SUDAN

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An Assessment of Sudan's Wheat Value Chains

Exploring key bottlenecks and challenges

Fatma Abdelaziz, Amy William, Kibrom A. Abay, and Khalid Siddig

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LIST OF ACRONYMS

ABS	Agriculture Bank of Sudan
CBS	Central Bank of Sudan
KFSC	Khartoum Food Security Company
MoANR	Ministry of Agriculture and Natural Resources
MoF	Ministry of Finance
SRC	Strategic Reserve Corporation
SCPS	Sudanese Consumers Protection Society
SDG	Sudanese Pound
SSMO	Sudanese Standards and Metrology Organization

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ABSTRACT

Wheat is a strategic and political good in Sudan and has played a central role in the country's economy during successive regimes. Disruptions in Sudan's wheat value chain usually leads to shortages of wheat bread, price spikes, and political unrest. With the objective of ensuring sufficient grain supplies for domestic consumption, Sudan's domestic and imported wheat sectors have been subject to several government interventions over the last decades. Most interventions have focused on and aimed to (i) stimulate domestic production, (ii) ensure a reliable flow of wheat imports to compensate for low domestic wheat production, and (iii) monitor wheat flour and bread distribution processes to limit leakage and wastage.

Sudan has two distinct wheat value chains: one for imported wheat and one for domestic wheat. The imported wheat value chain involves three major actors: milling companies, wheat flour agents, and bakeries. The domestic (locally produced) wheat value chain involves four main actors: wheat producers, wheat grain wholesalers, wheat grain retailers, and consumers. To understand the landscape of the wheat sector in Sudan, this report relies on rapid assessment surveys of the main wheat value chain actors. The aim is to closely identify different value chain actors' distinct roles of the and to explore their linkages. The report evaluates and identifies key bottlenecks that likely cause wheat and bread supply disruptions while also shedding light on untapped opportunities and possible policy options to improve the functioning of Sudan's wheat sector. We document wheat value chain actors' policy preferences, which vary depending on whether actors are engaged in the domestic or the imported value chain. The report highlights the differential impact of COVID-19 and related mobility restrictions on wheat value chain members. For example, while wheat production remains mostly unaffected by the outbreak of the COVID-19 pandemic, the marketing, trade, and distribution of wheat and wheat flour has been adversely affected by it.

INTRODUCTION

Disruptions in Sudan's wheat value chain usually leads to shortages of wheat bread, price spikes, and political unrest. Historically, wheat has been a strategic and political good in Sudan and hence played a central role in Sudan's political economy during successive regimes (Resnick 2021). For example, recent attempts to remove subsidies (on bread and fuel) resulted in higher bread and fuel prices and sparked sustained protests. Moreover, the outbreak of the COVID-19 pandemic in 2020 and various mobility restrictions have added stress to an already ailing economy and a poorly performing wheat market by disrupting production, trade, and transport in many sectors.

To describe the landscape and functioning of wheat value chains, identify major bottlenecks in wheat value chains, and hence understand the landscape of wheat markets in Sudan, this report relies on rapid assessment surveys of the major wheat value chain actors. Sudan satisfies about 80–85 percent its total demand for wheat through imports, with the remaining 15–20 percent covered by domestic production (World Bank 2020). This imbalance in trade is mainly attributed to increasing consumer demand for wheat and bread, coupled with low domestic wheat productivity (Ahmed and El-Saied 2017). The Sudanese government is striving to ensure self-sufficiency by increasing domestic production and reducing the bill for imported wheat, which costs the country approximately US$1 billion annually (Asharq Al-Alawsat 2021). In 2020, domestic wheat production in Sudan was estimated at around 7,000 tons, while the country's domestic consumption needs are estimated at around 2.9 million tons annually (Asharq Al-Alawsat 2021).

The value chain for imported wheat in Sudan involves three major actors: milling companies, wheat flour agents, and bakeries. The value chain for locally produced wheat involves four main actors: wheat producers, wheat grain wholesalers, wheat grain retailers, and consumers. This report aims to closely identify the roles of the different value chain actors and explore the linkages among them, for both the imported and domestically produced wheat value chains. This in turn helps determine the key bottlenecks that likely cause wheat and bread disruptions, while shedding light on untapped opportunities to improve the functioning of wheat value chains in Sudan.

SECTION 1: BACKGROUND OF SUDAN'S WHEAT VALUE CHAINS

Agriculture plays an important role in the Sudanese economy. The sector contributed 22–34 percent of gross domestic product between 2011 and 2019 and employed 38-45 percent of the labor force (World Bank 2020).

Cereal grains are considered the most important calorie source in the Sudanese diet: wheat, sorghum, and millet alone provide more than one-half of the population's daily energy supply (FAO 2010; African Development Bank 2020). Wheat in particular has witnessed a steady increase in consumption, not only due to population growth but also to the changes in households' consumption preferences driven by rural-urban migration (Siddig and Grethe 2015; CBS 2015). Khartoum absorbs a large share of both imported and domestically produced wheat.

Wheat in Sudan is sourced either from local production or from importing countries such as Australia and Canada (Resnick 2021). Domestic and imported wheat each operate within their own value chain.

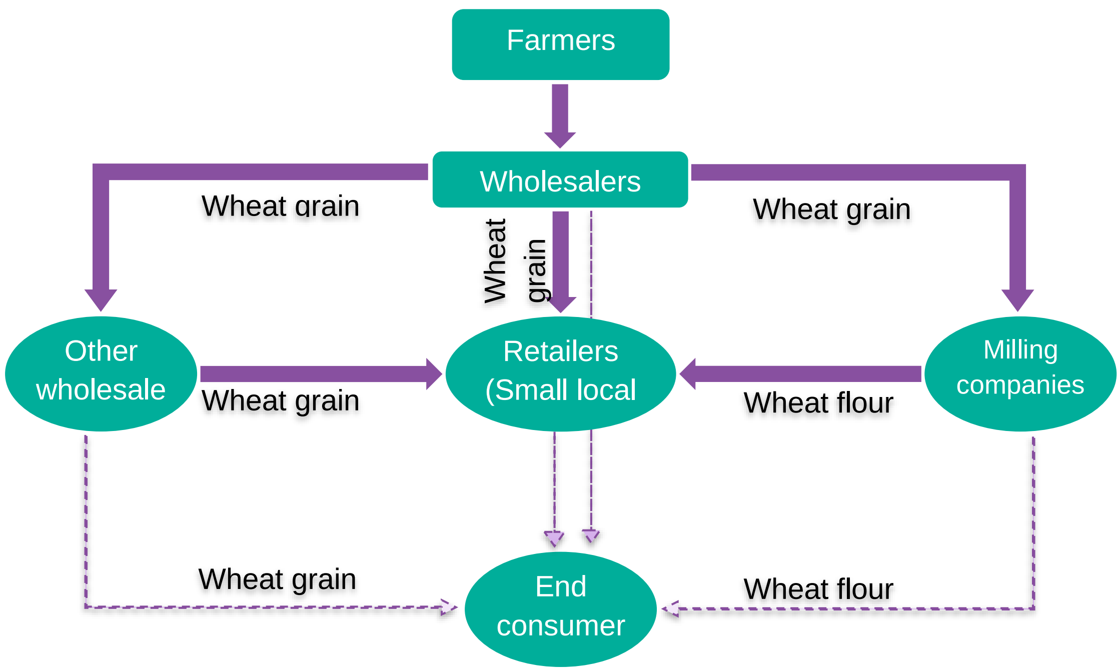
A short summary describing the landscape of domestic wheat production and imported wheat in Sudan follows.

1.1 Key value chain actors

1.1.1 Domestic wheat value chain

The domestic wheat value chain in Sudan involves three key players beside final consumer: farmers, wholesalers, and retailers. Sudanese farmers usually plant wheat in winter months (between November and December) and harvest it between February and March the following year. Once the harvest is ready, farmers collect grain and pack it in sacks for sale. Farmers may sell part of their harvest to a financing party (for example, the El-Gezira Project Administration and the Agricultural Bank of Sudan [ABS]) or in a local market directly to wholesalers. Wholesalers purchase grain from farmers or other wholesalers in regional markets. These wholesalers then sell the collected wheat grain in common cereals markets in Sudan where retailers also operate. Retailers resell grain in smaller sacks or mill it into flour in their small milling facilities and sell the flour directly to end consumers/households. Some wholesalers also sell directly to consumers through their retailing outlets. Figure 1.1.1 provides a schematic description of the main actors and their relationships in the domestically produced wheat value chain.

Figure 1.1.1 Domestic wheat value chain in Sudan



Source: Data collected from Sudanese wholesalers, August 2021

1.1.2 Imported wheat value chain

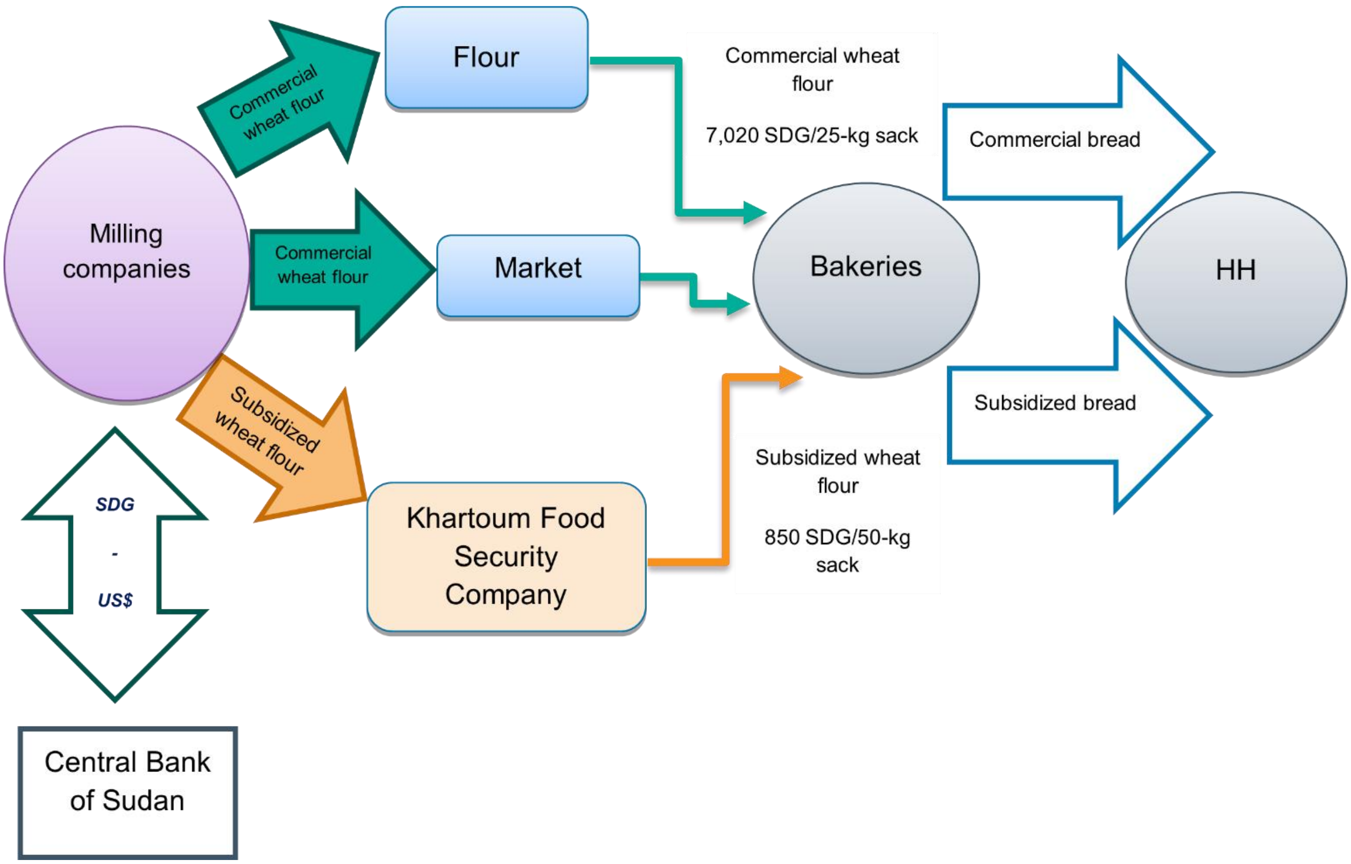
Milling companies are the entry point of the imported wheat value chain in Sudan. Sudan has approximately ten big milling companies scattered around the state, with only a few 3-4 companies that hold significant market share, dominating wheat imports, milling, and distribution. Milling companies buy imported wheat from exporting countries at a preferential subsidized exchange rate provided by the Central Bank of Sudan (CBS). Milling companies are not only the sole providers of the outsourced wheat, but are also responsible for processing wheat into flour, mixing local wheat initially obtained from local wheat markets in a grain form with imported wheat grains – following standard mixing ratios and extraction procedures – to produce subsidized and commercial wheat flour. While both types of wheat flour are generally a mix of local and imported milled wheat grains, a clear distinction exists between the two. Subsidized wheat flour is used by bakeries to produce subsidized bread. The ratio of local to imported wheat grain for subsidized wheat flour is 45–55 percent. On the other hand, commercial wheat flour is of a higher-quality grade: the ratio of local to imported wheat grain is approximately 30–70 percent. Commercial wheat flour is thus directed to commercial bread-producing bakeries and other pastry producers, as it is used to produce a variety of bread types and other bakery products of higher quality.

Although both types of flour are produced by milling companies, they are distributed through different value chain members until they reach the end consumer, whether a bakery or a household (HH). To limit smuggling and closely monitor the distribution of subsidized flour, a few designated federal entities were established after the revolution to mirror the government's authority in distributing a preassigned quota of subsidized wheat flour over bakeries in each locality.[1] On the other hand, commercial wheat flour is available and sold in nearly all local Sudanese markets. Bakeries can usually get as much commercial flour as they want either from a local market or through flour agents. Flour agents are present in the current imported wheat value chain as distributors of commercial wheat flour to bakeries.

Sudan has two types of bakeries: "Baladi bakeries," which only produce subsidized bread and thus rely solely on subsidized wheat flour for their production; and "mechanized bakeries," which operate with both commercial and subsidized flours, producing both subsidized bread and other commercial bread varieties. Some mechanized bakeries in more developed regions operate only with commercial wheat flour for their bread production. Figure 1.1.2 provides a schematic description of the relationship among the various actors participating in Sudan's imported wheat value chain.

[1] We describe the roles of these key entities in the next section.

Figure 1.1.2 Imported wheat value chain actors and relationships in Sudan[2]



Source: Data collected from Sudanese bakeries, August 2021

1.2 Government roles and interventions to stimulate domestic production

Successive governments in Sudan have considered wheat as a strategic crop and political commodity to ensure food self-sufficiency and political stability. With the objective of ensuring sufficient grain supplies for domestic consumption, Sudan's domestic and imported wheat sectors have been subject to countless government interventions over the last few decades. Most interventions focused on and aimed to (i) stimulate domestic production, (ii) ensure the reliable flow of wheat imports to compensate for low domestic wheat production, and (iii) monitor the wheat flour and bread distribution process to limit leakage and wastage. Like several countries in the Middle East and North Africa region that

[2] 1. All prices shown on Figure 1.1.2 were reported on August 2021 in Sudanese Pound (SDG).
2. HH stands for households.

continue to invest in strategic reserves and pursue self-sufficiency (Cafiero et all 2011), the Sudanese government has attempted to reduce import dependence and encourage domestic production.

The Sudanese government's support to farmers has been delivered in a variety of forms. Viewing wheat as a strategic crop to help the country achieve food self-sufficiency, the government intervened to incentivize wheat growers and stimulate domestic production using several instruments, such as offering a minimum price guarantee (using a concentration price) and enhancing the availability of agricultural credit and inputs for wheat growers.

1.2.1 Price guarantee and a concentration price – El-Gezira Scheme

The concentration price is another term for a promotional or guaranteed price, and is essentially the state's declared price floor for wheat grain at which the government promises to buy from farmers. The concentration price is not a fixed market price – meaning that market prices can be less or more than the government-announced concentration price. With the objective of promoting wheat cultivation and ensuring sufficient reserves of this strategic crop, the government declares this price to safeguard wheat farmers and sets a price that is remunerative, covering the costs of production and a margin of profit.

Despite the declining production efficiency among wheat farmers in the El-Gezira Scheme (Siddig and Grethe 2015), it is one of the largest irrigated agricultural projects in Sudan and in all of Africa. Former Prime Minister Abdalla Hamdok frequently highlighted its importance to the Sudanese economy. Sudan's Ministry of Agriculture and Natural Resources (MoANR) used the concentration price as an incentive over the years to encourage El-Gezira state farmers to dedicate more area to wheat cultivation. For example, in November 2020 El-Gezira state declared a concentration price for wheat of 8,000 Sundanese Pounds (SDG) per sack. Farmers protested this decision, claiming that the price merely covered the costs of production. According to El-Gezira Project Administration estimates, it costs farmers 7,000–8,000 SDG to cultivate and produce a sack of wheat. Accordingly, the Administration urged the government to add a 2,000–3,000 SDG profit margin to secure farmers a fair profit and to ensure sufficient reserves of this strategic crop. Shortly thereafter the government was forced to review its decision and raised the concentration price to 10,000 SDG per sack (Al-Intibaha Online 2020). Months later in March 2021, amid a bread flour crisis in the country, the government again increased the concentration price, this time to 13,500 SDG per sack (Asharq Al-Alawsat 2021).

It is important to note that the Sudanese economy continues to face stagflation and major macroeconomic imbalances that also affect the wheat sector and wheat value chains. For example, despite the government's significant increase in the concentration price, mainly to counter inflation and encourage local farmers to boost local wheat supply, this remains a challenging policy tool to manage. Price changes to wheat, a key staple food in Sudan, are quite sensitive and usually fuel political unrest and protests (Siddig and Grethe 2015).

1.2.2 Enhancing the availability of agricultural credit to wheat growers

The ABS is the government entity through which Sudan's agriculture sector acquires all needed financial aid and inputs. The ABS was the first national bank in Sudan, and is considered one of the core financiers of the country's leading economic sectors. Established in 1959, the ABS has developed into a comprehensive banking institution that serves the public, pushes agricultural development forward, and accelerates the growth of the economy. The ABS aims to provide any needed facilitation to promote Sudan's agriculture sector – particularly wheat – while guaranteeing a sufficient strategic reserve of commodities to ensure food security through data collection, preparation of studies, and conduct of relevant research (Agriculture Bank of Sudan 2021).

The ABS tailors its financial services to best serve wheat farmers' potential growth. The bank collects wheat from farmers once they harvest, to ensure a sufficient strategic reserve. In the meantime, the ABS encourages farmers to plant more wheat by offering them a fair selling price, the "concentration price." Farmers usually compare the market price with that provided by the ABS and accordingly choose the more profitable option. If the ABS's guaranteed price is higher than the market price, then farmers can sell to the ABS; otherwise, farmers can sell their production at market price elsewhere (Agriculture Bank of Sudan 2021).

Another approach the Sudanese government uses to help wheat farmers in Sudan is its support to the El-Gezira Project Administration, which operates under the MoANR. The Administration supplies wheat growers with needed agricultural inputs of production: chemical fertilizers, seeds, and soil enhancers. Once the harvest is ready, farmers calculate the amount of wheat grain harvested per one sack of seeds. Based on the number of sacks of seeds farmers initially received from the Administration, they deliver an equivalent amount of wheat grain back to the El-Gezira Scheme and sell the rest in an open market, or even use it for own consumption.

Nonetheless, the above-described efforts and interventions to stimulate domestic production have not been successful in significantly increasing the domestic production of wheat, a situation exacerbated by the population's rising level of consumption.

1.3 Government interventions to ensure the reliable flow of wheat imports

1.3.1 Policy instruments

Besides efforts to stimulate domestic production, successive Sudanese governments have introduced alternative policies and instruments to ensure a reliable flow of imported wheat. Most involved supporting wheat importers through alternative variants of subsidies and monitoring the distribution of imported wheat.

A preferential exchange rate was the subsidy form followed by the previous administration to provide support to the top three wheat importers. Wheat importers received the foreign currency required for any purchase business transaction by depositing an equivalent fund in local currency in the CBS. Wheat importers were provided with a preferential exchange rate for their purchases that is said to be almost one-half the official exchange rate (Siddig and Grethe 2015). The government provided such subsidized rates to wheat importers while guaranteeing a fixed selling price to bakeries and ultimately a fixed bread price to end consumers.

Most imported wheat is transported to Khartoum from Port Sudan for milling and is then distributed either by wholesalers or flour agents of the milling companies. A certain quota of wheat flour is distributed to each Sudanese state. Quotas are preassigned to each state based on historical consumption data and population size. Subsidized wheat flour reaches its destination at bakeries' shops through millers' flour agents based on a determined quota (Siddig and Grethe 2015).

This subsidy approach caused a few market failures. For example, a shortage of bread at local bakeries resulted in long waiting lines, and in some areas, wheat quality and loaf weight were manipulated. Moreover, since the wheat distribution process to local bakeries was not closely monitored, some local distribution agents reportedly sold the subsidized wheat to traders in parallel local and regional African markets (Siddig and Grethe 2015). Furthermore, the CBS was unable to sustainably provide the preferential foreign currency for wheat importers due to low foreign currency reserves and persistent budget deficits. This eventually resulted in more bread shortages, as wheat milling companies and importers were unable to claim their shipments from Sudan's ports.

Another prominent market failure occurred, as the price of wheat flour varied slightly over time and states because of transportation costs and inflation. This opened room for smuggling: flour agents and bakeries tried to profit from selling a portion of the subsidized flour to the black market (Siddig 2016).

When the post revolution government took over, it made significant changes in the operation of the wheat value chain. In 2019, Sudanese government stopped providing subsidies to wheat importers. This decision took place in parallel with the depreciation of the national currency. As the exchange rate was liberalized, importers were no longer provided with a preferential rate. Furthermore, a monitoring system was set up to ensure no subsidized flour leaked from its designated distribution pathway to the black market. The system was also made responsible for ensuring that bakeries provide subsidized bread to consumers (Resnick 2021).

This eventually resulted in a sharp rise in bread prices (FAO 2020). Moreover, the government pushed wheat prices by around 150 percent, hoping to incentivize local farmers to boost local wheat supply. Such adjustments led to more political unrest, resulting in another regime change. While subsidy reforms and alternative social safety nets have yet to be implemented, wheat import subsidies are now back in the form of a preferential exchange rate provided to the top three wheat importers in Sudan (Resnick 2021).

1.3.2 Establishing institutions to monitor the wheat and bread distribution process

The 2019 revolution in Sudan led to the rise of new institutions to prioritize improved affordability and equitable accessibility of bread and flour. These include resistance committees in many states of Sudan and the Khartoum Food Security Company (KFSC).

1.3.2.1 Resistance committees

Over the past decade and particularly after the revolution, Sudan witnessed a rise in novel federal institutions that became a newly integrated vital part of the wheat flour distribution structure. The first structure to emerge was resistance committees, initially established in during the 2019 revolution. They consist of a set of volunteers who support enforcement of consumer protection and competition laws against monopolies (Resnick 2021). The committees mainly focus on overseeing bakeries' production of bread relative to the amount of flour they receive to make sure none of the bakeries smuggle and resell flour on the black market (Equal Times 2020).

1.3.2.2 Khartoum Food Security Company

Another state-owned structure recently started is the KFSC, founded by the Khartoum State Ministry of Industry and Trade to be responsible for providing subsidized flour to underlying localities in Khartoum.

The KFSC officially began operating in August 2020 and is still running. Since its inception, flour agents are no longer held responsible for distribution of subsidized flour to bakeries, as they now operate as providers of commercial wheat flour (Al-Intibaha Online 2021). The KFSC assigns a designated quota of subsidized wheat flour to each locality. Once each locality is provided with the needed quantities of subsidized wheat flour, a set of relevant individuals builds one committee per locality. Each committee consists of four individuals: one administrative officer from the supply chain unit and three representatives, one each from the bakeries' division, resistance committees, and the KFSC. The committee's mandate is to assign a wheat quota to each bakery and distribute flour to its facilities while ensuring that all bakeries receive their weekly preassigned flour quotas.[3]

Despite the aforementioned interventions and government-led support, Sudan's wheat value chains continue to face significant impediments and disruptions. Indeed, not all government interventions meant to stimulate domestic wheat production are successful. Sudan's wheat production and productivity continue to dwindle while demand for wheat continues to increase significantly. This imbalance between demand for and supply of wheat usually leads to price spikes, shortages of wheat grain, shortages of bread, and ultimately political unrest.

SECTION 2: DOMESTIC WHEAT VALUE CHAIN IN SUDAN

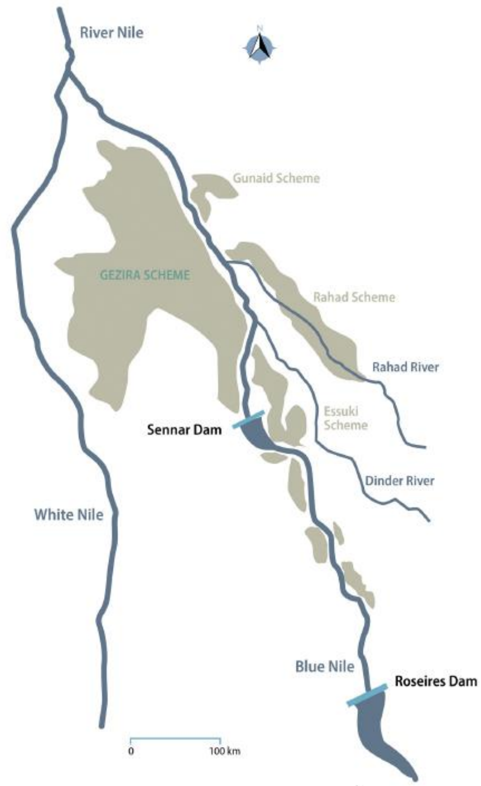
In September 2021, the Sudan Polling and Statistics Center (SPSC) under support and guidance from IFPRI conducted a survey of 385 farmers was conducted in El-Gezira Scheme area. El-Gezira state grows most of the wheat produced in the country, contributing 53–74 percent of the total area harvested nationwide between 2015 and 2020 (MoANR 2021, Department of Agricultural Statistics, unpublished data).

2.1 Farmers

Farmers are the domestic wheat producers upstream in the value chain. Wheat production and wheat producers are concentrated in the El-Gezira Scheme, located in El-Gezira state, and are governed by the El-Gezira Project Administration (Figure 2.1.1). The El-Gezira Scheme comprises 2.2 million feddans, where farmers farm wheat among other winter and summer crops, making it one of the largest irrigated agricultural areas in all of Africa (Goelnitz and Al-Saidi 2020; FAO 2020). The project, established in 1925 with the objective of promoting cotton production for Britain's textile industry, started off with only 22,000 feddans. The scheme reached today's size in the early 1960s, amid the construction of the Roseiries Dam; this large-scale irrigation project later peaked at the end of the 1970s, when agricultural area expanded and was diversified to produce cotton, wheat, sorghum, and other vegetable crops.

[3] This information is based on an interview conducted with an official from the KFSC and was published in the Al-Intibaha Online newspaper in March 2021.

Figure 2.1.1 Map of El-Gezira Scheme



Source: From *Too big to handle, too important to abandon: Reforming Sudan's Gezira scheme* (p.3), by Al-Saidi and Goelnitz, 2020, Agriculture Water Management.

While the El-Gezira Scheme represents less than 11 percent of Sudan's cultivated area, it produces 60 percent of its cotton and 75 percent of its wheat (Verhoeven 2015). During the 2020/21 season, over 500,000 tons of wheat grain were produced in El-Gezira state (FAO 2020). The total area planted with wheat during the winter 2020/21 season reached 510,000 acres, with production expected to cover more than 60 percent of domestically covered consumption, or about 15 percent of total wheat consumption (Asharq Al-Alawsat 2021).

Given the sheer importance of the El-Gezira Scheme, we sampled 385 farmers from El-Gezira Scheme area. The following sections provide descriptive findings from this survey.

2.1.1 Farmers' demographic and household characteristics

Table 2.1.1 provides an overview of the demographic and household characteristics of the sample of farmers selected for this wheat value chain study. Almost all (98 percent) interviewed farmers are men, with an average age of 51 years. Based on self-reported literacy, most farmers (about 94 percent) can read and write with understanding in at least one language and have attended formal schooling. About 90 percent have completed at least primary school and 10 percent have no formal education.

Farming is the only main occupation for about 60 percent of respondents; the remaining 40 percent have other occupations in addition to farming. For example, 12 percent have wage and salary employment, and 21 percent cited also doing commercial work. The average household size is 5.3 persons; the adult household size is 3.7 persons, with 1.6 persons, on average, participating in farming.

The majority (81 percent) of farmers in the sample have more than 10 years of experience in farming business, 14 percent have 5–10 years of experience, and only 5 percent have less than 5 years of experience.

Table 2.1.1 Farmers' demographic and household characteristics

Variable	Mean	Standard deviation
Age (years)	51.5	12.33
Male (%)	98.4	12.4
Can read and write (%)	94.3	23.2
Attended school	93.5	24.6
Education category (%)		
No education	10.1	
Primary	17.7	
Secondary	37.4	
Post-secondary	34.8	
Occupation category (%)		
Farming only	58.7	
Farming and wage/salary employee	12.2	
Farming and commercial works	20.5	
Farming and other works	8.6	
Household size (#)	5.3	2.5
Adult household size (#)	3.7	2.1
Adult household size participating in farming (#)	1.6	1.1
Experience in farming (%)		
Less than 2 years	0.9	
Between 2 and 5 years	4.4	
Between 5 and 10 years	14.2	
More than 10 years	80.5	
Number of observations	**385**	

Source: Authors' calculations from farmers survey, 2021.

2.1.2 Wheat crop cultivation

Wheat is largely grown using irrigation during the months of October and November and is harvested in March and April.

To analyze farmers' crop production preferences, farmers in the sample were asked which crop they would cultivate more of if they had more land, and why. Farmers' preferences were elicited from a list of cereal crops that included wheat, sorghum, rice, and maize. Table 2.1.2 cross-tabulates farmers' responses to these questions, summarizing their crop preferences and the main reasons for their chosen preference.

Wheat was ultimately the most preferred cereal crop to cultivate by farmers in the sample. The majority would choose to cultivate more wheat (95 percent: 366 of 385 in Table 2.1.2) over sorghum (4 percent) and other crops (negligible percent). Farmers attributed their preference for wheat to consumption/food security (27 percent), profitability (22 percent), lower cost of production (20 percent), and market potential and price (15 percent).

Table 2.1.2 Farmers' preferences for cultivation of certain crops and reasons why

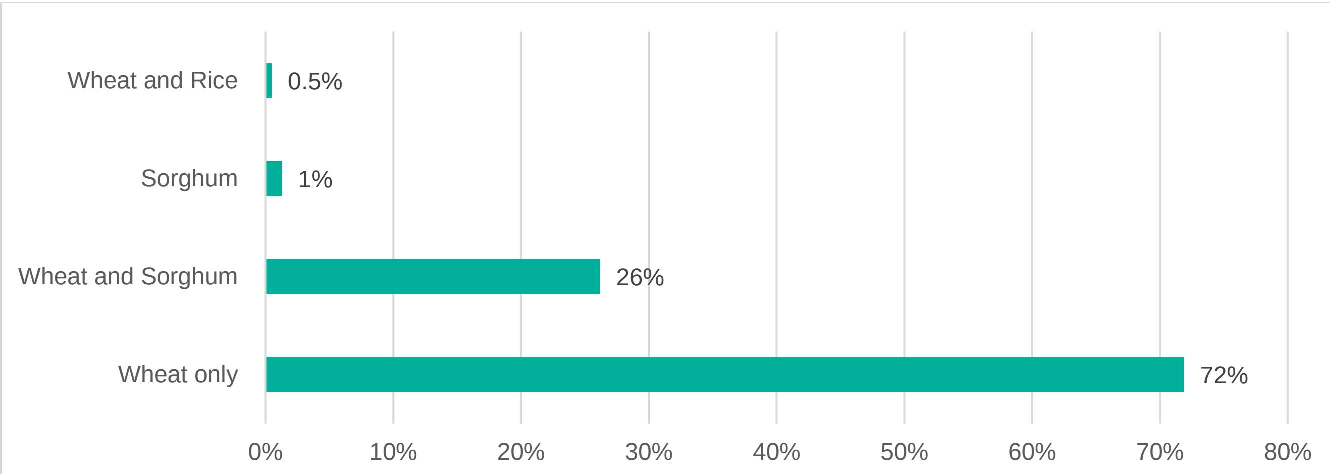
	Preferred crop to cultivate									
	Wheat		Sorghum		Rice		Maize		Total	
Reason crop preferred	No.	%	No.	%	No.	%	No.	%	No.	%
Consumption/food security	97	26.5	7	46.7	0	0	0	0	104	27
Market potential and price	54	14.8	0	0	1	50	0	0	55	14.3
Water saving	5	1.4	0	0	0	0	0	0	5	1.3
Timing of production	16	4.4	1	6.7	0	0	0	0	17	4.4
Cost of production	74	20.2	1	6.7	0	0	0	0	75	19.5
Maturity period	10	2.7	0	0	0	0	0	0	10	2.6
Profitability	81	22.1	1	6.7	1	50	2	100	85	22.1
Other	29	7.9	5	33.3	0	0	0	0	34	8.8
Total	366	100	15	100	2	100	2	100	385	100

Source: Authors' calculations from farmers survey, 2021.

Nine out of ten (91 percent) farmers cultivated their own fields, about 6 percent cultivated rented fields, and 2 percent cultivated sharecropping fields. Regarding the cost of production, about 94 percent and 84 percent of farmers hired machinery and labor, respectively, for field preparation and cultivation. The majority (55 percent) reported that their fields had access to irrigation water at least every 10 days, and about 24 percent had daily access to irrigation water.

Asked about their preference for growing cereal crops, during the winter 2020/21 season, almost all farmers (98 percent) indicated that they had cultivated at least one cereal crop. In fact, 72 percent cultivated only wheat, while 26 percent cultivated wheat and sorghum (Figure 2.1.2).

Figure 2.1.2 Percentage of farmers who cultivated cereal crops



Source: Authors' calculations from farmers survey, 2021.

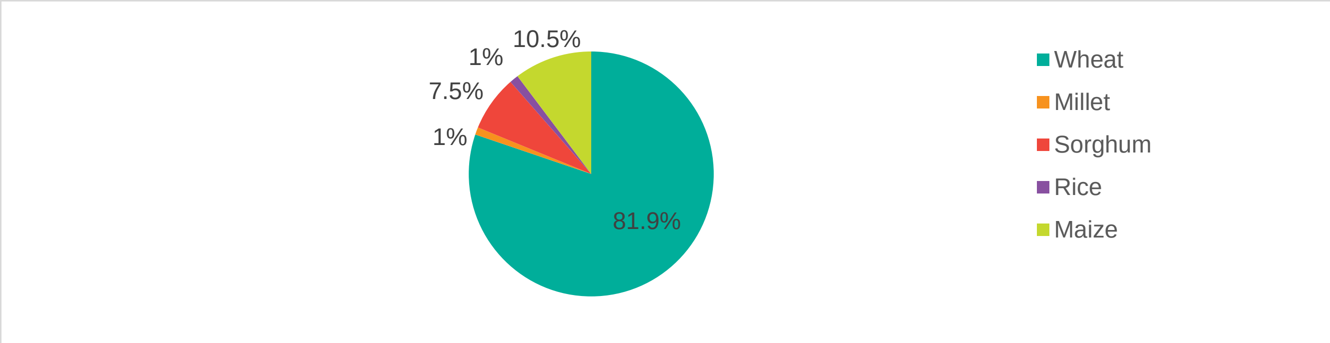
2.1.3 Wheat crop harvest

Among surveyed farmers, the average cultivated land area was 10.3 feddans for all crops and 10.5 feddans for wheat. The average amount harvested was 105.5 sacks for all crops and 81.9 sacks for wheat (Figure 2.1.3 provides total harvest for each crop). The average yield was 13.4 sacks per feddan for all crops, and 8.6 sacks per feddan for wheat. This is slightly above the national wheat yield, which is about 2 tons per hectare[4] (MoANR 2021).

For the winter 2020/21 harvest season, farmers reported that wheat was sold at price per sack of approximately 13,500 SDG. This price coincides with the government's latest announced concentration price as of March 2021.

[4] A hectare is equal 2.4 feddan

Figure 2.1.3 Distribution of total harvest (in sacks) by crop

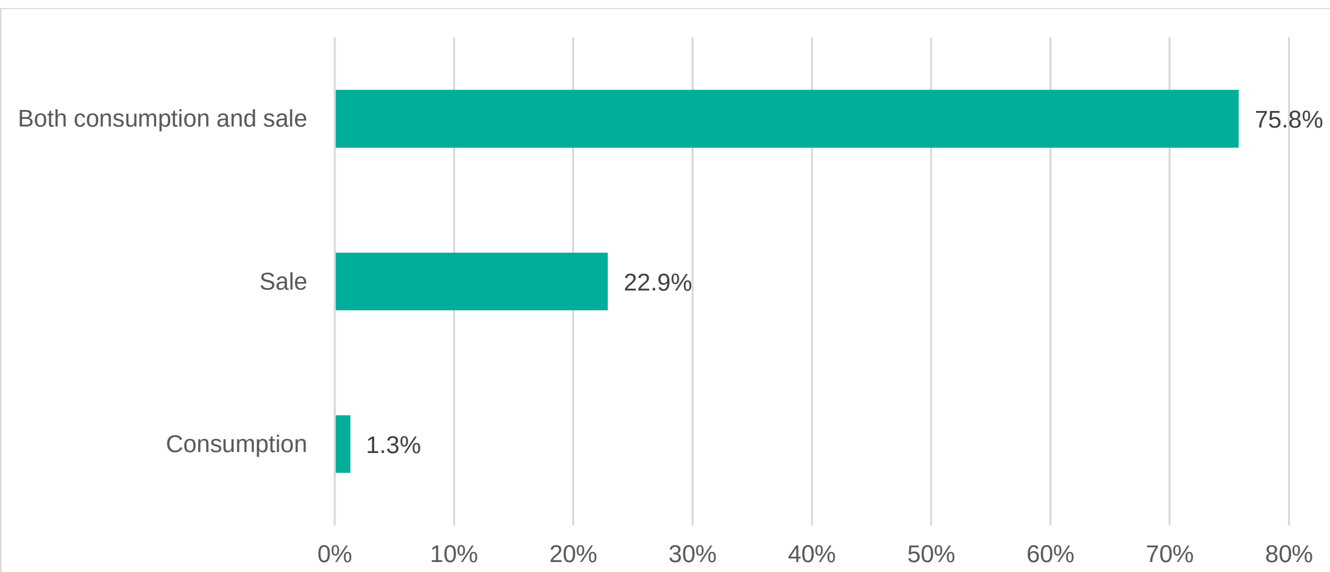


Source: Authors' calculations from farmers survey, 2021.

Note: 1 sack = 100 kg.

Asked whether they mainly produce wheat for consumption or for commercial purposes, 76 percent of surveyed farmers indicated that they produced wheat for both consumption and sale, while 23 percent produced wheat for commercial purposes only (Figure 2.1.4). This suggests that even in the El-Gezira Scheme, the nation's largest wheat-producing area, wheat production is not yet fully commercialized, although farmers sell a large share of their production. This may suggest the need for market orientation and marketing support to farmers.

Figure 2.1.4 Percentage of farmers producing wheat for consumption and sale



Source: Authors' calculations from farmers survey, 2021.

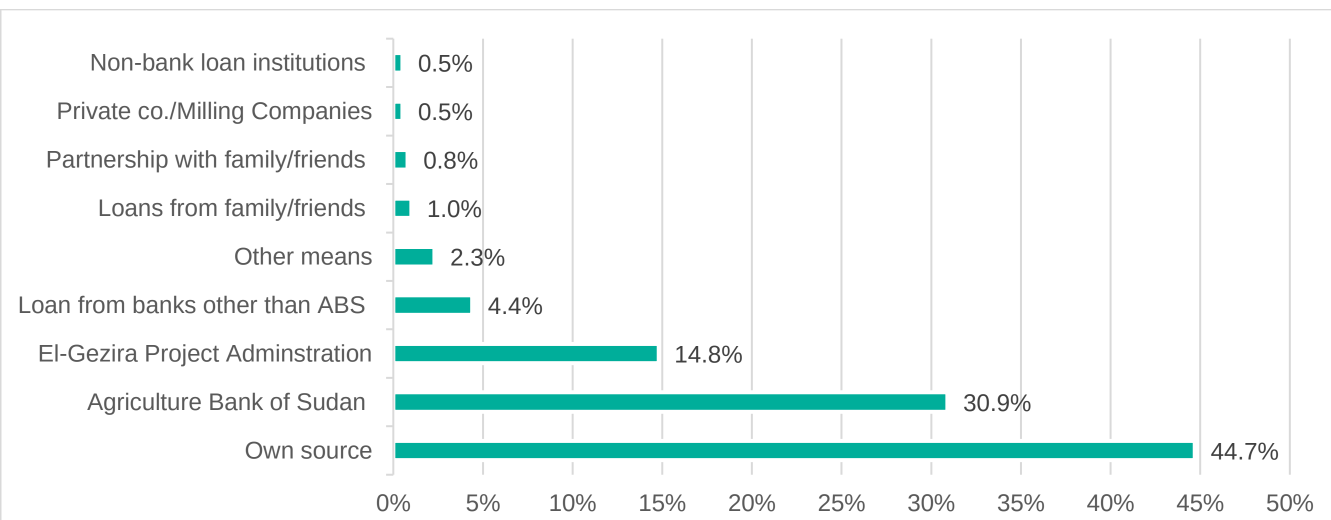
2.1.4 Sources of capital

Access to finance is considered one of the key bottlenecks faced by wheat farmers.[5] As highlighted in earlier sections, the Government of Sudan attempted to address this issue by giving farmers access to finance through the El-Gezira Project Administration and the ABS. The El-Gezira Project Administration finances farmers by supplying them with needed inputs of production: fertilizers, seeds, and soil enhancers. The rest of the farm/land preparation costs for farming are usually covered by the farmer, including the costs of irrigation, harvesting, and packaging. Once the harvest is ready, the farmer calculates the amount of wheat grain harvested per one sack of seeds. According to the number of sacks/quotas the farmer initially received from the Administration, the farmer is obliged to deliver an equivalent amount of wheat grain sacks back to the Administration. The rest of the wheat harvest is usually sold by farmers themselves in any open market or they may reserve some for personal consumption.[6]

In contrast, the ABS similarly supplies farmers with necessary inputs for production, but farmers financed this way are not obliged to sell their harvest back to the ABS. These farmers can compare the market price per sack of wheat with the price provided by the ABS and sell at the higher of the two. That is, if the ABS concentration price is higher than the market price, farmers can sell back to the ABS; conversely, if the ABS concentration price is lower than the market price, then farmers usually sell their produce in the market and pay back in cash the costs of production borrowed from the ABS.

The surveyed farmers were asked to identify the main source of capital for farming and cultivation of wheat. Almost one-half (45 percent) used their own source; the ABS was the main source of finance for about 31 percent; and the El-Gezira Project Administration was the source for 15 percent. Other financing sources such as the private sector/ milling companies and banks were not identified as a main source of capital for farming wheat (Figure 2.1.5).

Figure 2.1.5 Main source of finance for farmers



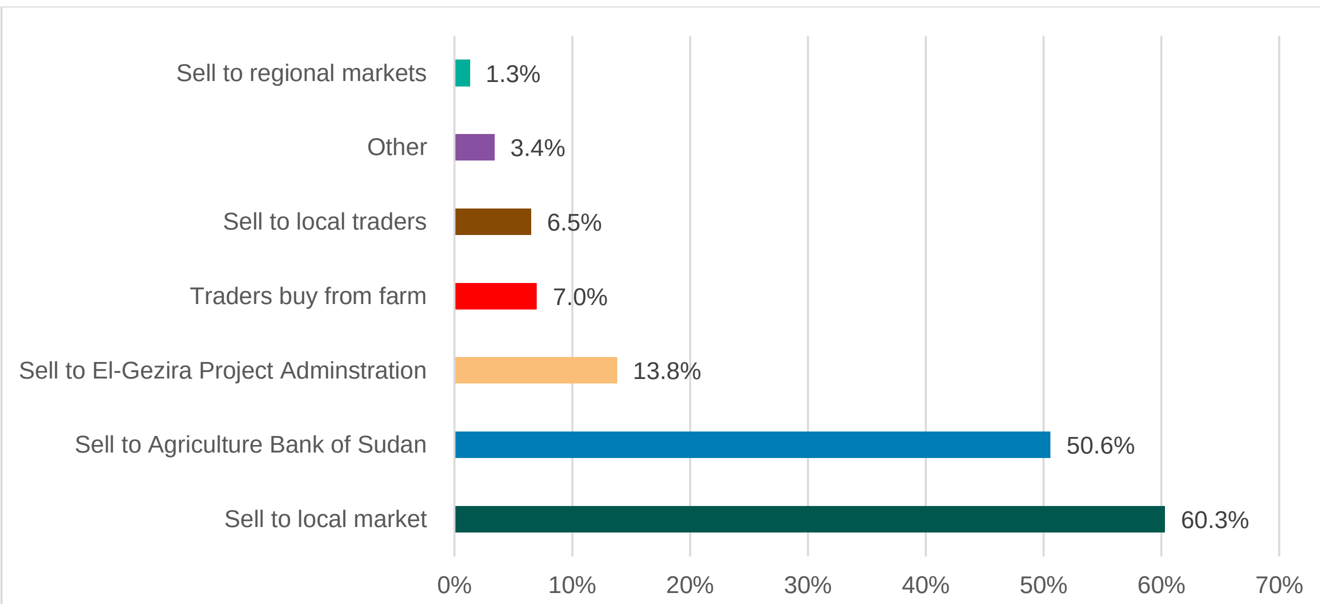
[5] Focus group discussion with enumerators.

[6] Interview with a farmer in the El-Gezira Scheme.

Source: Authors' calculations from farmers survey, 2021.

Indeed, if a farmer has sufficient capital and can afford to buy the necessary inputs of production from the market, he will choose self-financing and simply pay the El-Gezira Project Administration's operational fees (set by the Administration per feddan to account for water/irrigation costs and the Administration's management overhead costs). Self-financed farmers may choose to sell their harvest to the private sector, the ABS, or the El-Gezira Project Administration. or directly in an open market, with liberty to sell at the highest available price.[7] Consequently, when surveyed farmers were asked where they sold their harvested wheat, farmers were allowed to choose more than one option. Figure 2.1.6 indicates that 60 percent of farmers reported selling their wheat grain harvest to the local market. Meanwhile, approximately 51 percent sold to the ABS, although the ABS only financed 30 percent of the sample, which indicates that the ABS likely offers competitive market prices or is commonly resorted to as a key marketplace for farmers.

Figure 2.1.6 Places where farmers usually sell wheat



Source: Authors' calculations from farmers survey 2021.

2.2 Wholesalers and retailers

Wheat traders in Sudan are the middlemen who play an intermediary role in the domestic wheat value chain. They provide core marketing and distributional functions to facilitate business interactions between domestic wheat producers (farmers) and end consumers (for example, households, supermarkets, and small shops). A wheat wholesaler in Sudan typically buys goods from a farmer and resells them to either another wholesaler or a retailer. Retailers, on the other hand, deal directly with

[7] Interview with a farmer in the El-Gezira Scheme.

end consumers, and hence typically sell to households, supermarkets, shop owners, or other retailers. Wheat traders (wholesalers and retailers) in Sudan are scattered around major cereal markets and states. For example, wheat wholesalers and retailers cover major seasonal and weekly cereal markets. Wheat is available year-round in these markets, not just in the postharvest season.

2.2.1 Traders' demographic characteristics

Our rapid survey in September 2021 included a total of 251 traders (200 wholesalers and 51 retailers) in El-Gezira and Khartoum states. Table 2.2.1 provides an overview of the demographic and household characteristics of the sample of traders selected for this wheat value chain study. Almost all (94 percent) interviewed traders were men, with an average age of 45 years. Based on self-reported literacy, most traders (about 76 percent) can read and write with understanding in at least one language and have attended formal schooling. About 75 percent have completed at least primary school and 25 percent have no formal education.

More than 86 percent of surveyed traders (wholesalers and retailers) engage only in trading activities; the remaining 14 percent have other occupations in addition to trading. Surveyed traders who are occupied with other business activities either have their own farmlands producing wheat or operate milling facilities to produce wheat flour.

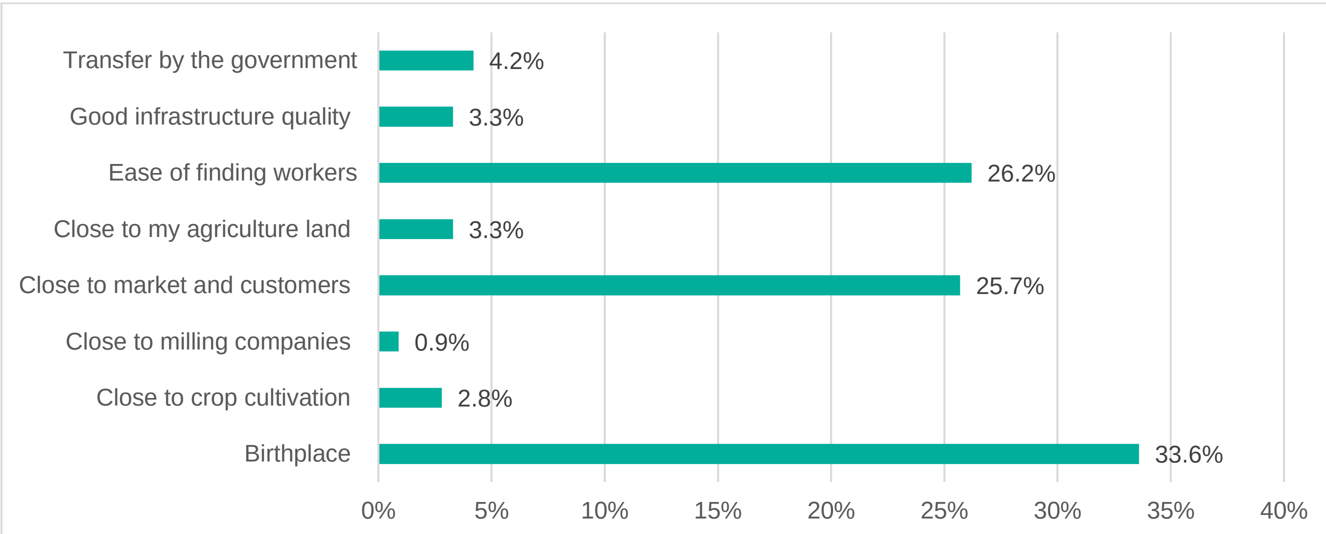
Table 2.2.1 Traders' demographic characteristics

Variable	Mean	Standard deviation
Age (years)	45.5	11.6
Male (%)	93.6	24.4
Can read and write (%)	76.5	42.4
Attended school? (%)	78.1	41.4
Education category (%)		
No education	24.7	
Primary	18.3	
Secondary	37.1	
Post-secondary	19.9	
Occupation category (%)		
Engaged in trading activities	86.4	
Owns a milling facility	3.9	
Producer of local wheat	5.6	
Dairy farming/livestock breeding	3.2	
Employee in a private company	1.2	
Produces other crops	2	
Experience in trading (%)		
Less than 5 years	17.9	
Between 5 and 10 years	8.8	
Between10 and 20 years	37.4	
More than 20 years	35.9	
Number of observations	251	

Source: Authors' calculations from traders' survey 2021.

Asked why they chose specific locations to establish their businesses, traders in the sample identified birthplace, proximity to markets, and ease of finding workers as key determinants (Figure 2.2.1).

Figure 2.2.1 Justification for business location – Traders

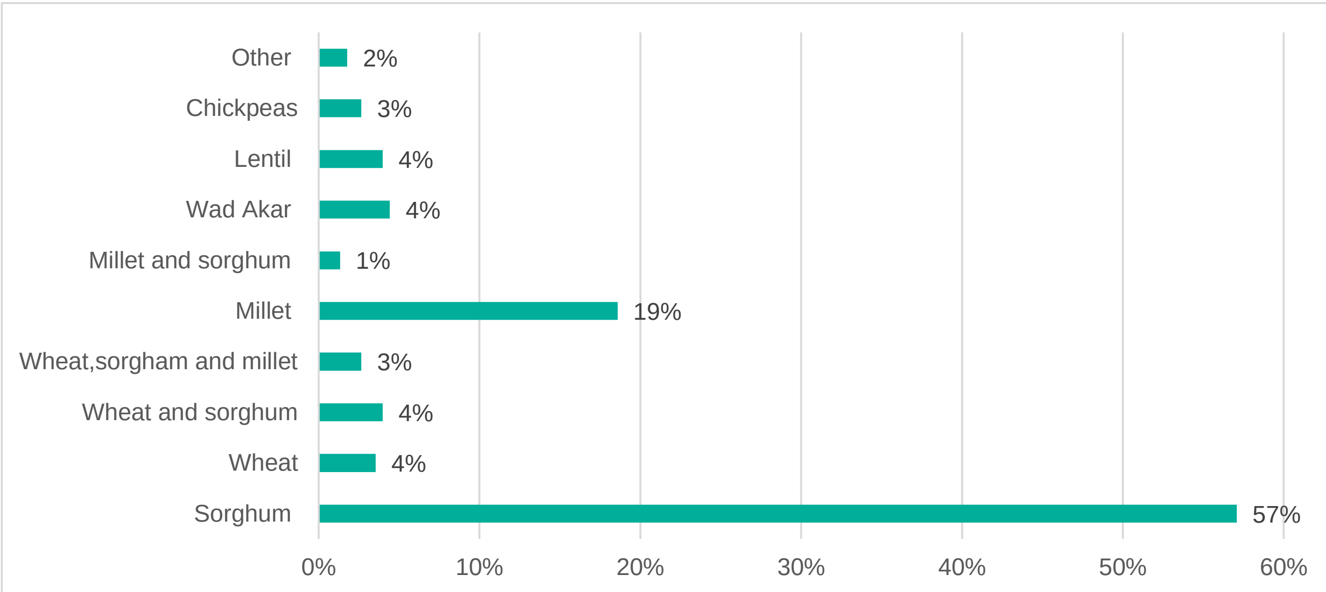


Source: Authors' calculations from traders' survey 2021.

More than 70 percent of traders in the sample have operated in their business for more than 10 years. Most traders (wholesalers and retailers) reported being formally registered by the government. Around 72 percent of the sampled traders are registered by the government's designated ministries. Meanwhile, of those 29 percent who are not formally registered by the government, one-half reported that they aim to formally register their business (that is, to work under a commercial register).

Most (90 percent) sample respondents reported that they trade several cereal crops besides wheat. Sorghum's varieties (such as Tabet and Fetrieta) were the top traded cereal varieties besides wheat, while millet ranked second. Crops such as lentils and chickpeas were less frequently reported.

Figure 2.2.2 Cereal crops commonly traded by respondents[8]



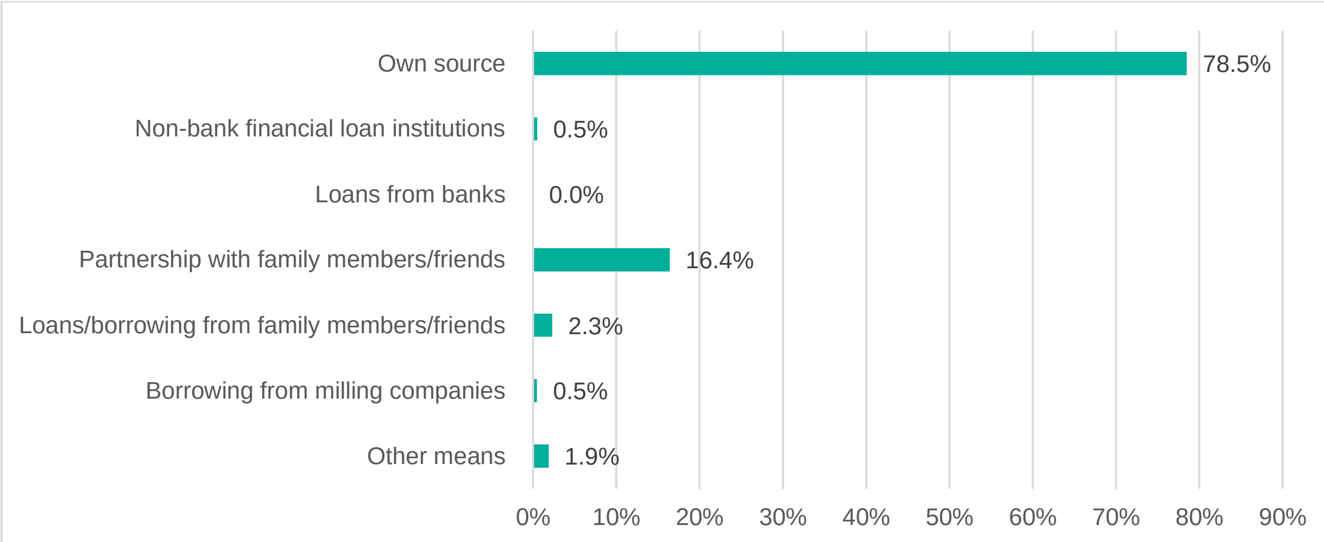
Source: Authors' calculations from traders' survey, 2021.

2.2.2 Sources of capital

The surveyed traders (wholesalers and retailers) were asked to identify their main sources of start-up capital. Figure 2.2.3 illustrates that most traders (79 percent) relied on their own sources. The second most common source of start-up capital was friends and family (16 percent partnered with family members and 2 percent took loans or borrowed from family members). Informal finance may have substituted for official financial markets, as traders were more likely to obtain informal financing from friends and relatives than to resort to formal financing sources. Other financing sources such as the private sector, milling companies, and other nonbank financial institutions were rarely identified as the main source of capital for wheat traders.

[8] Wad Akar is one of the Sudanese wheat varieties.

Figure 2.2.3 Main source of start-up capital for traders



Source: Authors' calculations from traders survey, 2021.

2.2.3 Supply chain: Buying and selling transactions

A typical domestic wheat value chain in Sudan has three actors aside from the final consumer: farmers, wholesalers, and retailers. Wholesalers mostly source their wheat from other wholesalers (48 percent) or from farmers directly (23 percent), whereas retailers source their wheat from wholesalers (63 percent) or other retailers (20 percent) (Figure 2.2.4).

Farmers typically sell their wheat grain to large wholesalers. Wholesalers either sell the grain to other regional wholesalers or, to avoid transaction costs, by following the oftentimes more straightforward value chain and selling directly to a retailer.

Figure 2.2.4 Wheat sourcing – Wholesalers and retailers

Source: Authors' calculations from traders survey, 2021.

In terms of logistical procedures, wholesalers reported that either other larger wholesalers deliver wheat grain to their door, or wholesalers pick up grain directly themselves from wholesalers in other regional markets. In some cases, farmers deliver their harvest of wheat grain directly to wholesalers' facilities. Retailers most commonly pick up wheat grain directly from wholesalers' facilities, or in some instances, wholesalers deliver grain directly to retailers' facilities. The typical end consumers for a wholesaler are retailers or other wholesalers, whereas retailers commonly sell wheat grain or wheat flour to rural or urban households, supermarkets, or other retailers (Figure 2.2.5). Both wholesalers and retailers sell their wheat through their own shops. Less than 9 percent of sampled wholesalers reported dealing directly with milling companies to sell local wheat grain.

Figure 2.2.5 End consumers for wholesalers and retailers

Source: Authors' calculations from wheat traders' survey 2021.

2.2.4 Supply chain: Prices and marketing margins

Based on survey findings, the average price per 50-kg sack of wheat grain at the farm gate is 13,922 SDG, in line with the announced government concentration price of 14,000 SDG during the winter 2020/21 season. Wholesalers then sell the wheat grain to other wholesalers or retailers at an average price of 15,460 SDG, for an 11 percent marketing margin. Retailers reported their selling price to end consumers to be an average of 18,374 SDG, realizing the highest marketing margin in the wheat value chain (19 percent).

Figure 2.2.6 Supply chain marketing margins for wheat grain

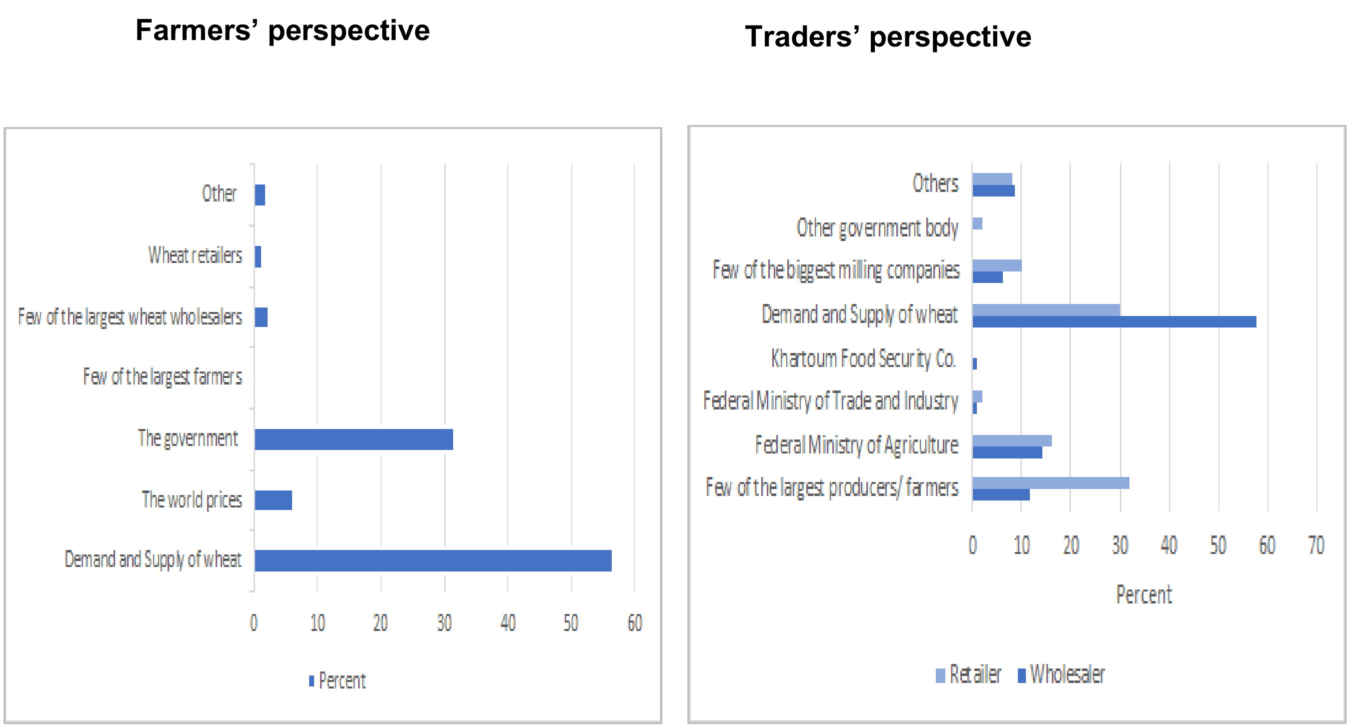
	SDG per 50-kg sack	Marketing margin
Average buying price from farmers	13,922	
Average selling price to retailers	15,460	11%
Average selling price to households	18,374	19%

Source: Authors' calculations from traders survey, 2021.

Farmers, wholesalers, and retailers were asked their opinion on who controls the price of domestic wheat grain in Sudan. Overall, wheat prices are perceived to be largely driven by the market. Most farmers (57 percent) perceived domestic market demand and supply forces to be the driver and (6 percent) see world prices as a key factor determining the price of wheat grain. Almost one-third (31 percent) of farmers perceive the government as the entity influencing or controlling wheat prices.

Retailers' and wholesalers' responses reflect their different views of the business: 58 percent of traders cited forces of supply and demand as the key determinant of wheat grain prices, versus 29 percent of retailers. In addition, 32 percent of retailers suggested that farmers control the price of wheat grain, while 11 percent of wholesalers did so. Contrary to the view of farmers, only 17 percent of retailers and 14 percent of wholesalers perceived the government as the entity that controls prices.

Figure 2.2.7 Who controls wheat grain prices?



Source: Author's calculations from domestic wheat value chain surveys, 2021.

SECTION 3: IMPORTED WHEAT VALUE CHAIN IN SUDAN

3.1 Milling companies

Up until 1996, the government held a monopoly on wheat imports, which were allocated to 20 milling companies through a quota system. When wheat milling was liberalized in 1996, the wheat milling business became dominated by family-owned companies; most existing milling companies started as small family businesses and were inherited and expanded by subsequent generations. Over time, a few milling companies began to dominate wheat imports, milling, and distribution as they adopted more sophisticated technology. Today Sayga, Wheata, Seen, and El-Hamama, among others, hold a significant market share of Sudan's wheat imports (Miller Magazine 2014; FEWS NET 2015). The imported wheat value chain assumes significant importance in Sudan's agrifood system, while being susceptible to potential disruptions arising from financial (limited foreign currency to fund international market orders and inflation), logistical (port closures or mobility disruptions), and policy-related challenges (regularly changing subsidies and procedures).

This section summarizes findings from three structured interviews held with two large milling companies to expand our understanding of the common activities and supply chains involving milling companies in Sudan. Questions covered a few important areas of discussion: What are the common procedures to import wheat, and how have they changed over time? What are the main countries from which wheat grain was imported during the last three to five years? What are the differences between the composition of subsidized and commercial wheat flour? How is wheat handled from the port until it reaches the end consumer/bakeries? How do flour agents, the KFSC, and the resistance committees manage the wheat distribution process?

Phone interviews were mostly conducted between January 21 and January 25, 2022. The interviews were conducted with the Dal group (Sayga) and the El-Hamama group (El-Hamama Flour Mills). While the results may not be nationally representative, Sayga holds more than one-half of the commercial wheat flour market share in Sudan, and El-Hamama is one of the leading five milling companies in terms of production and sophisticated technology. Thus, the information below highlights important insights from two key stakeholders that can inform the understanding of the value chain and the wheat imports landscape in Sudan.

3.1.1 Importing wheat and associated subsidies

Subsidies in the imported wheat value chain mainly entail preferential access to foreign currency for milling companies. In the past, before the 2019 revolution, a milling company would submit an application request to import wheat from a supplier abroad. The Ministry of Finance (MoF) either approves or rejects the request after inspecting the grain origin, specification, price, and quantity. If the MoF approves the request, it releases foreign currency at a subsidized value to the milling company. After the milling company receives the foreign currency, it initiates an import order and pays all import duties and expenses (including logistical and handling costs, shipment, and port rental fees). It then produces a predefined quantity of subsidized wheat flour (set according to its productive capacity) to be distributed among bakeries.

Since the 2019 revolution, this process changed, and is now fully governed and implemented by the Strategic Reserve Corporation (SRCo) and the MoF to better ensure the availability of subsidized flour.

Every season the government directly signs contract agreements with various wheat grain suppliers worldwide (Russia, Australia, and Germany, among others) and initiates import orders. Once the wheat grain shipments arrive in the Sudanese ports, they are handled through the Strategic Reserves Authority and transported to three main outlets (wheat silos).

Three wheat silos are located at the port, owned by the ABS, Sayga, and Seen (the latter two are rented by the government during this process). Imported wheat grain is distributed among the different milling companies through these three outlets based on pre-set quotas depending on their production capacity and their respective bakeries' coverage. Sayga absorbs at least 50 percent of the volume, and the remaining share goes to the other two milling companies. The SRCo in partnership with the KFSC inscribes an official letter for each milling company outlining its designated quota of wheat grain, and the date by which it can collect its share of grain from the designated silo.

Next, an agent from the milling company collects the company's quota and produces wheat flour. The volume of production is based on the pre-agreed quota of subsidized flour each milling company should produce and distribute to bakeries. Production of subsidized wheat flour initiates according to the share of wheat flour each milling company is supposed to produce and deliver to its assigned bakeries. These quantities are set by the KFSC.

Under this subsidy system, the government has already paid the value of imported wheat grain and the milling companies' rental fees, namely fees to cover their operational and processing costs for milling the wheat into flour.

However, the above procedure caused significant shortages of subsidized flour. Thus, after the revolution in 2019, the government began to rely on milling companies to manage the wheat import orders themselves and requested each to dedicate a portion of its wheat grain to subsidized flour production. The MoF paid the milling companies and covered the cost of producing subsidized wheat flour. The government then directly paid the milling companies the difference between the market price and the subsidized price of wheat flour so that it reached bakeries at a subsidized rate.

On January1, 2022, however, the subsidization of wheat was terminated. The government no longer provides any subsidies for wheat flour or grain, and all milling companies now operate with commercial wheat flour (Al-Nilin 2021; Sudan Press 2021).

Commercial flour is imported from various countries and milling companies have different preferred suppliers. Milling companies apply through the MoF, informing the Ministry of the specifications and quantity of imported grain they will purchase. The MoF accordingly finances and provides them with the required foreign currency.

3.1.2 Main origins of imported wheat grain in Sudan

Interviews with milling companies reveal that no set client exists for every season, as they change depending on the offers received, and thus it may be difficult to rank them. However, the most common suppliers are in the Black Sea region (Russia, Romania, and Bulgaria), the United States, Canada, and Australia. Some of these imports occur indirectly.[9]

Table 3.1.1 illustrates the top wheat exporters to Sudan in descending order, based on data from the CBS. In 2020, the top wheat exporting countries to Sudan were Russia, followed by Germany, Romania, Canada, and Bulgaria. While Australia was one of the top wheat exporters in previous years, it was not among the top five exporters in 2020.

Table 3.1.1 Top wheat exporters to Sudan (in value), 2005–2020

Top wheat exporters to Sudan	2005	2011	2015	2020
1	Australia	Germany	Turkey	Russia
2	Canada	Australia	Canada	Germany
3	United States	Canada	Australia	Romania
4	Russia	Pakistan	Germany	Canada
5	Ukraine	Turkey	Poland	Bulgaria

Source: Central Bank of Sudan (2020).

3.1.3 Composition of subsidized and commercial wheat flour

Each of the existing 10 milling companies produce both commercial and subsidized wheat flour and must match the wheat quality with the quality specifications enacted and outlined by the government. Two institutions enact and inspect these wheat flour production specifications: the Sudanese Standards and Metrology Organization (SSMO) and the Sudanese Consumers Protection Society (SCPS).

The difference between subsidized and commercial wheat flour is the extraction rate – the extraction of the husk from wheat grain. In Sudan, subsidized wheat flour is produced at an extraction rate of 85–87 percent, while commercial wheat flour is produced at an extraction rate of 72–78 percent. Thus, the subsidized flour has more bran and is darker in color, whereas commercial wheat flour is white in color, smoother in composition, and known to be of better quality. However, the commercial flour extraction rate varies from one milling company to another, depending on the type of flour produced and the type of bakeries and products (biscuits, pizza, pasta, and other varieties of multipurpose flour) targeted.

3.1.4 Wheat flour distribution from milling companies to bakeries

Wheat flour distribution changes not only from one year to the next, but even more regularly. For example, the Sayga respondent noted that the distribution process changes depending on new procedures and laws enacted. In the past, each milling company relied on its own salespersons and handled the distribution process itself. Before the revolution, the process of distributing subsidized

[9] For example, some milling companies stated that they do not directly import from the United States, but rather mostly import through a Cargill (a privately held American global food corporation) office based in Canada.

wheat flour was handled through flour agents. Each agent was responsible for a set of bakeries in his region and handled the necessary logistical operations through his designated agency.

After the revolution, the government established the KFSC to handle and monitor the distribution process and eliminated the role of flour agents in Khartoum state. However, respondents suggested that logistical procedures differ. Originally, milling companies delivered their subsidized flour output to the KFSC, which handled distribution to bakeries. The government ordered each locality official to pick up the subsidized flour quota for his own locality, under KFSC supervision. This proved unsustainable as localities did not have the financial or technical capacity to handle such mass distribution procedures. Under the current process, each milling company agent has trucks filled with sacks of flour to distribute among its bakeries, and a KFSC inspector oversees and monitors the process to ensure that each bakery receives its designated quota.

While the KFSC oversees the subsidized wheat flour distribution process from milling companies to bakeries, resistance committees oversee the process of bread distribution from bakeries to consumers. The respective aim of each entity is to ensure fair and egalitarian distribution of subsidized wheat flour and of citizens' access to subsidized bread.

3.2 Flour agents

As discussed in the introduction, flour agents' roles witnessed a few changes after the 2019 revolution. Instead of relying on flour agents to distribute subsidized wheat flour to bakeries, the government established the KFSC to actively monitor and distribute subsidized wheat flour together with localities. These changes were meant to ensure the fair distribution of subsidized wheat flour to bakeries and limit potential leakage to the black market. Over time, the KFSC became the main distributor of subsidized wheat flour, while flour agents continued to trade and distribute commercial wheat flour to bakeries and retail outlets (Resnick 2021).

3.2.1 Flour agents' demographic characteristics

Table 3.2.1 presents the demographic characteristics of surveyed flour agents. The average age of the sampled flour agents was 48.5 years. All interviewed flour agents were men. Most of the sample (more than 90 percent) claimed an ability to read and write and all had attended school. One in five (19.5 percent) had completed primary education while over 37 percent had pursued higher education after completing secondary school. More than 65 percent of respondents established their businesses within the past 5 to 10 years, while the rest of the sample (34 percent) had more experience in the wheat market. Unlike domestic wheat traders, nearly all flour agents (98 percent) were solely occupied with wheat distribution as their main business activity in the wheat value chain. Besides their main business activity, 54 percent of flour agents belonged to the resistance committee.

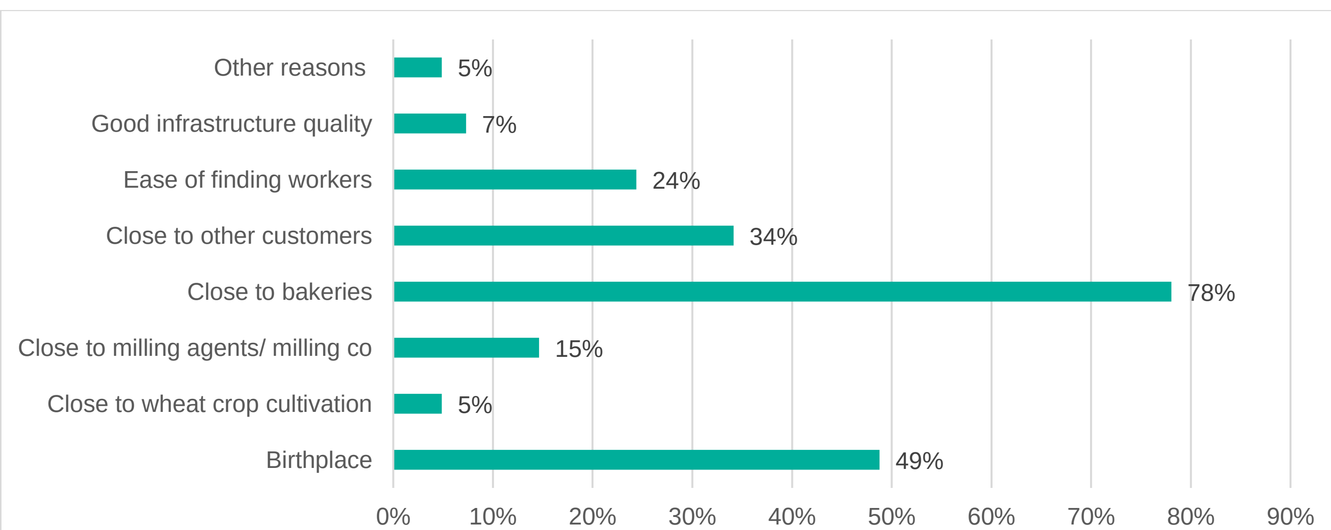
Table 3.2.1 Flour agents' demographic characteristics

Variable	Mean	Standard deviation
Age (years)	48.5	8.2
Male (%)	100	
Can read and write (%)	92.7	26.3
Attended school (%)	100	
Education category (%)		
Primary	19.5	
Secondary	43.3	
Post-secondary	37.2	
Experience as flour agent (%)		
Less than 5 years	43.9	
Between 5 and 10 years	22.0	
Between 10 and 20 years	19.5	
More than 20 years	14.6	
Number of observations	**41**	

Source: Authors' calculations from flour agents survey, 2021.

Flour agents were asked to elaborate why they chose to establish their shops/facilities in their particular place, with the option to select more than one answer. The majority (78 percent) preferred to operate close to bakeries, while around 50 percent preferred their birthplace (Figure 3.2.1). All sampled agents were either registered in the government (98 percent) or aimed to register themselves soon (2 percent).

Figure 3.2.1 Justification for business location – Flour agents

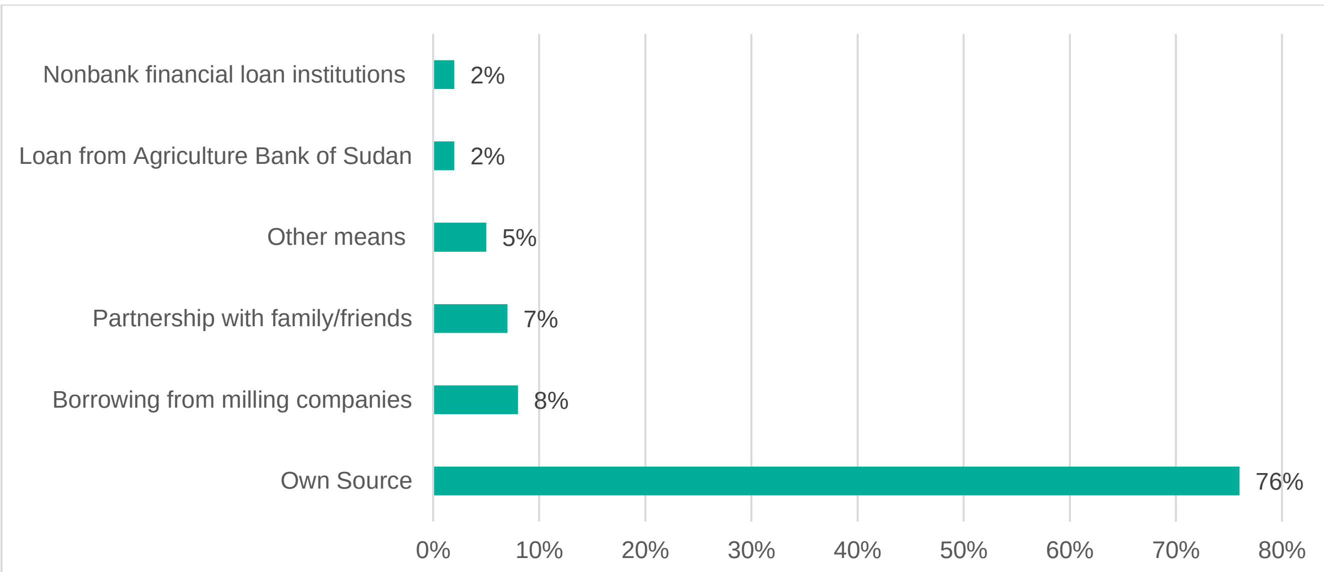


Source: Authors' calculations from flour agents survey, 2021.

3.2.2 Distribution activities

As mentioned earlier, two compositions of wheat flour are traded in the Sudanese market: subsidized and commercial. When asked which type of wheat flour they distribute, 76 percent of flour agents claimed to distribute commercial wheat flour to bakeries, 9 percent distributed subsidized wheat flour, and 15 percent distributed both types of wheat flour. Almost all (95 percent) surveyed flour agents did not usually distribute/trade any other kinds of crops besides wheat flour.

Figure 3.2.2 Main source of start-up capital for flour agents



Source: Authors' calculations from flour agents survey, 2021.

As shown in Figure 3.2.2, 76 percent of respondents financed their start-up capital from their own sources. The remaining sample either financed through milling companies (8 percent) or were supported by informal sources such as family members or friends (7 percent).

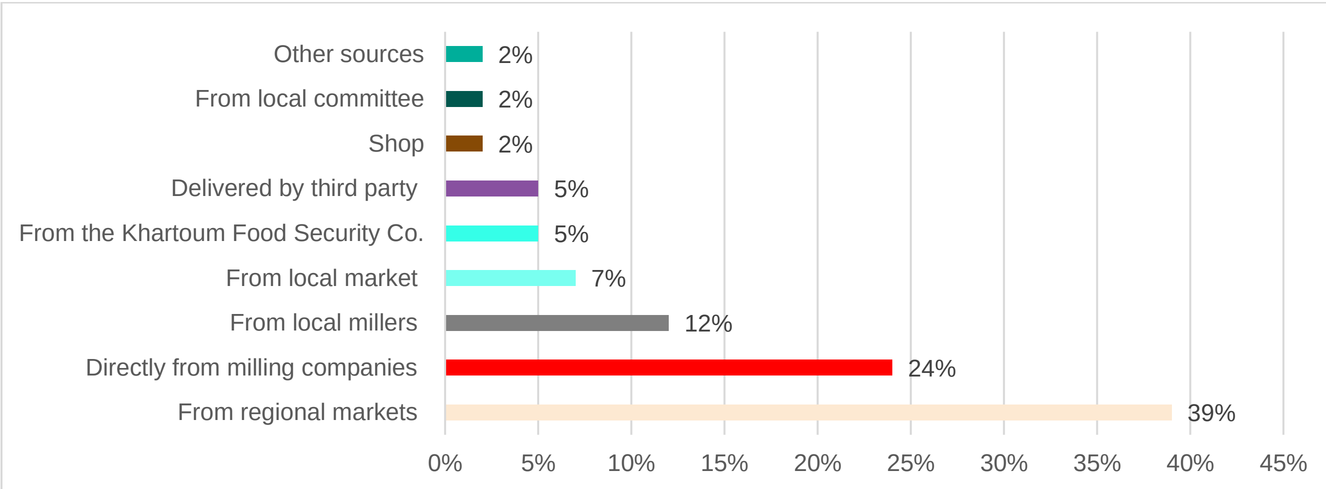
3.2.3 Supply chain and production

Flour agents obtain their wheat flour from different sources and distribute it to bakeries. The relationships between flour agents and their sources of wheat flour and bakeries are described next.

3.2.3.1 **Relationship between flour agents and milling companies**

Almost 40 percent of sampled flour agents sourced wheat from regional markets (Figure 3.2.3). Meanwhile, around 24 percent sourced wheat flour directly from milling companies. Additional secondary sources were also reported, such as buying directly from local millers (12 percent), the local market (7 percent), and the KFSC (5 percent).

Figure 3.2.3 Wheat sourcing – Flour agents



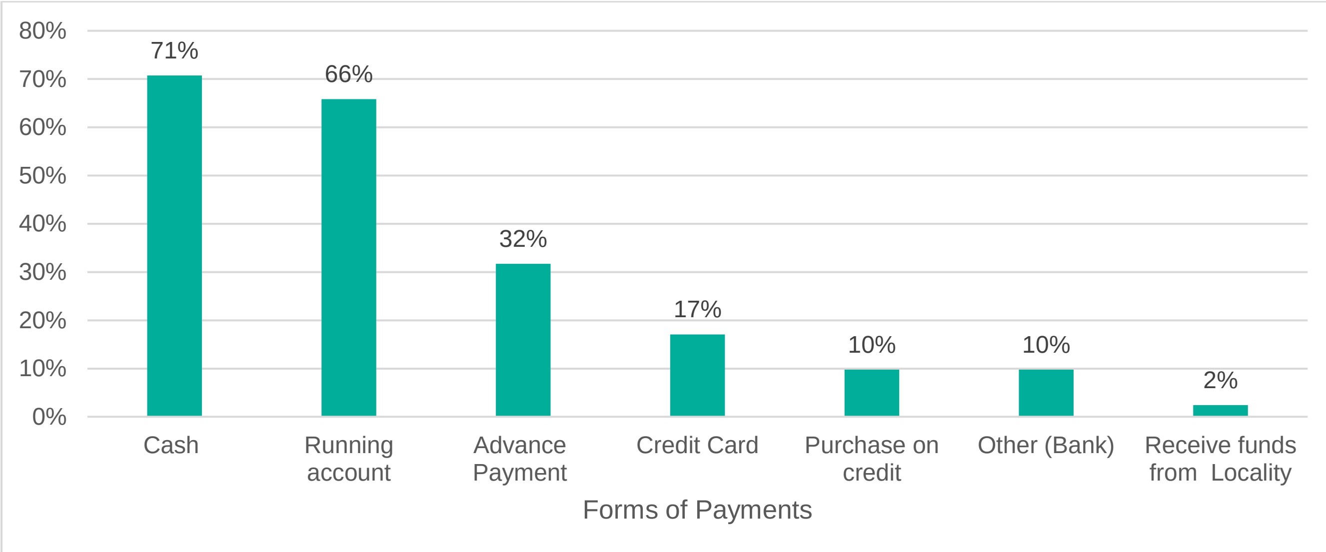
Source: Authors' calculations from flour agents survey, 2021.

Although many milling companies operate within Sudan's wheat market, only three major milling companies – Sayga, Wheata, and Seen– have led wheat imports, milling, and distribution since wheat milling was liberalized in 1996 (FEWS NET 2015).[10] Our results are in line with recent market observations: Sayga ranked as the first source of wheat flour for flour agents among milling companies, while Wheata and Seen ranked second and third, respectively. Other milling companies such as Rotana and El-Hamama were less frequently mentioned.

Figure 3.2.4 reveals that 71 percent of sampled flour agents paid milling companies in cash, while 66 percent kept a running account in a bank as the second-best option.

[10] Based on Sudan News Agency (2020), Seen and Sayga have received 124,823 and 92,000 tons of domestic wheat grain, respectively, followed by 65,244 tons for Wheata for the 2020 harvest. The remaining milling companies such as Rotana and El-Hamama received around 22,000 tons or less.

Figure 3.2.4 Forms of payment used by flour agents to pay milling companies[11]



Source: Authors' calculations from flour agents survey, 2021.

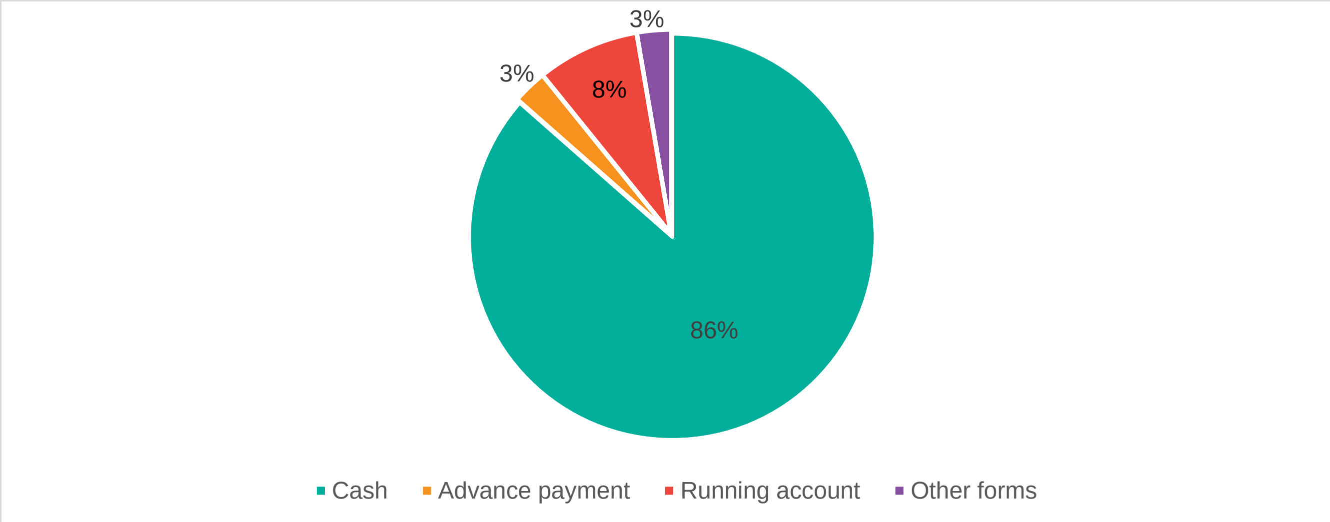
3.2.3.2 Relationship between flour agents and bakeries

As stated earlier, flour agents are currently involved in providing commercial wheat flour to bakeries or other retail outlets (Resnick 2021). Nearly 50 percent of interviewed flour agents relied on their own shops to distribute wheat flour to bakeries while 44 percent claimed to sell wheat flour in an open market within the same town.

Figure 3.2.5 indicates that 86 percent of flour agents collected their money from bakeries in cash while the remaining 14 percent relied on other methods, such as keeping a running account (8 percent) and advance payments (3 percent).

[11] Survey question allowed for selection of multiple options.

Figure 3.2.5 Forms of collecting payment for wheat flour from bakeries

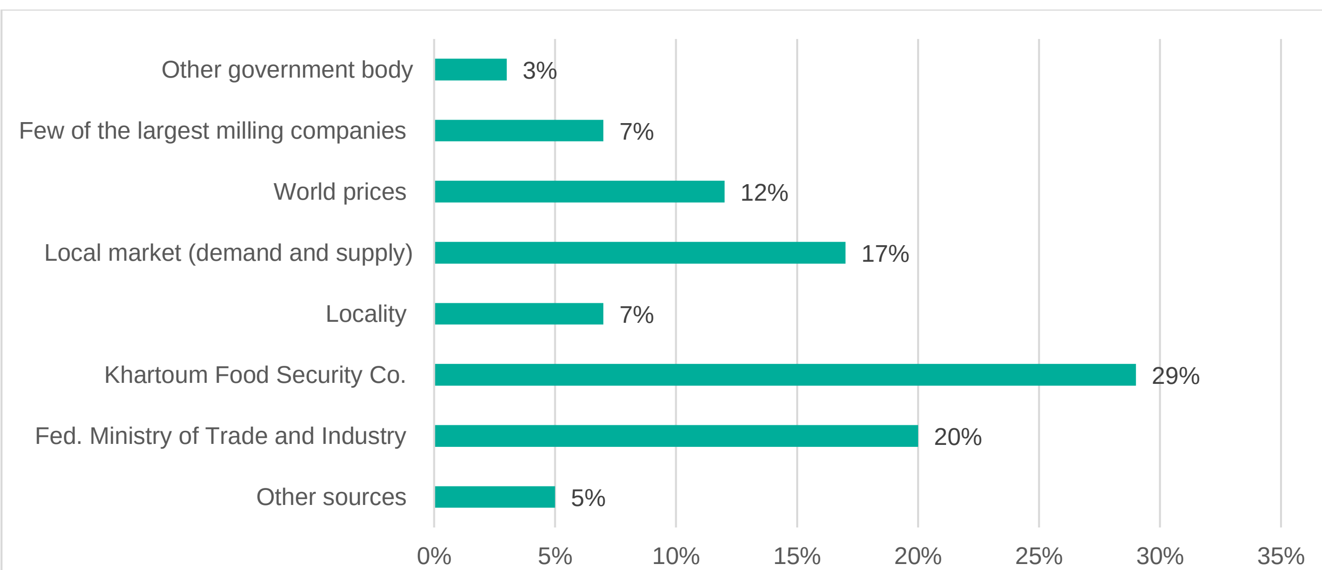


Source: Authors' calculations from flour agents survey, 2021.

3.2.4 Prices and market margins

The price of subsidized wheat flour is controlled and set by government-designated bodies such as the Ministry of Trade and Industry. Nevertheless, the commercial wheat flour price is set freely to reflect demand and supply in the Sudanese market. Flour agents were asked to share their thoughts about who controls the price of commercial wheat flour. As shown in Figure 3.2.6, responses were scattered and varied. The KFSC was perceived by 29 percent as the controller of the commercial wheat flour price, while 20 percent of the sample saw the Ministry of Trade and Industry as the price setter. Demand and supply in the local market seemed to be less impactful in determining commercial wheat flour prices, contrary to expectations. This finding is inconsistent with the typical market dynamics that used to drive Sudan's economy.

Figure 3.2.6 Who sets the price for commercial wheat flour?



Source: Authors' calculations from flour agents survey, 2021.

3.3 Bakeries

3.3.1 Bakeries respondents' demographic characteristics

Sudan has two types of bakeries: "balady" and "mechanized" bakeries. Balady bakeries only use subsidized flour to produce subsidized bread and are considered Sudan's main distribution outlet for balady-subsidized bread. According to the country's laws and regulations, it is illegal for a balady bakery to purchase or operate with commercial wheat flour. Mechanized bakeries are allowed to operate with both subsidized and commercial flour to produce either balady or commercial bread. Some mechanized bakeries specialize in the production of higher-quality bakery items only (biscuits and pies, among other pastries).

Our rapid survey in September 2021 included a total of 182 bakeries in El-Gezira and Khartoum states; 122 were balady bakeries, 43 were mechanized bakeries, and 17 were characterized as both. Table 3.3.1 provides an overview of the demographic and household characteristics of the sample of bakeries selected for this wheat value chain study. Essentially all (99 percent) interviewed respondents were men, with an average age of 41 years. Based on self-reported literacy, most bakeries respondents (about 94 percent) can read and write with understanding in at least one language and had attended formal schooling. About 89 percent of bakeries respondents had completed at least primary school and approximately 11 percent reported having no formal education.

Most of the sample (84 percent) was involved in the bakery business as their only main occupation; the remaining 16 percent had other occupations in addition to the bakery business. Of those 16 percent with other occupations, 39 percent were involved in other commercial activities (non-agriculture-related work), 25 percent worked as government employees, and 14 worked as employees in the private sector.

The majority (55 percent) of sampled respondents reported having less than 5 years of experience in the bakery business; 13 percent had 5–10 years of experience; 20 percent had 10–20 years of experience, and 12 percent had more than 20 years of experience.

Almost all sampled bakeries (98 percent) were registered by the government's designated ministries; only 2 percent reported not being formally registered by the government.

Table 3.3.1 Bakeries respondents' demographic characteristics

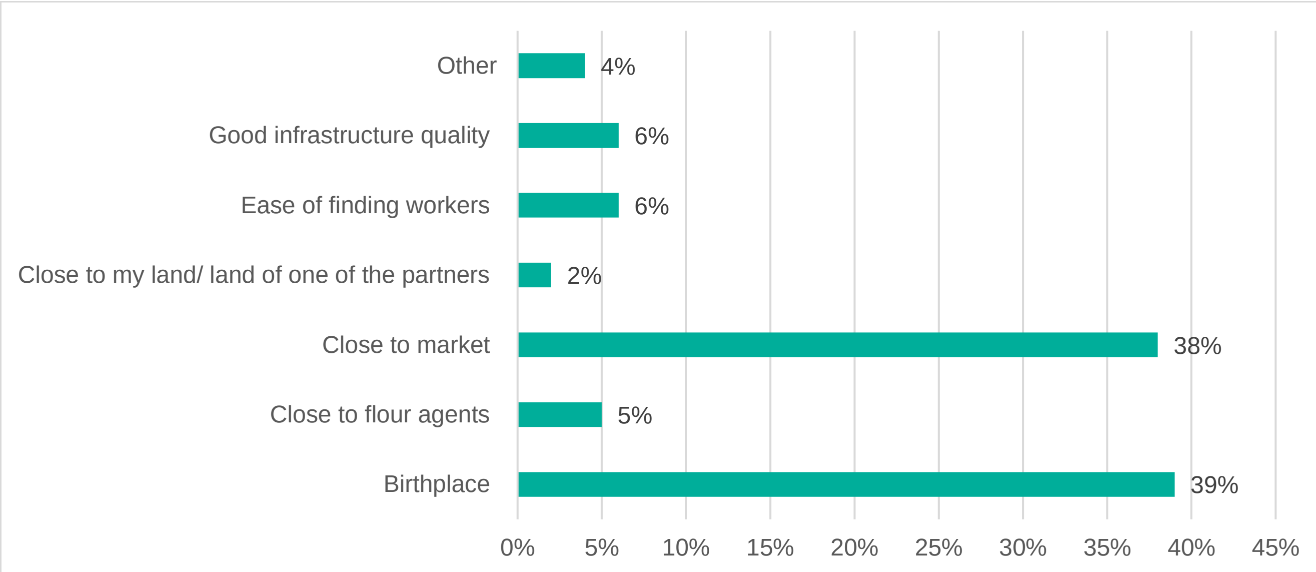
Variable	Mean	Standard deviation
Age (years)	41.4	12.0
Male (%)	99.4	7.0
Can read and write (%)	93.4	24.8
Attended school	93.4	25.0
Education category (%)		
No education	11.5	
Primary	11.0	

Secondary	45.6
Post-secondary	31.9
Occupation category (%)	
Baking only	84.1
Other occupation (of which, see below)	15.9
Owns a milling facility	3.6
Producer of local wheat	3.6
Government employee	25.0
Employee in a private company	14.3
Commercial, nonagricultural work	39.3
Other activities	14.2
Experience in baking (%)	
Less than 5 years	55.0
Between 5 and 10 years	13.2
Between 10 and 20 years	19.8
More than 20 years	12.0
Type of bakery (%)	
Balady bakery	66.6
Mechanized bakery	23.9
Both	9.9
Number of observations	182

Source: Authors' calculations from bakeries survey, 2021.

Most respondents were either single owners (39 percent) or hired managers (37 percent) in bakeries; only 8 percent were partners and 7 percent were workers. Asked why they chose specific locations to establish their business, partners or owners of bakeries identified birthplace, proximity to markets, and proximity to flour agents as key determinants (Figure 3.3.1).

Figure 3.3.1 Justification for business location – Bakeries

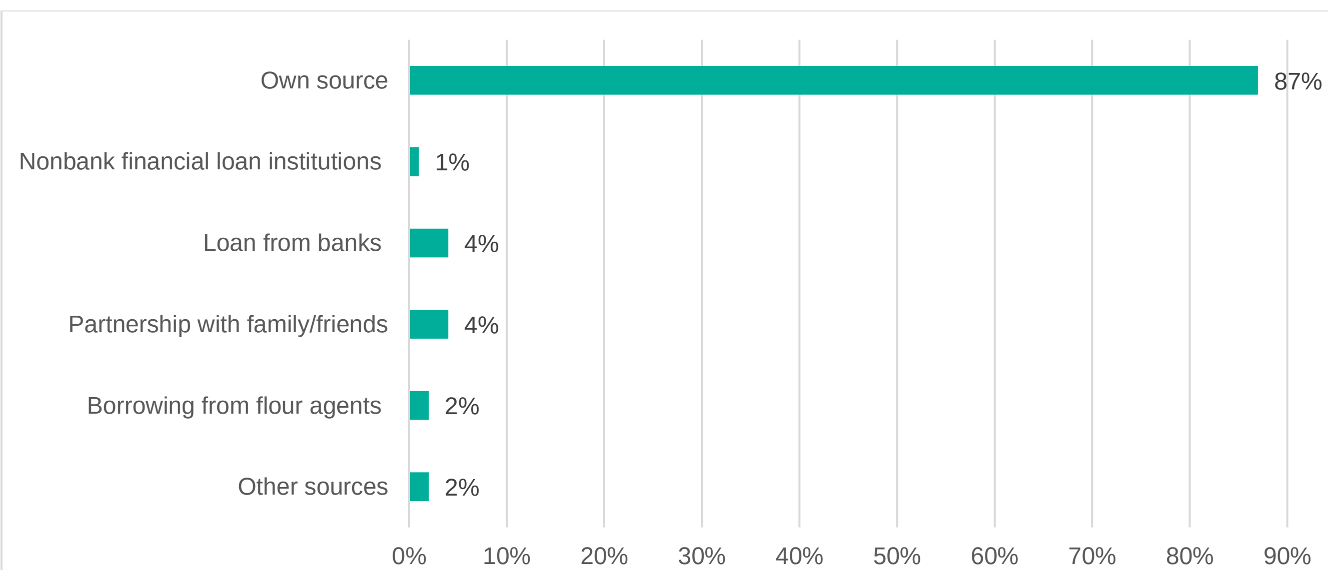


Source: Authors' calculations from bakeries survey, 2021.

3.3.2 *Source of capital*

The surveyed bakeries were asked to identify the main sources of their start-up capital. Most of them (87 percent) relied on their own sources; alternative financing sources were rarely identified as the main source of capital for bakeries (Figure 3.3.2).

Figure 3.3.2 Main source of start-up capital for bakeries

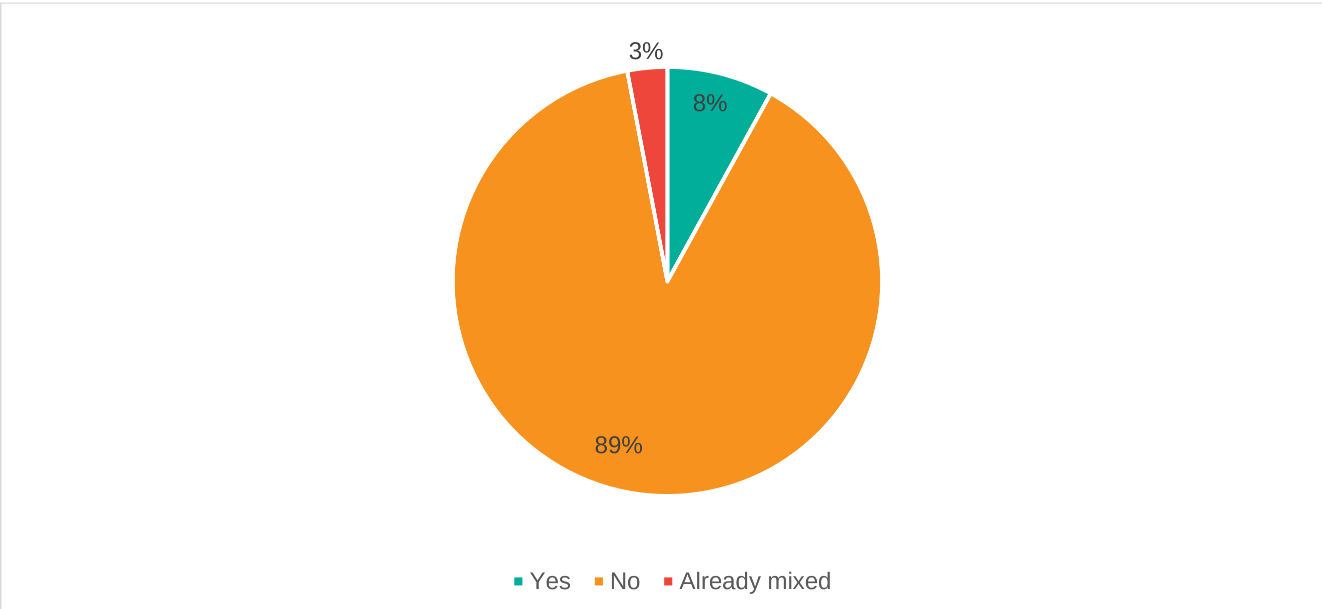


Source: Authors' calculations from bakeries survey, 2021.

3.3.3 Baking business activities

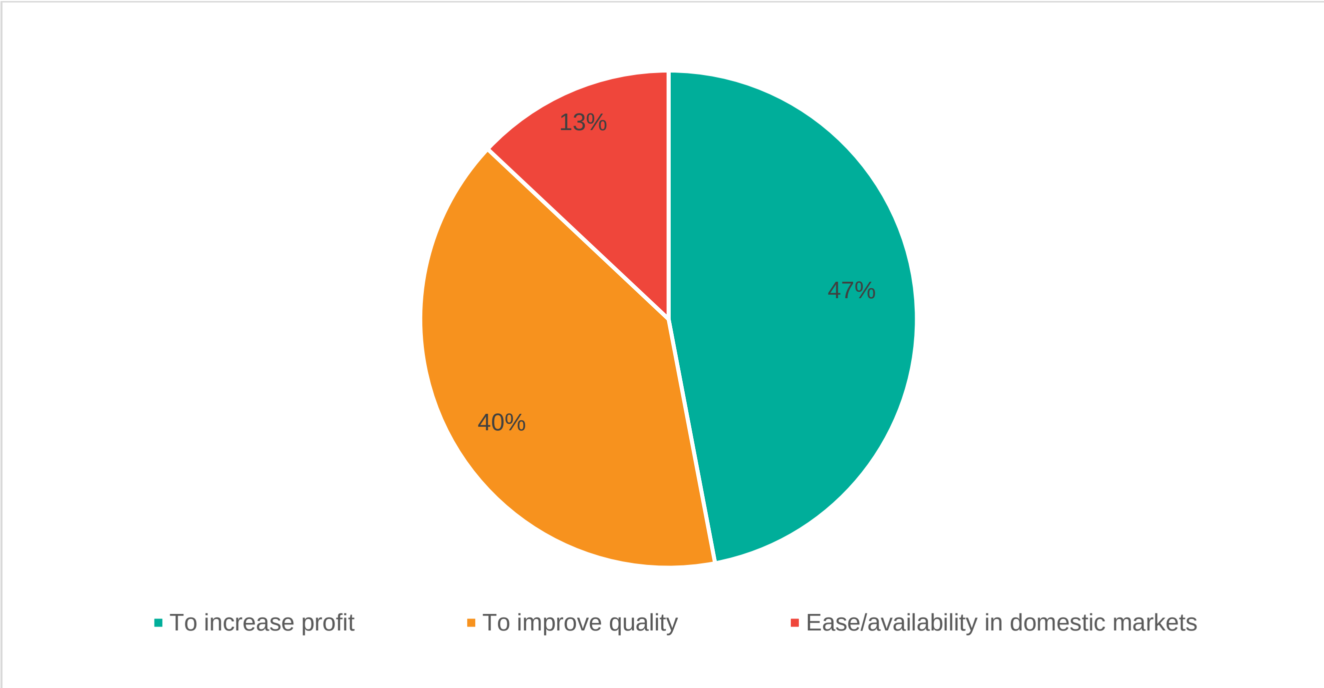
It is uncommon for bakeries to mix subsidized wheat flour with commercial wheat flour, mainly due to the difference in composition, protein, and moisture content (Ahmed et al. 2014). Only 8 percent of the sample reported mixing both types of flour when producing bread and 89 percent did not mix (Figure 3.3.3). Of those 8 percent who reported mixing both types of flours, 47 percent attributed this to higher profits and 40 percent to better quality (Figure 3.3.4).

Figure 3.3.3 Tendency to mix both wheat flour types to produce bread



Source: Authors' calculations from bakeries survey, 2021.

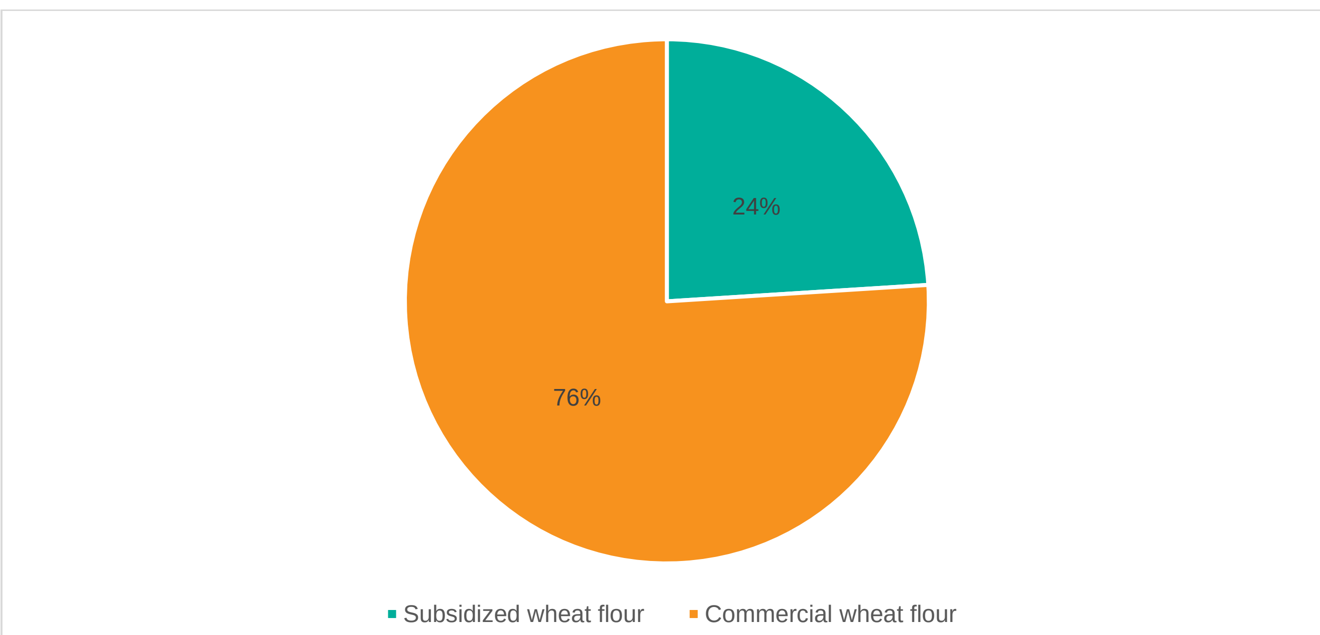
Figure 3.3.4 Reason behind mixing flour types



Source: Authors' calculations from bakeries survey, 2021.

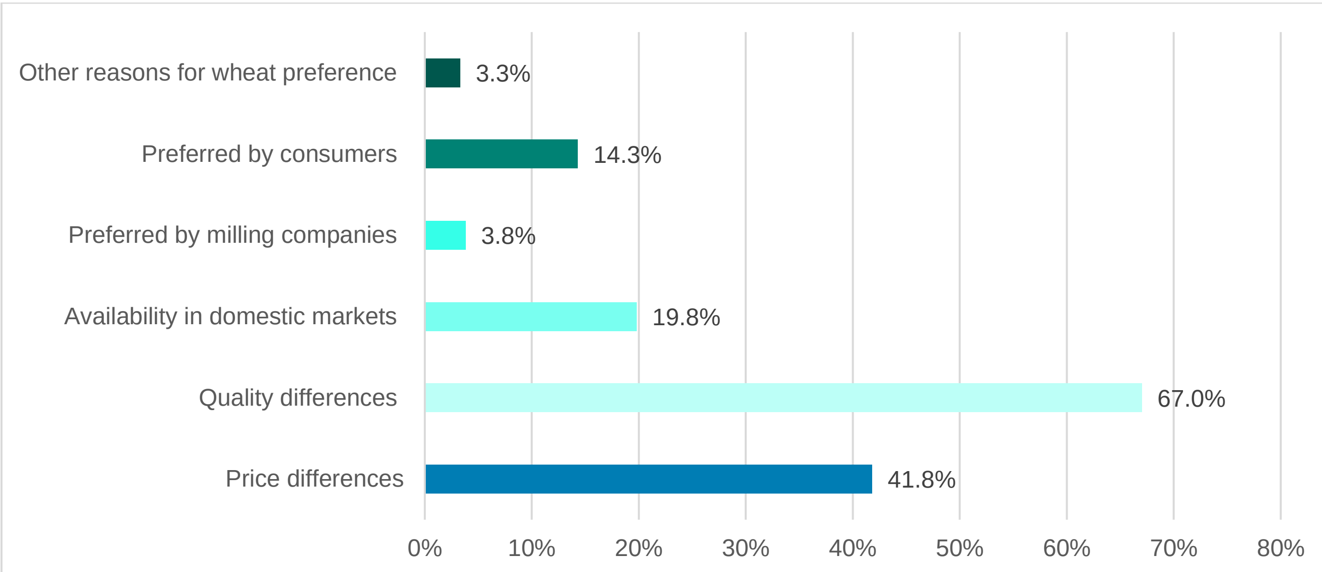
Most sampled bakeries (76 percent) preferred commercial wheat flour over subsidized wheat flour (Figure 3.3.5). When asked to identify the main reasons for this preference, 67 percent cited quality differences while price was second (42 percent) (Figure 3.3.6).

Figure 3.3.5 Preferred wheat flour for production (%)



Source: Authors' calculations from bakeries survey, 2021.

Figure 3.3.6 Bakeries respondents' reasons for their preferred wheat flour[12]



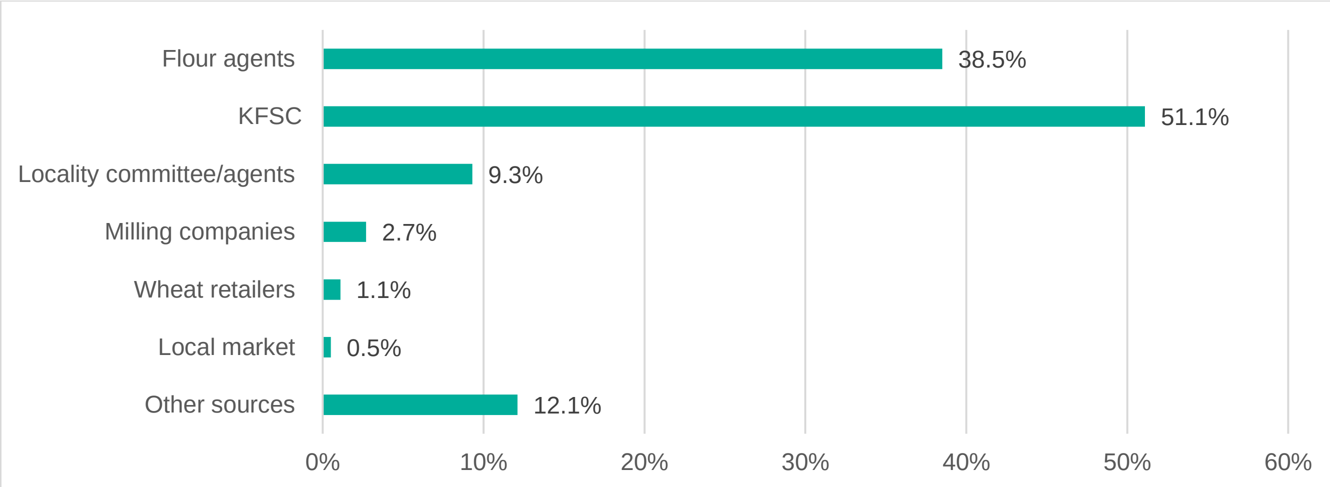
Source: Authors' calculations from bakeries survey, 2021.

3.3.4 Supply chain and production

As mentioned earlier, in August 2020, the KFSC officially began to operate with a mandate to oversee and monitor subsidized wheat flour distribution to bakeries, ensuring that each bakery received its fair share or quota. While the objective was to gradually take over the role of flour agents, the KFSC found this challenging, and in many instances still had resort to flour agents, relying on their distributional resources and capacity. Indeed, while surveyed bakeries mostly sourced their subsidized wheat flour from the KFSC (51 percent), a decent share also reported that they sourced their subsidized flour from flour agents (39 percent), followed by locality committee agents (9 percent) (Figure 3.3.7).

[12] Survey question allowed for selection of multiple options.

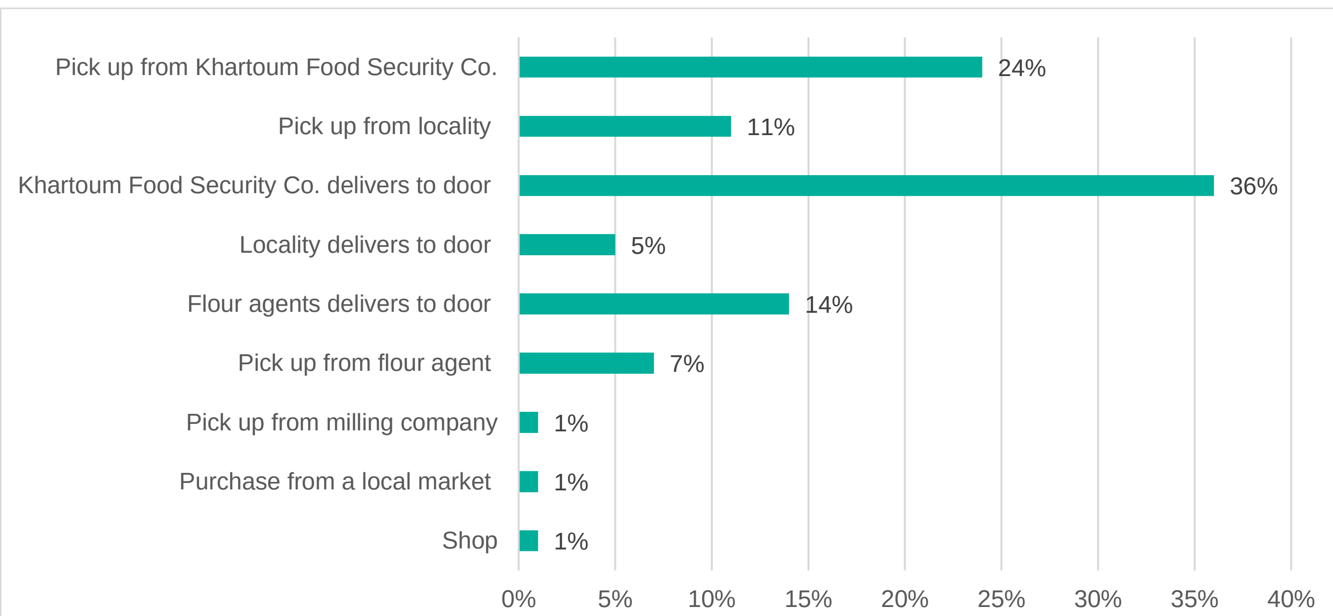
Figure 3.3.7 Bakeries' sources of subsidized wheat flour[13]



Source: Authors' calculations from bakeries survey 2021.

In terms of logistical procedures, bakeries reported that either the KFSC delivered flour to their door (36 percent) or (less often) bakeries picked up flour directly from the KFSC (Figure 3.3.8). For those who dealt with flour agents, 14 percent reported that flour agents delivered flour to bakeries' while 7 percent reported picking up flour from flour agents' facilities.

Figure 3.3.8 Options for delivery of subsidized wheat flour to bakeries

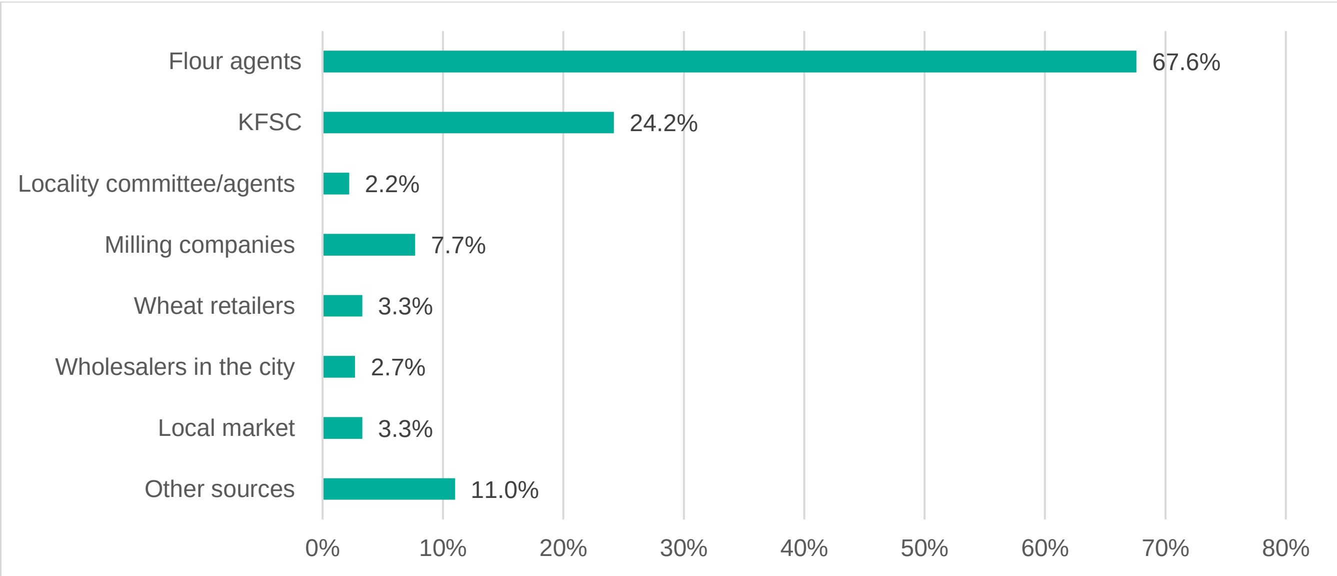


Source: Authors' calculations from bakeries survey, 2021.

[13] Survey question allowed for selection of multiple options.

Figure 3.3.9 shows that flour agents are the main intermediaries between milling companies and bakeries in the commercial wheat flour value chain. Two-thirds (68 percent) of surveyed bakeries sourced their commercial wheat flour from flour agents and 24 percent from the KFSC. Among the other listed choices, sourcing from milling companies directly was cited by 8 percent of respondents, with the remaining listed choices cited by less than 3 percent each. Other unlisted sources were cited by 11 percent of respondents.

Figure 3.3.9 Sources of commercial wheat flour for bakeries[14]

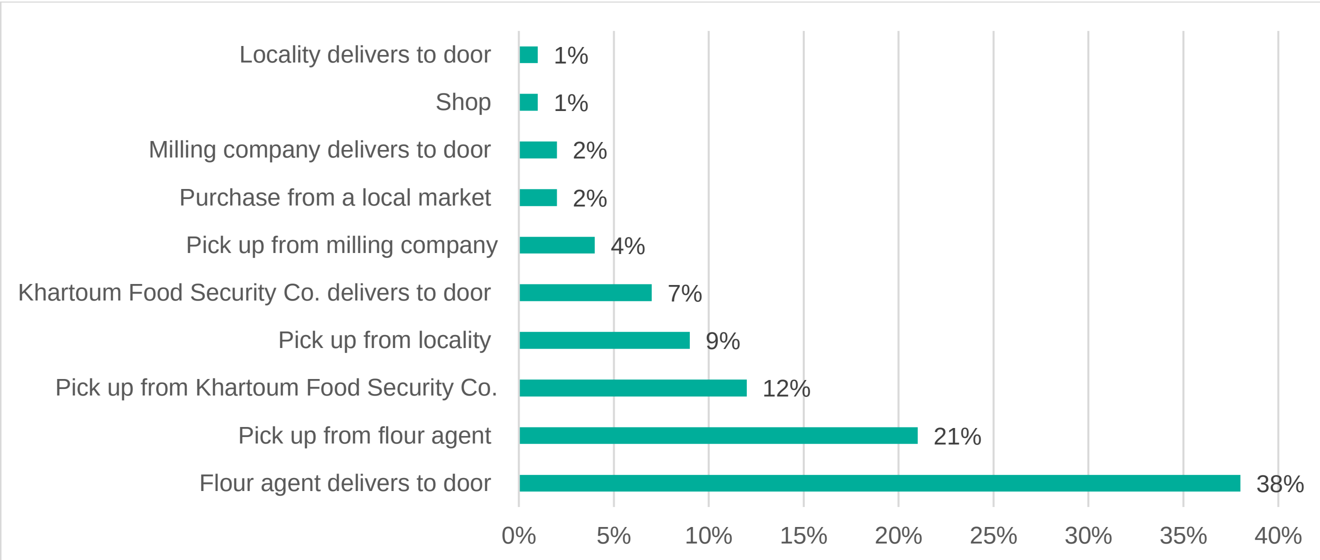


Source: Authors' calculations from bakeries survey 2021.

Asked to report on delivery options for their commercial wheat flour, 38 percent of bakeries respondents stated that flour agents delivered flour to their bakeries, 21 percent picked up flour from flour agents, and 12 percent picked up flour from the KFSC (Figure 3.3.10).

[14] Survey question allowed for selection of multiple options.

Figure 3.3.10 Options for delivery of commercial wheat flour to bakeries[15]



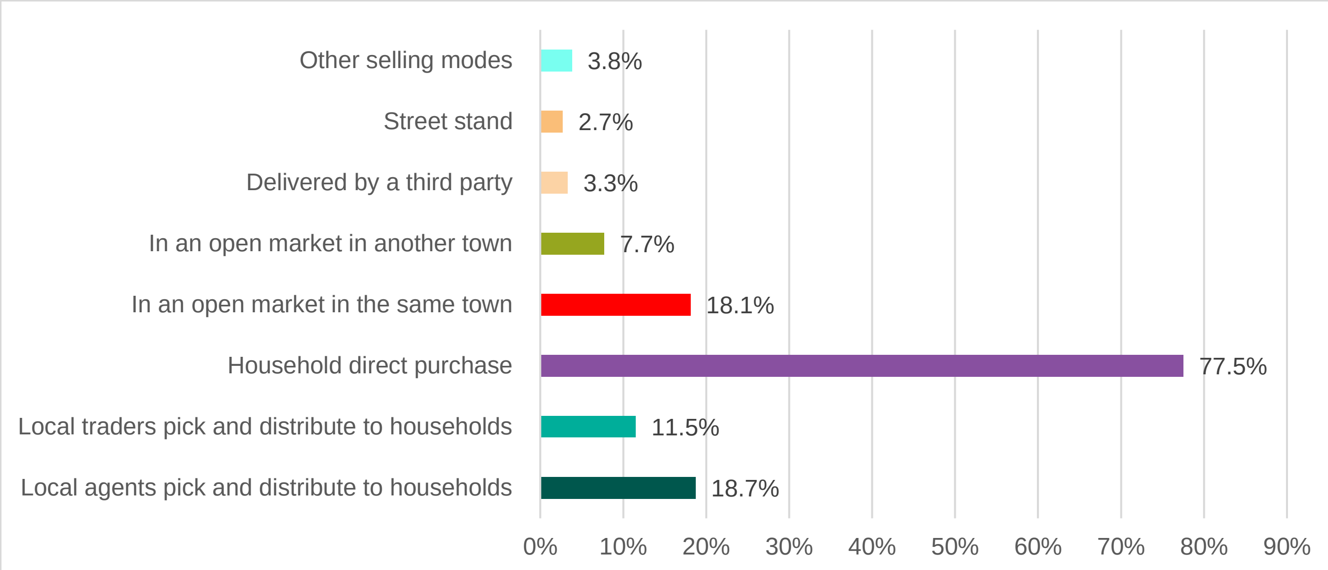
Source: Authors' calculations from bakeries survey, 2021.

Most bakeries reported that they sold subsidized bread through their own bakery shops. Respondents were asked to rank the most common method of bread sales/distribution. The majority reported that either consumers directly purchase bread loaves from bakery shops (78 percent), or locality agents collect sacks of bread from bakeries to distribute among households in their respective locality (37 percent) (Figure 3.3.11).

As each locality has a fixed bread quota determined by the government, resistance committees assign locality agents to purchase sealed bread sacks (each sack has 15–20 bread loaves) from bakeries. The bread sacks are then distributed to households in each respective locality. After the bread is distributed, bakeries receive the final payment from the locality agents.

[15] Survey question allowed for selection of multiple options.

Figure 3.3.11 How do bakeries sell bread to end consumers?



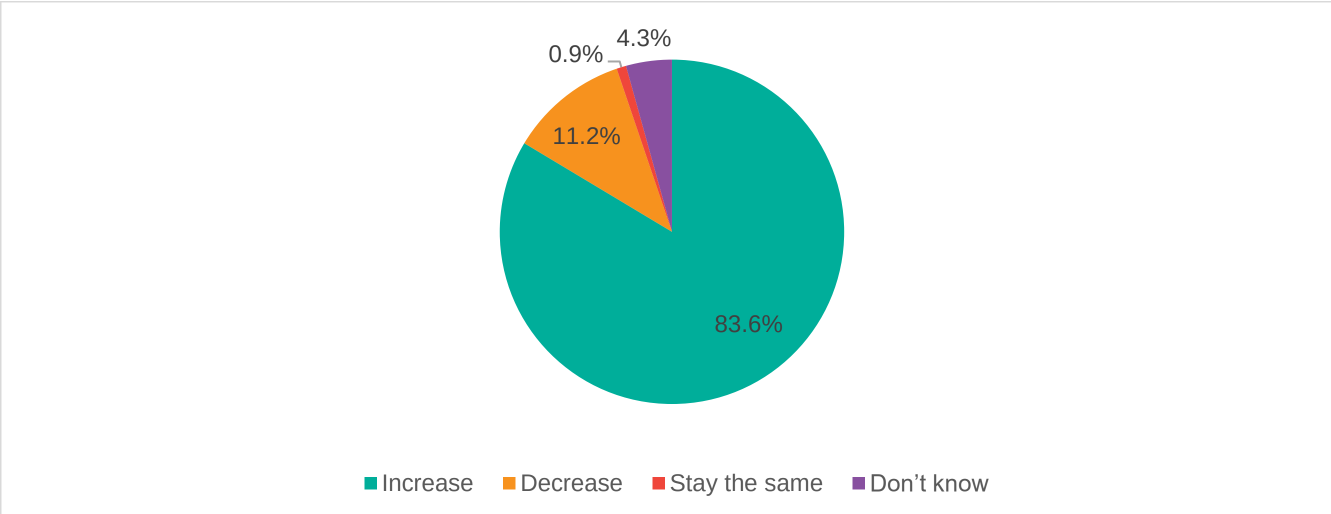
Source: Authors' calculations from bakeries survey, 2021.

3.3.5 Supply chain: Prices and marketing margins

As prices of wheat flour vary due to inflation, bread prices in Sudan fluctuate often. Based on interviews conducted in August 2021 with mechanized and balady bakeries, the price of a 50-kg sack of subsidized wheat flour was 850 SDG and a 25-kg sack of commercial wheat flour was 7,020 SDG. The average reported price of a sack of 15 loaves of subsidized bread was 70 SDG (5 SDG per loaf) while a loaf of commercial bread sold for 33 SDG. Based on follow-up interviews in 2022 following the government removal of flour subsidies, bakery respondents reported that subsidized flour was no longer produced or sold by milling companies. Instead, commercial flour is now available in the market in different qualities and prices, ranging from 17,200 SDG to 20,800 SDG per 50-kg sack. Only commercial bread is now offered in the market, sold at 30–35 SDG per loaf.

Asked about their expectation of future prices of domestic wheat, the majority (84 percent) of bakeries respondents expected a rise in the price of domestic wheat flour, 11 percent expected a decrease in the price, and less than 1 percent expected the price to remain constant (Figure 3.3.12).

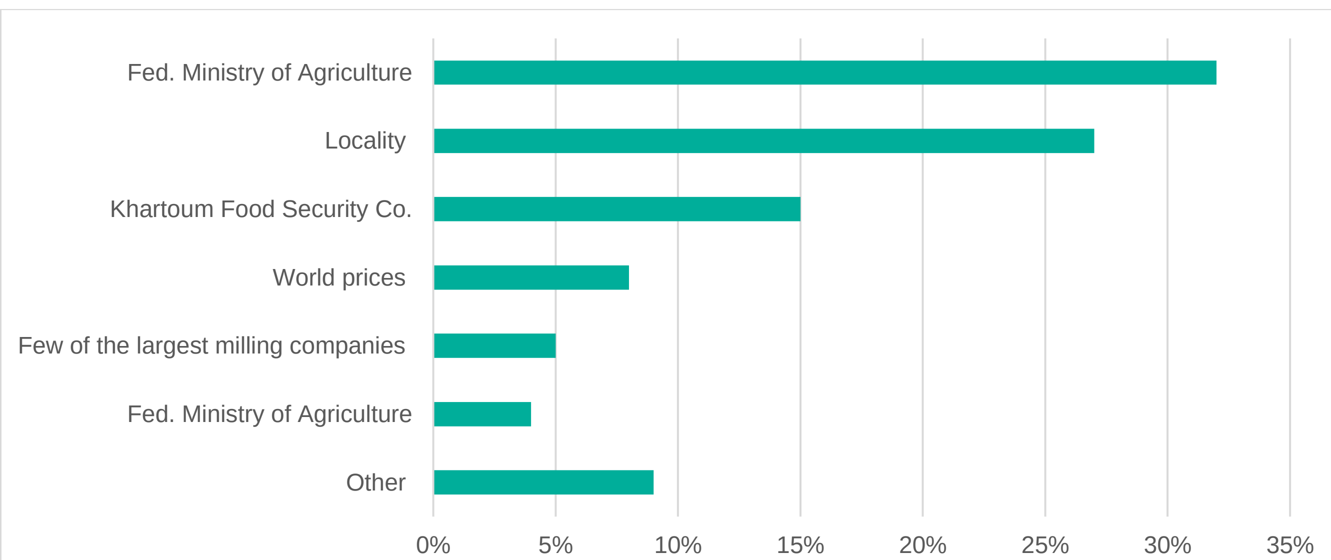
Figure 3.3.12 Bakeries' expectations for domestic wheat prices in the next season



Source: Authors' calculations from bakeries survey, 2021.

Findings on the bakeries respondents' views on who determines commercial wheat flour prices show that wheat prices were perceived to be largely controlled by localities (27 percent), the KFSC (15 percent), a few of the largest milling companies (5 percent), and the MoANR (4 percent). Nevertheless, most respondents still believed in free market forces: 32 percent perceived domestic market demand and supply forces to be the driver of the price of wheat flour and 8 percent cited world prices as the key factor (Figure 3.3.13).

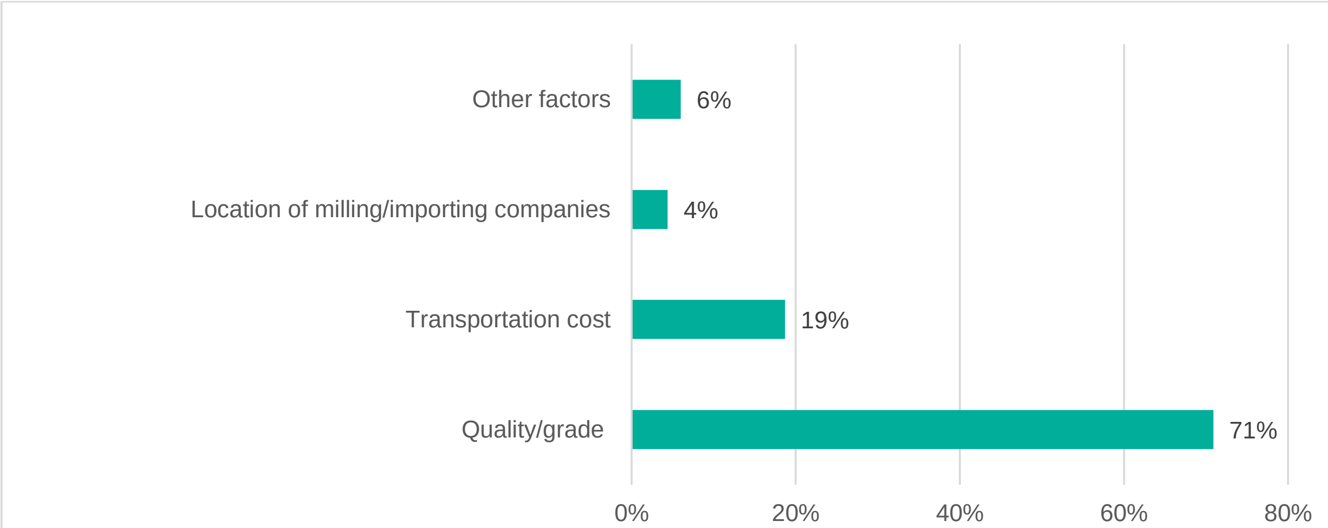
Figure 3.3.13 Bakeries' views on who controls commercial wheat flour prices



Source: Authors' calculations from bakeries survey, 2021.

Asked what determines the price of commercial wheat flour, 71 percent of bakeries respondents suggested that the price is determined by flour quality, while 19 percent indicated that transportation cost is a major factor (Figure 3.3.14).

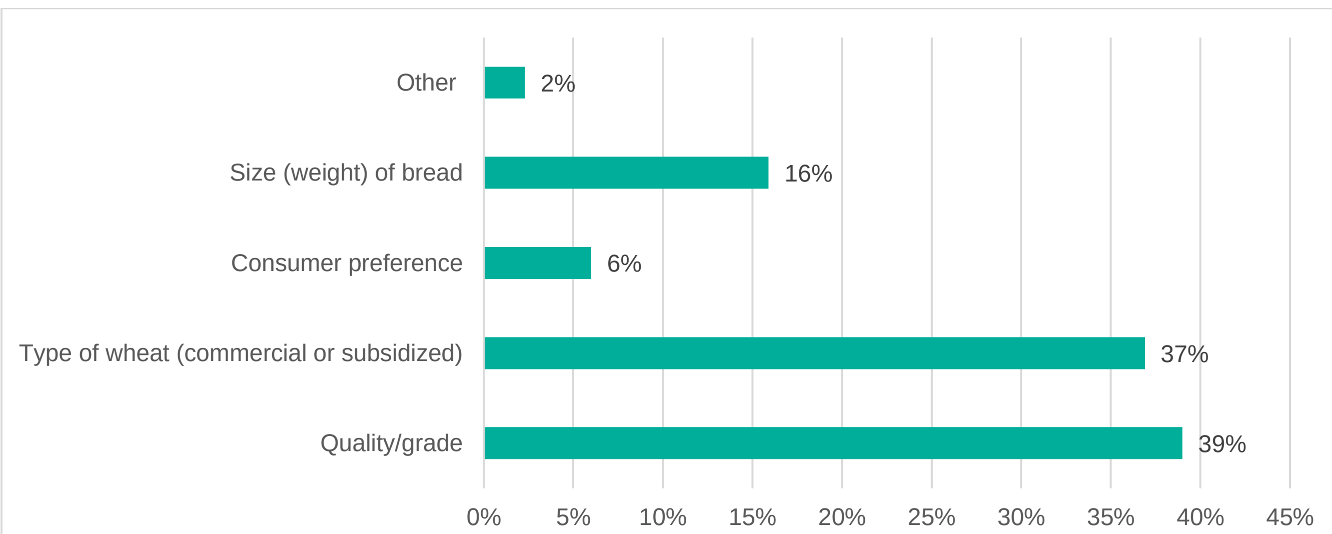
Figure 3.3.14 Bakeries' views on what determines the price of commercial wheat flour



Source: Authors' calculations from bakeries survey, 2021.

Bakeries respondents suggested different determinants for the price of bread itself: 39 percent stated that bread price is determined by quality and 37 percent that it is affected by the type of wheat flour (commercial or subsidized). A smaller share of respondents mentioned the size or weight of bread as a determining factor of price, while 6 percent cited consumer preferences (Figure 3.3.15).

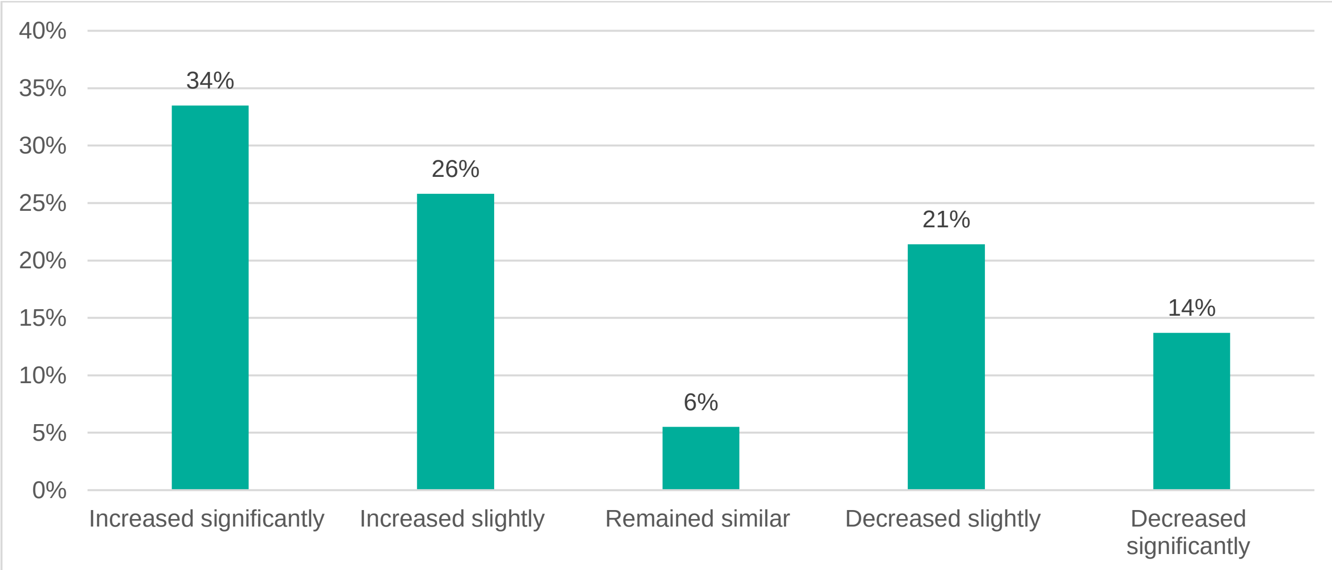
Figure 3.3.15 Bakeries' views on what determines the price of bread



Source: Authors' calculations from bakeries survey, 2021.

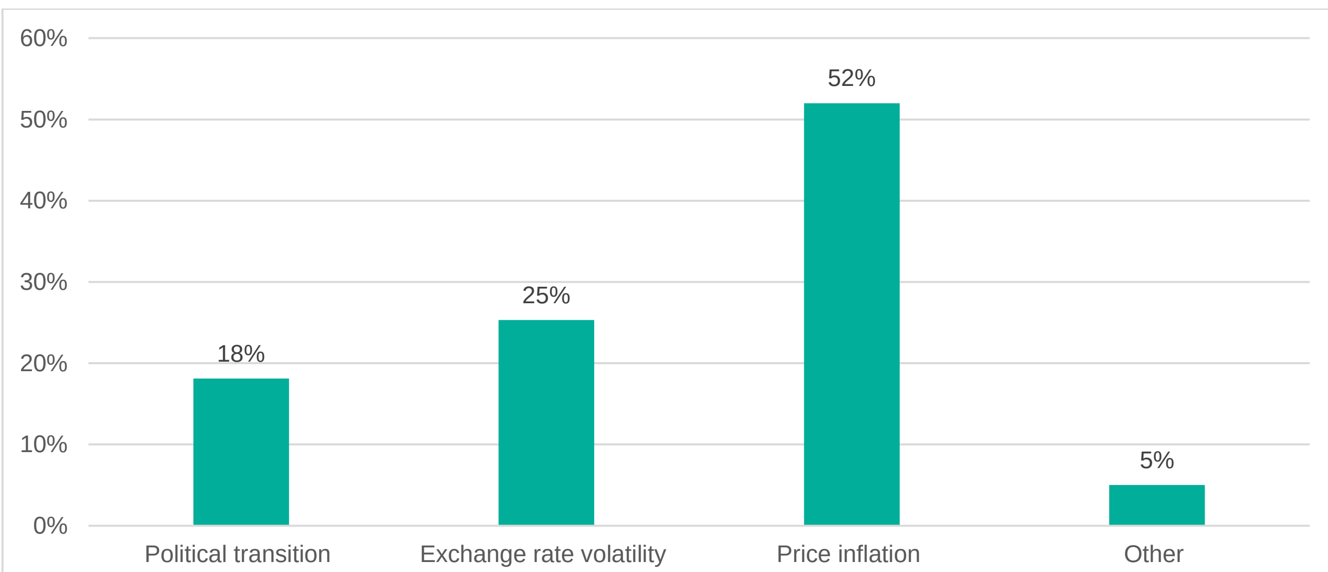
Respondents were asked about their profit dynamics during the past three years. Relative to the previous year, more than one-half (60 percent) of respondents experienced increased profits (Figure 3.3.16). Of these, 34 percent experienced a significant increase in profits, while 26 percent experienced a slight increase. When asked the main reasons for the changes in profit, about one-half of bakeries respondents (52 percent) cited price inflation (Figure 3.3.17).

Figure 3.3.16 Changes in bakeries' profits during the previous three years



Source: Authors' calculations from bakeries survey, 2021.

Figure 3.3.17 Reasons for changes in bakeries' profits during the previous three years



Source: Authors' calculations from bakeries survey, 2021.

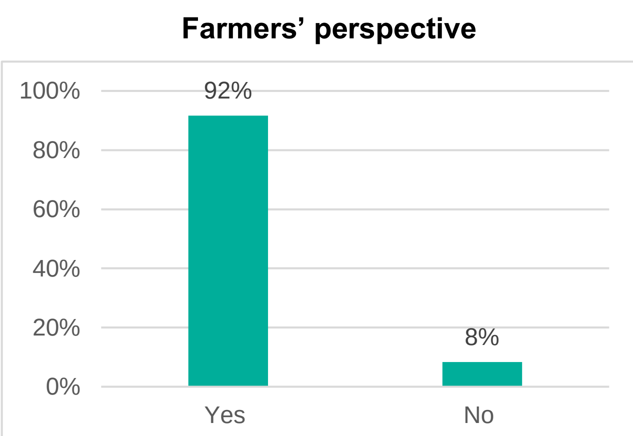
SECTION 4: CHALLENGES FACING SUDAN'S WHEAT VALUE CHAIN

4.1 Common challenges in the domestic wheat value chain

Most farmers (92 percent) aimed to expand their wheat production, while 74 percent of retailers and 69 percent of wholesalers aimed to expand their trading business in 2022 (Figure 4.1.1). To assess what is perceived as the most critical challenge constraining the different domestic value chain members from expanding their wheat production or business activity, respondents were provided with a list of challenges to choose from (Figure 4.1.2). Lack of irrigation water (39 percent) followed by lack of finance (37 percent) were the two highest binding constraints that farmers suggested as limiting their capacity to increase wheat production, followed by lack of access to inputs of production such as fertilizers and seeds (5 percent) and lack of land (5 percent).

On the other hand, asked to rank the most critical challenges constraining expansion of their trading business, wholesalers stated lack of finance (89 percent) and lack of credit (67 percent) as the starkest binding constraints, followed by government restrictions and red tape (43 percent). In parallel, retailers ranked lack of finance (74 percent) as the most important challenge, followed by farmers' capacity to acquire more land for cultivation (51 percent) and rental costs of retail facilities (42 percent).

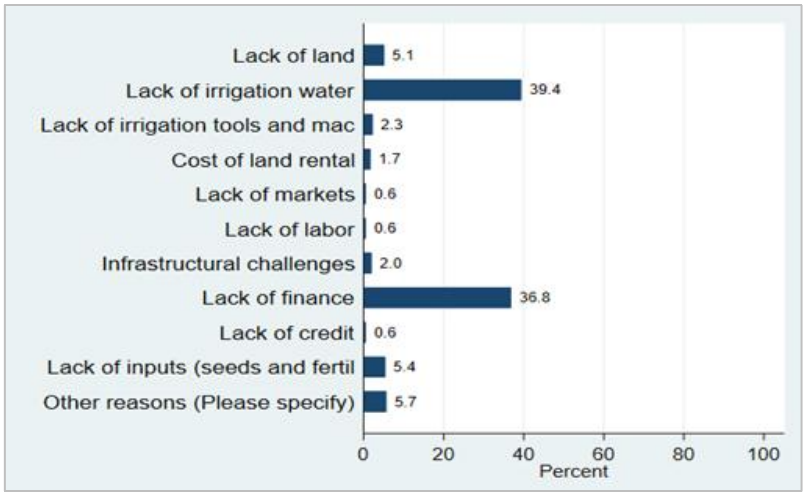
Figure 4.1.1 Desire for business expansion – Domestic wheat value chain



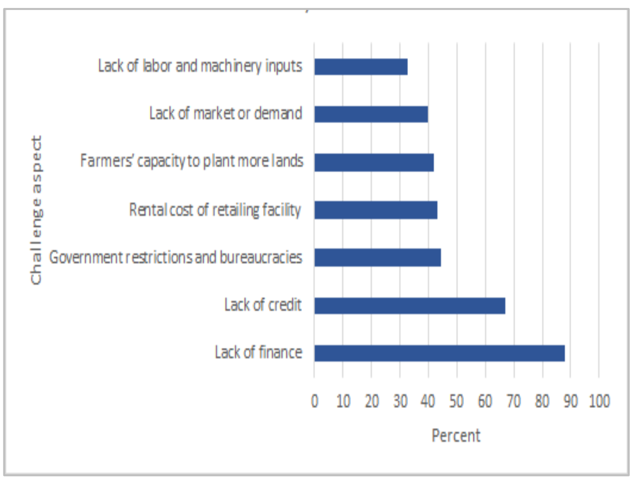
Source: Authors' calculations from domestic value chain surveys, 2021.

Figure 4.1.2 Common challenges – Domestic wheat value chain

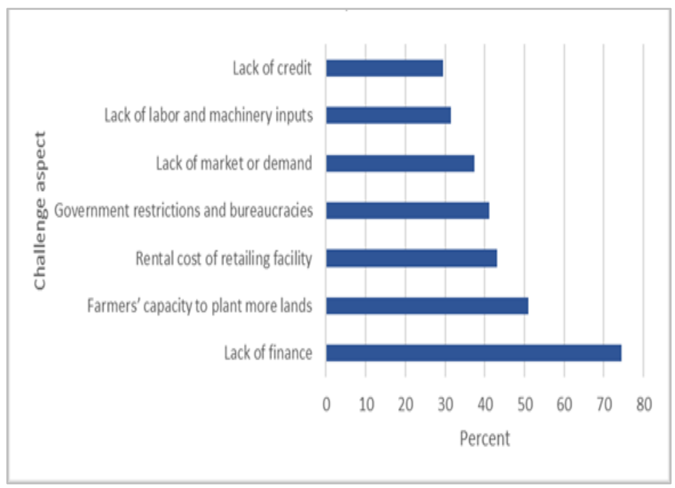
Farmers



Wholesalers



Retailers



Source: Authors' calculations from domestic value chain surveys, 2021.

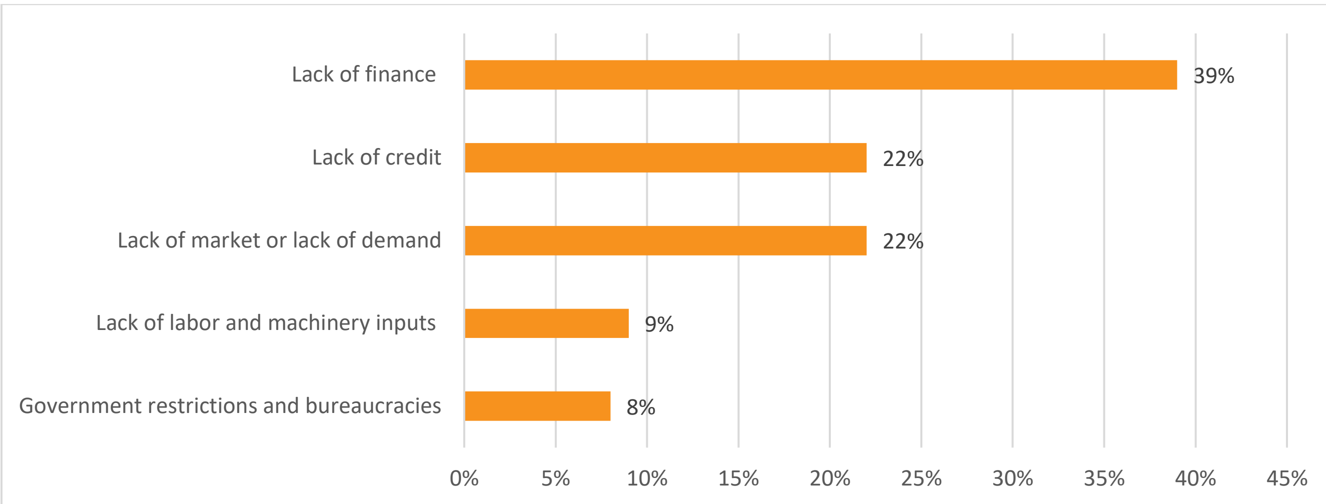
4.2 Common challenges in the imported wheat value chain

Milling companies, as the entry point of imported wheat flour into Sudan, note that access to sufficient foreign exchange is necessary to ensure they can supply and meet market demand. The interviewed sample explained that inconsistent government policies for subsidized wheat flour (with regard to pricing and quota distribution) and frequent changes in the logistical procedures that milling companies must follow to distribute flour pose challenges to their day-to-day operations.

Nonetheless, when asked if they aimed to expand their operations to a larger scale, 64 percent of flour agents indicated their desire to expand while the rest were satisfied with their current level of business activity.

As seen in Figure 3.2.2 (Section 3.2: Flour agents), the majority of sampled flour agents are "self-financed." However, access to finance is still considered a top persistent bottleneck facing flour agents (Figure 4.2.1). Lack of credit and lack of market demand tied as the second most important aspects (each cited by 22 percent of respondents).

Figure 4.2.1 Common challenges – Flour agents

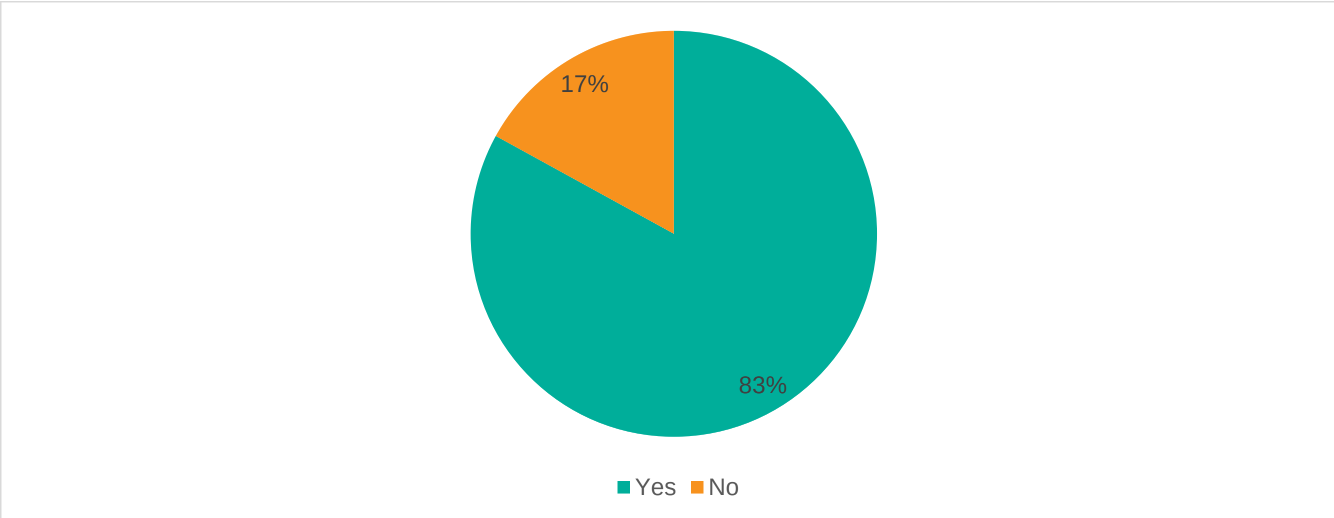


Source: Authors' calculations from flour agents survey, 2021.

Flour agents were asked to reflect on the six-month period from January to July 2021,[16] and to say if they witnessed any insufficiency of wheat flour in the market. About four out of five (83 percent) sampled flour agents had observed a shortage in imported wheat flour (Figure 4.2.2).

[16] Data collection took place between October and November 2021. Respondents were asked to reflect on the period between January and July 2021.

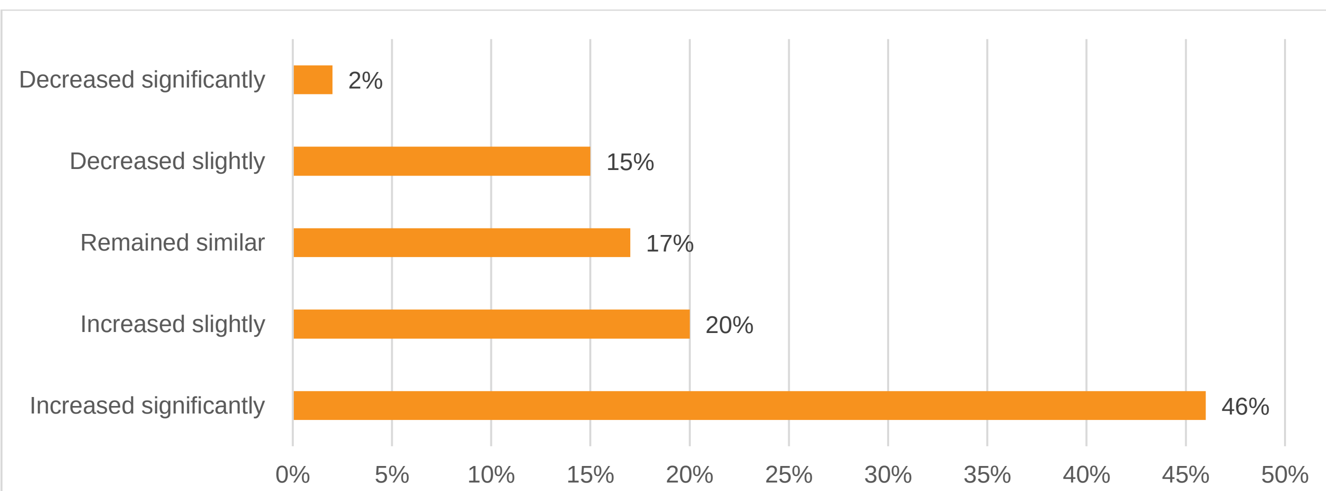
Figure 4.2.2 Wheat shortage observed in the past six months – Flour agents



Source: Authors' calculations from flour agents survey, 2021.

Although 66 percent of sampled flour agents experienced an increase in profits over the past year (46 percent significant and 20 percent slight; Figure 4.2.3), more than one-half of the sample reported price inflation as a core cause for changes in their profits. Flour agents gained from wheat flour price spikes over the past year, yet the increase in profits did not translate into higher purchasing power because of the high inflation.

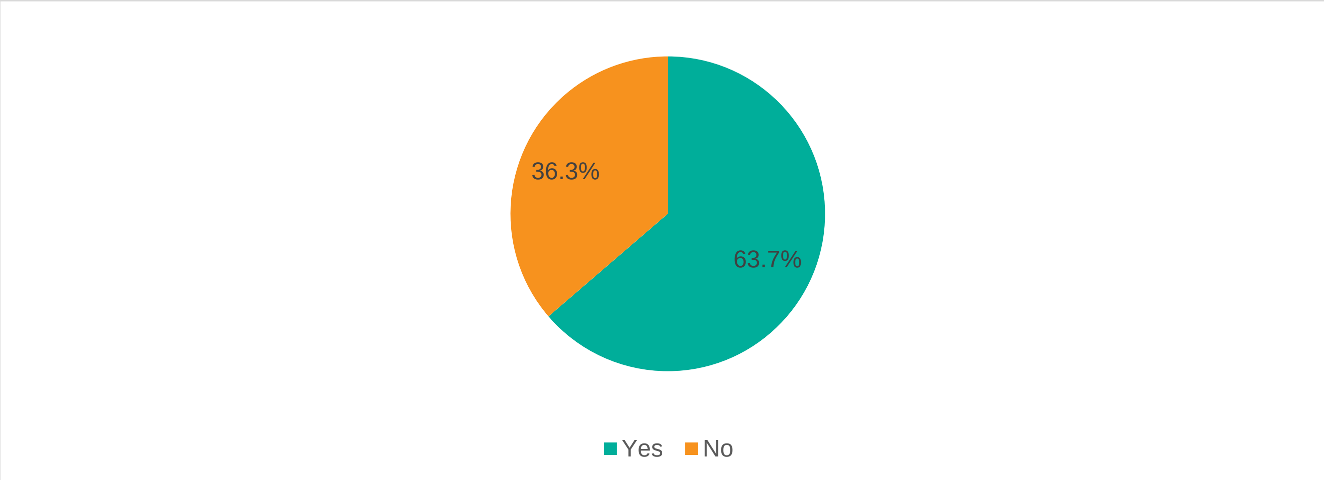
Figure 4.2.3 Profit changes over the past year – Flour agents



Source: Authors' calculations from flour agents survey, 2021.

Speaking about bakeries, the bakeries union in Sudan has collective bargaining power over the government. Indeed, two-thirds (67 percent) of sampled bakeries reported membership in bakery unions. In many instances they were able to lobby for higher subsidized bread prices.[17]

Figure 4.2.4 Desire for business expansion – Bakeries



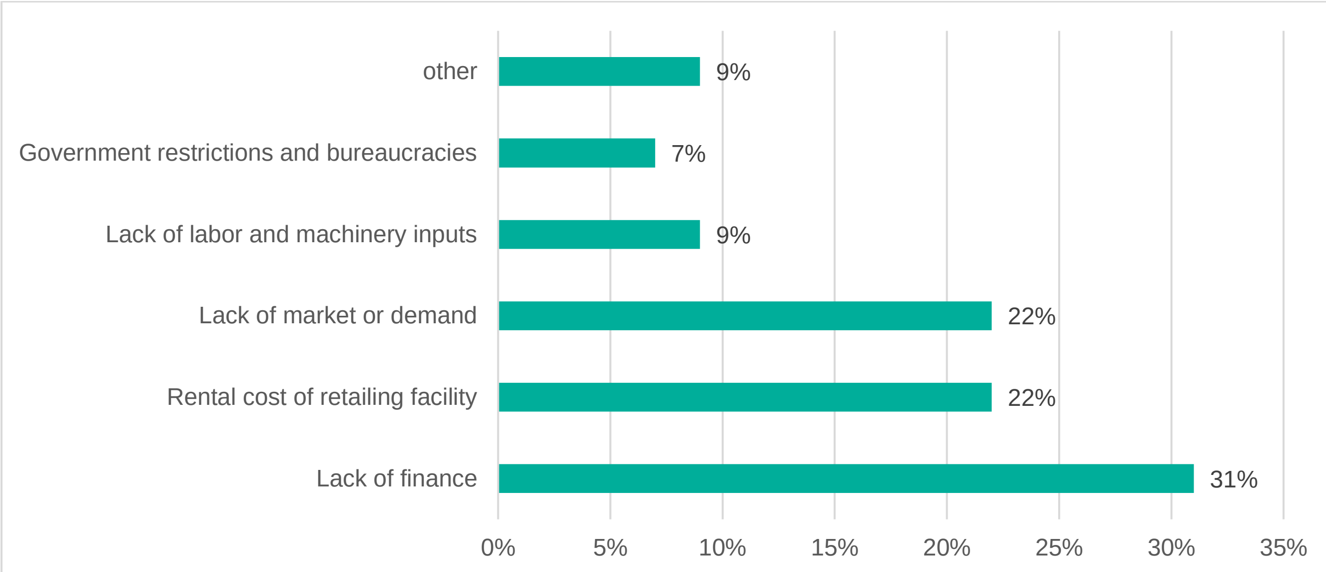
Source: Authors' calculations from bakeries survey, 2021.

While approximately 64 percent of sampled bakeries reported interest in expanding their business, they noted that the increase in diesel prices and in prices of key inputs of bread production (yeast, oil, and bread enhancers) as well as the unstable supply of electricity all posed challenges to their business.

Survey results highlight other key challenges: 31 percent of bakeries respondents cited the lack of finance, 22 percent the rental costs of retailing facilities, 22 percent the lack of market demand, and 9 percent the lack of labor and machinery inputs. Besides these challenges, 7 percent of bakeries respondents suggested that government restrictions and bureaucracy also hindered their business (Figure 4.2.5).

17 In some instances, they go on strike or full closure when they incur losses due to rising costs of production (Sky News Arabia 2020).

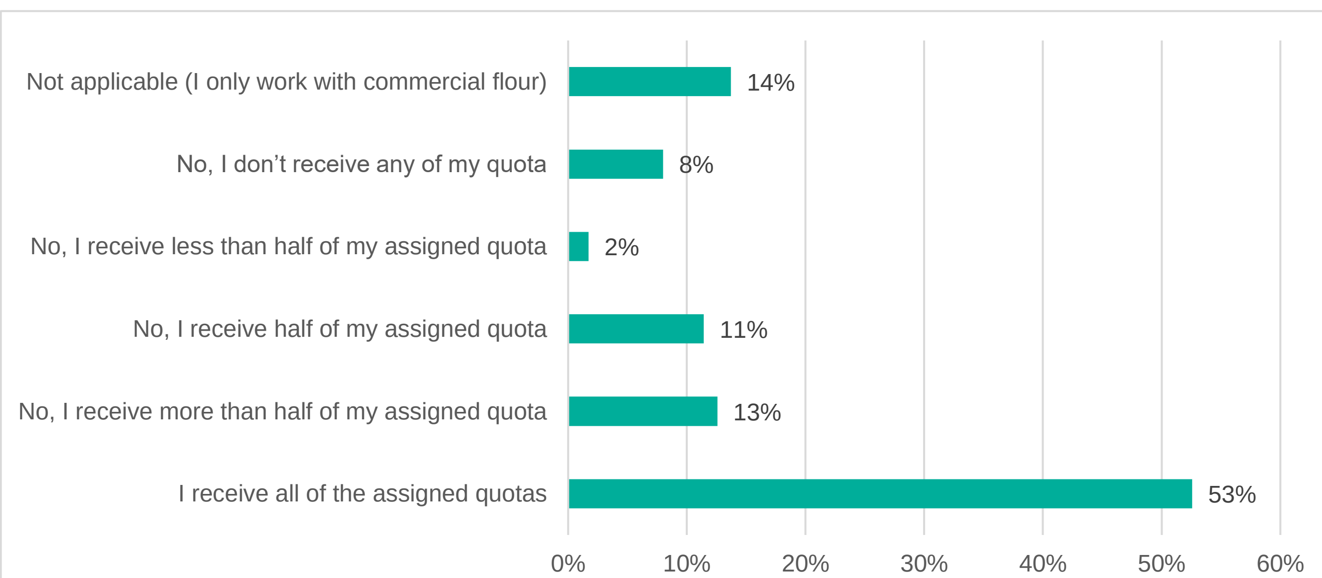
Figure 4.2.5 Common challenges – Bakeries



Source: Authors' calculations from bakeries survey, 2021.

Bakeries were asked whether they received their designated quota of subsidized wheat flour. About one-half (53 percent) of respondents indicated that they received all of their quota (Figure 4.2.6). Among those who did not receive their wheat flour quota, 14 percent said that they were not working with subsidized flour, but 8 percent of those expecting to receive subsidized flour indicated that they did not receive any, with the remaining 26 percent receiving an amount different from, but less than, their quota.

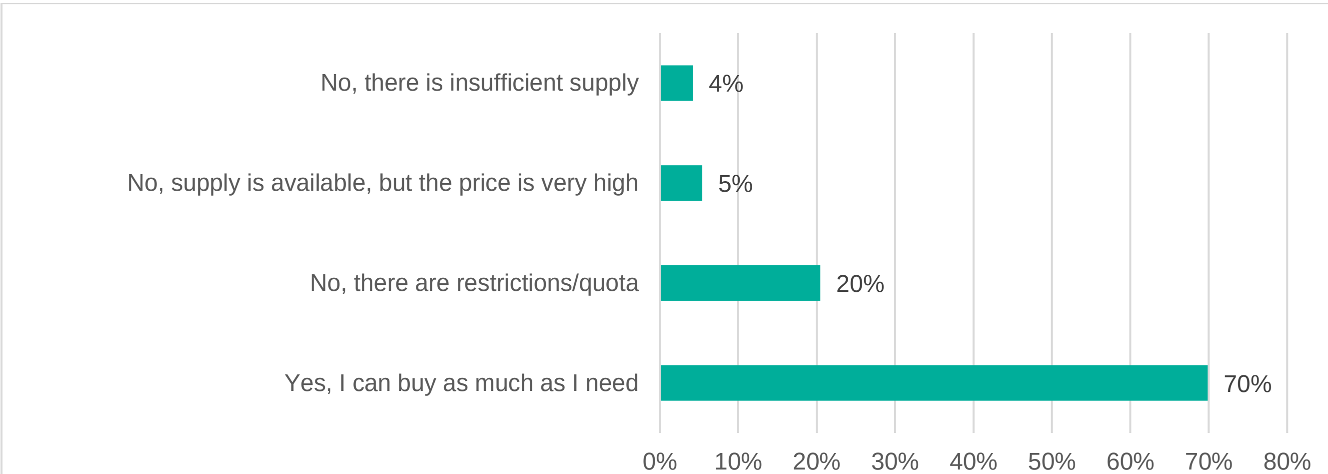
Figure 4.2.6 Bakeries' experience with receiving their designated quota of subsidized wheat flour



Source: Authors' calculations from bakeries survey, 2021.

When asked how much commercial wheat flour they can buy, 70 percent of bakeries respondents said that they could buy as much commercial wheat flour as they needed. Nonetheless, 20 percent noted restrictions on buying commercial flour, while 4 percent indicated that the supply was insufficient; another 5 percent said that flour was available but unaffordable (Figure 4.2.7).

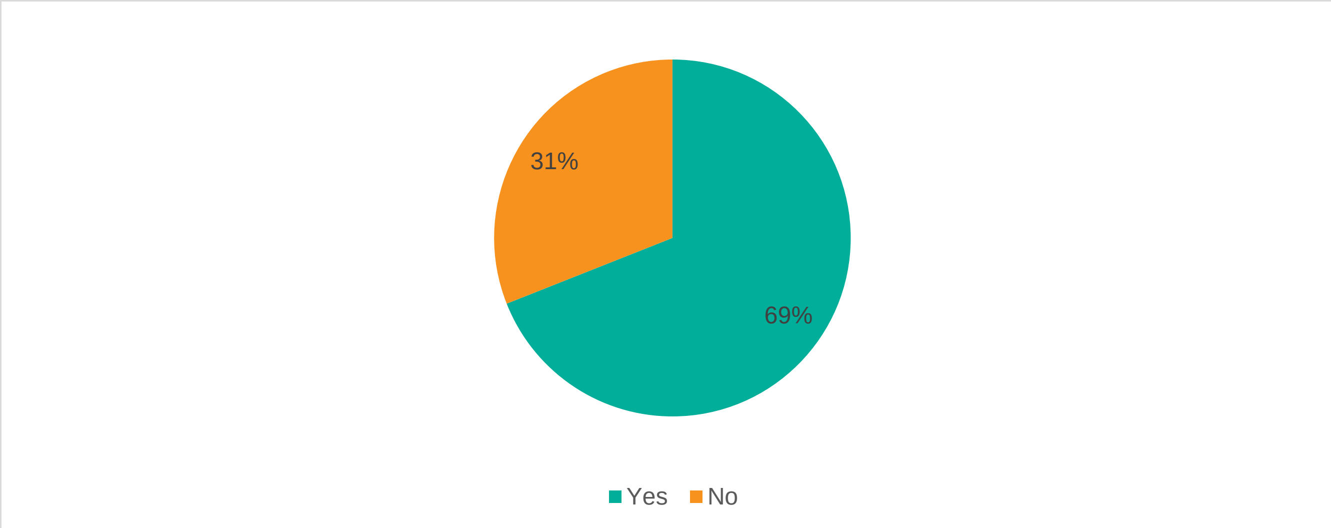
Figure 4.2.7 Bakeries' ability to buy as much commercial wheat flour as they need



Source: Authors' calculations from bakeries survey, 2021.

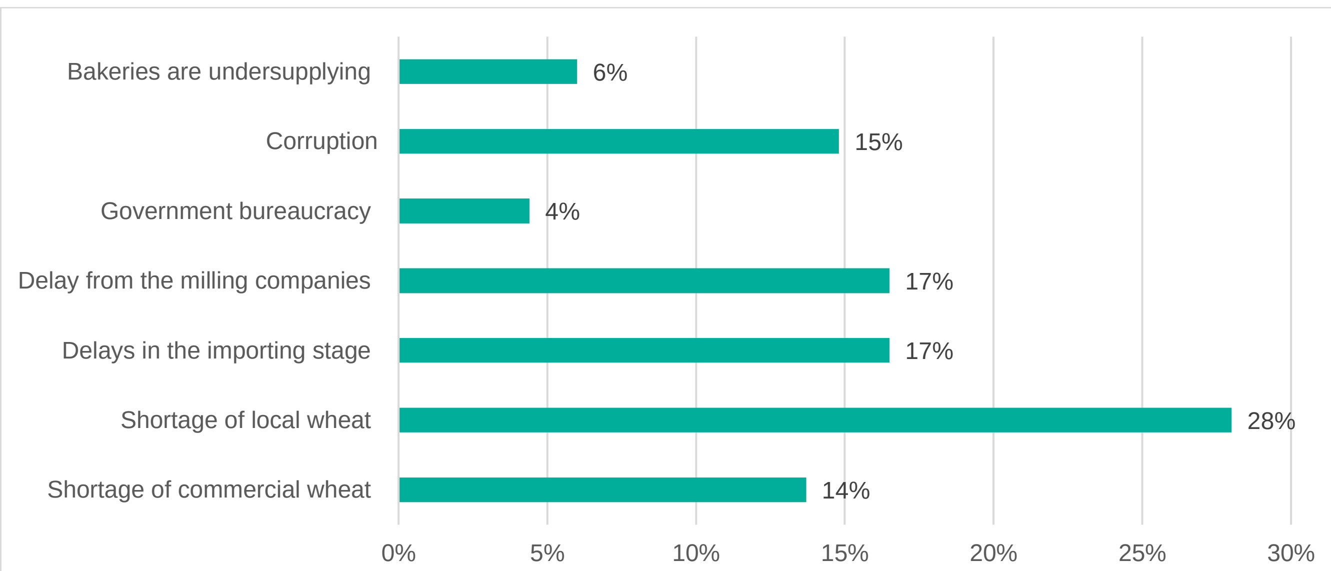
Respondents were asked to report whether any shortage occurred in the supply of bread in the last six months – the period between January and July 2021. Figure 4.2.8 shows that 69 percent of bakeries experienced a shortage in the supply of bread in the last six months. To explain this, 28 percent of bakeries mentioned a shortage of wheat, 17 percent attributed delays in the import stage and delays from milling companies, and 15 percent mentioned corruption (Figure 4.2.9).

Figure 4.2.8 Bakeries' experience with bread shortages in the past six months[18]



Source: Authors' calculations from bakeries survey 2021.

Figure 4.2.9 Reason behind the bread shortage – Bakeries



Source: Authors' calculations from bakeries survey, 2021.

[18] Data collection took place between October and November 2021. Respondents were asked to reflect on the period between January and July 2021.

SECTION 5: POLICY PREFERENCES OF WHEAT VALUE CHAIN ACTORS

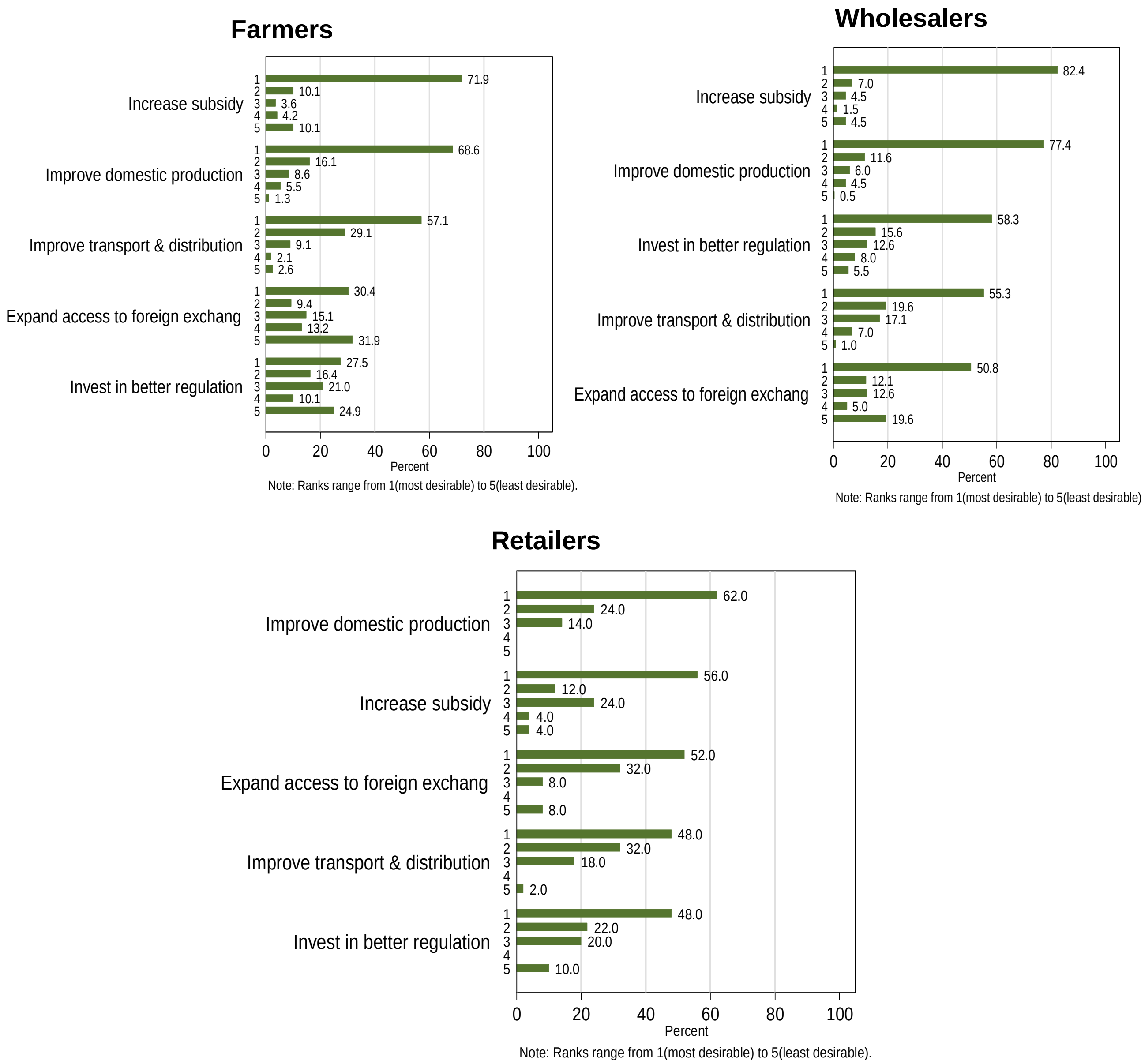
5.1 Domestic wheat value chain policy preferences

To assess the policy preferences of various actors in Sudan's wheat value chains, the survey included hypothetical policy questions. Farmers, wholesalers, retailers, bakery owners, flour agents, and milling companies were asked to consider a situation where the Government of Sudan has 45 billion SDG in additional funds to spend to improve the wheat sector and the functioning of wheat value chains. They were then provided with a list of five different options that could be adopted by the government for spending the money and asked to rank them from 1 to 5, with 1 indicating the best (most desirable) use of the money and 5 the worst (least desirable). The five wheat policy options provided were: (i) increase the subsidy for wheat flour; (ii) increase investment in infrastructure to improve the transport and distribution of wheat and wheat flour; (iii) invest in better regulation of wheat flour agents and bakeries; (iv) expand access to foreign exchange for importing/milling companies; and (v) expand investments to improve domestic wheat production.

Figure 5.1.1 illustrates farmers', wholesalers', and retailers' preferences for the five wheat policy options. Almost three-quarters (72 percent) of farmers ranked increasing the subsidy for production (for example, subsidize key inputs of production such as seeds, soil enhancers, and fertilizers) as the most desirable policy option, followed by expanding investments to improve domestic wheat production (69 percent), and increasing investment in infrastructure to improve the transport and distribution of wheat and wheat flour (57 percent). Expanding access to foreign exchange to importing/milling companies and investing in better regulation of wheat flour agents and bakeries were farmers' least preferred policy options, ranked by 30 percent and 28 percent, respectively, as the most desirable policy option.

For both wholesalers and retailers, the three most preferred policy options were increasing the subsidy, improving domestic production of wheat, and improving the transport and distribution of wheat and wheat flour (Figure 5.1.1). Traders' preferences were ordered similarly: the most preferred was increasing the subsidy, followed by improving domestic production, improving transport and distribution, expanding access to foreign exchange, and last, investing in better regulations. The only difference between wholesalers and retailers is that the strength of preference was stronger among wholesalers for the first two policies compared to retailers. What makes farmers' preferences different from that of traders was that they did not seem as enthusiastic about expanding companies' access to foreign exchange.

Figure 5.1.1 Policy preferences – Domestic wheat value chain



Source: Authors’ calculations from domestic wheat value chain surveys, 2021.

Table 5.1.1 Perceptions of the implication of political transition on wheat production and distribution – Domestic wheat value chain

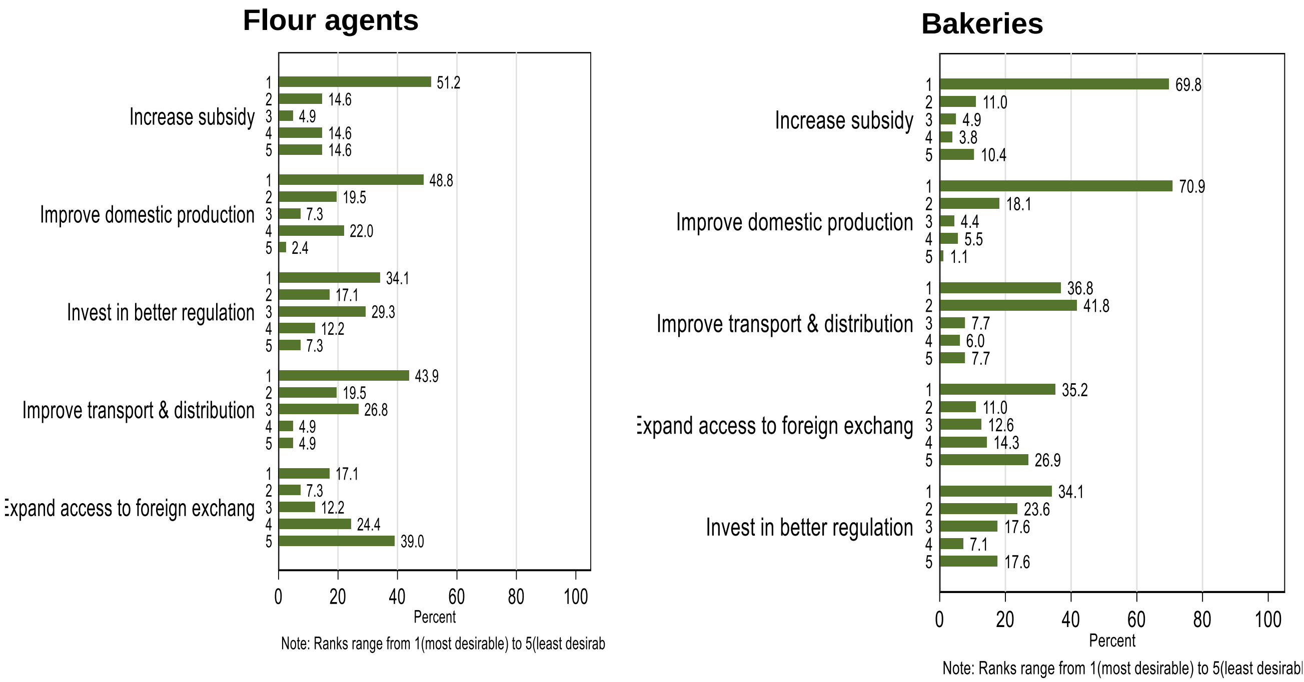
	Farmers	Wholesaler (%)	Retailer (%)
Compared to the period before the political transition did your **production/profits** increase or decrease?			
Increased significantly	13.5	23.1	38.0
Increased slightly	8.3	21.1	46.0
Remained similar	28.3	18.6	12.0
Decreased slightly	16.4	17.1	4.0
Decreased significantly	33.5	20.1	0.0
Compared to the period before the political transition do you get more or less **support** from the government to produce/distribute wheat grain?			
Significantly more support	7.3	2.0	6.0
Slightly more support	5.2	5.5	10.0
No change in support	58.2	76.9	78.0
Slightly less support	14.0	4.5	2.0
Significantly less support	15.3	11.1	4.0

Source: Authors' calculations from domestic wheat value chain surveys, 2021.

5.2 Imported wheat value chain policy preferences

Figure 5.2.1 reports the policy preferences of flour agents and bakeries; both were keen on increasing subsidies to the wheat sector and improving domestic production, although bakeries seemed more enthusiastic about these policies. On the other hand, flour agents were relatively supportive of investments in better regulation and transport and distribution than were bakeries.

Figure 5.2.1 Policy preferences – Imported wheat value chain



Source: Authors' calculations from imported wheat value chain surveys, 2021.

Overall, the policy preference survey clearly shows important differences in the preferences and priorities of various actors in wheat value chains in Sudan. While those engaged in the domestic wheat value chain prefer policies that can stimulate the domestic supply of wheat, those operating in the imported wheat value chain prefer policies that improve the supply chain and regulation of imported wheat. These differences in policy preferences are important and hence should be considered in the design of government policies aimed to improve the functioning and efficiency of wheat value chains in Sudan.

Table 5.2.1 Perceptions of the implication of political transition on wheat importation and distribution – Imported wheat value chain

	Flour agents	Bakeries
Compared to the period before the revolution, did your profits increase or decrease? (%)		
Increased significantly	29	26
Increased slightly	20	24
Remained similar	27	17
Decreased slightly	19	15
Decreased significantly	5	19
Compared to the period before the revolution, do you get more or less support from the government to produce bread?		
Significantly more support	7	17
Slightly more support	10	20
No change in support	49	36
Slightly less support	12	10
Significantly less support	22	17

Source: Authors' calculations from imported wheat value chain surveys, 2021.

SECTION 6: COVID-19 AND WHEAT VALUE CHAINS IN SUDAN

6.1 Domestic wheat value chain and COVID-19

The outbreak of the COVID-19 pandemic in 2020 and associated mobility restrictions added stress to an already ailing economy and Sudan's poorly performing wheat market by disrupting production, trade, and transport in many sectors. The value chain survey included several questions to identify potential COVID-19-related disruptions in the functioning of domestic and imported wheat value chains. The survey questions aimed to identify potential disruptions in the production, processing, and marketing of wheat within the two value chains. The impact of the pandemic was expected to vary across value chains and actors. Most farmers reported that production of wheat was not affected by the pandemic (Table 6.1.1). Among those reporting an impact of COVID-19 on their wheat production (about one-third of our sample), the most important effects were disruption of input supply and closure of markets. Although only one-third of the sampled farmers reported adverse impacts on production, about one-half reported adverse impacts on income. Interestingly, about two-thirds of our sample reported an adverse impact of the pandemic on marketing of wheat, mainly driven by closure of markets and mobility restrictions.

Table 6.1.1 Impact of COVID-19 on production, income, and marketing of wheat in Sudan – Farmers

	Percent of farmers reporting yes
Did the COVID-19 pandemic affect your production of wheat?	32.2
The impacts on production of wheat	
Disruption of input supply	39.5
Closure or disruption of market	49.2
Loss of income	4.8
Access to labor inputs	3.2
Transportation of inputs and labor	3.2
Overall impact of COVID-19 on income	
Negative	49.9
Did not impact	50.1
Did the COVID-19 pandemic affect the marketing of your wheat?	67.3
The impacts on marketing	
Disruption of input supply	8.9
Closure or disruption of markets	56.8
Mobility restrictions	28.6
Access to labor inputs	0.8
Transportation of output to markets	0.4
Decrease in demand and price of wheat	0.4
Lack of buyers	4.3
Compared to the period before the COVID-19 pandemic, did your production of wheat increase or decrease?	
Increased significantly	7.5
Increased slightly	4.4
Remained similar	63.1
Decreased slightly	18.2
Decreased significantly	6.8

Source: Authors' calculations from farmers surveys, 2021.

On the other hand, 85 percent of wholesalers and 74 percent of retailers in our sample reported negative impacts of the pandemic on the trade of wheat (Table 6.1.2). Similarly, 62 percent of wholesalers and 46 percent of retailers reported that the pandemic affected the supply of domestic wheat grain. Interestingly, while the closure and disruption of markets adversely affected retailers, wholesalers were more affected by curfews that limited working hours. About four out of five (81 percent) wholesalers reported a reduction in overall revenues and sales because of the pandemic, while the corresponding figure for retailers was 64 percent. About one-third of sampled retailers reported that their revenues and sales were not affected by the pandemic; the corresponding share for wholesalers was 15 percent.

Table 6.1.2 Impact of COVID-19 on wheat trading activities – Wholesalers and retailers

	Wholesalers (%)	Retailers (%)
Yes, COVID-19 pandemic negatively affected trading activities	84.9	74.0
Yes, COVID-19 pandemic negatively affected the supply of domestic wheat grain	61.8	46.0
What were the impacts of COVID-19?		
Disruption of input supply	2.9	2.6
Decline in wheat production	2.9	2.6
Closure/disruption of markets	12.1	36.8
Decline in demand for wheat	4.1	2.6
Shortage of labor	4.6	2.6
Mobility restrictions limiting transport	19.1	13.2
Less working hours for wholesaling	49.7	39.5
Other	4.6	0.0
What is the overall impact of the pandemic on your revenues/sales volume?		
Negatively impacted	80.9	64.0
Did not impact	14.6	30.0
Positively impacted	4.5	6.0

Source: Authors' calculations from traders surveys, 2021.

6.2 Imported wheat value chain and COVID-19

More strikingly, 95 percent of flour agents reported that the pandemic affected their distribution activities. Almost three-quarters (73 percent) of flour agents reported that the pandemic affected the supply of imported wheat, reducing the wheat flour quota and leading to the closure and disruption of markets (Table 6.2.1). Moreover, 85 percent of flour agents reported that the pandemic negatively affected their revenue and sales volume. Approximately 80 percent of sampled flour agents reported that bread prices increased amid the pandemic.

Table 6.2.1 Impact of COVID-19 on wheat distribution – Flour agents

	Percent of flour agents reporting yes
Yes, COVID-19 pandemic negatively affected my distribution activities	95.1

Yes, COVID-19 pandemic negatively affected the supply of imported wheat flour	73.1
How were you impacted by COVID-19 pandemic?	
Disruption of input supply Decline in wheat flour quota	36.6 68.3
Closure or disruption of market Decline in demand for bread	78.0 34.1
Lack of labor	31.7
Mobility restriction on input transport	22.0
Fewer working hours due to curfews	22.0
Overall impact of COVID-19 on revenue/sales volume	
Negatively impacted	85.4
Did not impact	5.0
Positively impacted	9.6
Compared to the period before the COVID-19 pandemic, did the price of imported wheat increase or decrease?	
Increased significantly	70.7
Increased slightly	7.3
Remained similar	9.8
Decreased slightly	9.8
Decreased significantly	2.4
Yes, there was a shortage in imported wheat flour due to COVID-19	63.4
Compared to the period before the COVID-19 pandemic, did the price of bread increase or decrease?	
Increased significantly	51.2
Increased slightly	29.3
Remained similar	7.3
Decreased slightly	9.8
Decreased significantly	2.4

Source: Authors' calculations from flour agents' surveys 2021.

Similarly, the majority (73 percent) of bakeries reported that the pandemic affected their bread production activities. Respondents reported experiencing closure or disruption in their regional market (37 percent), disruption in the supply of key inputs of production (36 percent), and a decline in their share of the wheat flour quota (31 percent) (Table 6.2.2). Moreover, 70 percent of bakeries sampled reported that the pandemic negatively affected their revenue and sales volume. Overall, more than 70 percent of the sampled bakeries reported that the price of bread increased compared to the period immediately before the COVID-19 pandemic, although it is important to note that part of this increase may have been driven by the general inflation Sudan experienced over the last few years.

Table 6.2.2 Impact of COVID-19 on bread production – Bakeries

	Percent of bakeries reporting yes
Did the COVID-19 pandemic affect the supply of commercial wheat flour?	69.2
Did the COVID-19 pandemic affect your production of bread?	73.1
Impacts on production of wheat	
Disruption of input supply	35.7
Decline in wheat flour quota	31.3
Closure or disruption of market	37.4
Decline in demand for bread	18.7
Lack of labor	27.5
Mobility restriction on input transport	29.1
Fewer working hours due to curfews	10.4
Overall impact of COVID-19 on revenue	
Negatively impacted	70.0
Did not impact	23.0
Positively impacted	5.0
Compared to the period before the COVID-19 pandemic, did the price of bread increase or decrease?	
Increased significantly	41.7
Increased slightly	22.0
Remained similar	28.0
Decreased slightly	3.9
Decreased significantly	4.4
Compared to the period immediately before the COVID-19 pandemic, did the price of bread increase or decrease?	66.5
Increased significantly	46.7
Increased slightly	23.6
Remained similar	22.0
Decreased slightly	4.4
Decreased significantly	3.3

Source: Authors' calculations from bakeries survey, 2021.

Overall, the COVID-19 pandemic has had significant but differential impacts across Sudan's wheat value chain actors. While wheat production remains mostly unaffected by the outbreak of the pandemic, the marketing, trade, and distribution of wheat and wheat flour has been adversely affected by the pandemic. This is intuitive, as COVID-19-related mobility restrictions and social distancing measures are more likely to limit trading activities than farming activities, which may be performed with limited interaction. Thus various actors within the wheat value chain are likely to experience impacts of differing severity from the pandemic. These pieces of evidence are important to inform immediate rescue programs and post-COVID-19 sectoral investment plans.

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ABOUT THE AUTHORS

Fatma Abdelaziz is a Senior Research Associate with the Egypt Strategy Support Program (ESSP) of the International Food Policy Research Institute (IFPRI), based in Cairo. **Amy William** is a Research Assistant with the Egypt Strategy Support Program (ESSP) of the International Food Policy Research Institute (IFPRI), based in Cairo. **Kibrom A. Abay** is a Country Program Leader and Research Fellow in the Development Strategy and Governance Division at IFPRI, based in Cairo. **Khalid Siddig** is an Assistant Professor in Humboldt University, based in Potsdam, Germany.

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INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE
1201 Eye St, NW | Washington, DC 20005 USA
T. +1-202-862-5600 | F. +1-202-862-5606
ifpri@cgiar.org | www.ifpri.org

IFPRI Sudan
Amarat street 7 | P.O. Box 474, Khartoum 11111, Sudan
Tel: +249 183 472176 83 | Fax: +249 183 471402
Ifpri-sudan@cgiar.org | sudan.ifpri.info

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