

Wheat to Bread Market Assessment

Part 2

Northeast Syria – August 2023



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1. Executive Summary

After evaluating the wheat cultivation outcomes for the 2022–2023 season in the initial phase of the Wheat to Bread Market System assessment in Northeast Syria (NES), that primarily examined challenges of wheat production, the accessibility and affordability of production inputs, and limitations faced by farmers due to climatic factors and irrigation issues. The subsequent stage of the assessment focuses on mapping the bakeries within the Northeast Syria region to gain insights into their operational efficiency, functionality, accessibility, and availability of bread. Additionally, the assessment aims to identify any gaps in production that might exist and whether bread production adequately meets the local population's bread needs. The main focus of this study is to further examine the availability and cost-effectiveness of inputs crucial for bread production, particularly wheat grains and flour.

In general, the findings highlight several challenges across various market actors within the wheat-flour to bread value chain after cultivation, all of which contribute to an inefficient trade cycle. The trading market encounters issues related to imports, border closures, and escalated transportation expenses, all of which amplify difficulties in accessing and obtaining inputs within the market. In comparison to imported flour, local flour holds a more significant presence in the market, especially among bakeries, whereas traders rely more heavily on imported flour trade due to the control applied by the Local Self Administration (LSA) over the local grain and flour market.

Furthermore, bakeries are not operating at their maximum capacity potentially due to the restricted availability of the distributed local flour. In fact, bakeries receive limited quantities of flour according to their contracts with the LSA. On the other hand, if bakeries were to operate independently, their operational costs would exceed those bakeries benefiting from subsidized flour and fuel support. This limitation constrains bakery production, subsequently restricting the available bread quantity to meet the local minimum standards of bread needs of the population. Another notable factor influencing bakery production is the need for rehabilitation, where bakeries rehabilitation needs increased since the previous rounds of wheat-flour to bread facility mapping assessments.

Finally, the market infrastructure faces various other challenges, such as inadequate and restricted storage conditions for traders and bakeries.

However, the most significant challenge impacting all market actors is the increasing fuel costs, compounded by the poor quality of subsidized fuel they acquire. This, in turn, affects their operations, including irrigation, generator usage, bread production, and the transportation of goods across market actors, leading to increased overall production costs.

This report incorporates valuable insights into the state of the wheat-flour to bread value chain in Northeast Syria (NES), defining the market linkages, obstacles, and opportunities of market actors throughout the value chain. The report also presents recommendations and strategies to facilitate the improvement of the market, recognizing its significance as one of the crucial markets in NES.

2. Introduction

Bread is a crucial wheat-based food that serves as a staple in Syria. Wheat, the primary ingredient in bread, is considered one of the most essential food crops in the region. However, the conflict that began in 2011 has severely disrupted the wheat-flour to bread value chain in some communities, starting from wheat production and extending to bread production facilities. In Northeast Syria (NES), government support has diminished, and the wheat-to-bread infrastructure is deteriorating. Additionally, climate events, global inflation, and reduced quality of wheat seeds have contributed to the reduction in wheat production. As a result of previous assessments, Northeast Syria now produces less than what is required to feed its own population¹.

To prevent the instability of the wheat-flour to bread market and prepare for any upcoming shocks, iMMAP conducted a comprehensive analysis of the wheat-flour to bread sector. In details, a market system assessment was conducted in Q1 of 2023 and focused on the input supply chain management and output market of wheat production in NES. The primary objective of this study was to complement existing assessments, such as the Wheat-Flour to Bread Processing Facilities Mapping, the Post-Harvest Study of Wheat Production in Northeast Syria (NES), and the Integrated Price Monitoring, with crucial information that sheds light on the market dynamics of wheat production/cultivation and trade in NES. The study aimed to provide additional insights into the complex economic environment of the wheat market in NES and help identify potential gaps and opportunities to support the sustainable growth of the sector. The assessment was divided into two parts to ensure a comprehensive evaluation of the wheat-flour to bread value chain.

The first part of the assessment focused on the post-cultivation season, exploring the wheat production and trade market, including the sources and prices of wheat seeds, and agricultural inputs utilized in the wheat production process. The primary goal of the first part of the assessment was to gather data and insights into the wheat production and trade system, including the identification of potential challenges and opportunities for improvement. The full report can be accessed [here](#).

The second part of the assessment, which took place in the third quarter of 2023, enabled a more extensive examination of wheat grains, flour, and bread production, and allowed for providing a more comprehensive view of the entire value chain. This part of the assessment will focus on examining several factors, such as the quality and availability of wheat grains and flour, the sources of inputs used for bread production, the volumes utilized of imported versus local grains and flour, bread productivity, and an overall gap analysis of bread production across different sub-districts of NES.

2.1. Study Objectives

The objectives of this initial assessment are multi-faceted and aimed at gaining a comprehensive understanding of the challenges and opportunities facing bakeries, wheat, and flour traders in the NES region. The specific objectives of the study are:

1. Explore the wheat-flour to bread trading norms and analyze the effects of imported grains and flour on the local wheat grains and local flour availability.
2. Assess the availability of wheat grains and bread production inputs.
3. Provide an overview of the bread production market and the challenges faced by bakeries.
4. Study prices of different inputs across the wheat-flour to bread value chain.
5. Gap analysis of actual bread availability by sub-district/district level in comparison to population bread needs.
6. Understand the role of different market actors in the wheat-flour to bread value chain (NGOs, LSA, traders, mills, bakeries)

2.2. Study Methodology

The study area covered 30 sub-districts located across 11 districts in 4 different governorates in Northeast Syria (NES), including Aleppo, Al-Hasakeh, Ar-Raqqa, and Deir-ez-Zor. However, it's noteworthy that Menbij sub-district was not covered in the assessment due to accessibility challenges. Data collection was carried out by iMMAP's service provider and six NES Food Security and Livelihood Working Group partners.

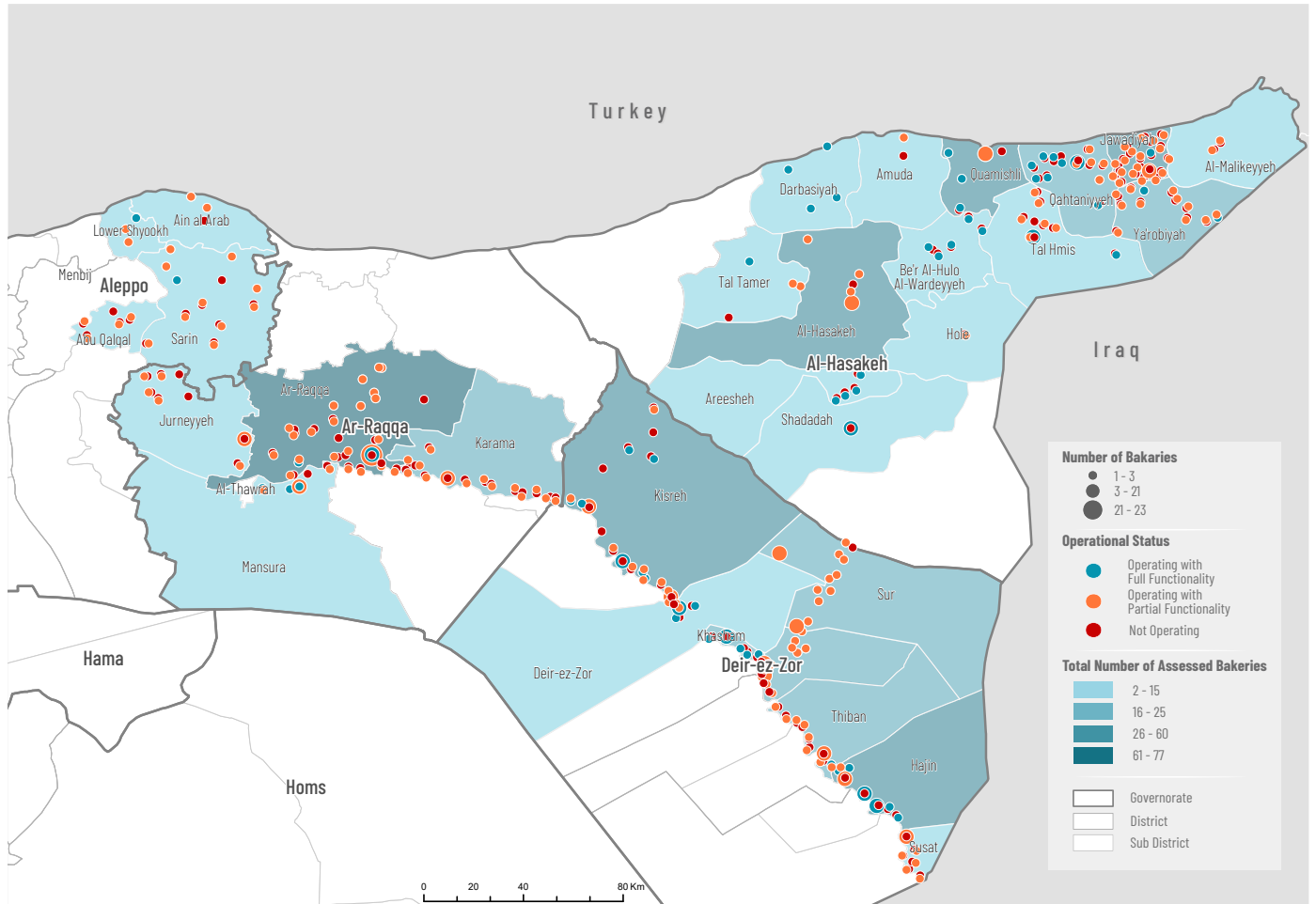
To carry out the interviews, enumerators were trained to use two data collection tools with semi-structured questions, targeting bakeries and wheat/flour traders as study respondents. The sample for bakeries was identified through providing the partners with an accumulated pre-defined list of bakeries that was generated from previous rounds of the Wheat-to-Bread Processing Facilities Mapping assessment. Accordingly, the snowball sampling technique was adopted to cover the highest number possible of bakeries (both functional and non-functional) across NES.

The study also adopted value chain analysis techniques, built on primary and secondary data from previous assessments. This approach aimed to construct a comprehensive market map, displaying the market linkages between the market actors in the wheat-flour to bread value chain. This map will allow a clearer understanding of the flow of information and market linkages between the market actors and help identify main challenges and opportunities for improvement of the market environment, essential business activities, and trade cycles. Furthermore, iMMAP's Research and Analysis unit collated qualitative insights from its researchers in the NES region to complement the study findings.

The study also integrated quantitative data analysis techniques, which enabled an evaluation of bakery functionality and the implementation of a gap analysis. This analysis, conducted at a sub-district level, highlighted the bread production gaps that are necessary to meet the local population's needs of bread.

The data collection process involved conducting interviews with a total of 521 bakeries, 34 wheat grain traders, and 24 flour traders. A visual representation of the study's coverage is provided in Map 1.

Wheat to Bread Market Assessment - Part 2
 Northeast Syria - August 2023



Map 1: Data Collection Coverage Map - Bakeries

3. Market Map

Wheat - Flour to Bread Market System Northeast Syria August 2023

The Market Environment

Institutions, rules, norms & trends



Cross-border taxes



SYP Depreciation



Laws and Regulations



Water Scarcity



Climate Events



Business Network

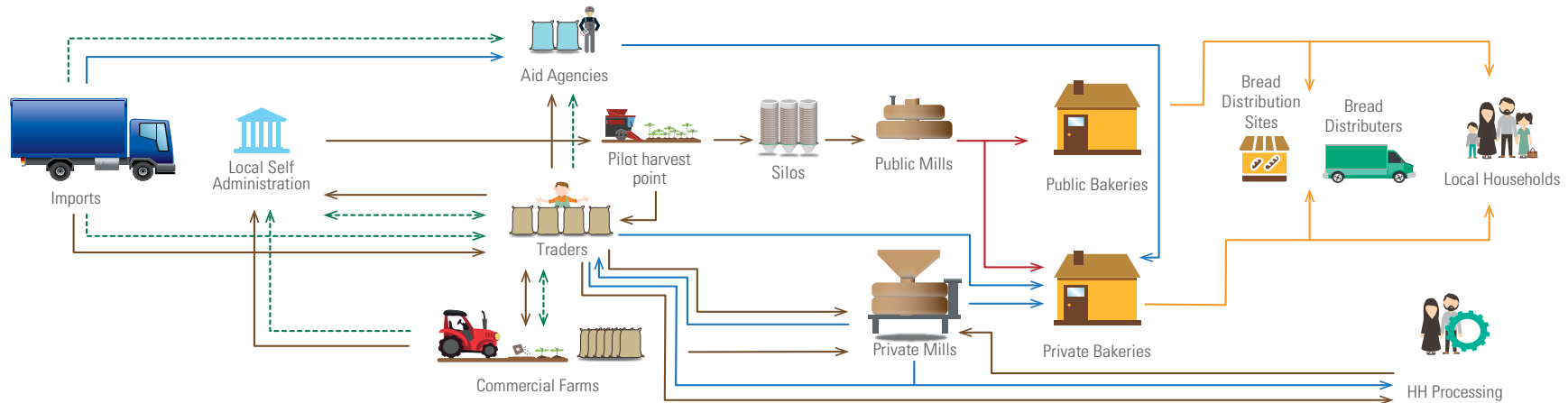


Quality Control

Value Chain

Market actors & their linkages

Retail Market Prices	Price of Wheat Grains (USD/MT):	Price of Flour (USD/MT):	Price of Tourist Bread (SYP/kg):	Price of Subsidized Bread (SYP/kg):	Price of Unsubsidized Bread (SYP/kg):
Local	Min: 320 Mean: 380 Max: 550	Local Min: 300 Mean: 360 Max: 500	Min: 2,083 Mean: 3,992 Max: 4,700	Min: 225 Mean: 288 Max: 522	Min: 231 Mean: 303 Max: 500
Imported	Min: 350 Mean: 410 Max: 450	Imported Min: 350 Mean: 420 Max: 550			



Key Infrastructure

inputs, market-support services

→ Wheat Seeds
 → Wheat Grains
 → Flour
 → LSA Flour
 → Bread
 ✔ No Disruption
 ⊘ Partial Disruption
 ✘ Major Disruption
 ⚠ Critical Issue



Prices of Wheat & Bread Production Inputs



Supply Chain



Transport



Electricity



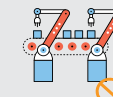
Fuel



Financial Services



Credit based trade



Machinery



Stocking

3.1. Market Environment

Following the Syrian crisis and subsequent barriers such as currency depreciation, restricted border crossings, limited accessibility of inputs, water scarcity, and climate events, the agricultural sector in Syria, which is the foundation of numerous value chains and productions in the local market, faced significant challenges. Among those affected were wheat farmers, who experienced notable changes in wheat production within the wheat-flour to bread value chain, leading to an impact on bread production. As bread is a staple food for the population, this situation affected both the food security of the people and the livelihoods of market actors involved in the value chain.

As a result of the crisis, the total area of wheat cultivation in the NES region decreased significantly, now representing less than 50% of the overall agricultural land in the area ². The water crisis and adverse climate events contributed to a decline in the availability of water required for irrigating wheat crops. Specifically, the reduced water supply from Turkey, which flows through the Euphrates River, along with disruptions in river flows and damaged water infrastructure, have had negative consequences for wheat production³. Farmers interviewed in the Wheat to Bread market assessment reported low levels of rainfall occurring late in the season, which they identified as the primary challenge affecting irrigation needs for wheat production ⁴.

Furthermore, climate events like drought conditions, irregular rainfall patterns with lower levels of precipitation and longer dry periods, and the risks posed by hailstorms, fires, diseases, and pests have all had an impact on wheat production in previous seasons. To mitigate the effects of these climate events, farmers have adopted a range of climate-smart agriculture (CSA) practices, such as reducing soil tillage, implementing irrigated wheat production, and utilizing drought-tolerant seeds to cope with water stress. **However, the NES region still lacks sufficient water management infrastructure for practices like water harvesting and modern irrigation techniques.** Farmers have also employed CSA practices for soil preservation and improving harvested wheat crops, including the use of herbicides, pesticides, crop residues, and crop rotation. Nevertheless, CSA practices come at a high cost for wheat production, especially for those lacking adequate adaptation strategies.

Poor adaptation strategies may arise due to a lack of technical knowledge or skills, limited access to weather and climate forecasting information, and a shortage of expertise in water and soil conservation techniques. It is crucial for farmers to have a comprehensive understanding of CSA activities that can enhance productivity, including their timing and technical implementation. Factors such as the quality and variety of seeds, as well as the choice of fertilizers and pesticides based on the geographical area of their land and soil composition, are essential considerations for their farming practices.

The market dynamics of the wheat-flour to bread value chain are also influenced by the Local Self Administration (LSA) in various ways. Firstly, the LSA plays a significant role in supporting farmers by providing them with wheat seeds and production inputs, and in turn engaging in contracts with farmers, requiring them to sell their harvest exclusively to the LSA. Additionally, they manage the purchase and distribution of post-harvest wheat produce. The LSA is also responsible for determining prices for wheat seeds and grains in the market, as well as regulating import and export levels within the NES region. While this approach encourages farmers to actively participate in wheat production activities and ensures better control and accessibility of wheat grains and flour throughout the value chain, it does have its limitations, including not providing farmers with any substantial profit or power in the market. The exclusive arrangement with the LSA affects the entry of private traders into the market, giving them significant market power over essential stages of the value chain, including the trade of seeds, pesticides, herbicides, fertilizers, flour, and more. **This, in turn, affects the accessibility of farmers to private markets due to their low purchasing power and financial limitations.** Towards the downstream end of the wheat-flour to bread value chain, the LSA and NGOs also actively participate in supplying flour to bakeries. This leads either to free distributions of bread or to be sold at subsidized prices, thereby increasing support for bread production, and improving the bread accessibility to local communities to meet their needs.

² Post-Harvest Study of Wheat Production in Northeast Syria (NES), 2021/2022 Winter Season. The full report can be accessed [here](#).

³ Post-Harvest Study of Wheat Production in Northeast Syria (NES), 2021/2022 Winter Season. The full report can be accessed [here](#).

⁴ Wheat to Bread Market Assessment – Part 1, Northeast Syria (NES), April 2023. The full report can be accessed [here](#).

Another limitation affecting the market environment of the wheat-flour to bread value chain in the region is the limited availability of testing laboratories for wheat seeds and grains, where only a small proportion of traders have reported their presence in certain areas. Moreover, only a small minority of traders conduct lab tests on the products they sell, often relying on grain centers or external experts for such quality tests. **On the other hand, many traders do not carry out lab tests due to the lack of accessible facilities and expertise, which can in turn have significant implications on the overall quality of seeds in the region.** Furthermore, farmers who lack access to these testing facilities face challenges in ensuring the authenticity and quality of their produce. Consequently, this causes a growing concern about the potential impact on the entire wheat-flour to bread value chain. **Without proper testing and verification, the risk of substandard products entering the market increases, affecting not only farmers but also consumers who rely on high-quality grains, flour, and ultimately bread.**

3.2. Wheat Production

The most recent assessment of the Wheat Market System revealed a predominant preference for irrigated lands over rainfed lands in local wheat production in NES. Yet, it was noted that the cultivation size of rainfed lands displayed greater stability in comparison to irrigated lands, which reported fluctuating land sizes in the 2022-2023 season ⁵.

In a broader context, the wheat harvest season of 2022/2023 yielded favorable results, with a substantial volume of 1,150,000 metric tons (MT) of wheat grains harvested and subsequently received by the LSA. **This marks a significant increase from**

the 2021/2022 season, during which the total harvested wheat amounted to 470,000 MT of wheat grains. Additionally, farmers and traders are estimated to have stored around 300,000 MT of wheat as retained seeds for the next season. This significant increase in harvested wheat grains can largely be attributed to the positive impact of the support received by farmers, and the fixed pricing strategy in USD set by the LSA effectively mitigating currency fluctuations.

The improvement in harvest can also be attributed to the improvement in the rainfall levels later in the season. As indicated in the Wheat to Bread Market Assessment⁶, up until February, the rainfall has predominantly remained below the long-term average. Nonetheless, prior to harvest, the period from March to May 2023 saw an increase in rainfall amounts, which were either above average or near the average, consequently leading to an enhancement in the crop conditions.

Nevertheless, several challenges emerged during this season. Increased production costs, irrigation requirements, limited water access, lack of substantial profit and power of farmers in the market were among the main reported issues. In addition to these factors, difficulties in obtaining fuel, and its' increasing prices, also contributed to elevated transportation costs. Notably, truck rental prices rose to as high as 700 USD this season due to extended periods of cargo storage before offloading. Delays in post-harvest payments, lasting up to 45 days in some instances, presented difficulties for farmers as well. However, the stability derived from conducting transactions in USD played helped mitigate the impact of this challenge.

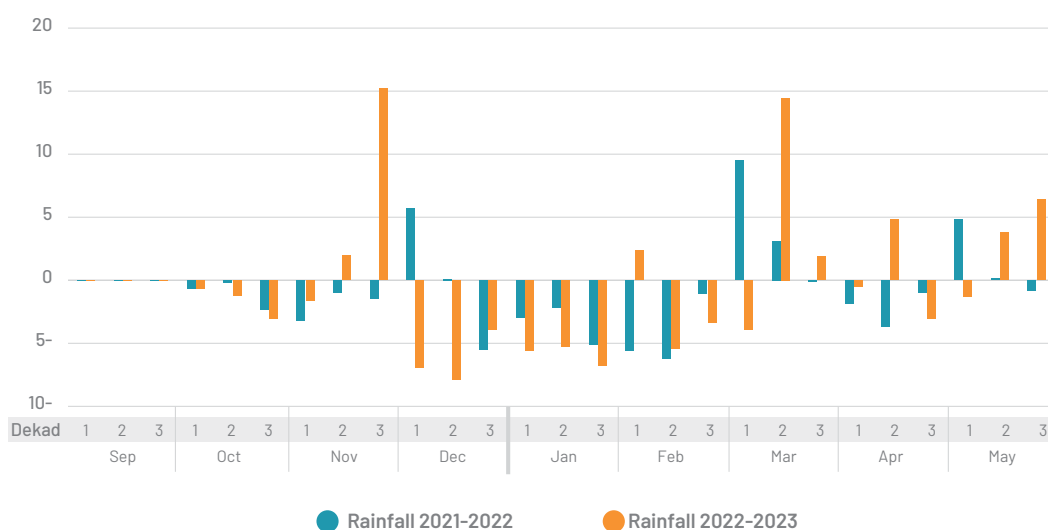


Figure 1: Rainfall Anomalies in mm for the 2021-2022 and 2022-2023 Winter Season – Average of all NES Districts

⁵ Wheat to Bread Market Assessment – Part 1, Northeast Syria (NES), April 2023. The full report can be accessed [here](#).

⁶ Wheat to Bread Market Assessment – Part 1, Northeast Syria (NES), April 2023. The full report can be accessed [here](#).

3.3. Wheat Grain and Flour Trading

Wheat Grains

The study included assessing 34 wheat grain traders, with 68% being wholesalers and 32% retailers. Only 4 traders participated in regional trade, whereas the rest operated as local traders. Among the assessed traders, **95% of the traded wheat grains were locally sourced, while a mere 5% were imported** - originating from Turkey (51%), Iraq (26%), and European countries such as Germany and France (23%).

Over half of traders reported steady local wheat grain availability, while the rest reported fair availability in the trade market. On the other hand, 63% of the traders reported unavailability of imported wheat grains, whereas only 13% reported constant availability. The primary challenges for the unavailability and difficulty in accessing imported wheat grains included import-related challenges, border closures, high transportation expenses, and elevated imported wheat grain prices.

As shown in figure 2, the primary sources for local wheat grains included local farmers (84%) and NES traders (16%). On the other hand, imported wheat grains were primarily provided by importers (49%), NES traders (42%), or self-imported (9%). Regarding the supply dynamics, only 3 traders had regular contracts with their suppliers, implying limited consistent agreements among suppliers and traders. Moreover, the majority of purchases from suppliers were conducted using cash (78%), with these transactions predominantly made in USD (83%) rather than Syrian Pound (SYP). **Notably, credit transactions were infrequent (19%) among suppliers and traders and were often involving informal agreements** related to payments in USD, payment timelines, and mutual familiarity between suppliers and traders.

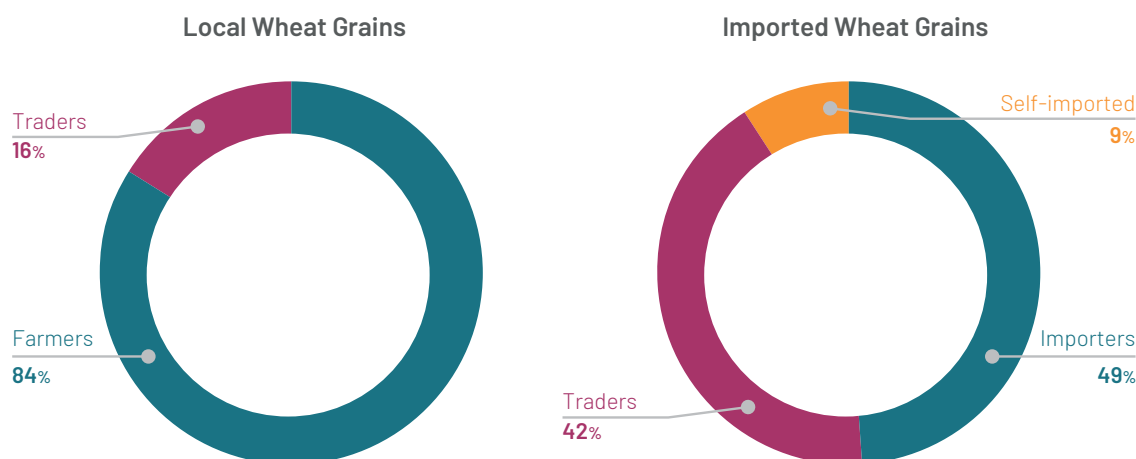


Figure 2: Suppliers of Local and Imported Wheat Grains

As for customers, both imported and local wheat grains were primarily purchased by NES farmers, traders, and mills. In the case of local wheat grains, customers also included the LSA, while imported wheat grain customers extended to include NGOs. Regarding the demand dynamics, only 4 traders maintained regular contracts with their customers, also highlighting limited consistent agreements between traders and customers. Additionally, sales transactions were predominantly carried out in cash (73%), and in USD (76%) rather than SYP. **Notably, credit transactions were more prevalent with customers (26%) than with suppliers** and were characterized by similar informal arrangements as observed with the suppliers.

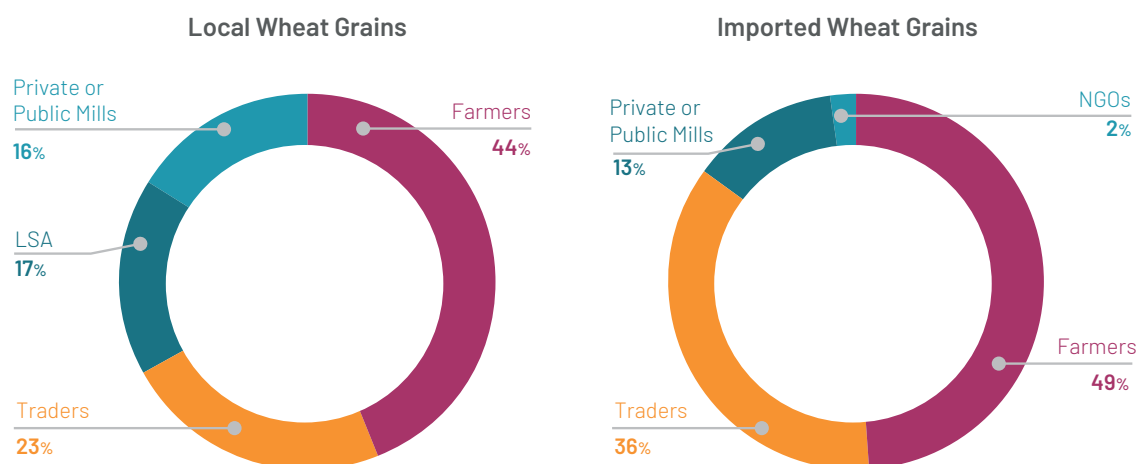


Figure 3: Customers of Local and Imported Wheat Grains

In general, traders noted that the prices of local wheat grains experience seasonal fluctuations. **Specifically, the costs are highest in October, November, and December, while the lowest prices are observed in June and July.** This price pattern can be attributed to the heightened demand for wheat grains during the cultivation season, leading to price hikes. Conversely, prices tend to decrease during the harvest season, conditional on the quantity of harvested wheat. On the other hand, a majority of traders lack awareness of imported wheat grains price fluctuations, although those who are familiar with these fluctuations reported similar price patterns to local wheat grains.

Flour

The study included assessing 24 flour traders, almost all of which are wholesalers. Only 4 traders participated in regional trade, whereas the rest operated as local traders. **Among the assessed traders, 22% of the traded flour was locally sourced, while the majority of 78% was imported** – originating mainly from Turkey (78%), and Iraq (20%).

Over half of traders reported fair local flour availability, whereas 22% reported its unavailability in the trade market. Conversely, 57% of traders stated that imported flour was consistently available, and most of the remaining traders noted its fair availability. **In a broader context, it can be observed that imported flour maintains a more prevalent presence within the trade market compared to local flour.** This situation is primarily influenced by the oversight exercised by the LSA over the local flour supply and does not necessarily indicate the unavailability of local flour to market actors in the value chain.

The primary challenges for the unavailability and difficulty in accessing local flour are linked to reduced local flour milling capacity, along with variations in quality that can be traced back to inadequate storage conditions. Regarding imported flour, despite its availability, numerous accessibility challenges are tied to import-related issues, border closures, high transportation costs, and the increase of imported flour prices.

As show in figure 4, the primary sources for local flour included public or private mills (70%) and NES traders (30%). On the other hand, imported flour was primarily provided by NES traders (40%), importers (34%), or self-imported (26%). Regarding the supply dynamics, only 3 traders had regular contracts with their suppliers, implying limited consistent agreements among the suppliers and traders. Moreover, the majority of purchases from suppliers were conducted using cash (86%), with these transactions predominantly made in USD (91%) rather than SYP. **Notably, credit transactions were infrequent (14%) among suppliers and traders** and were often involving informal agreements related to payment timelines and mutual familiarity between suppliers and customers.

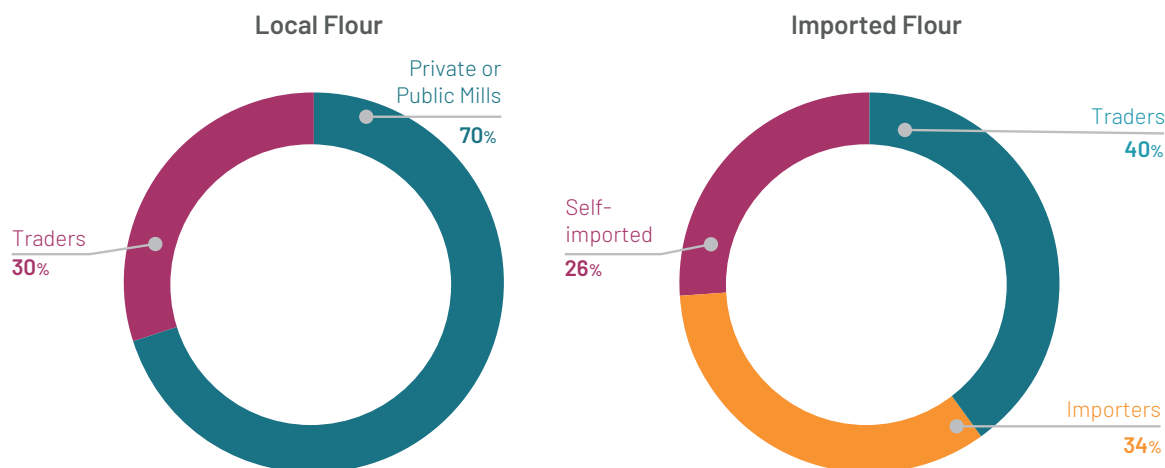


Figure 4: Suppliers of Local and Imported Flour

Regarding customers, both imported and local flour were primarily purchased by private bakeries, NES traders, and local households. Regarding the demand dynamics, only 3 traders maintained regular contracts with their customers, also highlighting limited consistent agreements between traders and customers. Additionally, sales transactions were predominantly carried out in cash (77%), and in USD (81%) rather than SYP. **Notably, credit transactions were more prevalent with customers (33%) than with suppliers** and were characterized by similar informal arrangements as observed with the suppliers.

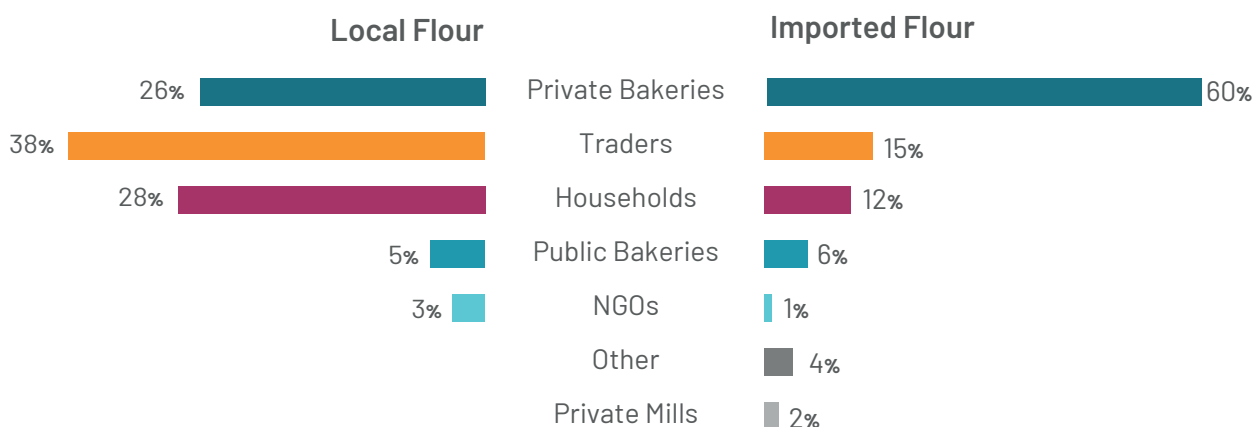


Figure 5: Customers of Local and Imported Flour

In general, traders noted that the prices of local flour experience seasonal fluctuations similar to those of wheat grains. **Specifically, the costs are highest in November, December, and January, while the lowest prices are observed in June and July.** This price pattern is similarly attributed to the availability of local wheat grains in the market due to its' seasonality and demand. On the other hand, a majority of traders also lack awareness of imported flour price fluctuations, although those who are familiar with these fluctuations reported similar price patterns to local flour.

Traders' Storage and Quality Control

Regarding storage, a total of 80% of wheat grain and flour traders indicated that their storage conditions are good, whereas the remaining traders (20%) categorized their conditions as average to poor. **Predominantly, their challenges centered around their inability to regulate storage temperatures and their storage area's exposure to sunlight and pests**, consequently affecting the stored grain and flour's quality. The quality of wheat grains and flour is also contingent on the extent of quality tests conducted.

Only 24% and 29% of wheat grains and flour traders, respectively, indicated performing laboratory quality tests on the wheat grains and flour they trade, whereas a few others conduct physical tests based on their expertise. Those who carry out laboratory checks examine random samples during buying and selling, focusing on metrics such as moisture content, dryness, cracks or roughness, and impurities. These tests take place in laboratories overseen by the Local Self Administration (LSA) or the Economics and Supply Committee. Conversely, **among traders who don't perform quality checks, a substantial portion mentioned the absence of testing facilities in their regions**, which were mainly located in Kisreh and Thiban sub-districts of Deir-ez-Zor governorate, and Qahtaniyyeh sub-district of Al-Hasakeh governorate. **However, other traders noted that the wheat grains or flour they purchase are typically tested by suppliers in advance.**

Trade Regulations, Restrictions, and Support

Numerous factors exert influence on the local and imported wheat and flour market including fluctuations in exchange rates, delayed processing of invoices, increased transportation and labor costs, limited storage facilities, and climate factors. Moreover, challenges encountered by the import market include import restrictions, tax implications, inflation in input costs, security, and political situations, along with financial limitations faced by local market actors. These factors collectively contribute to changes in the balance of supply and demand, consequently causing fluctuations in prices. For instance, the closure of border crossings can increase demand, thereby driving up both purchasing and selling prices of grains and flour.

In general, the import of wheat grains and flour is hindered by factors such as unstable security conditions, border closures, imposed taxes, quality disparities, and the dynamics of local demand. As determined among traders, it is evident that the prevalence of imported flour exceeds that of wheat grains

within the trade market. Although imported flour is subjected to import constraints similar to those mentioned earlier, the imports of wheat grains encounter distinct limitations. These include security approvals which are often denied. In addition to the restrictions on wheat imports, imported wheat is often not demanded due to the availability of abundant local grains. **Furthermore, the demand for imported wheat grains is also affected by farmers' uncertainty about its' suitability for the NES region and their preference for the quality and price of local produce, all of which decrease reliance on imported wheat grains.**

According to traders, the grain and flour trade market requires comprehensive assistance to enhance its functionality. This assistance includes several aspects, including the **improvement of storage facilities** to ensure better preservation of grains and flour, and supporting their regular rehabilitation. Moreover, there's a need to offer **support for irrigated agriculture, supplying improved seeds and essential agricultural inputs, as well as expanding cultivated areas** to boost production. From a trader's perspective, it is essential to **reduce trade barriers, and facilitate imports, along with the elimination or reduction of taxes** on grains and flour to stimulate trade.

3.4. Wheat to Flour Processing

Based on the findings from the Wheat to Bread Processing Facilities Mapping assessment conducted in the third quarter of 2022, the collective operational mills have an actual total milling capacity of approximately 15,300 MT of wheat grains per week⁷. This volume could potentially be expanded to 21,000 MT per week if the mills were operating at maximum capacity. On average, the mills reported that each metric ton of wheat grains yields around 820 kilograms of locally milled flour. The assessment also reveals that 56% of non-operational mills (totaling 19) and 72% of partially functional operational mills (totaling 79) reported that the scarcity of wheat as a primary challenge affecting their operations. This suggests that an increase in the local supply of wheat grains could contribute to improving mill functionality.

Moreover, considering the local minimum standard of bread needs (330 grams per person) of the entire population in Northeast Syria (NES)⁸, the total minimum weekly bread demand reaches 6,570 metric tons (MT). To meet this demand for bread, a minimum weekly flour production of 5,500 MT is necessary. **Given the existing milling capacity, the mills have the capability to generate 12,500 MT of flour every week, adequately covering the local flour needs for bread production.**

⁷ Wheat-Flour to Bread Processing Facilities Mapping, Northeast Syria (NES), October 2022. The full report can be accessed [here](#).

⁸ The total population is 2,844,385 as of May 2022 – HNO 2023

Additionally, considering the successful wheat harvest season (2022-2023) which yielded 1,150,000 MT of wheat grains, with an **estimated** required allocation of 700,000 MT of wheat grains for flour production, it is indicated that in the forthcoming season, there is an anticipation of heightened bread production that would adequately fulfill the minimal bread necessities of both the population and people in need. However, these projections could be influenced by other factors such as diverting wheat for uses other than flour production to meet bread demand or disruptions due to security instabilities.

3.5. Bread Production

3.5.1. Operational Status

Out of the 521 assessed bakeries, approximately 92% (n=481) were reported as operational. Among these operating bakeries, approximately 77% were privately owned, 10% were publicly owned, and 13% had joint ownership (a combination of public and private ownership). On the other hand, around 8% (n=40) of the bakeries were non-operational, with 20% of them permanently closed.

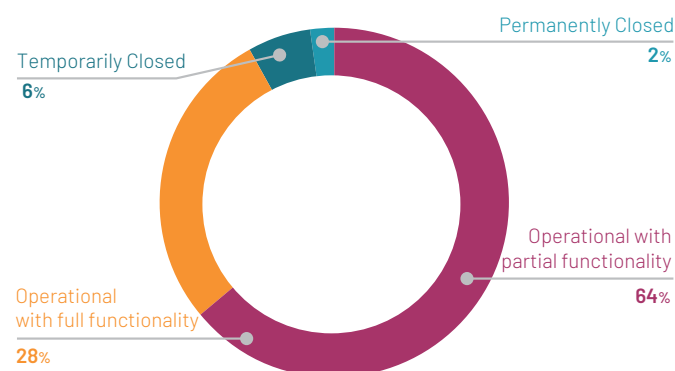


Figure 6: Operational Status of Bakeries

The closure of bakeries was primarily attributed to several key factors. **The main reason was the high operational costs associated with bread production, combined with limited access to support and financial resources, which negatively affected their ability to continue operating.** Another significant factor leading to temporary closures was the need for bakery machinery maintenance, where some bakeries had to suspend their operations temporarily to address their maintenance needs.

In Deir-ez-Zor and Al-Hasakeh governorates, some non-operational bakeries referred to limited distributions of subsidized flour and fuel from the Local Self Administration (LSA) as a critical issue. The quantities allocated by the LSA were insufficient to meet the demands of the local population, nor to generate profit that would cover their operational costs and maintenance needs. Additionally, the LSA's practice of setting prices for bread and fuel also contributed to increased costs for the bakeries, resulting in reduced profits and financial losses for some facilities. These challenges collectively created a complex situation for bakeries, impacting their sustainability and viability in the region.

Moreover, out of the assessed operational bakeries, 69% (n=333) were only partially operational due to reasons similar to the non-operational bakeries. Insufficient allocations of subsidized flour distributed by the LSA and the low availability of raw materials like flour, fuel, and yeast were cited as major obstacles to full functionality. The need for machine maintenance, high operational costs, and the lack of access to support were also considered limitations for bakeries to operate at full functionality.

Regarding bakery management, while 22% of the bakeries had some public entity involvement in ownership, only 4% reported being solely or jointly managed by the LSA. In the majority of cases (75%), the owners themselves were responsible for bakery management. Private investors (15%) and staff members (6%) were also involved in the management of some bakeries. The average weekly working days for bakeries were around 5.4, and the average daily working hours were approximately 7.3. **This limited working schedule of bakeries contributed to low accessibility of bread for consumers, as they often didn't operate on a daily basis and were usually closed on Fridays.** Moreover, bread availability at late hours of the day was also limited. Despite bread quantities covering the bread needs, accessibility to households was not always guaranteed throughout the entire day.

It's worth noting that regardless of bakery ownership, the average working days of bakeries were quite similar, ranging from 5 to 6 days per week. However, the working hours varied based on ownership. Public bakeries reported an average of 12 working hours per day, whereas private bakeries had the lowest average of 7 working hours per day. **This discrepancy could be due to higher flour allocations to public bakeries, enabling them to produce larger quantities of bread to support the population, hence necessitating longer operating hours.**

3.5.2. Rehabilitation Needs

Approximately 55% of the operating bakeries (n=264) expressed their needs for machine maintenance and/or support for building rehabilitation. The most pressing needs were related to the maintenance of oven houses and rehabilitation of building structures, closely followed by compressor maintenance. Additionally, other equipment in the bakeries, such as dough mixing machines, cooling paths, cutting machines, and generators, also required maintenance.

In terms of costs, and as estimated by bakery owners, the estimated cost for building infrastructure rehabilitation across all assessed bakeries amounted to \$440,750 USD, while equipment maintenance was estimated to cost \$1,031,555 USD. Additionally, new equipment costs were estimated at \$836,586 USD. **It's worth noting that despite the operational bakeries' percentage remaining consistent with Q3 2022, the rehabilitation costs have risen between the two quarters as shown in table 1.** This suggests a growing need for rehabilitation without any significant intervention taking place.

Type of Rehabilitation	Cost in Q3 2022 (USD)	Cost in Q3 2023 (USD)
Equipment maintenance	967,200	↑ 1,031,555
Building rehabilitation	412,450	↑ 440,750
Purchasing new equipment	790,540	↑ 836,586

Table 1: Rehabilitation Costs - Q3 2022 vs. Q3 2023

The lack of implementation of rehabilitation and maintenance in bakeries can be attributed to various challenges they face. The primary obstacle reported is the **high cost of materials and parts** necessary for maintenance or rebuilding, that can be attributed to their **limited availability**. Additionally, the wages demanded by workers are considerably high, and the **scarcity of technicians** in the area further contributes to **increased labor costs**. Moreover, some bakeries have limited financial capabilities, as their profits from bakery operations are not sufficient to cover maintenance expenses. These challenges are further compounded by **minimal support received by bakeries for rehabilitation**, which will be discussed in more detail in following sections.

3.5.3. Functionality of Bakeries

The bakeries' reported maximum total weekly production capacity for bread was 20,700 MT, yet the actual recorded total weekly production amounted to 5,700 MT. **This indicates a significant decrease in bread production, with the weekly actual capacity dropping from 6,770 MT in Q3 2022 to 5,700 MT in Q3 2023** (excluding Menbij sub-district), representing a 16% decline.

The governorates that experienced the highest decrease in bread production were Deir-ez-Zor and Al-Hasakeh. On average, **the functionality of bakery facilities was notably low, standing at 28% across the assessed operational bakeries.** Among the governorates, Aleppo governorate recorded the highest functionality rate at 40%, while Deir-ez-Zor governorate had the lowest functionality rate at 18%.

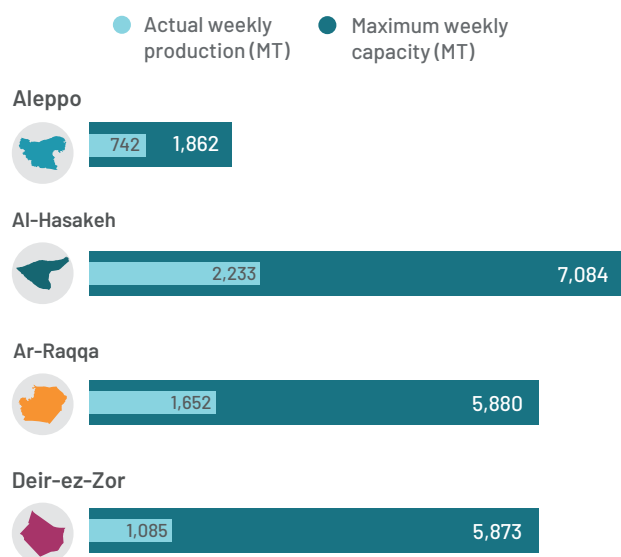


Figure 7: Production Capacity per Governorate

The decline in bread production has also impacted the local population's ability to meet their minimum bread quantity needs (330g) per individual per day⁹. **The average individual daily portion of bread in this quarter reached 287g per person, covering only 87% of the population's needs.** This represents a significant decrease (-37%) compared to the recorded 458g per individual in Q3 2022. Consequently, the current daily production volume is falling short of meeting the minimum bread quantity required by the population.

Aleppo governorate experienced the highest decrease in the individual daily portion of bread (-59%), while Ar-Raqqa was the only governorate that saw a 7% increase in the individual daily portion, successfully meeting the local standard minimum daily bread needs of its population.

⁹ The survival need is 250 grams per person per day.

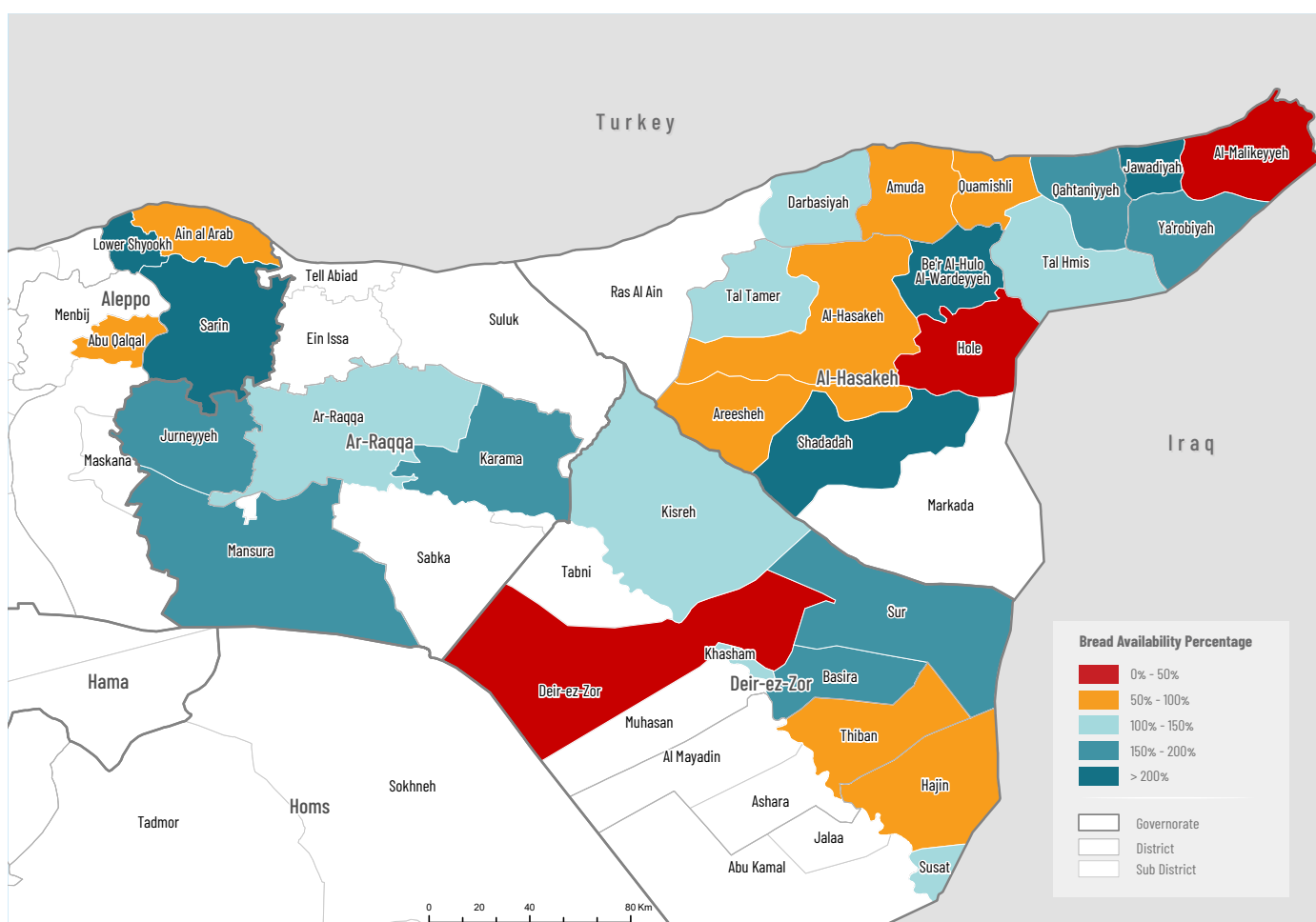
Governorate	Individual Daily Portion of Produced Bread (in grams)		
	Q3 2022	Q3 2023	% Change
Aleppo	498	206	↓ -59%
Al-Hasakeh	346	283	↓ -18%
Deir-ez-Zor	363	227	↓ -37%
Ar-Raqqa	428	456	↑ 7%

Table 2: Individual Daily Portion of Produced Bread in NES - Q3 2022 vs. Q3 2023.

Similar to the findings of Q3 2022, the sub-district of Be’r Al-Helo Al-Wardeyyeh in Al-Hasakeh governorate continued to record the highest percentage of coverage for population bread needs, reaching 331%. This underscores the abundant

production of bread within this area relative to its total population, highlighting the necessity for improved coordination of production across various sub-districts. Following closely as the highest percentages of covering population bread needs are the sub-districts of Sarin and Lower Shyookh in Aleppo governorate.

In contrast, the Deir-ez-Zor sub-district in Deir-ez-Zor governorate, along with Al-Malikeyyeh and Hole sub-districts in Al-Hasakeh governorate, reported the lowest percentage of coverage for population bread needs, being 12% with 12 operational bakeries, 18% with 2 operational bakeries, and 32% with 3 operational bakeries respectively. This observation indicates that not only did the coverage of population needs remain insufficient in these sub-districts, but the number of operational bakeries and their actual production also remains consistently low relative to the demands of the local population in these specific areas.



Map 2: % of Population Bread Needs Covered by Total Production in NES, August 2023

Conversely, 64% of the bakeries indicated that there was no significant change in the demand for bread during the last three months, while 33% reported an increase in demand. This rise in demand was mainly attributed to bread being an essential food source, coupled with an increase in the population and internally displaced persons (IDPs) in the area, leading to a greater need for bread that was not adequately covered by the amounts of flour distributed for subsidized bread production. Additionally, **the increase in prices for unsubsidized and tourist bread also contributed to the higher demand for subsidized bread.**

On the other hand, 3% of bakeries reported a decrease in demand, which they mainly attributed to the rising bread prices and its limited availability in the market, causing households to resort to home baking.

Furthermore, among the surveyed bakeries, the majority of the bakeries anticipate stability in demand in the upcoming months, **whereas 23% (n=102) reported anticipating an increase in their bread production capacities.** This is attributed to their expectations of receiving more support, potential new contracts with organizations, and an anticipated increase in population demand. Despite the current decrease in bread production compared to Q3 2022, many bakeries are hopeful for growth in their production levels in the next three months.

Moreover, 47% of the bakeries estimated that their current production levels were not meeting the population's demand for bread. One limiting factor is the challenge of accurately assessing population needs, particularly in areas with difficult-to-access villages. On average, these bakeries reported an estimated need to increase production by 50% to meet the current demand. To further validate the insufficiency in bread production, only 13% of bakeries reported producing excess bread, accounting for approximately only 4% of their overall production, which they typically sold as animal feed or distributed to the population for free.

3.5.4. Types of Bread Produced

Across all the governorates, the predominant type of bread produced is subsidized bread, making up nearly 86% of the total production. Tourist bread follows at 6%, while unsubsidized and NGO bread account for 5% and 2%, respectively. **The overall quantity of produced subsidized bread experienced a notable decrease from 5,370 MT/week to 4,930 MT/week, indicating an 8% decline.** Similar to the sufficiency of bread production, **subsidized bread production also fails to meet the local minimum bread needs of the population, providing only a portion of 248g per individual,** with the exception of Ar-Raqqa governorate, where the quantities of subsidized bread produced are sufficient to cover the needs of its population. Among the governorates, Al-Hasakeh reported the lowest percentage production of subsidized bread, with only 74% of the quantities of bread being subsidized, while the rest is distributed across different types of bread.

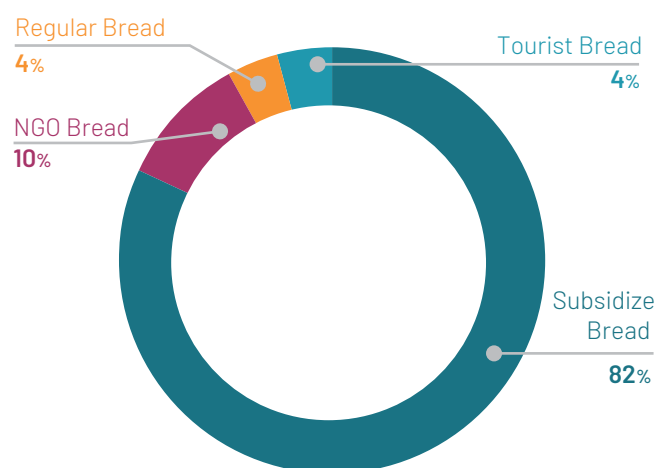


Figure 8: Types of Bread

According to bakeries, the quality of subsidized bread they produced was predominantly rated as average (59%). Only a third of the bakeries reported it as good (33%), while a smaller percentage considered it poor (9%). **The primary reason cited by bakeries for the poor quality of their subsidized bread was the use of flour that is of poor quality.** Some bakeries also attributed the issue to the insufficiency or unsuitability of the equipment used for bread production.

On the other hand, and although produced at significantly lower quantities, the quality of other types of bread, such as unsubsidized, tourist, or free NGO bread, was generally reported as good. These bread varieties seem to meet higher quality standards compared to subsidized bread, which highlights the need for addressing the challenges faced by bakeries producing subsidized bread to improve its overall quality.

The prices of bread varied across the different types of bread produced. Subsidized bread reported an average price of 290 SYP per kilogram (ranging from 225 to 520), while unsubsidized bread averaged 300 SYP per kilogram (ranging from 230 to 500). On the other hand, the price of tourist bread stood as the highest, reaching an average of 4,000 SYP per kilogram (ranging from 2,100 to 4,700). Notably, despite the variations in price, **subsidized bread dominated the bread market in terms of lowest price, highest production volumes, and availability.**

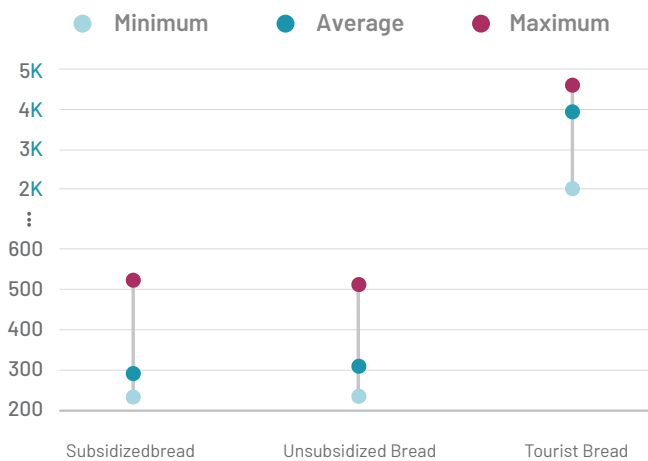


Figure 9: Bread Prices (SYP/Kg)

3.5.5. Production Costs

The production costs associated with bread have notable variation across different bakery ownership types. The primary inputs contributing to production costs are flour, labor, yeast, and fuel. Notably, **private bakeries appear as having the highest production cost**, averaging around 94 USD per metric ton (MT) of bread. This is followed by mixed ownership bakeries, combining private and public entities, with an average production cost of 60 USD/MT of bread. In contrast, **publicly owned bakeries present the lowest production costs**, averaging around 44 USD/MT of bread. This pattern is justifiable given that public bakeries tend to receive more substantial support, while private bakeries tend to have both subsidized and unsubsidized bread production activities, leading to increased operational expenses.

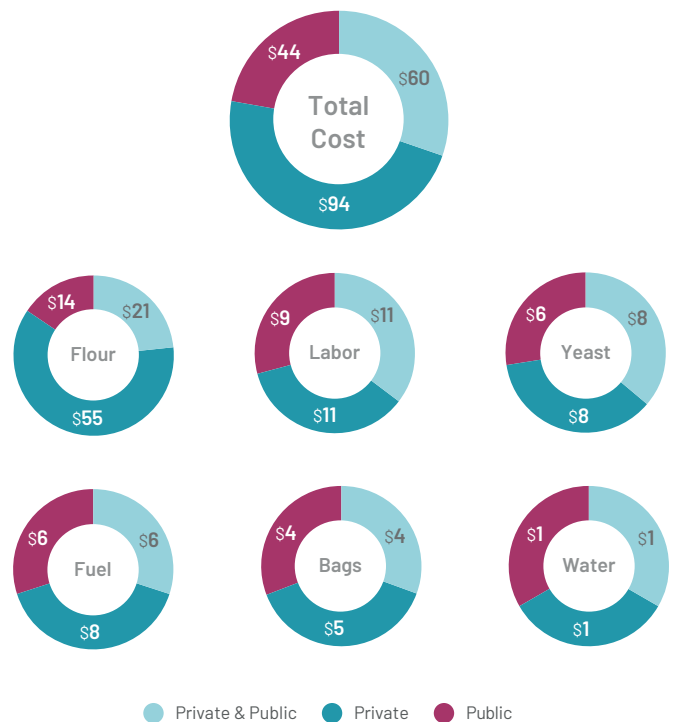


Figure 10: Production Costs (USD/MT of Bread)

3.5.6. Availability and Sources of Bread Production Inputs

Availability and Accessibility of Bread

In general, bread was found to be relatively available across Northeast Syria. When assessing the situation in bakeries, 45% reported the constant availability of bread, whereas 50% reported its fair availability. Only a small percentage (5%) of bakeries reported bread as unavailable, with this issue primarily observed in Ar-Raqqa and Al-Hasakeh governorates.

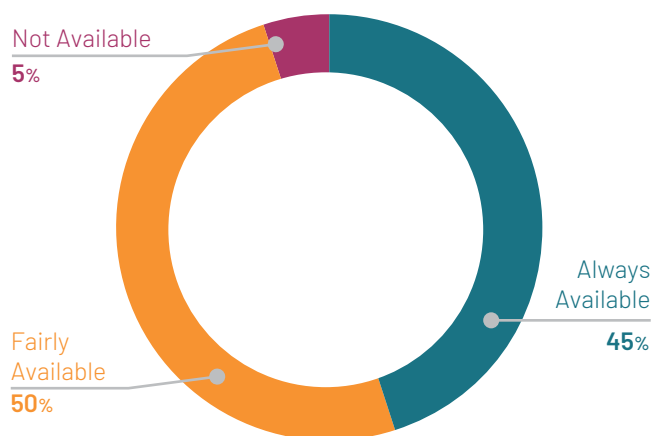


Figure 11: Availability of Bread

Despite bread being relatively available, bakeries mentioned several limitations that affect its accessibility. The most frequently cited reason was the **low quantities of flour allocated and distributed to bakeries, which adversely affected their operations and production capacities**. Another significant factor affecting accessibility was the increase in the population in certain areas due to the presence of internally displaced people (IDPs), resulting in higher demand for bread. This population increase was mainly reported in Ar-Raqqa and Karama sub-districts of Ar-Raqqa governorate, and in Kisreh sub-district of Deir-ez-Zor governorate. Additionally, the rise in prices, coupled with the limited availability of flour, and inconsistent bread quality were also noted as limitations affecting bread accessibility.

Availability and Sources of Local and Imported Flour

The majority of bakeries, accounting for 89%, exclusively use locally produced flour for their bread production. Meanwhile, 9% of bakeries utilize imported flour, and 2% use a combination of both types. **On average, 90% of the flour quantities used in bread production within NES is locally produced, marking a slight increase from 87% in Q3 2022. The remaining 10% of flour is mainly imported from Turkey.** Remarkably, and as illustrated in Figure 12, Al Hasakeh governorate stands out with the lowest usage of local flour among the governorates, at 81%, and concurrently, it demonstrates the highest reliance on imported flour from Turkey, reaching 18%.

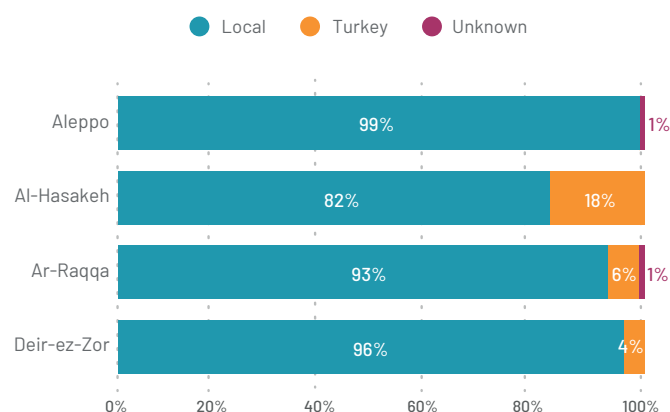


Figure 12: Origin of Flour Used by Bakeries per Governorate

Bakeries have different sources for the supply of their required flour. Predominantly, local flour is sourced from the Local Self Administration (LSA) at 94%, with the remaining 6% sourced from mills, traders, or NGOs, albeit in minimal quantities. On the other hand, imported flour is mostly procured from traders (69%), either within the same sub-district or from different sub-districts, and approximately 30% is sourced through NGOs.

In general, both locally milled and imported flour were relatively available to bakeries in the NES region, with local flour being slightly more available than imported flour. However, this difference in availability could be attributed to the wheat harvesting season, which leads to an increase in the availability of local flour in the market. Overall, only 5% of bakeries reported locally milled flour as unavailable, while 9% reported imported flour as unavailable.

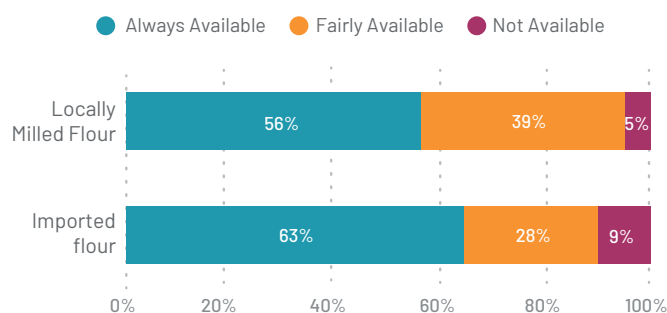


Figure 13: Availability of Local and Imported Flour

Similar to the bread accessibility challenges, **the main difficulties bakeries faced in accessing locally milled flour were the low quantities of LSA flour allocated and distributed to bakeries in NES.** This was followed by the limited availability and high price of private locally milled flour in the trade market within mills and traders and its' inconsistent quality. As for imported flour, **bakeries encountered limitations due to the increasing price of imported flour, which was compounded by the lack of access to support for imported flour.** Another frequently reported limitation was the closure of roads and borders, which affected the bakeries' access to imported flour. Such closures were reported in several sub-districts but were particularly concentrated in Deir-ez-Zor and Al-Hasakeh governorates. The highest reports of closures were in Jawadiyah, Ya'robiyah, and Quamishli sub-districts of Al-Hasakeh governorate, as well as in Basira and Susat sub-districts in Deir-ez-Zor governorate.

Availability and Sources of Fuel

Bakery owners primarily reported a concern revolving around the irregularity in the quality of the fuel they received, in addition to its' escalating price trends. This variability in fuel quality presented a major challenge for bakeries when it comes to fuel accessibility. In the Northeastern region of Syria, fuel purchase primarily depends on two main sources: the Local Self Administration (LSA) or traders operating within the same sub-district or across different sub-districts. **As reported by bakeries, a substantial 92% of the fuel procured is obtained from the LSA, whereas only 8% is sourced from traders.**

It can be noted that the majority of fuel sourced from traders is reported mainly by bakeries located in the governorates of Ar-Raqqa and Deir-ez-Zor. This trend is particularly prominent in Kisreh and Sur sub-districts within Deir-ez-Zor governorate, where over 50% of the bakeries operating in these areas rely on obtaining fuel from traders.

Bakeries often face challenges when sourcing fuel, which can be obtained either through the LSA at subsidized prices or from independent traders at standard prices. Each alternative presents its own advantages and challenges. **In the case of subsidized fuel, bakeries benefit from a low and fixed price point, although with a compromise in fuel quality when compared to unsubsidized alternatives.** The LSA support entails a reduced bakery fuel average cost of 425-525 SYP per liter, as of the updated pricing in July 2023, along with an estimated transportation expense of 10-25 SYP per liter. **Despite the consistent supply, the quantities supplied by the LSA can sometimes be insufficient for the bakeries' operational needs.** Nevertheless, the regular weekly or monthly deliveries, coupled with minimal transportation expenses, contribute to sustaining operational stability and serve as a crucial pillar of support to bakeries. Bakeries relying on subsidized fuel often rely on LSA-approved gas stations for distribution, as gas stations are mandated to follow standardized LSA prices, serving as the sole fuel source.

Nevertheless, **unauthorized fuel sales occasionally occur at varying rates, often at higher prices but of better quality,** typically utilized for private vehicles or machinery. Illicit/black market fuel can command prices ranging from 1000 to 3000 SYP per liter. Alternatively, choosing non-subsidized fuel ensures higher quality, albeit at a higher expense and accompanied by transportation costs. Furthermore, unsubsidized fuel holds significance for bakeries as it allows for the purchase of unlimited quantities, given its higher availability. **Some bakeries have reported an exchange practice, trading subsidized fuel for non-subsidized fuel from traders and covering the price difference personally to secure better quality, especially for using their private generators.**

Availability and Sources of Yeast and Water

Other essential components utilized in the production of bread – yeast and water – were readily available for bakery operations in general. **Yeast, in particular, presented high availability, with its accessibility primarily hindered by its increased cost.** Nevertheless, a significant number of bakery owners reported no substantial difficulties when procuring yeast.

Regarding water supply, although a majority of bakery owners did not report any accessibility challenges, **the primary limitations to water accessibility were the substantial expenses associated with transporting tanker water to feed the bakery’s water tanks and operations network, mainly due to disruptions in the public network.** These disruptions led to an increased reliance on tanker water supply. This is evident in the fact that 39% of bakeries exclusively depend on water delivered by tankers as a primary source. Following this, 29% of the bakeries rely on the public water network, while 16% use privately-owned water wells. The remaining bakeries (19%) utilized a combination of water sources, with the public water network serving as the main source but complemented by either tankers or private wells as a contingency measure in case of disruptions in the water network.

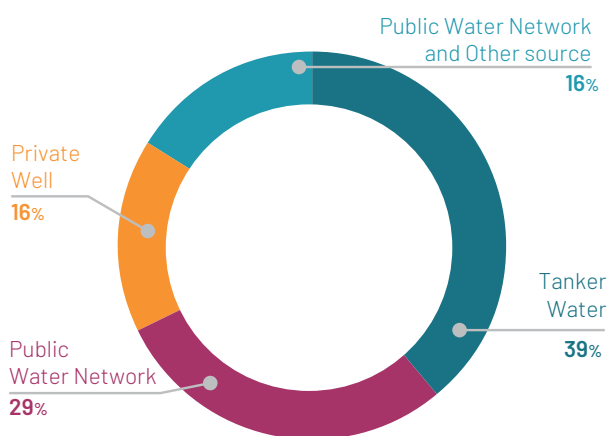


Figure 14: Bakeries Water Sources

3.5.7. Local and Imported Flour

Although more bakeries rely on local flour for their bread production, only 33% of the assessed bakeries actually favor it over imported flour. **The preference for local flour is largely conditional on its high quality. Nonetheless, its higher availability, and lower cost compared to imported flour serve as driving factors that encourage bakeries to utilize it.** The support provided by the Local Self Administration (LSA), including subsidized pricing and availability, is also a significant factor in favor of using local flour. Furthermore, respondents highlight that local flour is often chosen due to its consistent presence in the market, reasonable pricing, and suitability for both consumers and bakers in terms of production and consumption. Despite the occasional presence of impurities in local flour, many bakeries prefer it for its average quality and reliability.

On the other hand, the majority of bakeries (67%) prefer using imported flour. **The preference for imported flour in bread production is due to its superior quality, resulting in better bread quality.** Its high quality, absence of bran and impurities, consistent package weights, and ease of storage and use in baking machinery all significantly impact bread quality and contribute to better bread production quality and volume. According to bakeries, imported flour produces bread that is of better color and taste, and is more preferred by local residents. Additionally, some respondents suggest that a blend of local and imported flour can lead to excellent bread quality.

As reported by bakeries, the prices of distinct flour types exhibit notable variations based on their source and the subsidies they receive. **Imported flour is associated with the highest pricing, averaging \$425 USD per metric ton,** closely aligning with the average price of \$420 USD per metric ton reported by traders. Regarding local flour, bakeries provided two different price ranges depending on the level of support they received. **Subsidized local flour has an average price of \$16 USD per metric ton,** spanning from \$8 to \$60 USD per metric ton. On the other hand, **unsubsidized local flour maintains an average price of \$360 USD per metric ton,** also aligning with the price provided by traders. Additionally, there were instances where certain regions lacked access to unsubsidized local flour, and in some cases, its price surpassed that of imported flour. These price variations are also influenced by shifts in the market and the level of support extended, reflecting differences in production expenses and quality.

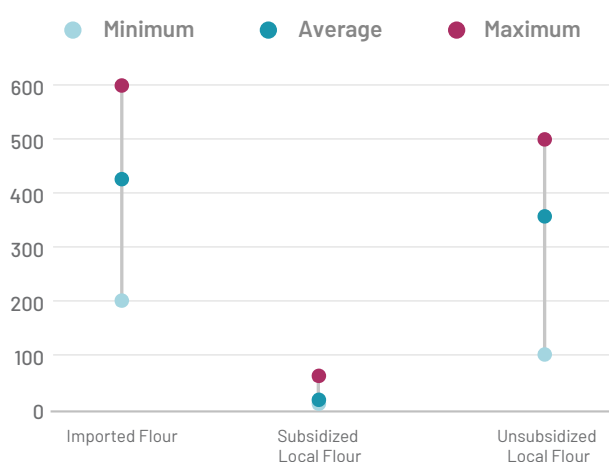


Figure 15: Prices of Local and Imported Flour (USD/MT)

As previously mentioned, the primary origin of local flour is the LSA, while traders and NGOs serve as the main sources for imported flour. The quality of local flour exhibits variations depending on the specific source. In general, local flour obtained from the LSA was predominantly categorized as average to poor in quality. The reported reasons for this inferior quality include impurities and, less frequently, instances of pest or insect contamination. In contrast, imported flour, despite being utilized in smaller quantities and by fewer bakeries, reported good quality.

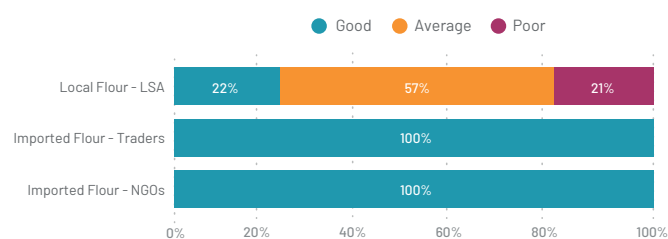


Figure 16: Flour Quality

3.5.8. Bakeries Support Status

The majority of the bakery representatives interviewed, amounting to 75% (n=362), indicated that they are currently receiving humanitarian support. However, this reflects an 8% decrease compared to Q3 2022, where the figure stood at 83%. Nonetheless, the majority of the bakeries receiving such support (94%) stated that their assistance came from the Local Self Administration (LSA). Furthermore, 2% of the bakeries reported receiving aid from Non-Governmental Organizations (NGOs), while 4% reported receiving assistance from both the LSA and NGOs.

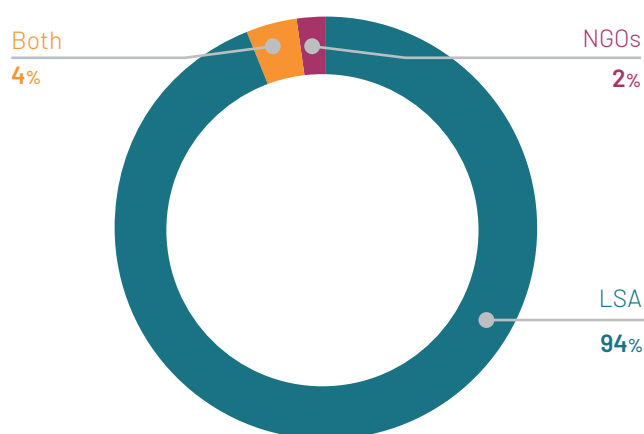


Figure 17: Bakeries Support Sources

The support provided by the LSA predominantly included flour and fuel distributions, and less commonly yeast. Flour allocations were distributed either daily, excluding Fridays, or on a weekly basis. The designated quantities for each bakery were allocated to produce the specified amount of subsidized bread, and the reported quality of the flour generally ranged from average to poor. Regarding yeast distributions, the frequency depended on flour quantities and occurred weekly or monthly. Similarly, fuel distributions varied from daily to weekly, and sometimes even monthly for certain bakeries. This variation in frequency depended on the predetermined quantities assigned to each bakery. However, the quality of the fuel was generally perceived as average to poor, leading some bakeries to procure better-quality fuel from the black market to operate their machinery.

NGO support was mainly in the form of flour and yeast distributions. Flour distributions occurred 2-3 times a week, providing sufficient supplies to produce the bread quantities supported by the NGO programs. The quality of the flour was generally considered as average to good. Moreover, yeast was distributed weekly or monthly, in quantities sufficient to meet the required bread production. **It can be noted that despite the support source, there was limited assistance extended to bakeries concerning their requirements for rehabilitation and maintenance;** only four bakeries received support from the LSA in this regard.

Most bakeries had established commitments with their sources of support. **These commitments primarily revolved around aspects such as bread price, quality, weight, and quantity, as well as operational hours.** Less common commitments included solely distributing bread to the official representatives of the supporting source, refraining from purchasing inputs from other sources, and avoiding contracts with alternative entities (less common in cases of NGO support).

According to the bakeries', the provided bread support has brought about several advantages, including enhanced production consistency, improved bread quality, and reduced pricing. The assistance has also proven significant in decreasing operational costs for bakeries, ultimately allowing them to successfully contribute to a balance between bread supply and demand within the market. However, it's noteworthy that some **unsupported bakeries are struggling with challenges restricted by their inability to compete against those that receive support.** These unsupported bakeries experience lower demand for their unsubsidized and tourist bread productions, necessitating price reductions to remain active in the market. Adding to their difficulties, these bakeries incur higher operational costs compared to the supported bakeries.

3.6. Bread Consumption – Market Outlets

In general, the primary currency utilized for purchasing operational inputs is evenly split between USD (51%) and SYP (49%). However, the sales dynamics present a distinct pattern, with 99% of sales conducted in SYP and merely 1% in USD. When it comes to distribution channels, 20% of bakery sales are directly made at the bakery premises, whereas the remaining 80% are facilitated through bread distributors. On average, each bakery maintains partnerships with approximately eight bread distributors, establishing a network for widespread distribution.

The distribution strategy varies but generally involves providing predetermined quantities of bread to each distributor, who then distributes it to residents in their assigned areas. The quantities are calculated based on the number of individuals or families and are handed out without variation, although occasional shortages might occur. The distribution takes place in villages, neighborhoods, and even cities, with the goal of ensuring accessibility and reducing congestion at the bakery. In some cases, the distribution adheres to specific guidelines set by the administration. The price and frequency of distribution are determined by administrative decisions, ensuring that the distribution process is manageable and cost-effective. Distributors play a vital role as intermediaries between the bakery and the residents, making the bread available and easily accessible.

While numerous bakeries encountered no issues with bread distribution, for those that did, the primary challenges revolved around maintaining the quality and freshness of bread, which could be compromised due to distribution delays. Moreover, there were difficulties in effectively coordinating with bread distributors and ensuring they received the necessary quantities. Lastly, elevated costs associated with packaging and transportation also posed challenges on bakeries for the distribution of bread.

3.7. Market Infrastructure

Storage conditions for bakeries were generally reported as good, with only 18% of bakeries reporting average to poor conditions. The storage condition is considered poor due to various factors such as inadequate storage space, lack of suitable storage facilities, and the need for building renovation. Furthermore, storage spaces encounter environmental challenges from weather, pests, and rodent infestations, and are often affected by unsuitable temperatures, humidity, and lack of ventilation. Storage infrastructure is also considered poor due to its need for maintenance and repair, with issues ranging from poor flooring to inadequate construction.

Moreover, it is worth observing that bakeries maintain a notably limited inventory of flour within their premises, ranging from completely no stocks to a maximum of 67 MT, with an average of around 4 MT per bakery. **In relation to their storage capacity, bakeries are utilizing only around 13% of their available storage space.** To ensure operational continuity over a 7-day emergency period, bakeries would need roughly 19 MT of flour per bakery. **This suggests that the current stock levels would fall short of meeting the requirements for bakeries to function during a crisis or emergency situation if their flour supply operations were to be affected.**

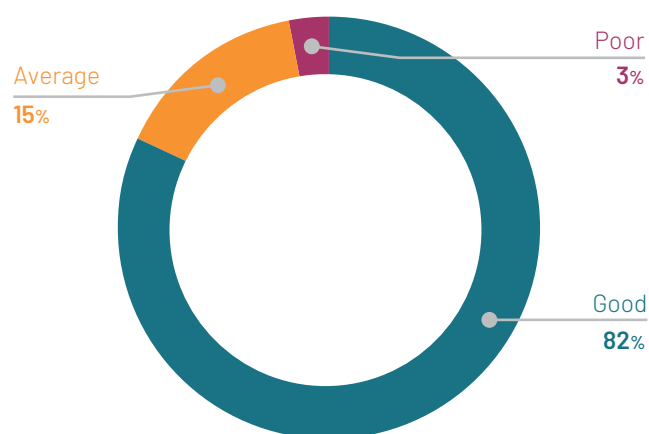


Figure 18: Bakeries Storage Conditions

In addition to storage, the market infrastructure is also influenced by a range of factors, including input prices, transportation costs, financial services, and credit-based trade, and strategic storage capacities. Collectively, these factors pose challenges for the wheat-flour to bread value chain in NES. For instance, according to the Q2 2023 Wheat to Bread Market Assessment, NES possesses a combined maximum silo storage capacity of around 874,000 MT of wheat¹⁰. However, this capacity varied across different governorates, with some lacking the ability to accommodate local wheat production levels, necessitating distribution to silos in other areas. This situation results in elevated transportation costs due to escalating fuel prices and its availability, consequently affecting both the quality of harvested produce and off-season storage volumes.

Apart from storage concerns, the report reveals a restraint in financial services among the types of support extended to various market actors. The majority of assistance provided is in-kind rather than financial. **The absence of financial services like grants or loans has significant implications for enhancing the value chain's efficiency and progress.** These services could empower market actors to enhance their operations, such as facility rehabilitation, procurement of superior quality inputs, acquiring sufficient quantities to increase production volumes, and ultimately gaining a competitive advantage in the market. **The current limited financial capacity in the market is limiting the market actors from expanding their businesses** and in certain cases, is making them highly dependent on the support provided by the LSA or NGOs.

Moreover, it's evident that credit-based trade is considerably constrained within the wheat-flour to bread value chain in NES, particularly being less prevalent among traders and suppliers in comparison to traders and customers. The utilization of credit transactions could serve as a means for traders facing financial limitations to broaden their market reach and enhance their supply capacities. This is especially relevant given the scarcity of wheat and bread production inputs in the market and the consistent increase of their prices. Additionally, these credit-based transactions improve the development of partnerships among market actors, thereby supporting constant commitments and more sustainable trading practices. However, it's worth acknowledging that credit-based trade poses risks. Potential challenges arise from price fluctuations, market instability, and currency fluctuations. Nonetheless, if executed within formal agreements and accompanied by risk mitigation strategies, credit-based trade holds the potential to elevate the efficiency of the value chain.

Finally, the issue of **fuel scarcity stands out as a significant obstacle impacting the entirety of the wheat-flour to bread value chain.** The necessity for fuel arises due to the shift of wheat farmers towards irrigated wheat cultivation instead of rainfed methods a practice that increases demand on fuel to operate water pumps. Additionally, fuel is crucial for the transportation of their produce and is crucial for the uninterrupted functioning of bakeries, especially given that nearly 84% of them rely on private generators due to the intermittent availability of city electricity. As a result, fuel emerges as a vital production input across all stages of the value chain. However, the unavailability, continuous rise in prices, and the poor quality of subsidized fuel collectively act as constraining factors across the value chain.

4. Market Challenges

Wheat Production:

1. Restricted Input Availability and Affordability:
 - The insufficiency of crucial inputs such as seeds, pesticides, herbicides, and fertilizers, along with their escalating costs, had an adverse impact on farmers' crop quality, production cost, and productivity.
2. Climate-Induced Events, Water Scarcity, and Inadequate Water Infrastructure:
 - Adverse climate events including erratic rainfall patterns, prolonged dry spells, risks of hailstorms, fires, and disease outbreaks negatively affect wheat production.
 - Water scarcity and inadequate irrigation infrastructure increased production costs and hindered the growth of wheat crops.
 - Despite adopting Climate-Smart Agriculture (CSA) practices, insufficient water management infrastructure limited the implementation of methods such as modern irrigation techniques or water harvesting methods.
3. Market Dynamics and Role of Local Self Administration (LSA):
 - The LSA played a pivotal role by supporting farmers through seed distribution and contractual production arrangements, albeit limiting their profit potential and market power.
 - The monopoly of private traders in the trade market restricted farmers' access to markets due to their financial constraints.
4. Limited Technical Knowledge and Information Flow:
 - Limited availability of information related to market trends, pricing, climate early warning systems, and market performance.
 - Farmers face a lack of technical expertise in agricultural practices that could enhance their productivity and yield.

Wheat and Flour Trade:

1. Inadequate Local Flour Milling Capacity:
 - Reduced local flour milling capacity is influenced by the unavailability of wheat grains and contributes to the unavailability and difficulty in accessing local flour, impacting the stability of the local flour supply.
2. Dependence on Imported Flour:
 - Although only 10% of the flour is imported, the reliance on imported flour, combined with import-related issues, border closures, high transportation costs, and price increases, poses challenges to the accessibility and affordability of flour.
3. Limited Quality Testing:
 - The low percentage of traders conducting laboratory quality tests on wheat grains and flour, coupled with a lack of testing facilities in some regions, raises concerns about the authenticity and quality of products in the market.

Wheat and Flour Processing:

Mills:

1. Scarcity of Wheat Grains:
 - The scarcity of wheat grains is a significant challenge affecting the operations of both non-operational and partially functional mills. The scarcity directly impacts their ability to produce flour and meet local bread production demands.
2. Operational Capacity vs. Maximum Capacity:
 - The gap between the actual operational milling capacity and the potential maximum capacity indicates that mills are not operating at their full potential, due to various constraints including limited availability of wheat grains, and the need for machine and/or building rehabilitation and maintenance.

Bakeries:

1. Rehabilitation Needs:
 - The need for building rehabilitation and equipment maintenance is significant among operational bakeries. High costs of materials, limited support, scarcity of technicians, and limited financial capabilities hinder rehabilitation efforts.
2. Unmet Demand:
 - The current productivity of bread is only covering 87% of the population's bread needs, with the average individual daily portion reaching 287g per person.
 - The individual daily portion decreased by 37% from previous quarters, indicating fluctuations in the bread productivity levels within bakeries.
3. Poor Quality of Subsidized Bread:
 - In comparison to other types of bread, subsidized bread reported the lowest quality, despite the fact that it is the most demanded due to its low price.
 - The main reasons for the poor quality of subsidized bread return to the poor quality of local flour used, in addition to unsuitability of the equipment used for bread production.
4. Water Availability:
 - The water supply is stable for most bakeries; however, the highest reliance is on tanker water supply due to the public network disruptions.
 - This poses limitations for water supply due to the increased expenses related to transporting tanker water.

Market infrastructure:

1. Storage Conditions and Capacity:
 - Bakeries and traders both reported poor storage conditions due to inadequate facilities, environmental challenges (temperature, pests, sunlight), and lack of maintenance.
 - Bakeries have limited flour inventory, and only use about 13% of their available storage space. The limited available inventory could lead to operational disruptions during emergencies.
2. Fuel Availability and Sources:
 - Fuel quality irregularity and escalating prices impact fuel accessibility.
 - Fuel is primarily sourced from the Local Self Administration (LSA), with some bakeries relying on traders for better quality fuel.
 - Subsidized fuel from LSA provides stability but might have compromised quality, affecting bakeries' operations and productivity.
3. Financial Services and Support:
 - Inadequate financial services and limited financial capacity hinder market actors' ability to improve operations and expand. Dependency on in-kind assistance limits market participants' self-sufficiency and growth potential.
4. Inconsistent Supplier Contracts and Credit-Based Trade:
 - Limited utilization of credit-based trade, particularly among traders and suppliers. Credit transactions could help traders expand their reach and enhance their supply capacities.
 - The lack of regular contracts between traders and their suppliers impedes stable and predictable supply dynamics, leading to uncertainties in the market.

5. Recommendations and Implications for FSL Programming

Considering the insights gathered from both phases of the Wheat-Flour to Bread Market Assessment, the following comprehensive set of recommendations is provided to assist all market actors involved, as well as to enhance the processes throughout the entire value chain:

Promote climate smart agriculture (CSA) practices:

Although the general attitude of farmers towards implementing CSA activities was generally positive, farmers should be provided with further training and support in implementing CSA activities such as good agriculture practices, water harvesting, modern irrigation systems, and composting. This will help overcome the limited application of these practices due to the farmers' lack of expertise and knowledge.

Address water scarcity and support irrigation systems:

To address water scarcity, organizations should invest in water conservation and management interventions, given that water is a limiting factor for wheat production in NES. It is recommended to scale-up support towards the rehabilitation of irrigation systems, linking this with efficient systems for water delivery to wheat production. This will help overcome the challenges farmers face in irrigated wheat production and improve the productivity of irrigated lands.

Improve knowledge sharing and establish guidance units for wheat seed varieties:

To enhance knowledge sharing and guidance on wheat seed varieties in NES, it is recommended to organize workshops and training sessions for farmers. This should be complemented by close coordination with agricultural extension services to disseminate information on the types and varieties of wheat seeds available, specifically drought tolerant and high yield varieties. The information should include the characteristics of seeds, such as yield, disease resistance, and drought tolerance, to enable farmers to make informed decisions based on their specific needs and environmental conditions. Through this approach, organizations can help farmers to choose the most appropriate wheat seed varieties that will lead to better production outcomes.

Establish/improve storage facilities:

To enhance market actors' profit margin and value their produce, it is recommended to establish or improve storage facilities. Such facilities will increase their market access, especially outside the harvest season, allowing them to store their grains when demand is low and sell them at better prices when it increases. Wheat storage will also improve the food security situation in NES ensuring a steady supply for consumption all year long. Equally crucial is the storage of flour for mills and bakeries, where their facilities require enhancement in terms of infrastructure and supply to ensure their stock of flour is sufficient for at least 7 days of bread production. This will allow to accommodate emergency requirements and reduce operational risks.

Establish or support testing laboratories for wheat seed and grain analysis:

Establishing or supporting testing laboratories for wheat seed and grain analysis is crucial to increase the accessibility and availability of reliable testing services. This will enable traders to verify the quality of the wheat they trade, ensuring the availability of high-quality wheat seeds and grains in the market. This, in turn, will improve the wheat production yield of farmers and the quality of the locally milled flour used in the wheat-flour to bread value chain.

Extend Financial Support Initiatives:

The market currently faces constraints in accessing comprehensive financial services that can improve their long-term self-reliance and sustainability. Initiatives introducing financial services such as grants or low-interest loans can empower market actors, enabling them to rehabilitate their facilities, enhance the quality of sourced resources, and broaden their market influence. This strategy will facilitate business expansion, extending their competitive advantage within the market.

Invest in maintenance and rehabilitation of bread production facilities:

Numerous bakeries and mills faced operational interruptions due to unmet rehabilitation and maintenance requirements, which often remained unaddressed due to financial constraints and low profit margins. The assessment also highlighted the limited availability of support programs in this regard. It is critical to address these facilities' rehabilitation needs through collaborative efforts, through assessing the needs, and extending technical knowledge and financial assistance to facilitate essential repairs.

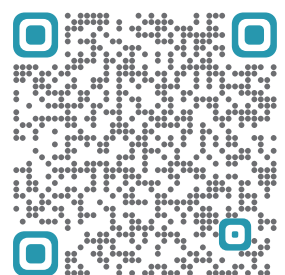
Bread programs need to consider sub-district local population needs:

11 sub-districts were not meeting the local minimum standard of bread needs per individual (330g). Considering the gaps in production levels per sub-district will allow better targeting of the sub-districts with the highest needs for bread interventions.

Promoting Local Flour Sustainability:

Al-Hasakeh emerged as the governorate with the highest reliance on imported flour (18%) from Turkey. It is crucial to enhance local flour production across all governorates to reduce the vulnerability linked to border closures and external market challenges. Additionally, this effort prevents local producers from being dominated by imports, as long-term dependence on external sources is not a sustainable strategy.

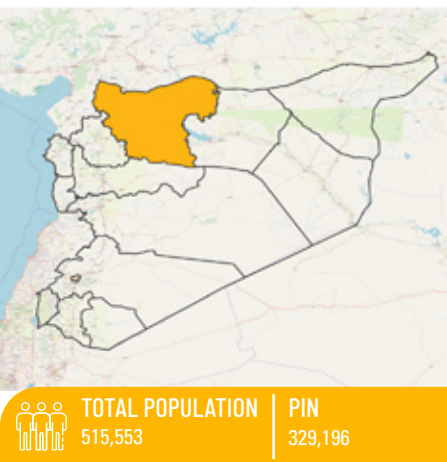
**TELL US WHAT YOU
THINK!**



[LINK](#)

Mapping of Wheat-to-Bread Processing Facilities

Aleppo August 2023



BAKERIES 25

Bakery Status

- Non-Operational 3
- Operational 22

88%

Functionality

- Full 3 (14%)
- Partial 19 (86%)

Reasons for Non-Operation

- Machines need maintenance
- No financial liquidity
- Needs building rehabilitation

Ownership

- Public 3 (12%)
- Private 9 (36%)
- Mix 13 (52%)

CURRENCY USED

USD 0%
SYP 100%

Bread Production

Daily Production (MT)

Subsidized Bread	101
Unsubsidized Bread	0
Tourist Bread	0
Free Bread (NGO)	5
Others	0

Price (SYP) /KG
250 - 455
N/A - N/A
N/A - N/A

Average Subsidized Bread Package Weight 1,081g
Average Unsubsidized Bread Package Weight N/Ag

QUALITY CONTROL (LAB TESTING) N/A

Daily Production 106 MT
Full Daily Capacity 266 MT

Current Productivity 40%

Daily Bread Needs of Total Population 170 MT
Daily Bread Needs of PIN Population 109 MT

Subsidized Bread Availability to PIN 93%

Bakery Management

Bakery Owner	15 (68%)
Private Investor	1 (5%)
Employee	5 (22%)
LSA	1 (5%)
Joint LSA	0 (0%)
Committee	0 (0%)
Other	0 (0%)

Availability

Always Available Fairly Available Not Available

Bread

100% Always Available, 0% Fairly Available, 0% Not Available

Local Flour

100% Always Available, 0% Fairly Available, 0% Not Available

Imported Flour

50% Always Available, 36% Fairly Available, 14% Not Available

Yeast

100% Always Available, 0% Fairly Available, 0% Not Available

Fuel

100% Always Available, 0% Fairly Available, 0% Not Available

Support Status

Never Received Support 0 (0%)
Used to Receive Support 0 (0%)
Currently Receive Support 22 (100%)

Type of Support	NGO	LSA	Other
Rehabilitation	2%	0	1
Operational Support	6%	1	2
Flour	46%	0	21
Yeast	46%	0	21

Source and Price of Flour

Imported Flour 400-520 \$/MT
Local Flour 10-400 \$/MT

0% Imported, 100% Local

Source	0%	36%	64%	0%
Trader	0%	0%	0%	0%
Mill	0%	36%	0%	0%
LSA	0%	0%	64%	0%
NGO	0%	0%	0%	0%

MILLS N/A

Mills Status

- Non-Operational N/A 0%
- Operational N/A

Reasons for Non-Operation

- N/A
- N/A
- N/A

Functionality

- Full N/A (0%)
- Partial N/A (0%)

Ownership

- Public N/A (0%)
- Private N/A (0%)
- Mix N/A (0%)

MILLS SOURCE OF WHEAT N/A

Milling Capacity

Maximum Capacity N/A MT
Current Capacity N/A MT

Production Functionality N/A%

Market Actors Supplied by Mills

Bakeries Supplied N/A
Traders Supplied N/A

SILOS N/A

Silos Status

- Non-Operational N/A 0%
- Operational N/A

Functionality

- Full N/A (0%)
- Partial N/A (0%)

Ownership

- Public N/A (0%)
- Private N/A (0%)

Reasons for Non-Operation N/A

SILOS SOURCE OF WHEAT N/A

Needed Support for Silos

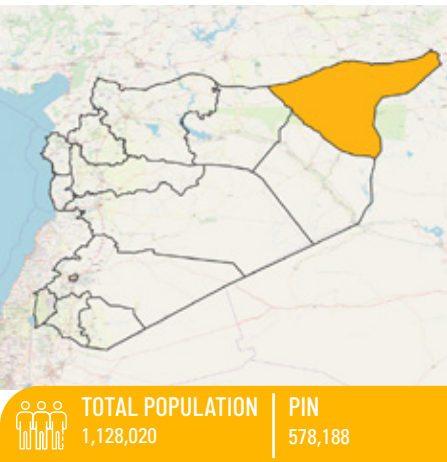
- Building Rehabilitation N/A
- Machine Rehabilitation N/A
- Estimated Cost of Machines and Rehabilitation \$ N/A

Silos Capacity

Silos Maximum Storage Capacity N/A MT

Mapping of Wheat-to-Bread Processing Facilities

Al-Hasakeh August 2023



BAKERIES 196

CURRENCY USED
USD 1%
SYP 99%

QUALITY CONTROL (LAB TESTING) N/A

Bakery Status



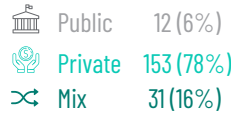
Reasons for Non-Operation

- Lack of access to support
- Machines need maintenance
- No financial liquidity

Functionality

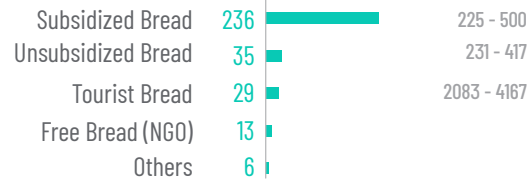


Ownership



Bread Production

Daily Production (MT)



Average Subsidized Bread Package Weight 1,223g

Average Unsubsidized Bread Package Weight 1,147g

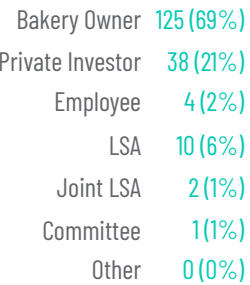


Daily Bread Needs of Total Population 372 MT

Daily Bread Needs of PIN Population 191 MT

Subsidized Bread Availability to PIN **100%**

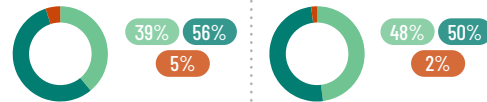
Bakery Management



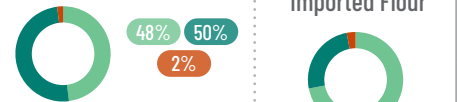
Availability

● Always Available ● Fairly Available ● Not Available

Bread



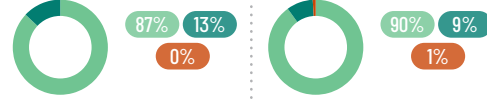
Local Flour



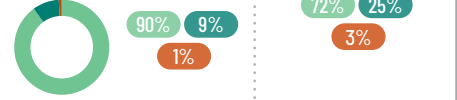
Imported Flour



Yeast



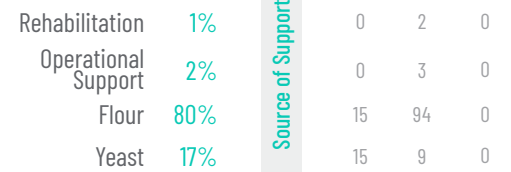
Fuel



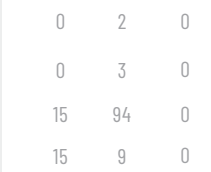
Support Status



Type of Support



Source of Support



Source and Price of Flour



MILLS N/A

MILLS SOURCE OF WHEAT N/A

SILOS N/A

SILOS SOURCE OF WHEAT N/A

Mills Status

Milling Capacity

Silos Status

Needed Support for Silos



Reasons for Limited Functionality

N/A



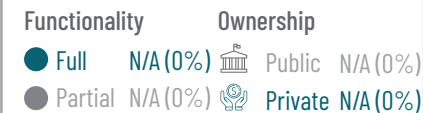
N/A

Maximum Capacity N/A MT
Current Capacity N/A MT

Production Functionality **N/A%**

Market Actors Supplied by Mills

Bakeries Supplied N/A
Traders Supplied N/A



Reasons for Non-Operation N/A

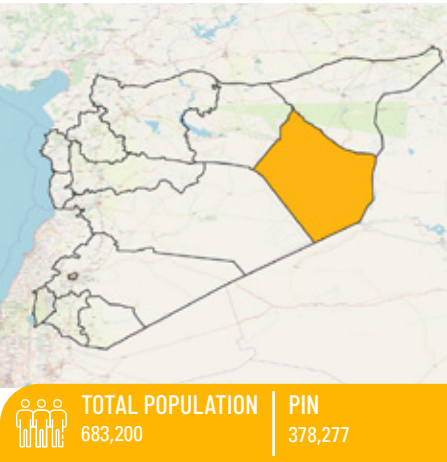
Building Rehabilitation N/A
Machine Rehabilitation N/A
Estimated Cost of Machines and Rehabilitation \$ N/A

Silos Capacity

Silos Maximum Storage Capacity **N/A MT**

Mapping of Wheat-to-Bread Processing Facilities

Deir-ez-Zor August 2023



BAKERIES 177

CURRENCY USED
USD 2%
SYP 98%

QUALITY CONTROL (LAB TESTING) N/A

Bakery Status



Reasons for Non-Operation

- High operational cost
- Lack of access to support
- Machines need maintenance

Functionality

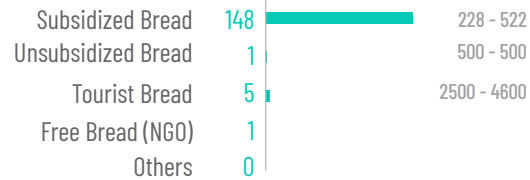


Ownership



Bread Production

Daily Production (MT)



Average Subsidized Bread Package Weight 1,236g

Average Unsubsidized Bread Package Weight 1,000g



Daily Bread Needs of Total Population 225 MT
Subsidized Bread Availability to PIN 100%

Daily Bread Needs of PIN Population 125 MT

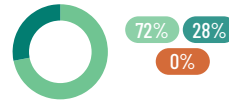
Bakery Management

- Bakery Owner 137 (83%)
- Private Investor 9 (5%)
- Employee 18 (11%)
- LSA 1 (1%)
- Joint LSA 0 (0%)
- Committee 0 (0%)
- Other 0 (0%)

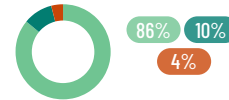
Availability

● Always Available ● Fairly Available ● Not Available

Bread



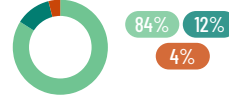
Local Flour



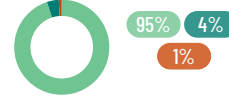
Imported Flour



Yeast



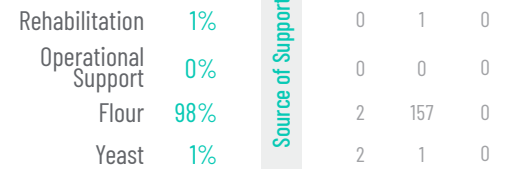
Fuel



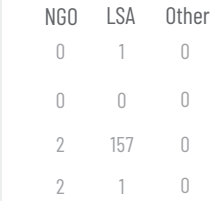
Support Status

Never Received Support 8 (5%)
Used to Receive Support 0 (0%)
Currently Receive Support 157 (95%)

Type of Support



Source of Support



Source and Price of Flour

Imported Flour 300-500 \$/MT 5%
Local Flour 10-460 \$/MT 95%



MILLS N/A

Mills Status

● Non-Operational N/A 0%
● Operational N/A

Functionality

● Full N/A (0%)
● Partial N/A (0%)

Reasons for Limited Functionality

N/A

Ownership

● Public N/A (0%)
● Private N/A (0%)
● Mix N/A (0%)

N/A

N/A



MILLS SOURCE OF WHEAT N/A

Milling Capacity

Maximum Capacity N/A MT
Current Capacity N/A MT

Production Functionality N/A%

Market Actors Supplied by Mills

Bakeries Supplied N/A
Traders Supplied N/A



SILOS N/A

Silos Status

● Non-Operational N/A 0%
● Operational N/A

Functionality

● Full N/A (0%)
● Partial N/A (0%)

Ownership

● Public N/A (0%)
● Private N/A (0%)

Reasons for Non-Operation N/A



SILOS SOURCE OF WHEAT N/A

Needed Support for Silos

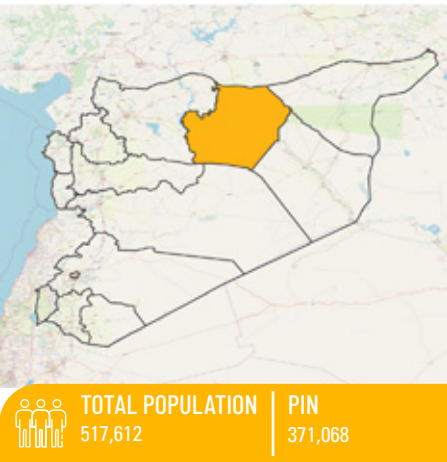
Building Rehabilitation N/A
Machine Rehabilitation N/A
Estimated Cost of Machines and Rehabilitation \$ N/A

Silos Capacity

Silos Maximum Storage Capacity N/A MT

Mapping of Wheat-to-Bread Processing Facilities

Ar-Raqqa August 2023



BAKERIES 123

Bakery Status



Reasons for Non-Operation

- Machines need maintenance
- No financial liquidity
- High operational cost

Functionality



Ownership



CURRENCY USED

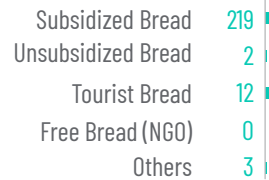
USD 1%
SYP 99%

QUALITY CONTROL (LAB TESTING)

N/A

Bread Production

Daily Production (MT)



Price (SYP) /KG

233 - 356
350 - 350
3200 - 4700

Daily Production 236 MT

Full Daily Capacity 840 MT

Current Productivity



Daily Bread Needs of Total Population 171 MT

Subsidized Bread Availability to PIN



Daily Bread Needs of PIN Population 122 MT

Average Subsidized Bread Package Weight 1,125g

Average Unsubsidized Bread Package Weight 1,000g

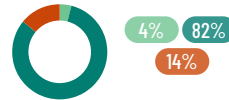
Bakery Management

Bakery Owner 86 (75%)
Private Investor 23 (20%)
Employee 1 (1%)
LSA 3 (3%)
Joint LSA 1 (1%)
Committee 0 (0%)
Other 0 (0%)

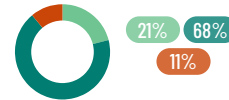
Availability

● Always Available ● Fairly Available ● Not Available

Bread



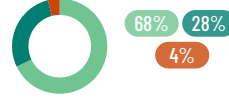
Local Flour



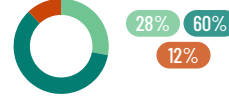
Imported Flour



Yeast



Fuel



Support Status

Never Received Support 33 (29%)
Used to Receive Support 0 (0%)
Currently Receive Support 81 (71%)

Type of Support

Rehabilitation 0%
Operational Support 2%
Flour 49%
Yeast 49%

Source of Support

	NGO	LSA	Other
Rehabilitation	0	0	0
Operational Support	0	2	0
Flour	5	81	0
Yeast	5	81	0

Source and Price of Flour

Imported Flour 200-600 \$/MT
6%

Local Flour 8-400 \$/MT
94%

Trader 67%
Mill 0%
LSA 0%
NGO 33%

1%
0%
98%
1%



MILLS N/A

Mills Status

● Non-Operational N/A 0%
● Operational N/A

Functionality

● Full N/A (0%)
● Partial N/A (0%)

Reasons for Limited Functionality

N/A

Ownership

● Public N/A (0%)
● Private N/A (0%)
● Mix N/A (0%)

N/A

N/A



MILLS SOURCE OF WHEAT N/A

Milling Capacity

Maximum Capacity N/A MT
Current Capacity N/A MT

Production Functionality  N/A%

Market Actors Supplied by Mills

Bakeries Supplied N/A
Traders Supplied N/A



SILOS N/A

Silos Status

● Non-Operational N/A 0%
● Operational N/A

Functionality

● Full N/A (0%)
● Partial N/A (0%)

Ownership

● Public N/A (0%)
● Private N/A (0%)

Reasons for Non-Operation N/A



SILOS SOURCE OF WHEAT N/A

Needed Support for Silos

Building Rehabilitation N/A

Machine Rehabilitation N/A

Estimated Cost of Machines and Rehabilitation \$ N/A

Silos Capacity

 Silos Maximum Storage Capacity N/A MT

Annex Table 1: NES Bread Needs and Production Gap Analysis, August 2023

Sub-District	Total population	PIN	Weekly bread needs of population in MT	Weekly bread needs of PIN in MT	Weekly subsidized bread in MT	Weekly unsubsidized bread in MT	Weekly unsubsidized tourist bread in MT	Weekly NGO-free bread in MT	Weekly other types of bread in MT	Total weekly bread production in MT	Bread availability to the population - % of population bread needs covered by total production	Subsidized bread availability to the population - % of population bread needs covered by subsidized & free bread	Subsidized & free bread availability to PIN - % of PIN bread needs covered by subsidized & free bread	Bread production gap in MT per week	Subsidized & free bread production gap in MT per week for total population	Subsidized & free bread production gap in MT per week for PIN	Number of supported bakeries	Number of bakeries	Number of unsupported bakeries	%Unsupported bakeries	Weekly full bread production capacity in MT	% Current productivity
<i>Ain al Arab</i>	86,088	52,692	199	122	165	0	0	20	0	185	93%	93%	152%	14	14	-63	4	5	1	20%	546	34%
<i>Lower Shyookh</i>	15,961	15,961	37	37	107	0	0	0	0	107	290%	290%	290%	-70	-70	-70	3	3	0	0%	238	45%
<i>Sarin</i>	50,158	33,891	116	78	351	0	0	0	0	351	303%	303%	449%	-235	-235	-273	11	12	1	8%	857.5	41%
<i>Abu Qalqal</i>	58,035	38,005	134	88	96	0	0	0	0	96	72%	72%	109%	38	38	-8	4	5	1	20%	217	44%
<i>Menbij</i>	305,311	188,647	705	436	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<i>Al-Hasakeh</i>	291,962	138,028	674	319	243	0	162	86	0	491	73%	49%	103%	183	346	-10	24	31	7	23%	1,260.7	39%
<i>Areeshah</i>	43,064	25,979	99	60	53	0	0	0	0	53	54%	54%	89%	46	46	7	4	4	0	0%	280	19%
<i>Be'r Al-Hulo Al-Wardeyyeh</i>	8,916	7,598	21	18	64	0	0	0	4	68	331%	312%	366%	-47	-44	-47	6	8	2	25%	126.4	54%
<i>Hole</i>	65,181	63,421	151	147	48	0	0	0	0	48	32%	32%	33%	103	103	99	3	3	0	0%	168	29%
<i>Shadadah</i>	36,579	33,370	84	77	188	0	0	0	0	188	222%	222%	244%	-104	-104	-111	1	8	7	88%	448	42%
<i>Tal Tamer</i>	49,487	35,286	114	82	126	0	0	0	0	126	110%	110%	155%	-12	-12	-44	0	5	5	100%	224	56%
<i>Al-Malikeyyeh</i>	86,012	26,983	199	62	15	0	0	20	0	35	18%	18%	56%	164	164	27	2	2	0	0%	70	50%
<i>Jawadiyah</i>	27,397	20,012	63	46	89	0	0	48	0	137	216%	216%	296%	-74	-74	-91	26	26	0	0%	624.8	22%
<i>Ya'robriyah</i>	27,718	26,458	64	61	93	0	0	22	1	116	181%	179%	188%	-52	-51	-54	14	16	2	13%	375.2	31%
<i>Amuda</i>	48,749	12,187	113	28	81	0	22	0	0	103	91%	72%	288%	10	32	-53	2	5	3	60%	224	46%
<i>Qahtaniyyeh</i>	28,401	10,487	66	24	99	0	0	0	0	99	151%	151%	410%	-34	-34	-75	2	23	21	91%	810.6	12%
<i>Quamishli</i>	347,264	146,782	802	339	105	232	242	0	0	579	72%	13%	31%	223	698	235	5	45	40	89%	1,381.8	42%
<i>Tal Hmis</i>	28,830	17,495	67	40	73	0	0	0	0	73	110%	110%	181%	-6	-6	-33	7	14	7	50%	614.6	12%
<i>Darbasiyah</i>	38,460	14,102	89	33	118	0	0	0	0	118	133%	133%	362%	-29	-29	-85	6	6	0	0%	476	25%
<i>Ar-Raqqa</i>	379,993	282,685	878	653	1042	0	30	0	0	1,072	122%	119%	160%	-194	-164	-389	45	77	32	42%	3,812.9	28%
<i>Karama</i>	52,647	39,725	122	92	239	0	0	0	0	239	196%	196%	260%	-117	-117	-147	21	22	1	5%	980	24%
<i>Jurneyyeh</i>	37,184	26,618	86	61	158	0	8	0	0	166	193%	184%	257%	-80	-72	-97	8	12	4	33%	493.5	34%
<i>Mansura</i>	47,788	22,040	110	51	104	7	32	0	36	178	162%	94%	204%	-68	7	-53	7	12	5	42%	591.5	30%
<i>Hajin</i>	105,177	32,555	243	75	175	0	0	0	0	175	72%	72%	232%	68	68	-100	27	27	0	0%	773.5	23%
<i>Susat</i>	32,946	18,947	76	44	100	0	0	0	0	100	131%	131%	228%	-24	-24	-56	13	13	0	0%	280	36%
<i>Thiban</i>	49,804	27,960	115	65	89	0	10	0	0	99	86%	78%	138%	16	26	-25	16	17	1	6%	270.2	37%
<i>Basira</i>	39,030	9,341	90	22	136	0	0	0	0	136	151%	151%	630%	-46	-46	-114	24	24	0	0%	422.1	32%
<i>Deir-ez-Zor</i>	275,894	192,579	637	445	77	0	0	0	0	77	12%	12%	17%	561	561	368	12	12	0	0%	322	24%
<i>Khasham</i>	30,428	14,580	70	34	76	0	8	0	0	84	120%	108%	226%	-14	-6	-42	12	16	4	25%	616	14%
<i>Kisreh</i>	111,654	72,503	258	167	236	0	30	12	0	277	108%	96%	148%	-20	10	-80	33	45	12	27%	2,261	12%
<i>Sur</i>	38,267	9,812	88	23	128	10	0	0	0	138	156%	145%	565%	-50	-40	-105	20	23	3	13%	931	15%