles in the SAF's control over critical segments of the agri-food system. The Seen Milling Company, for instance, manages substantial milling operations in Khartoum and Port Sudan, benefiting from preferential access to import licenses and government contracts (KII41).

Geographically, SAF has concentrated their influence in northern Sudan, particularly in the River Nile state, where they control vast tracts of land and water resources (see Figure 3). This dominance is evident in their extensive agricultural investments, such as the projects in Atbara and Abu Hamad, which benefit from substantial irrigation infrastructure (KII40). SAF operates several large agricultural projects, including Al-gima, West Dongla in the Northern State, and Zadi (a subsidiary of Zadna) in the River Nile state (KII41). The control of these projects extends along the Nile from Khartoum to the Egyptian border, with major projects like Zadna covering 1 million acres in Wadi Alhawwad (KII41). The SAF's control over land is facilitated by their authority and ability to obtain government licenses, as seen with Zadna's extensive land holdings and irrigation installations (KII40).

Figure 3: Geographical Distribution of Business Dominance: SAF and RSF in Sudan



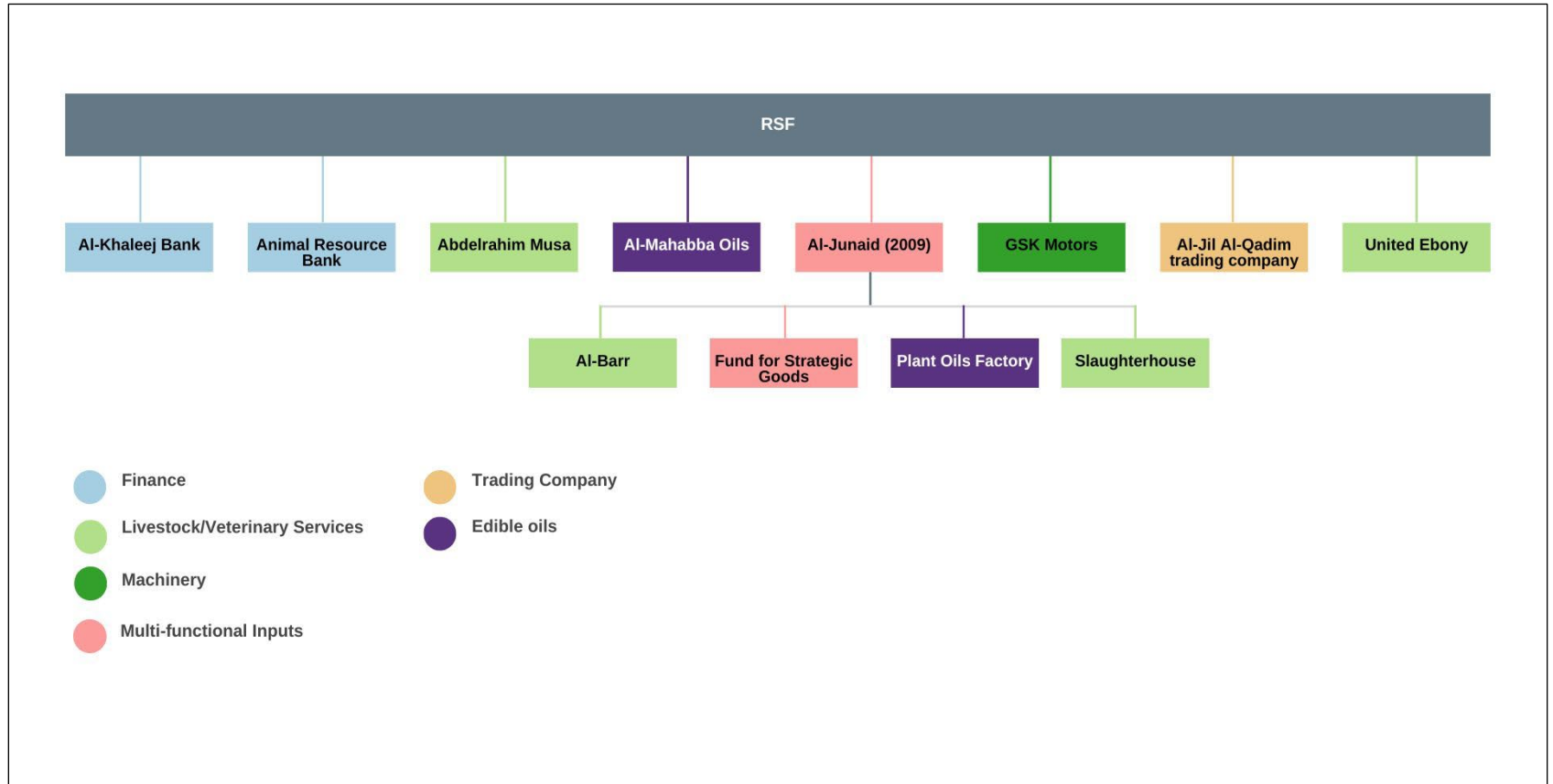
Source: Authors' illustration based on KIIs.

RSF's Agricultural Businesses

The origins of the RSF's empire are from Hemedti's control of the Jebel Amer gold mines in Darfur and his family's ownership of the gold trading company known as Al Junaid (Global Witness 2019). Al Junaid has expanded into a larger holding company with multiple subsidiaries spanning multiple sectors, including banking, agriculture, construction, transport, and information technology (Cartier, Kahan, and Zukin 2022; Sarkar and de Waal 2023). As shown in Figure 4, the paramilitary group (RSF) has established direct ties with the global banking system through their ownership of Al-Khaleej Bank, which received \$50 million from the Bank of Sudan prior to the onset of the 2023 war (USG 2024). Both Al Junaid and Al-Khaleej are now under US and EU sanctions. Along with bank accounts and companies in the UAE, such as Tradive General Trading LLC, the RSF is able to capture domestic rents with minimal risk, as they are safeguarded by foreign assets (Cartier et al., 2022).

Geographically, Figure 3 illustrates that the RSF wields significant influence in Darfur and South Kordofan areas, where their historical and tribal connections run deep (KII23). Their recent expansion into the Gezira scheme underscores their growing economic ambitions (KII38). RSF's agricultural activities are spread across the Blue Nile, west and south Darfur, and multiple directions in the animal resources sector (KII38). Despite controlling less land overall, they have significant projects in the Blue Nile and key regions of Darfur and have achieved notable success in export proceeds and crop purchasing (KII38). Moreover, the acquisition of agricultural land and investment in irrigation systems has extended beyond the Darfur and Kordofan regions, to include River Nile, White Nile, Sennar, and Northern States; in the latter, the RSF has been involved in the digging of irrigation canals over an area of 200,000 acres (Gallopín, 2020; KII28). Most of their agricultural companies, however, concentrated on livestock and oilseeds. For instance, the RSF acquired 60% of the Animal Resources Bank to develop livestock trade (KII 21, KII 33, KII 41, KII 42) while United Ebony focuses on goat breeding for export (KII 42). Al-Mahabba Oils is owned by Hemedti's brother, and the Plant Oils Factory is part of the Al Junaid (Figure 4).

Figure 4: Landscape of RSF Companies



Source: Authors' compilation from interviews, Cartier et al. (2022) and Hoffmann and Lanfranchi (2023). Years in parentheses indicate year of establishment, where available.

Agrifood System Strategies Adopted by Armed Actors

Despite gold being Sudan's main foreign exchange earner and a key income source for both SAF and RSF, the country has significant agricultural potential. The two armed actors engage in different value chains using distinct strategies—capture, compete, innovate, and cede—based on the technical complexity of value addition and the level of private sector involvement. We demonstrate this argument by examining these strategies in four key value chains: livestock, wheat, gum Arabic, and horticulture, with secondary applications to other commodities.

Capture - Livestock

Livestock is a pivotal commodity in Sudan. At least 26 million Sudanese rely on livestock production as a critical source of their livelihoods, and it remains one of Sudan's biggest export earners after gold (World Bank 2020), contributing over \$550 million of export revenue in 2022, which is equivalent to 13% of total export value (CBoS 2022). Moreover, it is the largest contributor to agricultural GDP (Alfadul et al. 2024; Asare et al. 2020). About 60 percent of all live animal exports go to Saudi Arabia, a third go to Egypt, and smaller shares are directed to Qatar, Bahrain, Kuwait, and Lebanon (World Bank 2020). It is also highly lucrative; just exports of live sheep to Saudi Arabia alone have been valued at about \$400 million annually (Humphrey et al. 2021).

The livestock value chain in Sudan is highly fragmented, involving numerous actors such as input suppliers, small-scale pastoralists, large-scale herders, brokers, jellaba (who transport animals from remote production areas to consumption areas), agents, auctioneers, traders, processors, retailers, and exporters (Idris 2007). This fragmentation creates multiple access points for actors to increase rents – or super-profits – within the chain.

Higher returns could be realized through investments in infrastructure improvements, including traceability systems, quarantine practices, slaughterhouses, cold chain infrastructure, and technical knowledge (World Bank 2020). On multiple occasions, Sudan has faced import bans and rejections of live animals and processed meat due to noncompliance with sanitary and phytosanitary (SPS) standards and with vaccination protocols. This is particularly an issue when there are outbreaks of Rift Valley fever (World Bank 2020; Humphrey et al. 2021, KII33).

The SAF primarily focuses on beef cattle, while the RSF trades in sheep, goats, and camels (KII 43). SAF's Multiple Directions Company opened a \$40 million Al-Kadaru industrial slaughterhouse in 2020, rehabilitated by Egypt, allowing for processed meat exports (Gallopini 2020: KII 42, KII 43, KII 50). The slaughterhouse used to belong to the government and a bilateral agreement signed in 2021 allows SAF to export approximately 2000 cows per day to Egypt (KII 33, KII 43, KII 50). However, Al-Kadaru is not operating at full capacity; while its maximum capacity was 480,000 cows and 440,000 sheep, the slaughterhouse only operated at 55 percent of that capacity at the height of its operations (KII49).

Due to its deep ties with Darfur and Kordofan—regions known for pastoralism—the RSF has long been involved in the livestock trade. Hemedti and the Dagalo family, historically traders, exported camels to Libya and Egypt two decades ago during Hemedti's leadership of the Janjaweed (KII 29, KII 23, KII 33, KII 39). Leveraging resources from their participation in the Yemen war, their involvement in the gold trade, and strategic political alliances, the RSF expanded livestock exports to Gulf countries (KII 37). In 2021-2022, the RSF sought to construct a technologically advanced

slaughterhouse north of Khartoum, with \$36 million in support from the Netherlands (Gallopini 2020; KII 23, KII36). However, due to inadequate business planning, the facility was not equipped with refrigeration, consequently preventing it from becoming operational by the start of the 2023 conflict (KII 22).

The involvement of both actors in the livestock value chain is largely seen as a modality of rent generation. SAF retains the profits from the sales through the MDC, which are not reported to or transferred to the Ministry of Finance and Economic Planning (MoFEP). At the same time, MDC and SAF have few operational costs since the MoFEP provides the operation with funding for the trucks, fuel, and drivers to transport the livestock (KII 33). As one respondent noted, “For Multi-Directions, many people think this is one of the strongest companies of the army because the army needs foreign exchange. They export crops and livestock that generate foreign exchange...There are doubts that the foreign exchange is coming into the Central Bank of Sudan. They [SAF] can use it instead to import military equipment” (KII 38). Although livestock is a risky commodity, where exporters can lose about 2 percent of the livestock per shipment, the motivation of rent extraction still makes the value chain very lucrative, even if it does not encourage further investments in the value chain: “For them [SAF], it doesn’t matter how much they lose because the goal is to gain revenue, not to build up the value chain or a business enterprise” (KII 45). Due to the required capacity requirements, much of the meat quality control occurs in Egypt. As one insider notes, “There’s animal quarantine in Abu Simbel in Egypt, and they [live animals] get fattened there. We do not do anything besides export live animals. In livestock, we are not up to the standards” (KII50).

The involvement of both SAF and RSF in the livestock sector has not resulted in significant benefits for pastoralist communities or improvements in veterinary health to ensure safer processed meat (KII 35; KII 50). Due to the ability to generate high rents under the status quo, there is little incentive for either group to invest in substantial value addition that could expand Sudan's international markets or meet growing domestic demand. For instance, SAF has not prioritized improving animal breeds, enhancing nutritional feed, or raising quality standards that would enable exports beyond Egypt and the Gulf, such as to the EU (KII 46). As one expert noted, "Nothing has been invested in the livestock sector for decades to improve its value and productivity, even though it's a major export earner for Sudan" (KII 33).

Even the domestic market for meat, processed meat, and dairy products has largely been overlooked by both SAF and RSF, with the private sector taking the lead in producing sausages, mincemeat, and other by-products. As one expert stated, "The private sector has been more involved in processing than SAF and RSF. Processing is a long-term investment—any business that wants a quick return looks for something else" (KII 44). Dairy, in particular, presents a valuable opportunity for expansion, as most of Sudan's milk remains unprocessed, and dairy imports reached \$148 million by December 2022 (KII 42). However, the sector poses technical challenges, requiring high standards, costly equipment, and careful alignment with meteorological conditions (KII 42, KII 44).³ “We have observed that both the SAF and RSF are inactive in the dairy value chain. This could be due to the challenge of competing with leading food industries in the field, or perhaps because the dairy value chain system in Sudan is complex and requires specific production

³ Dairy cows and their feed crops are affected by extreme temperatures, which in turn impacts their milk output. This is why a close following of meteorological conditions is required (USDA 2022).

technology and standards” (KII 42). SAF owned the Faapy dairy company, which was established in 2013, via the Export Development Group, but which went out of business several years later (KII41). It was dwarfed by six private sector companies operating milk processing plants in Sudan. DAL Group is the largest and started in the dairy value chain in 1997. The company markets its dairy products under the CAPO brand and manages a farm of 6,600 dairy cows. The farm features climate-controlled cattle housing, artificial insemination breeding techniques, and modern milking equipment, positioning it as a leader in the country’s dairy sector (World Bank 2020).

In summary, the livestock sector—encompassing both domestic trade and exports of live animals and processed meat—has proven highly profitable for both SAF and RSF. SAF, through the MDC, secures stable markets, particularly with the Egyptian army, allowing it to reinvest profits directly into the military rather than state funds. The RSF, with its strong ties to trading communities in Darfur and Kordofan and resources from the gold trade, benefits from local trust relationships and favorable pricing with Gulf partners. While expanding into higher value-added meat and dairy products could increase market access domestically and internationally, this requires significant investments and skill development. With the private sector already more competitive in this area, SAF and RSF prioritize rent-seeking strategies by capturing the livestock trade market.

Compete - Wheat milling

Livestock trade in Sudan is rife for capture by armed actors due to the absence of private sector actors, its relatively low technical complexity, and the networks—via Egypt and the Gulf countries—fostered by the SAF and RSF, respectively. Yet, other value chains have been equally appealing to armed actors. These include commodities for which there is domestic demand and value addition involves less sophisticated technology, skills, and capital and therefore less risk. If the private sector though is already involved in such value chains, the predominant strategy of Sudan’s armed actors has been competition through a distorted enabling environment.

Due to historical collusive relations between such actors and the state (e.g. the NCP), armed actors competing with the private sector may benefit from price distortions created by selective import licensing, foreign exchange rationing, and subsidies. For instance, SAF’s exemptions from Sudan’s labyrinthine set of levies, including interstate taxes, produce cess charges (i.e., turnover taxes on production sold by farmers to traders) and the *zakat* (Islamic tax) provided the military actors a price advantage (KII 45). Overall, these mechanisms facilitate a skewed policy landscape whereby armed actors enhance their competitive advantage through their structural power rather than due to any market-driven efficiencies (KII 38).

Wheat milling represents one of the main value chains where the competitive strategy has been most pronounced by SAF.⁴ Wheat is a major food commodity in Sudan, especially for urban dwellers who consume substantial amounts of bread. Domestic production in Sudan only covers approximately 15-20 percent of the country's total wheat demand, with the remaining 80-85 percent being satisfied through imports (Abdelaziz et al. 2022; Dorosh, Siddig, and Kirui 2022; Resnick 2021). In 2022, wheat imports were valued at more than \$1 billion, which is equivalent to 10% of Sudan’s total import value (CBoS 2022).

⁴ RSF is not involved in wheat flour milling, though there are speculations that may make be involved in wheat flour trade coming from Libya (KII23).

Up until 1996, when wheat milling was liberalized, the government held a monopoly on wheat imports, which were allocated to 20 small milling companies through a quota system (FEWS NET 2015). Since then, several major companies have dominated the wheat milling sector. Wheata on the other hand, is a part of a large conglomerate called Araak Group which was established in 2002 and held 48 percent of Sudan's B2B wheat flour market (KII 50). Sayga is part of the large DAL conglomerate and until the 2023 war, supplied about 70 percent of Sudan's consumption of wheat flour, inclusive of subsidized and commercial flour (Radio Dabanga 2015).⁵ It was first mover in this area in the wake of liberalization, which created frictions with the state: "DAL had a long battled with the government with wheat...DAL built a milling company and no one realized that the sector was growing so quickly and when the government realized that they missed the boat, they tried to do the 'nasty games'" (KII23). As noted earlier, Seen was under the armed intelligence services, NISS, until the 2019 revolution when it has been directly under SAF's ownership (KII 41, 46). The company also is a shareholder in SAF's United Capital Bank (KII41). Prior to the war, Seen had a large milling base in Khartoum and two mills in Port Sudan (KII 23).

Seen's clear goal was to take over the wheat flour business from its private sector competitors who had seen a market opportunity as Sudan began importing more wheat to satisfy domestic demand. The company benefitted from many advantages over its competitors. Most notably, between 2016-2021, a wheat subsidy was provided to the milling companies through a preferential exchange rate to import wheat grain. This required the companies to deposit finance with the Central Bank of Sudan (CBoS) for the required amount of wheat and in turn obtain from the CBoS the necessary amount of foreign currency for the imports (Siddig 2016). While all three of the big milling companies were eligible for the subsidy, the Central Bank of Sudan (CBoS) would favor Seen when issuing approvals for the milling companies to import wheat: "CBoS might allow Wheata and Sayga to import one month but then wouldn't approve for the following month. Seen though was consistently given approval to import" (KII 50). If there was a shortfall in money to import, Seen received access to dollar financing from SAF's Omdurman National Bank, which often did not need to be repaid (KII23). This subsidy became instrumental to Seen's growth:

"Seen benefited greatly from the subsidy era, which allowed the company to establish a strong brand and develop a network of agents and distributors across Sudan. This foundation has been instrumental in helping Seen maintain its position as a top milling company, even after the conflict erupted. In contrast, Wheat and Sayga were significantly affected" (KII50).

By also leveraging their access to the media, Seen accused the DAL conglomerate of trying to control Sudan's food staples. The company had to shut their mills for six months and had even considered exiting from the wheat milling business (KII 23).

Groundnut oil represents another minimally complex processing activity where armed actors leverage their privileged access to resources to bias the playing field against the private sector. Notably, due to its historical and cultural linkages in the peanut producing states of Darfur and Kordofan, the RSF is involved in groundnut oil processing via its Al-Juneid Plant Oils Factory.

⁵ Sayga, under DAL, has its own fleet of railway locomotives and wagons as well as its own grain terminal and storage silos at Port Sudan that supplies its mills with about 1.5 million metric tons of grains annually (Ganson 2013).

The company leverages its substantial currency reserves and ownership of domestic banks to compensate smallholder farmers cultivating groundnuts in these states (KII41). The RSF's growing control over groundnuts, combined with the government's history of setting high groundnut prices, hurt private sector actors trying to also obtain access to raw groundnuts (KII31). Instead, private sector companies have either imported crude groundnut oils to refine (KII44) or engaged in product upgrading by cultivating high-quality peanuts that are free from aflatoxins—a property that is highly valued by humanitarian agencies working in the country and which use groundnuts as a core ingredient for Ready-to-Use-Therapeutic Foods (KII31).

Cede - Gum Arabic

Gum Arabic, valued for its distinct chemical properties, is a crucial ingredient in various industries, including food and beverages, cosmetics, inks, paints, and pharmaceuticals. Gum Arabic's hardened sap comes from two Acacia tree species—*Senegalia senegal* and *Vachellia seyal*—which thrive in dry regions like the Sahel (World Bank 2020). Sudan is the world's largest producer of gum Arabic and accounts for about 70% of the global trade and about 3 percent of total export value (World Bank 2020). Gum Arabic is produced in 13 out of Sudan's 18 states with primary production areas including Kordofan, Kassala, and Darfur (UNCTAD 2018). In 2022, Sudan's gum Arabic exports were valued at \$139 million, representing 3% of the nation's total exports (CBoS 2022).

For decades, Sudan exported crude gum Arabic, predominantly to France, the largest global processor. From 1969 to 2009, the Gum Arabic Company (GAC) held a state monopoly on these exports (KII40). Due to its critical role for the soft drink industry, gum Arabic was exempted from the US sanctions implemented against Sudan in 1997, largely due to effective lobbying by Coca-Cola (Mahmoud et al. 2017). However, the government decided that, as a punishment to the US, it would not export directly to the country. The French were the biggest beneficiaries; the two main French companies are Nexira and Alland & Robert, which buy almost 60 percent of Sudan's gum Arabic production for re-export through processed gum Arabic (Africa Intelligence 2022b). After liberalization in 2009, precipitated by the global financial crisis (Mahmoud et al. 2017), the GAC lost its monopoly rights on the production, trade, and export of gum Arabic, and over ten companies set up gum processing plants in the country. However, most of these plants focused on less sophisticated modes of upgrading.

Functional upgrading in gum Arabic involves moving up the scale of technological innovation and quality, from wet gum to kibbled gum and mechanically powered gum, which involve using hammer mills to produce smaller granules or crushing raw gum until a powder is created (Couteaudier 2007; UNCTAD 2018). The most sophisticated processing techniques are spray-dried powder, instant soluble gum, and specialty gum (Mahmoud et al. 2017; UNCTAD 2018; World Bank 2020). Spray drying, which is an advanced and highly-capital intensive method, dissolves raw gum in water, then uses centrifugation to remove impurities, followed by pasteurization, and then sprays hot air to evaporate water to transform the product into a free-flowing powder (Couteaudier 2007). The process requires continuous water and electricity, or backup generators and water pumps in case of outages (KII31). Spray drying allows for entry into higher value markets because the solubility of the product improves, thereby expanding the number of uses to which it can be applied (Mahmoud et al. 2017; UNCTAD 2018). The value of this technique is even greater since the Codex

Committee for Food Additives approved dried gum Arabic as an additive with prebiotic qualities, allowing it to be marketed for further specialized uses (World Bank 2020). In fact, spray drying can increase the value of gum Arabic by three or fourfold (Africa Intelligence 2022b).

To reduce the influence of the two main French companies, DAL established in May 2017 the largest spray drying facility in the country, which was valued at \$37 million (SNA 2017; World Bank 2020). To source its raw product, DAL established its own plantation and provided producers with tractors and paid premium rates for the product (KII40; World Bank 2020). Soon thereafter, DAL began exporting spray dried gum Arabic to India, Europe, and the UAE (Africa Intelligence 2022b). While some multinationals had set up local processing plants to re-export to their overseas headquarters, DAL was the first domestic private company to do so. Referencing DAL, a World Bank (2020: 45) report noted, “No other Sudanese company has so far entered into spray-drying processing of gum Arabic, despite its high sales price.”

Around the same time, SAF became involved in the trade and processing side of gum Arabic through one of its companies, the Green Zone (Africa Intelligence 2022a). The company has processing hubs in Khartoum and exports worldwide, but their lack of sophisticated processing does not generate high levels of revenue (KII 40). When Green Zone was established in 2017—a re-brand of a former company that had existed since 2008—it identified gum Arabic as a way to expand foreign exchange reserves since it had been one of the commodities exempt from US sanctions. The company has its agents in the gum Arabic auction markets in the country or they may just purchase directly from producers (KII 40). While Green Zone expanded its exports of crude gum Arabic from 500 to 2000 tons between 2017 to 2021, this was a small portion of the country’s 100,000 tons exported annually (Africa Intelligence 2022a). While SAF was interested in getting involved in more sophisticated gum processing, MEC chose to focus on livestock exports: “At some point there were discussions around meat or gum Arabic, and it became a matter of what kind of potential each of these sectors has and who would be interested in buying their gum produce” (KII 49).

After the military coup in October 2021, and with the halting of international aid that had initially resumed in the wake of Al-Bashir’s ouster, Al-Burhan searched for alternative ways to mobilize revenue. Among others, he unsuccessfully lobbied the French companies to subcontract to Green Zone the transformation of raw gum Arabic into powder (Africa Intelligence 2022a). In doing so, DAL served as a useful example to mimic given its own recent move into this niche. As one key informant noted:

“The government started with the easiest thing, which is exporting raw gum Arabic because processing is technical. They did export for a couple of years, but when they saw [DAL] having success [with spray drying], they bought an old factory... they tried to run it before the war, but it never took off” (Interview KII23)

Based on the observations of a representative for a global food and beverage company that sources gum Arabic from Sudan, the complex nature of gum Arabic processing is not realistic for the SAF:

“Spray drying is not an easy process. It’s not just the technology but the technical skills. DAL invested in a spray dryer and had good facilities, but [even] they have struggled to export

because the quality is not the same; there are lot of others like the French, where spray drying is their core business, so it is difficult to compete. If SAF operates in spray drying, who are they going to sell it to? ...the knowhow in the country is not that advanced, and they [SAF] won't be able to meet the standards that international companies require" (Interview KII47).

The case demonstrates how the first mover advantage of DAL, combined with corporate concentration by the French, meant that SAF could not effectively compete in a business that involves high levels of capital investment and technical skill. While the Green Zone was effective at the less technical aspect of trading gum Arabic from auctions, it was a follower rather than a leader in the spray drying niche. Ultimately, the Green Zone set up an outpost in Dubai to focus on selling directly raw gum Arabic to agribusiness companies (Africa Intelligence 2022a). In the early months of 2024, stakeholders noted a heavy uptake in purchases of gum Arabic by Green Zone (KII 45)—a tactic that both bolsters their own supply for direct export and undermines supply for sophisticated gum processed by both the French and DAL.

The SAF's tactics were similar in other domains that require more technical skills, including in the cotton sector. Through Green Zone, SAF invested in cotton production in the Blue Nile State through contract farming and established a ginning facility (KII 49). Their investment in cotton ginning was intended as a way to enter the Egyptian cotton market during the Al-Bashir era. Yet, in contrast with livestock, cotton production in the main export destination – Egypt—was highly competitive and ultimately, SAF was forced to downscale export-driven cotton production (KII 50). As one interviewee noted, "The more complex the commodity, the more difficult for SAF to intervene...Cotton is one of the big items they produce but it's a very technical commodity... they did not know what type of cotton they had, and they didn't have labs. They just saw it as a modality of dollar generation" (KII 45).

Likewise, SAF's MDC is active in the sesame value chain but focuses exclusively on trade rather than processing, with sesame exports predominantly to the UAE and China (KII 23; KII 38, KII 45). In the 1990s, SAF, in partnership with foreign investors, were the first to produce sesame oil, through SAF's National Insurance Fund for Sesame processing (KII 45). However, the inefficiency of production lines and slower returns resulted in the SAF downscaling processing and resorting to trading. As one respondent has noted, "SAF is involved in trading it [sesame] but it's quite a complex value chain that requires land and networks" (KII 23). To bypass competition from armed actors in the sesame trade and oil processing, certain private sector companies have functionally upgraded sesame into tahini and halwa and selling those on as a branded, finished product to the Gulf countries because they know neither armed actor can meet the complex food safety regulations for such products (KII 45).

Innovate - Horticulture

The case of gum Arabic illustrates the challenges armed actors like SAF face when attempting to enter high-skill, technology-intensive value chains. In contrast, horticulture demonstrates a stronger incentive for involvement when the domestic private sector is less active. Despite its nutritional and agro-ecological potential, Sudan's horticulture sector has underperformed compared to neighboring countries like Egypt (World Bank 2020). Among many other factors, Sudan's inability to meet sanitary and phytosanitary requirements of overseas markets historically has limited growth and investment in the horticulture value chain (World Bank 2020).

The primary entity working to reverse this trend is Zadna, a company established in 1997 with significant financial backing from the former ruling NCP.⁶ The Ministry of Finance and Economic Planning (MoFEP) and the Agricultural Bank of Sudan (ABS) were among its key financiers (KII 48). Previously part of the Military Economic Corporation (MEC), Zadna resisted attempts to place it under civilian control during the transitional government of Hamdok (Cartier, Kahan, and Zukin 2022). After the October 2021 coup, General El Mirghani Idris Suleiman, a close ally of General Al-Burhan, was appointed as Zadna’s chairman to prevent civilian interference (Hoffmann and Lanfranchi 2023). Uniquely, Hemedti’s older brother, Abdulrahim Hamdan Dagalo, also serves on Zadna’s board, making it one of the rare instances where both SAF and RSF have a presence on the same company board (Cartier, Kahan, and Zukin 2022).

Despite this background, Zadna has played a surprisingly active role in the horticulture value chain. The company’s Zadi 1 project encompasses one million acres, utilizing 3,500 pivot irrigation systems and generated an estimated \$1.5 billion in annual revenues (KII 41).⁷ The project involved annexing land in the River Nile State through opaque means (KII 42). Access to financing for such efforts comes from Zadna’s role as part of Omdurman National Bank’s shareholding network (Cartier, Kahan, and Zukin 2022). At one point, Zadna was partnering with American, European, and South Africa partners (KII 37, KII 38).

Zadna has a large nursery for preparing high-quality seedlings for citrus, banana, and mango, as well as labs for tissue culture, research on seedlings, and focus on new varieties (KII 23, KII 48). The company also houses Africa’s largest tissue culture lab (KII 44) and engages in research on new seedling varieties, fruit and vegetable drying, waste management, and exports. However, its most notable success has been in importing seeds and improving horticultural production, particularly through collaborations with international companies to enhance seed quality and establish demonstration farms aimed at increasing producers’ technical skills and improving export quality to Gulf markets (KII 38, KII 45).

To explain why Zadna invested so heavily in horticulture, several respondents pointed to the lack of private sector engagement in this sub-sector: “The lack of competition with the private sector is giving this company [Zadna] an advantage in this area” (KII 48). Another interviewee noted that Zadna had the capacity to focus on horticulture at scale because it could get around certain constraints that otherwise discouraged the private sector:

“I think they focused on fresh fruits and vegetables because the private sector wasn’t really focused on this on a larger scale. There were some small companies selling seeds in the fruits sector. City Seeds had greenhouses where they were breeding and selling plants, but really the private sector wasn’t even looking at this market because it really required a lot of work from the production and processing side and the logistics didn’t make sense and the Port [of Sudan] has always had its issues” (KII 45).

⁶ Rasiat, a subsidiary under the MEC’s Export Development Group, also concentrates on the horticulture value chain, providing export-ready commodities that meet high standards, providing pivot irrigation, and offering cold storage and other technical support (KII 41).

⁷ See also: <https://suna-sd.net/posts/al-burhan-inspects-zadi-pivot-irrigation-project-in-river-nile-state>

Moreover, investments in horticulture were not only motivated by enhancing consumer access to fruits and vegetables but to expand access to export revenue. The company’s model has relied on partnerships with private entrepreneurs to whom they lease their land and provide a series of services, including the distribution of high-quality horticulture tissue cultures (KII 33).⁸ In turn, they can sell the horticulture products on for export in order to generate more revenue for the military (KII 38, KII 41): “At the end of the day, their [Zadna’s] aim is to sell” (KII 44). Yet, as with other business enterprises that are often run by armed actors rather than technical professionals, and which do not need to care about operational planning and expenses, management and corruption in the upper echelons of the company are problematic (KII 33).

Summary and Discussion

The analysis in previous sections shows that Sudan's primary armed actors, the SAF and RSF, employ diverse sets of strategies across different agrifood value chains. Figure 5 illustrates how these strategies align with specific value chains and stages of value addition. Capture dominates in low-complexity value chains with limited private sector activity, such as livestock trade. Here, SAF and RSF focus on extracting profits without investing in value addition or production improvements, primarily to fund their operations. In contrast, in more technically complex sectors like gum Arabic spray-drying, the armed actors tend to adopt an acquiescence strategy, allowing private firms with advanced expertise, such as DAL Group, to lead. Despite attempts by SAF and RSF to enter these value chains, they have largely ceded control to more capable actors who have made substantial technological investments.

Figure 5: Examples of Agrifood Value Chains for each Strategy

		Level of complexity	
		Low	High
Substantive domestic private sector presence	Yes	Compete <i>Wheat milling</i>	Cede <i>Gum Arabic spray drying</i>
	No	Capture <i>Livestock trading</i>	Innovate <i>Horticulture research & development</i>

Source: Authors’ own compilation

By contrast, in value chains like wheat milling, where substantial private sector involvement exists but technical complexity remains lower, SAF employs an indirect capture strategy. By leveraging mechanisms such as preferential access to import licenses and financing, they skew the market in their favor, disadvantaging private sector competitors. Finally, in high-complexity sectors with limited private sector presence, such as the horticulture value chain, the SAF has adopted an innovation strategy. By investing in high-quality seedlings and tissue culture labs, they

⁸ As an interesting case of mimicry, the RSF tried to copy Zadna’s model of partnership and was the concept behind the establishment of RSF’s Production Bank (KII 33).

have filled a gap left by the private sector, positioning themselves as key players in a potentially lucrative value chain.

While the matrix is a heuristic tool and does not encompass all dynamics of every value chain, it effectively captures the country's most important commodities in terms of value and food security, aligning with and those identified for expansion in the World Bank's (2020) assessment of priority commodities. In addition, the external validity of these strategies is supported by their recurrence across multiple crops within the same category. For instance, in value chains where the private sector leads in technically complex value addition—such as spray-dried gum Arabic, dairy, and finished sesame products—armed actors have tended to cede control to the private sector. This reflects a broader pattern in which the complexity and competitiveness of certain sectors make it less attractive for armed actors to dominate.

These techniques of private sector actors, such as finding new niche markets through functional or product upgrading, underscores that the private sector is not a passive bystander to the decisions of armed actors. Just like SAF and RSF have expanded in some new agricultural areas and upgrading over time, many of the larger companies have become increasingly adept over the years at finding ways to navigate a very disabling business environment. For instance, while SAF through Green Zone has linkages in the sorghum production areas and control over trade in raw sesame through Port Sudan, DAL has been well-connected with buyers in foreign markets, especially China and the Gulf states. Thus, when the government opened up the sorghum sector in 2018 to competition, SAF and DAL had an effective partnership that involved the former sourcing sorghum and the latter supplying and marketing it overseas (KII49). Going forward, future analysis should consider why these examples of collusion occur, identifying when the private sector may be asset rather than a hindrance to armed actors' activities.

Conclusions

Focusing on developments prior to the outbreak of the 2023 war, this study offers a comprehensive analysis of how Sudan's two dominant armed actors, SAF and RSF, strategically engage with different agri-food value chains. These armed actors built their fortunes by drawing on proceeds from SOEs and natural resource extraction, as well as domestic networks with kinship groups and co-ethnics, transnational networks with governments in North Africa and the Gulf, and well as partnerships with European, America, and African companies. Our research identifies four predominant business strategies employed by these actors: capture, compete, cede, and innovate. The selection of a strategy is influenced by whether value chain upgrading is involved, the technical complexity of that upgrading, and the concurrent involvement of the private sector. The ability to expand into new value chains or more complex upgrading over time also means that these dynamics become self-reinforcing.

By bringing together several different distinct sets of scholarship—value chain upgrading and governance, business-state relations, and military commercialism—this analysis contributes to the broader literature on the political economy of agrifood systems. Given the number of countries where military and VNSAs are entrenched in economic systems (Sayigh and Meddeb 2024), the findings hold larger relevance beyond Sudan. Armed actors benefit from their close relationships with the state, but their engagement in agrifood systems often entails raising off-budget revenue that serves their own needs rather than those of the broader populace. This does not imply that all their activities are exclusively rent-seeking, and in several rare instances in the Sudan case, there have been positive externalities to their business initiatives. Nevertheless,

recognizing the incentives of armed actors in different value chains is essential for designing effective interventions to promote sustainable agricultural development and peacebuilding.

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