



WHOLE OF SYRIA (WoS)
FOOD SECURITY SECTOR
Strengthening Humanitarian Response

Wheat-to-Bread Processing Facilities Mapping Study for North East Syria

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Introduction

Bread is a staple in the Syrian diet and plays a key role in meals throughout the days¹. During the pre-conflict era in Syria, most of the wheat-flour to bread facilities (silos, mills and bakeries), whether public, private or the joint sector, received support from the Government of Syria (GoS), as the flour and yeast used to make the bread, and fuel used to power the bakeries, were provided by the government at subsidized prices². In return, bread was distributed under subsidized prices. Each sub-district town was allocated a specific amount of flour, distributed to the functional bakeries according to their production capacity and population density in the community neighborhoods where the bakeries were located³. However, with the onset of the conflict in 2011, the wheat-flour to bread value chain systems is perceived as severely disrupted in some communities with the absence of subsidies from the government of Syria (GoS). The report highlighted the Syrian peoples' overall requirements for the wheat-flour to bread value chain and the need for rehabilitation of silos, mills and bakeries which aims to assist humanitarian relief organizations in planning and project formulations related to the wheat-flour to bread support programs in North East Syria (NES).

Study Objectives

Given that bread is a key staple in the Syrian diet, humanitarian organizations also assist bakeries across Syria to increase the supply of bread, as well as to improve household access to bread at a stabilized price. Hence, there was a flagged need by the Food Security and Livelihood (FSL) cluster in NES, and the members of Bakeries and Bread Coordination Group (BBCG) in NES to have a better understanding of the market dynamics and map the processing facilities in the wheat-flour to bread value chain in NES. The study aims to provide recommendations to the implementing partners as per the following analytical questions:

1. What are the capacity and functionality of wheat to bread processing facilities in NES?
2. What are the existing gaps of bread production in NES which limit the capacity to meet the bread needs of the local population?
3. What are the main production barriers and needed support to fill these gaps?
4. What is the level of household accessibility to and affordability of bread in NES?

Geographical Coverage of the Study

Six-hundreds sixty-four wheat-to-bread processing facilities were mapped in North East Syria in November 2020 across thirty-six sub-districts in the four governorates (Aleppo, Al-Hasakeh, Ar-Raqqa, and Deir-ez-Zor). Out of these governorates, a total of 664 bread facilities were recorded, thus, 39 are silos, 188 are mills and 437 are bakeries. As illustrated in figure 1" Wheat-to-Bread Processing Facilities in NES-Nov. 2020", Ar-Raqqa governorate came first with the highest number of mapped bakeries and silos (151 bakeries, 17 silos) whereas, Al-Hasakeh came in first with the number of mapped mills (68 mills).

1 WFP in Syria, 2017 Year in Review. <https://docs.wfp.org/api/documents/WFP-0000068650/download>

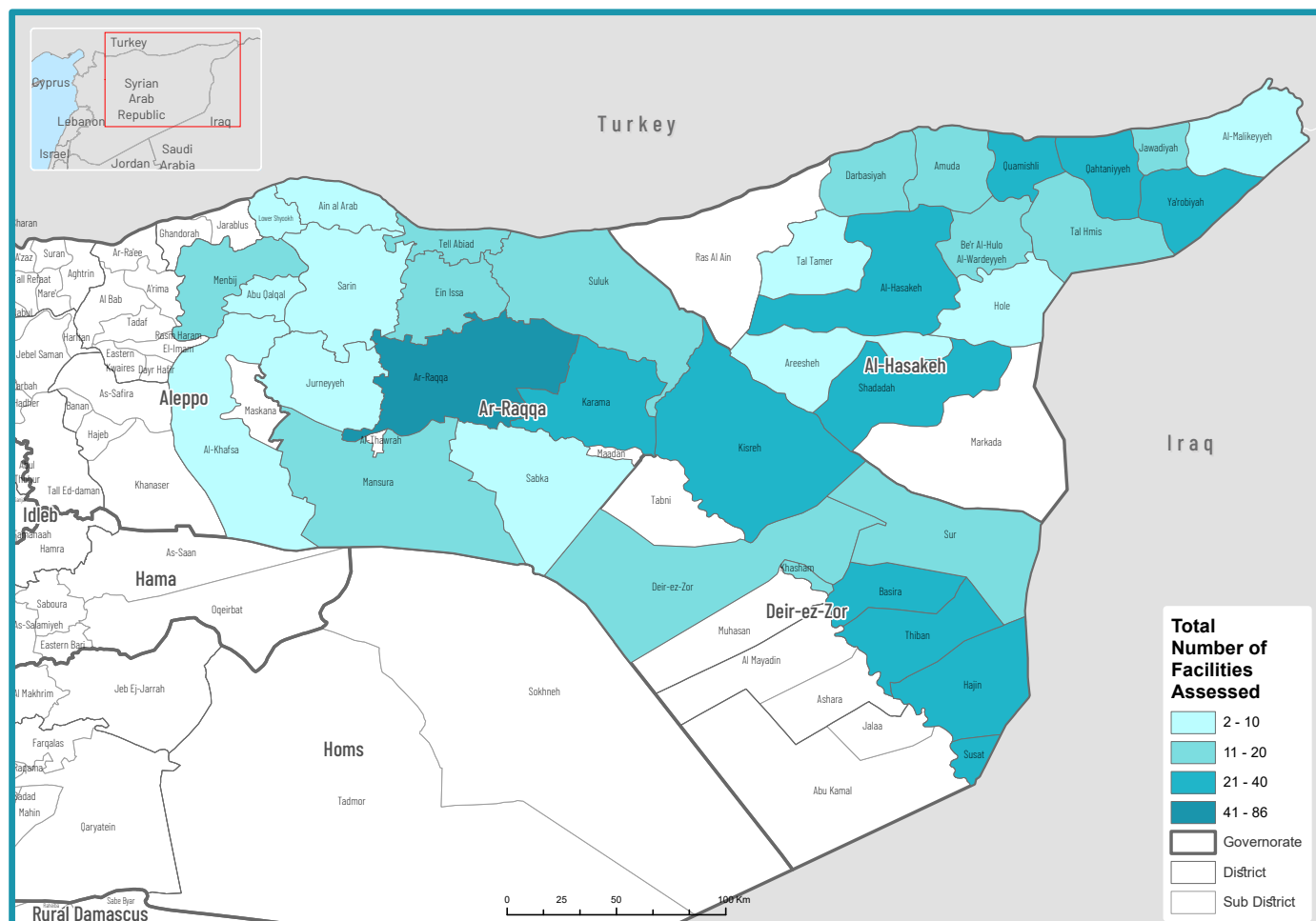
2 FAO/WFP Crop and Food Security Assessment Mission to the Syrian Arab Republic, October 2018

3 Jose Ciro Martinez and Brent Eng. 2017. Struggling to Perform the State: The Politics of Bread in the Syrian Civil War. *International Political Sociology*, 11(2), pp. 130-147

Wheat to Bread Processing Facilities Mapping

Study for North East Syria

Figure 1: Wheat-to-Bread Processing Facilities in NES-Nov. 2020



I. Methodology

The key informant interviews with market actors were carried out by enumerators, using three different questionnaires targeted to each processing facility type (Bakery, Mill and Silo). These questionnaires were developed by iMMAP in close coordination with the FSL cluster and BBCG in NES.

Data collection tools development- iMMAP designed three different facility mapping tools for silos, mills, and bakeries, respectively. These data collection tools were designed to identify and assess the highest number possible of:

- Public and private wheat-flour to bread processing facilities, providing a general profile overview of ownership.
- Functional wheat-flour to bread processing facilities and whether they are being supported by subsidized programs.
- Damaged wheat-flour to bread processing facilities and related malfunctioning equipment/machines.

Enumerators met with facility owners/ managers to carry out the mapping of silos, mills, and bakeries. The surveys were aimed at exploring the operational capacity of the functional wheat-flour to bread processing facilities.

Data collection- Upon the development of data collection tools, iMMAP provided online training to familiarize the enumerators on tools, data collection and took into consideration the enumerator's feedback to amend the tools accordingly. The next step was field testing, before kicking off the data collection activity.

Sampling- A predefined list of wheat-flour to bread facilities provided by the FSL cluster was used to kick off the data collection exercise. Accordingly, the snowball sampling technique was adopted to cover as many facilities as possible across the defined study area. The completed questionnaires were transferred from Syria to the iMMAP office in Amman, Jordan, through the Kobo Collect program, whereby iMMAP used the data to build a Microsoft Excel database, which was used to create relevant tables, charts, and graphs for reporting. The iMMAP Geographical Information System team developed maps for the report using ArcGIS software. Finally, the narrative report was drafted by iMMAP analysts and researchers, and the iMMAP production unit worked on the graphic designing component of the report, factsheets, and their layouts.

II. Silos Mapping

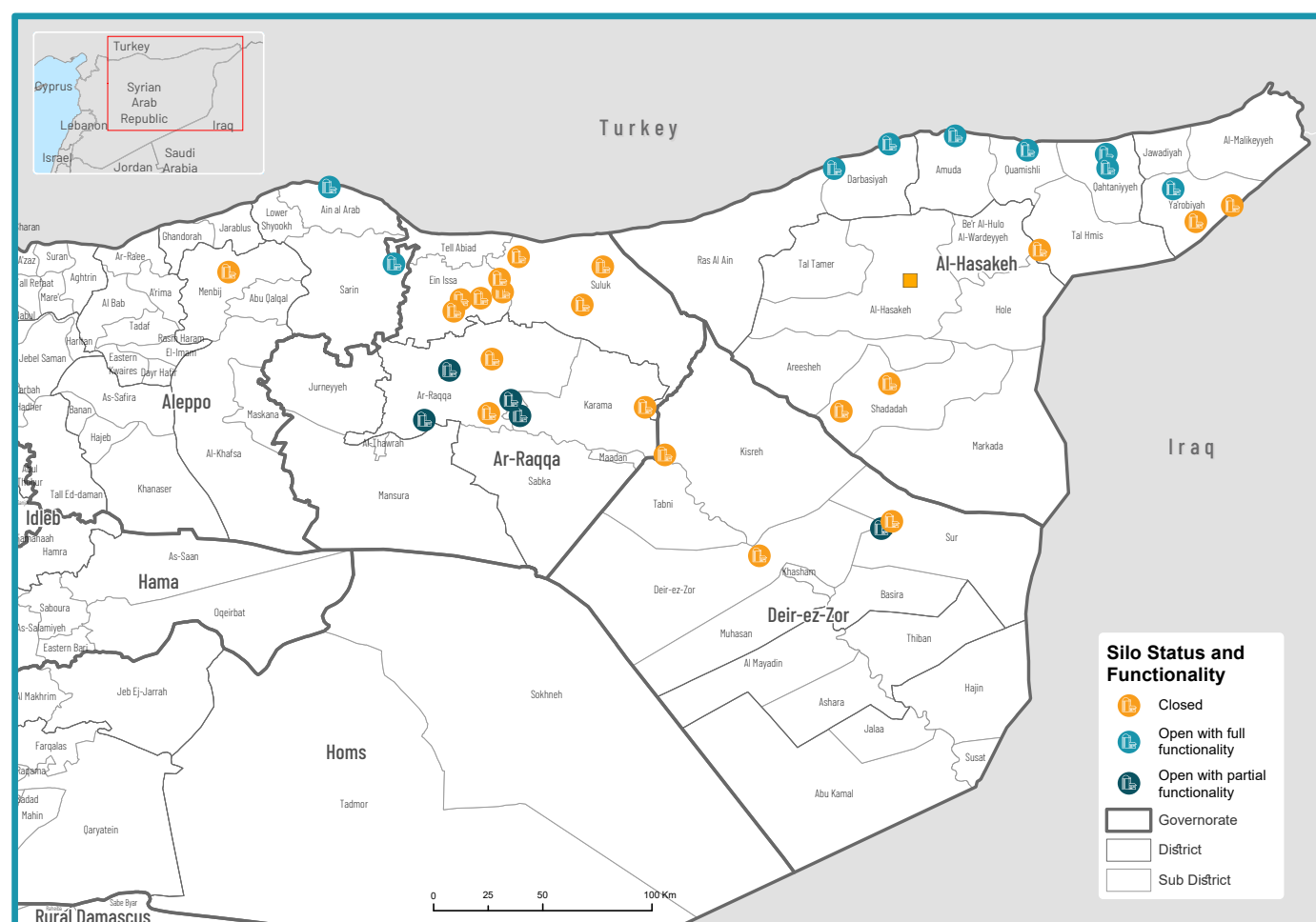
Sample

Thirty-nine silos were mapped across four governorates in NES. Ar-Raqqa governorate came first with the highest number of assessed silos with 17 silos, followed by Al Hasakeh governorate with 14 silos, then Deir-ez-Zor governorate with 5 silos, and Aleppo governorate came last with 3 silos. A questionnaire was administered to personnel managing silos to map the silo locations and assess its operational status functionality and general needs to improve wheat storage capacity.

Silos facility operational status

Seventeen out of the 39 assessed silos were open, while the remaining 22 assessed silos were closed during the reported period, which experienced the targeted heavy bombing of silo facilities. The majority (71% n=28) of the assessed silos had iron structure, while the remaining (29% n=11) silos had concrete structure. Ar-Raqqa governorate came in first with the highest number of the mapped silos, however, Al Hasakeh governorate came in first with the highest number of opened silos (9 opened silos in Al Hasakeh, 5 opened silos in Ar-Raqqa). Of the 17 opened silos, 11 silos were fully functional, while 6 silos were functional with limited capacity. It is worth mentioning that none of the opened silos in Ar-Raqqa (n=5) were operating in full capacity, while the majority (89%, n=8) of opened silos in Al Hasakeh were fully functional. The main reported reasons for limited functionality were due to machines which were reported not functional, shortages in fuel /electricity, high operational costs (raw material, electricity, workers salary, etc.), and water shortage. See Figure 2 “Silos Status and Functionality in NES”

Figure 2: Silos Status and Functionality in NES



The assessment indicated tremendous changes in the wheat prices. The average pre-conflict total cost of wheat per MT was 14,334 SYP while the average reported wheat per MT cost during the reporting period was 397,188 SYP. The prices of wheat in 2020 increased by 65% compared to prices of wheat in 2019 (from 240,000 SYP/MT in 2019 to 397,188 SYP/MT in 2020). In Al-Hasakeh governorate, the local Silo management reported that the desired wheat price by people was 150 000 SYP /MT.

It is worth mentioning that the official announced price of wheat by GoS was 185,00 SYP/MT in 2019 and 400,000 SYP/MT in 2020, while the official announced price of wheat by SDF was 150,000 SYP/MT in 2019 and 170 USD / MT in 2020.

Source of wheat and support required to improve wheat storage facilities

The main supplier of wheat to the assessed silos were local farmers (63%), followed by the Local Self Administration (35%). Non-governmental organizations were also reportedly supplying wheat to silos for storage (2%) for flour production. Four out of 17 opened silos reported they obtained wheat locally from more than one governorate in NES. The most reported source of stored wheat (45 %, n=10) by silos management was from Al-Hasakeh governorate, followed by (32%, n=7) Ar-Raqqa governorate, then Deir-ez-Zor governorate (14 %, n=3) was next, and Aleppo governorate (9%, n=2) came last.

The reported maximum capacity of all assessed silos in NES was 798 500 MT. However, the maximum storage capacity of silos in Al Hasakeh governorate represents 88% (701 000 MT) of the total maximum capacity of silos in NES. Ar-Raqqa governorate came next with 59 500 MT. From assessed silos, workers reported that they stored two types of wheat, namely soft and hard wheat.

Eleven out of the 17 opened silos had its workers who reported the need for structure rehabilitation, at an estimated average cost of 27,227 USD/per silo. Likewise, 14 out of the 17 opened silos workers reported the need for new machines and/or machine maintenance at an estimated average cost of 21,343 USD/ per silo. In terms of the type of rehabilitation support needed; rehabilitation of electric and mechanical systems, in addition to controlling panels were reported as priority by the silo management, then repairing machines, and followed by access to fuel and electricity. It is important to note that the main source of energy for the silos was the locally refined oil.

Lab Testing

Overall, 82% of interviewed silos workers reported that there is a laboratory in their silo that determines the percentage of moisture and extent of the presence of diseases and insects in the wheat samples. Also, all interviewed silos workers indicated that all the stored grains were sterilized. They are usually sterilized periodically every three months after testing and inspecting the sample. Furthermore, most interviewed silos workers (76%) periodically monitor the grain temperature. On the other hand, interviewed silos workers reported that they usually test the wheat and flour either manually or through using specialized tools to indicate the percentage of impurities and detect insects. These tools include sieves that are specialized with a standardized scale to detect impurities. Many interviewed silos workers reported experiencing challenges regarding the testing of wheat and flour. The main challenge they are facing is their usage and dependency on old and outdated testing devices. Silos workers indicated that the lack of advanced and specialized devices and tools was hindering their testing ability and efficiency.

COVID-19

Over one-half, 53% of the silos workers interviewed indicated that their work was not impacted by COVID-19. The other half reported that due to COVID-19, their workflow was impacted primarily due to increased fear, decreased labor, and increased work pressure. On a governorate level, silos workers in Ar-Raqqa reported facing a lot of work pressure, while workers in Al-Hasakeh reported a decrease in labor. Overall, most of the interviewed silos workers implemented preventative measures such as ensuring hygiene and requiring employees to wear masks and gloves. Also, some silos management adopted a shift-based work system to decrease the number of employees at the facility at a time and ensure social distancing.

III. Mills Mapping

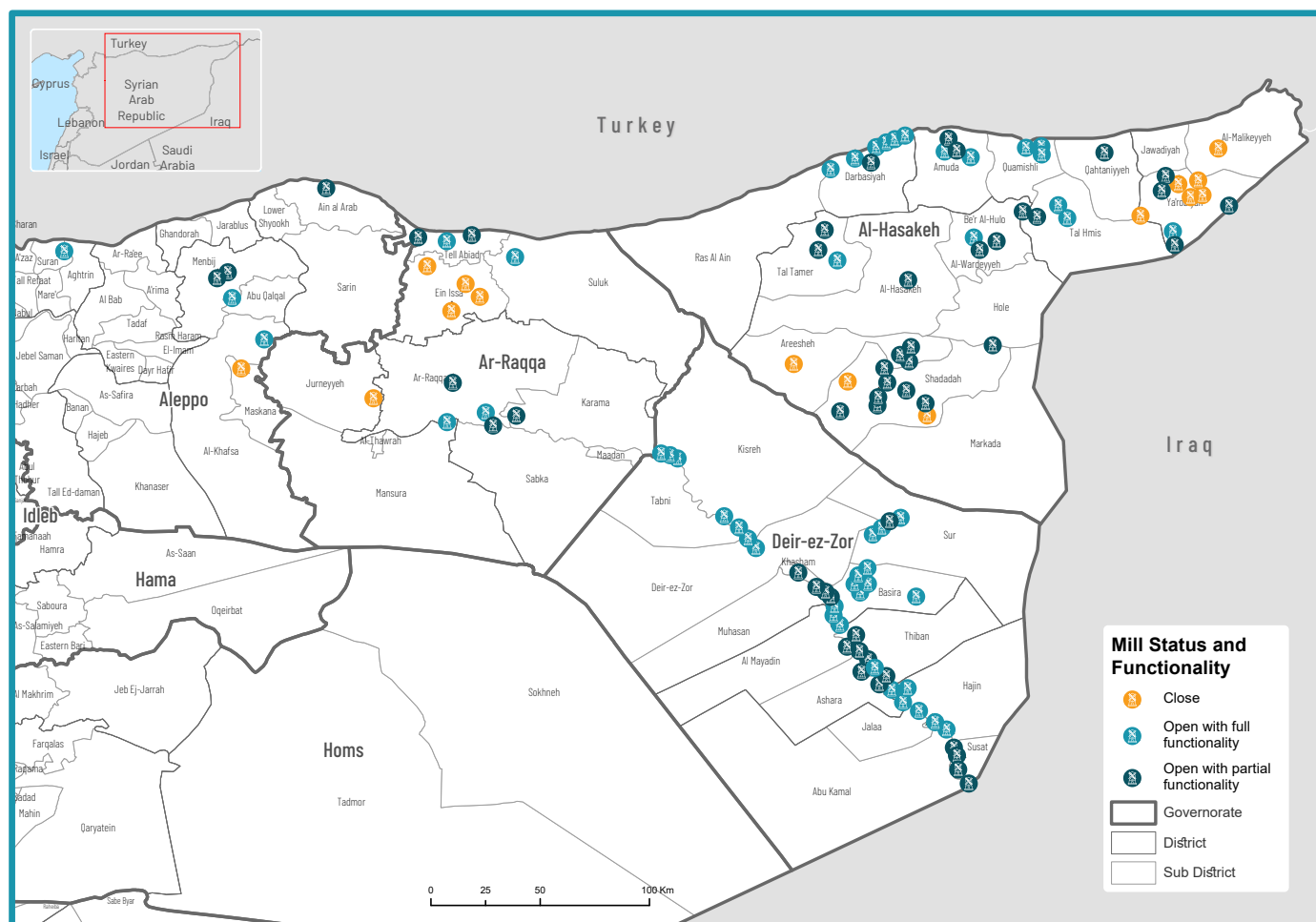
Sample

One hundred eighty-eight mills were mapped across four governorates in NES. Deir-ez-Zor governorate came first with the highest number of assessed mills with 94 mills, followed by Al Hasakeh governorate with 68 mills, then Ar-Raqqa governorate with 19 mills, and Aleppo governorate came last with 7 mills. A mill facility assessment questionnaire was developed to assess the mills functionality, production capacity, machine/equipment status, and general needs to improve milling productivity.

Mill facility location and operational status

Most mills (86%, n = 162) were open, 26 mills (14%) were closed, of which 23 mills were inactive since 2015 due to diminishing returns of milling production, malfunctioning machines, ongoing conflict with displacement and thefts incidents of mills' equipment, coupled with lack of access and high cost of processing inputs. The majority of mills (97%, n=182) were privately owned, where the number of publicly owned mills (3 %, n=6) were very low. In addition, 100 % of mills use locally produced diesel as fuel to power the mills. See figure 3 "Mills Status and Functionality in NES"

Figure 3: Mills Status and Functionality in NES



Sources of wheat grain for the surveyed mills

The main sources of wheat grain reported at each mill facility were local farmers (52%), followed by wheat traders (33%). Local self-administration (10%) was also reportedly supplying wheat to mills. It is worth mentioning that non-governmental organizations were surprisingly missing as a source of wheat grains for the mills. Figure 4 illustrates the main sources of wheat grain at the governorate level; data shows that farmers were missing as a source of wheat grain for the mills in Aleppo governorate.

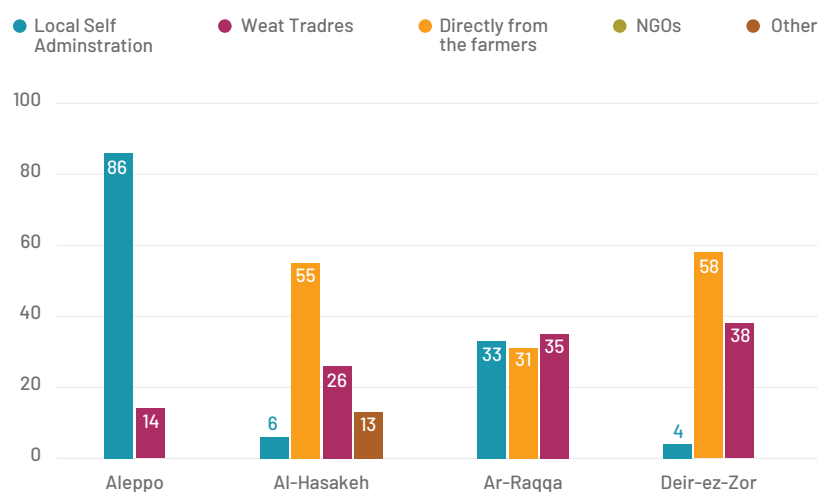


Figure 4: Main source of wheat grain for the mills in NES

Constraints to increased mill production

Almost half of the opened mills (51%, n=83) had the ability to operate with full functionality, whereas (49%, n=79) operate with partial functionality; shortage of wheat, malfunctioning machines, fuel and access to energy sources, coupled with the high cost of operational cost were the main reported reasons for the limited capacity of the opened mills. Figure 5 illustrates the different barriers to mill production at governorate level. Wheat shortage was reported in Al Hasakeh governorate as the main barrier, while shortage in fuel and electricity was reported as main barrier to mill production in Deir-ez-Zor governorate.

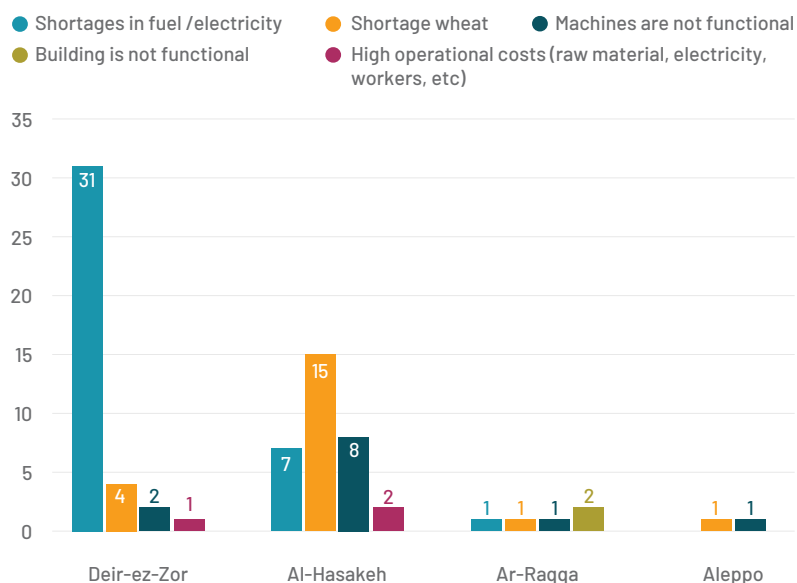


Figure 5: Main source of wheat grain for the mills in NES

Current structure and operational capacity of mills

Figure 6 below shows the maximum capacity of the mill facilities in each governorate. It can be noted that the governorate with the largest milling capacity was in Al-Hasakeh governorate, where the reported full milling capacity was 6348 MT per week as compared to the prevailing current actual milling production of 5033 MT per week. This was followed by the milling capacities for Aleppo governorate, this governorate reported a full milling capacity of 5800 MT per week, as compared to the prevailing actual milling production of 3472 MT per week. Although Deir-ez-Zor governorate came at third rank in terms of full milling capacity of 4634 MT per week, it took the second rank in terms of prevailing actual milling production with 3915 MT per week. Ar-Raqqa governorate came last, as the reported full milling capacity was 3211 MT per week compared to the overall current actual milling production of 2395 MT per week.

The assessment noted that there were 9 of the 36 assessed sub-districts in which the needs for mill support was high, as there were no reported opened mills there. See Figure 6 that illustrates the current milling production across the assessed sub-districts. Further, data indicated the need for support to these mills to attain their maximum milling capacities, where the reported gap between the current milling production (14815 MT per week) and the full capacity (19993 MT per week) was 35%.

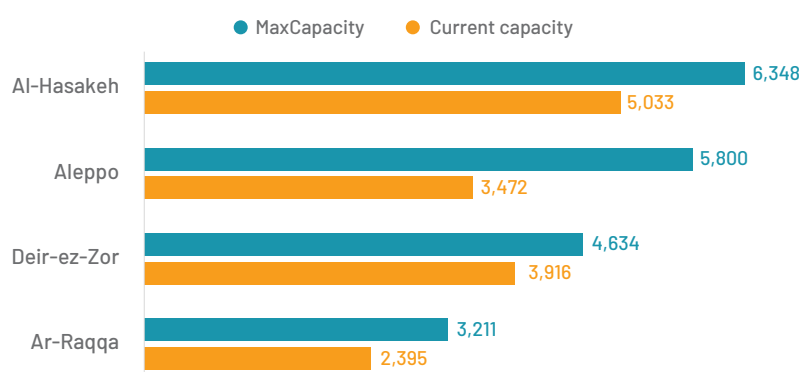


Figure 6: Mills Weekly Capacity in NES

Mills flour production

The mills' current flour production was reported at a range of 0.5 to 1,000MT per week for each mill. However, mills reportedly incur stoppages of operation due to various challenges. For instance, 0-25 days in a monthly cycle were recorded as a range of stoppages of mill operations due to breakdowns of machines/equipment, power cuts, and/or unavailability of fuel. Despite the challenges, the operating mills were still able to supply flour to a relatively large number of bakeries, ranging between 1-70 bakeries per mill (Table 1). The mill in A'zaz supplies the highest number of bakeries (55 bakeries), followed by another mill in Idleb sub district that reportedly supplies 30 bakeries. Distribution of flour is mainly directed from the mills to the bakeries (90%), and only (10%) is directly distributed from the mills to flour traders.

Governorate/number of mills in brackets	Number of bakeries being supplied	Number of traders being supplied	Number of people being served
Aleppo (7)	51	10	41
Al-Hasakeh (52)	137	139	25,878
Ar-Raqqa (12)	156	38	224
Deir-ez-Zor (91)	170	141	16,721

The average cost of milling one ton of wheat was reported to be USD 12 at an average profit of 20%. The more expensive milling service for beneficiaries were reported for the mills in Ar-Raqqa governorate (cost of milling one ton of wheat was USD 16 at 20% profit level). The cheaper milling service for beneficiaries was reported in Aleppo governorate (cost of milling one ton of wheat was USD 4 at 27% profit level). It is worth mentioning that mills' management reported that they had a functioning humidity line at the majority of the mills (80 %, n=57) in the three governorates of Al Hasakeh, Ar-Raqqa and Aleppo. In contrast, mills' management in Deir-ez-Zor governorate reported that the number of mills who had a functioning humidity line were very limited (11%, n=10). See Figure 7. Furthermore, only 12 (7%) mills out of the 162 opened mills had its workers who reported having a laboratory for testing the wheat and produced flour.

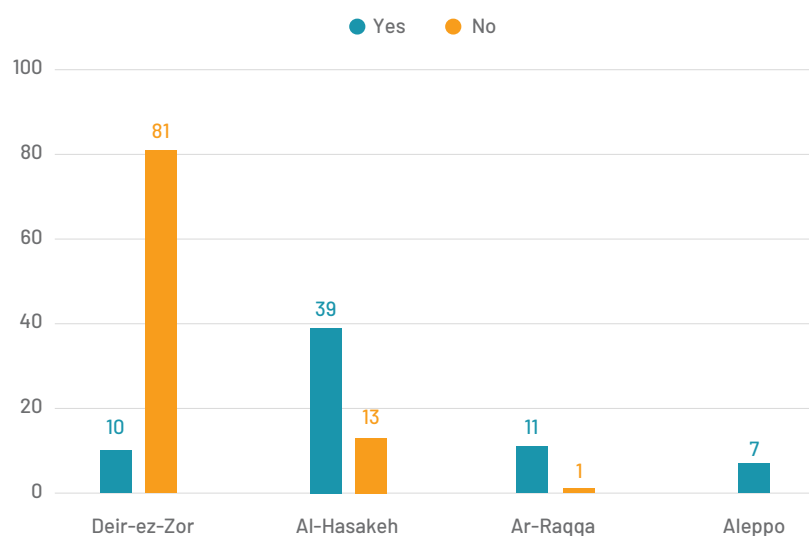


Figure 7: Existence of Humidity line at Mills in NES

Support required to improve mill production

Figure 8 highlights the most preferred form of support for mills to improve mill production at the governorate level. The most-reported support required was the rehabilitation of machines and equipment for the mills (n=26) and supply of energy in the form of fuel or electricity (25), followed by the minor rehabilitation of building (n=13). Structural rehabilitation of buildings was also cited as a requirement (n=10). However, there was a request to support the mills with wheat. However, there was a request to support the mills with wheat. When asked about the estimated cost of rehabilitating buildings the median reported cost (among 53 mills) was USD 1200 per mill and it ranged between 50–200,000 USD. Whereas, the median reported cost of rehabilitating machines/equipment (among 91 mills) was USD 2,000 per mill, and it ranged between 20–400,000 USD.

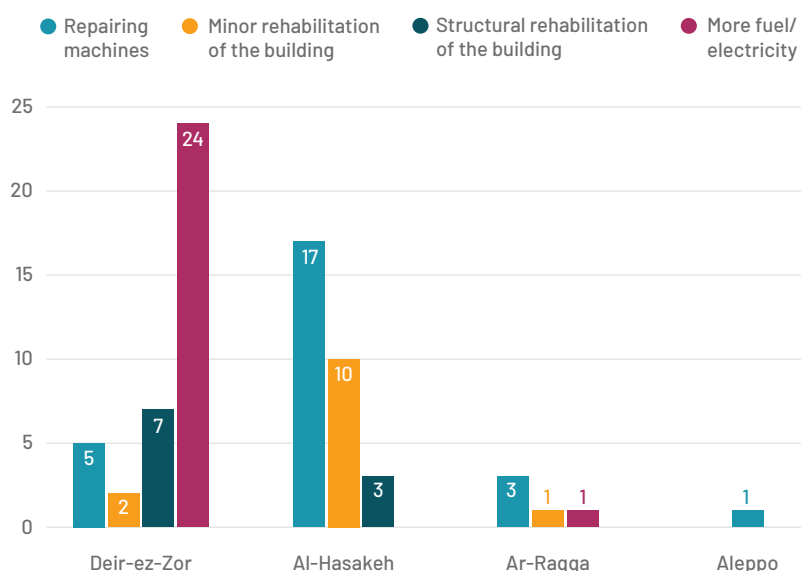


Figure 8: Required support to improve mill production

COVID-19

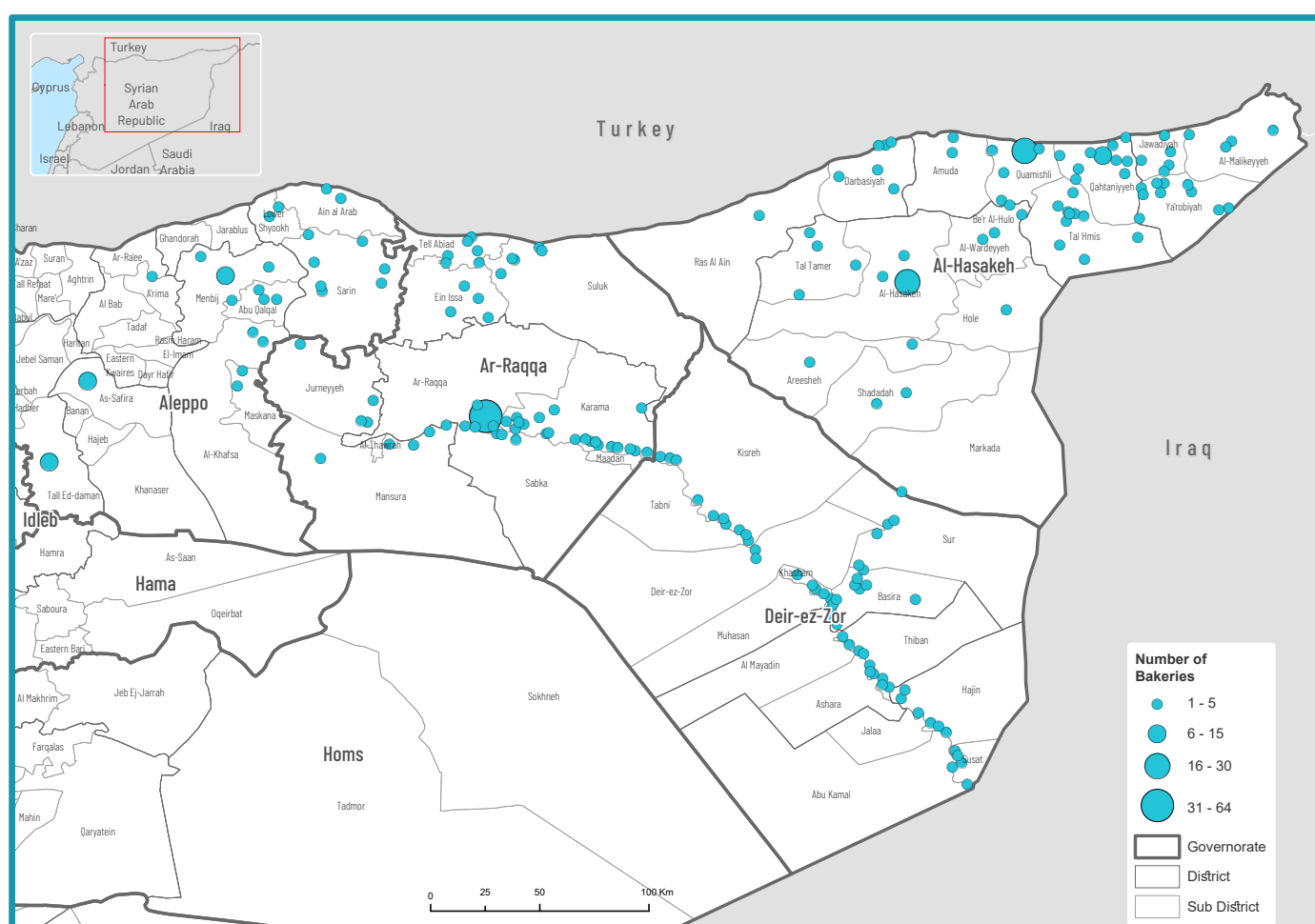
Around 66% of interviewed mills workers in all governorates indicated that their work was not affected by COVID-19. However, 34% reported that their work was affected. Some mills workers reported that they were negatively affected by the imposed movement restrictions, curfew hours, and social distancing. These measures and fear hindered customers' ability to physically visit the mills to make any purchases. This decrease in demand and work-hours restrictions caused many facilities to decrease work hours and in turn causing a decrease in labor productivity. To decrease the impact of COVID-19, affected mills management implemented preventative measures such as ensuring hygiene and requiring employees to wear masks and gloves.

IV. Bakery Mapping

Sample

This study conducted 437 bakery mapping surveys across the governorates of Aleppo, Al-Hasakeh, Ar-Raqqa, and Deir-ez-Zor in 12 districts, 36 sub-discitis, aiming to cover all existing bakeries. Ar-Raqqa governorate ranked first with the highest number of mapped bakery (n=151), followed by Al- Hasakeh governorate (n=149), then Deir-ez-Zor governorate (n=106), and then Aleppo governorate came last (n=31). See Figure 9 illustrates the number of assessed bakeries in NES.

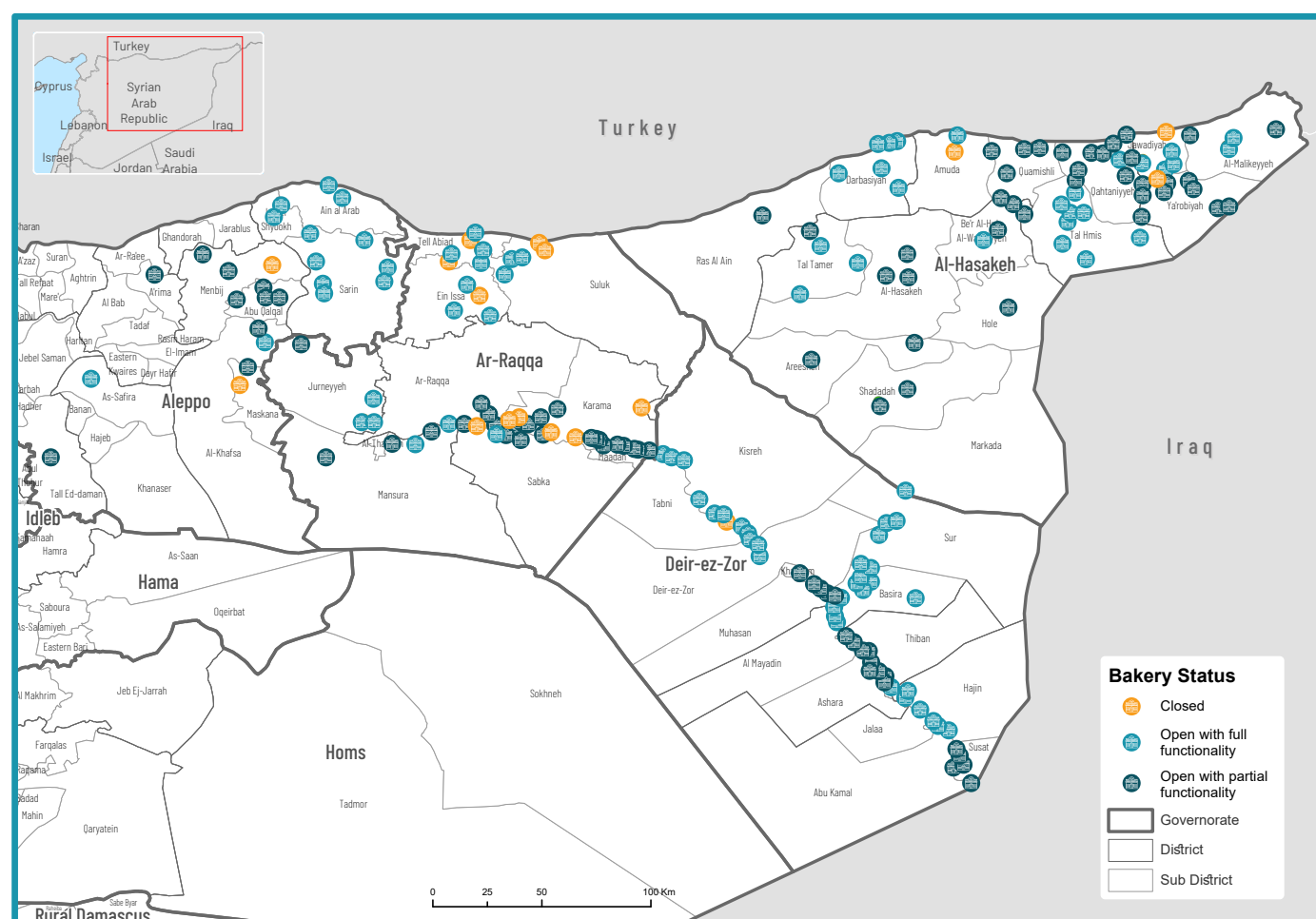
Figure 9: Figure 9 Map of assessed bakeries in NES



Bakery operational status

The bakery survey's first objective was to map out the open and closed facilities, hence explore the reasons behind the closure, as for the open facilities, the survey aimed at exploring the level of functionality. Collectively, this information helps in pinpointing and prioritizing the bakeries that require rehabilitation support. The reported number of closed bakeries was 29 out of total 437 surveyed, of which 244 bakeries were reported open with limited operational capacity due to partial-functionality, and 164 bakeries were reportedly open with the ability to work with full functionality. Several reasons were reported to be behind the closing of the bakery facilities, including lack of machinery maintenance; destruction as a result of bombing; limited access to funds; the deteriorating security situation; taxation issues, low quality and availability of flour and high operational cost. See figure 10 "Map of functional bakeries in NES"

Figure 10: Map of functional bakeries in NES



Deir-ez-Zor governorate came first with the reported highest number of bakeries (59%, n=63) which operated with full functionality, followed by Al-Hasakeh governorate (30%, n=45), then Ar-Raqqa governorate (27%, n=41), and Aleppo governorate (48%, n=15). However, Ar-Raqqa governorate came first with the reported highest number of bakeries (10%, n=15), which were closed, followed by Al-Hasakeh governorate (4%, n=6), then Aleppo governorate (16%, n=5), and last Deir-ez-Zor governorate (3%, n=3). See figure 11.

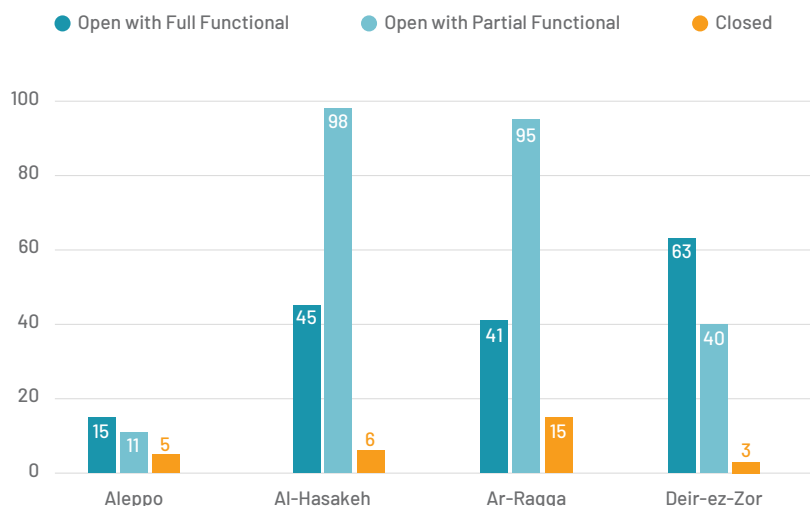


Figure 11: Bakery functionality in NES

Bakery Ownership and Management;

As a result of the conflict and the collapse of the GoS centralized wheat-flour-to-bread system, a notable number of privately-owned bakeries opened after the escalation of the conflict. The majority (84%, n= 368) of the mapped bakeries were privately-owned, whereas the number of publicly owned bakeries was relatively low (16%, n=69). The private ownership varied and included different ownership types such as individual-ownership, private partners, joint private and public partnership, and investor/tenant. The main form of private ownership (74%, n=272) of the assessed bakeries was individual ownership. The low percentage of publicly owned bakeries reflects the weak governance structure in place. It is worth mentioning that the management style of assessed bakeries also varied and reported in different forms; the main reported management authority was an independent management system by the individual owner with 74% (301 bakeries). This was followed by tenant management of bakeries with 19% (77 bakeries), then Local Self Administration (LSA) managed bakeries had a record of 4% (16 bakeries), and Joint management with LSA came next with 2% (10 bakeries). On the other hand, the bakery survey recorded that there was one bakery in Amuda sub-district in Al Hasakeh governorate that was being managed by the GoS. In addition, there was one bakery that was reported to be jointly managed by GOS and LSA in Ya'robiyah sub-district in Al-Hasakeh governorate. See figure 12.



Figure 12: Bakery Management Style in NES

Bakery Machinery and Building Status

The assessment also focused on the operational and processing capacity of the bakeries. The collected data from the bakeries using the mapping data collection tool showed that the assessed open bakeries (408) were well equipped with the needed basic machines and equipment. The mapping tool looked at the availability of the following basic machine/equipment types regardless of the number of machines/equipment at each facility. See figure 13;

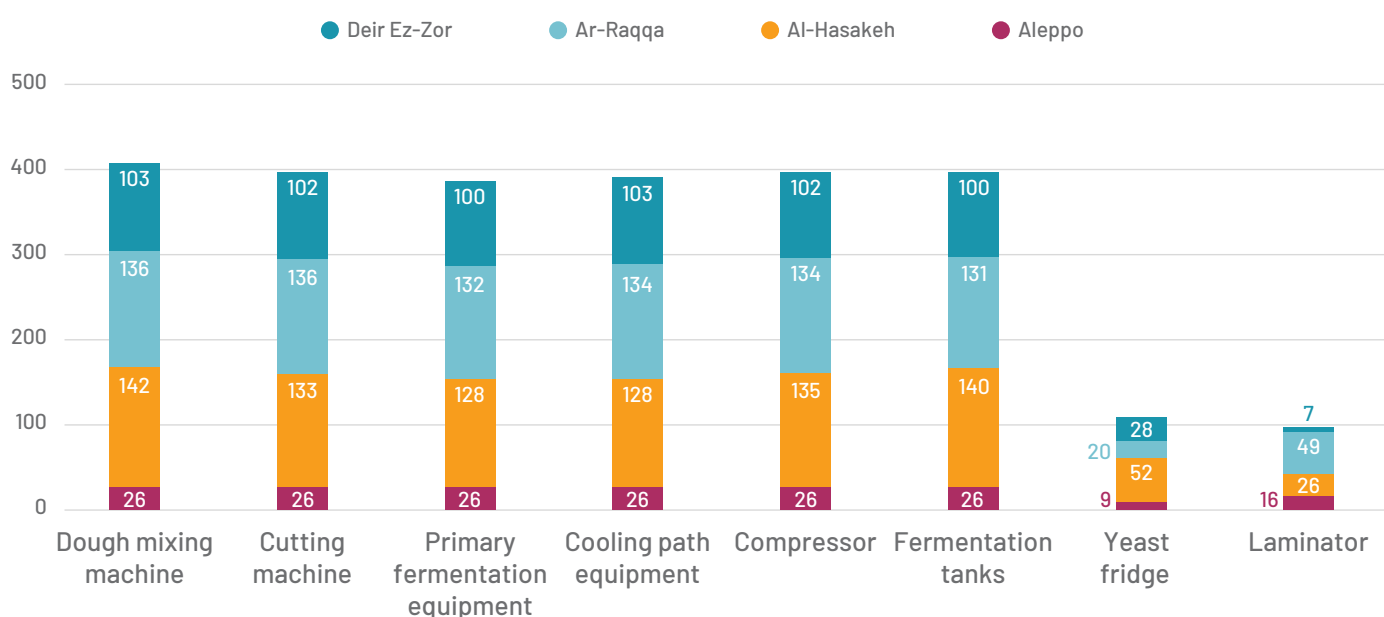


Figure 13: Bakery Machines in NES

1) All open Bakeries had Dough mixing machine, except one bakery in Qumishli sub-district (Al-Hasakeh governorate); 2) All open bakeries had cutting machine, except for 11 bakeries in four sub-districts; Ya'robiah (8), Al-Hasakeh (1) and Shadadah (1) sub-districts in Al-Hasakeh governorate, and Susat (1) sub-district in Deir-ez-Zor governorate 3) The majority (95%, n=386) of opened bakeries had primary fermentation equipment, the remaining 22 bakeries with no primary fermentation equipment are located in Al-Hasakeh (15), Ar-Raqqa (4), and Deir-ez-Zor (3) governorates. 4) The majority (96%, n=391) of the opened bakeries had Cooling path equipment, 17 bakeries reported that they were not equipped with Cooling path equipment, those 17 bakeries located in Al-Hasakeh (15) and Ar-Raqqa (2) governorates. 5) Majority (97%, n=397) of the opened bakeries had Dough Compressor, bakeries with no Dough compressor are in Al-Hasakeh (8), Ar-Raqqa (2), and Deir-ez-Zor (1) governorates. 6) Majority (97%, n=397) of the opened bakeries had Fermentation tanks and bakeries with no Fermentation tanks are in Al-Hasakeh (3), Ar-Raqqa (5), and Deir-ez-Zor (3) governorates. However, only 98 bakeries out of the 408 opened bakeries had Laminator machines, representing only 24% of the total bakeries in NES. Furthermore, 11 out of 36 sub-districts reportedly had a need for a yeast fridge, with only 106 bakeries out of the 408 opened bakeries reported to have a yeast fridge.

In terms of the needed cost for rehabilitation, new machines/equipment, and the machines' maintenance; data showed that the median cost of bakery rehabilitation was 2,000 USD per bakery, where the median cost of buying the new needed machinery was 10,000 USD per bakery, however, the cost of required maintenance was 4,000 USD per bakery.

Bakeries Functionality

The functionality of bakery facilities was 38% across the 408 assessed bakeries in the NES region of Syria. This indicated that 408 open bakeries in the NES region were producing 38% of their full production capacity. Hence, as the total current daily production of the assessed 408 bakeries was 988 MT, the 408 bakeries had the capacity to produce 2,585 MT daily if input support could be secured .

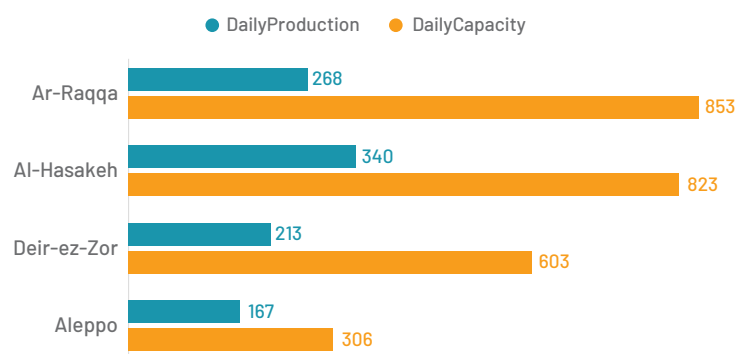


Figure 14: Bakery Production in NES

Figure 14 shows that Al-Hasakeh governorate came first in terms of the largest amount of daily production of bread with 340 MT, this was followed by Ar-Raqqa governorate with 268 MT, then Deir-ez-Zor governorate with 213 MT. Aleppo governorate came last with 167 MT as the daily production amount of bread. It is worth mentioning that although Ar-Raqqa governorate ranked second in terms of the daily production of bread, it came the highest in terms of production capacity with 853 MT of bread.

This study indicated the limited production capacity in a large number of open bakeries, 65 % (264 bakeries) operated at less than 50% functionality rate. As illustrated in figure 15, the functionality rate of the assessed open bakeries was as follow : 38%(154 bakeries)of the open bakeries operated at 0-0.25 functionality rate, 27 % (110 bakeries)of the open bakeries operated at 0.25-0.5 functionality rate, 13%(52 bakeries)of the open bakeries operated at 0.5-0.75 functionality rate, and 23%(92 bakeries) of the open bakery operated at 0.75-1 functionality rate.

Deir-ez-Zor governorate came first with the highest number of bakeries which worked at 0.75-1 functionality rate with 40 bakeries, this was followed by Al Hasakeh governorate with 33 bakeries, Ar-Raqqa came next with 14 bakeries, and Aleppo governorate came last with 5 bakeries.

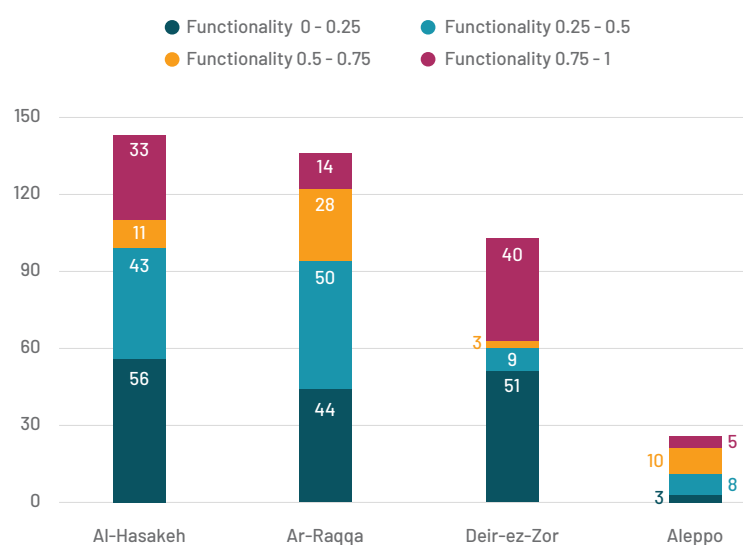


Figure 15: Bakery Functionality Rate in NES

Rehabilitation needs

Building rehabilitation and machine/equipment maintenance were the primary reported needs. This section provides in-depth details of the needs of the assessed bakeries. Building rehabilitation came first with as the most reported need, with 35% of the open bakeries (141) reported the need for building rehabilitation, this was followed by the need for dough compressors maintenance with 32% (131 bakeries), then cooling path equipment's maintenance with 14% (109 bakeries), cutting machine came next with 13% (102 bakeries). The maintenance of the yeast fridge came last with 1% (7 bakery). It is worth mentioning that the need for new machines was reported by 10% (81 bakeries). Figure 16 represents the percent of need as compared to total needs.

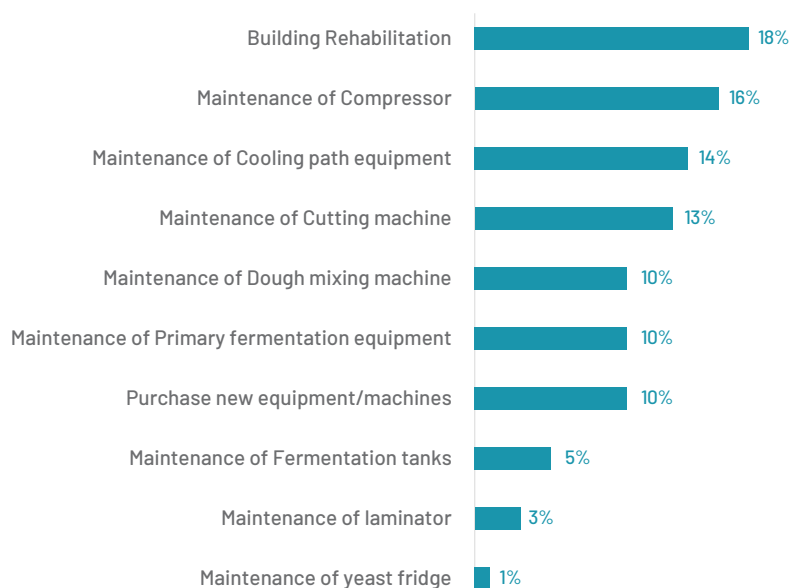


Figure 16: Bakery Support Needs in NES

Bread and Production Inputs Availability

Eighty-four percent of the interviewed bakeries' manager reported that bread was available (ranged between always and fairly available), however, 16 % reported that bread was either rarely available (8%), or not available at all (8%). Al-Malikeyyeh sub-district reported that bread was rarely available where there were only 2 open bakeries with 12 MT of daily production where the daily need was 28 MT of bread. Furthermore, over half of the interviewed bakeries in the four sub-districts of Al-Hasakeh (62%), Tal Hmis (93%), Karama (52%), and Sabka (67%) reported that bread was not available. Figure 17 represent the bread availability in NES.

In terms of bread production inputs availability, majority (91%, n=366) of the bakeries reported that local flour was available, likewise Yeast was reported to be widely available (98%, n=391), and fuel was available as well (93%, n=370).

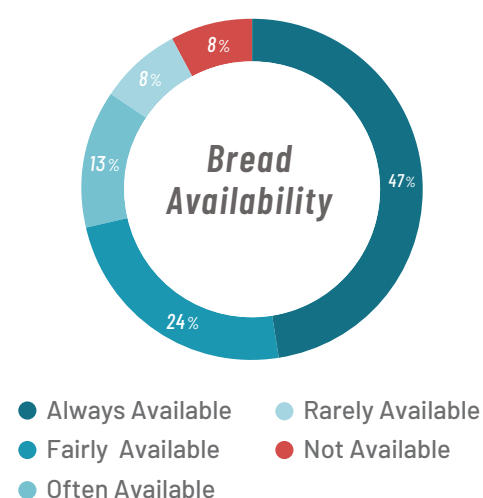


Figure 17: Bread Availability in NES

Types of Produced Bread

The main types of bread produced across the 36 assessed sub-districts in the NES region were the subsidized bread, unsubsidized Bread, NGOs Bread, and other types of bread.

1) Subsidized Bread;

Bakeries receive operational and/or input support or have access to subsidized inputs to produce regular bread at a lower price (the price of 1kg bread ranged between 25-400 SYP). The data shows that 272 bakeries reportedly produce Subsidized Bread, with a daily production of 685.3 MT across 32 sub-districts. Jawadiyah (1.44 MT, 6%,), Basira (1.7 MT, 5%), and Hajin (3.04 MT, 16%), were reported to have the smallest amount of daily production of Subsidized Bread among the sub-districts that produce Subsidized Bread. However, collected data showed that there were 4 sub-districts (out of the 36 sub-districts that had open bakeries) that do not produce Subsidized Bread at their bakeries (40 bakeries/produce 106 MT daily).

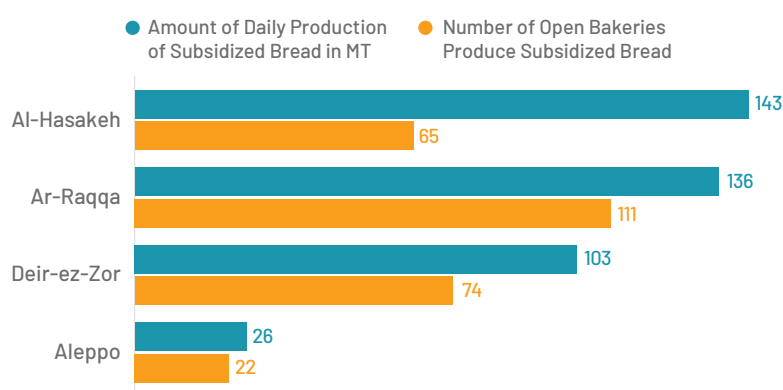


Figure 18: Subsidized Bread in NES

Figure 18 illustrates the daily production of subsidized bread against the number of bakeries that produce subsidized bread at governorate level. Although Ar-Raqqa came first with the highest number of bakeries that produce subsidized bread (111 bakeries, 136 MT of Subsidized Bread), it came second after Al-Hasakeh governorate with the daily amount of produced Subsidized Bread (65 bakeries, 143 MT of subsidized Bread).

2) Unsubsidized Bread;

This type of bread specifications are unlike the subsidized bread, whereas bakery does not receive any support and sells at higher price (price of 1kg bread ranged between 55-1100 SYP). The data shows that 90 bakeries produced unsubsidized Bread with a daily production amount of 177.78 MT across 11 sub-districts.

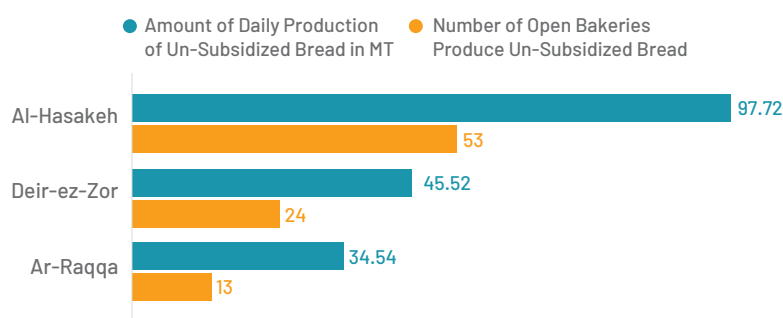


Figure 19: Un-Subsidized Bread in NES

Be'r Al-Hulo Al-Wardeyyeh sub-district in Al-Hasakeh governorate reported that it produced only unsubsidized bread at 8 bakeries with daily production of 16 MT bread. Qumishli sub-district came first with the highest number of bakeries producing unsubsidized Bread (21 Bakeries) and the daily produced amount of unsubsidized bread with 41.89 MT.

Figure 19 illustrates the daily production of unsubsidized bread against the number of bakeries that produced unsubsidized bread at the governorate level. Al-Hasakeh governorate came first with the highest number of bakeries that produce Un-subsidized bread (53 bakeries, 97.72MT of unsubsidized Bread). However, the 6 assessed sub-districts in Aleppo governorate reported that they do not produce un-subsidized bread.

3) NGOs bread

In some cases, bakeries received support from NGOs to produce free bread; NGOs distributed this free bread to vulnerable people for free. Only 4 sub-districts reported that they produce NGOs bread at 5 bakeries with 30.78 MT of bread daily. Figure 20 illustrates the daily production of NGO bread against the number of bakeries producing NGO bread at the governorate level. This type of bread was limited to Deir-ez-Zor and Al-Hasakeh governorate.

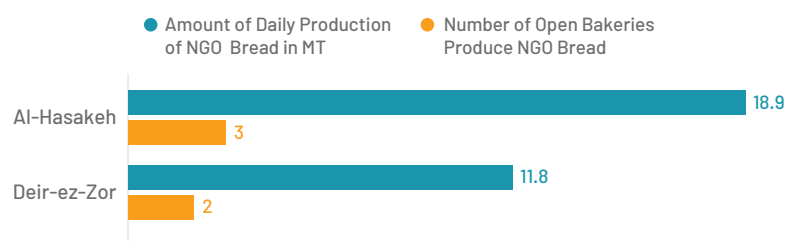


Figure 20: NGOs Free Bread in NES

It is worth mentioning that the data triangulated with FSL cluster and some organization reported working in Raqqa, where they provided support to bakery to produce bread and transport it to informal settlements (NGO provide wheat flour, yeast and paying for the production and transportation cost).

4) Other types of bread;

The production of Other Types of Bread was reported across 17 sub-districts in 43 bakeries with a total daily production of 94.14 MT. Ar-Raqqa sub-district came first with the largest production amount of this type of bread with 23.63 MT of bread at 7 bakeries. Figure 21 illustrates the daily production of other types of bread against the number of bakeries produced other types of bread at the governorate level. Al-Hasakeh governorate came first with the highest number of bakeries that produced other types of bread (23 bakeries, 42.83 MT of other types of Bread)

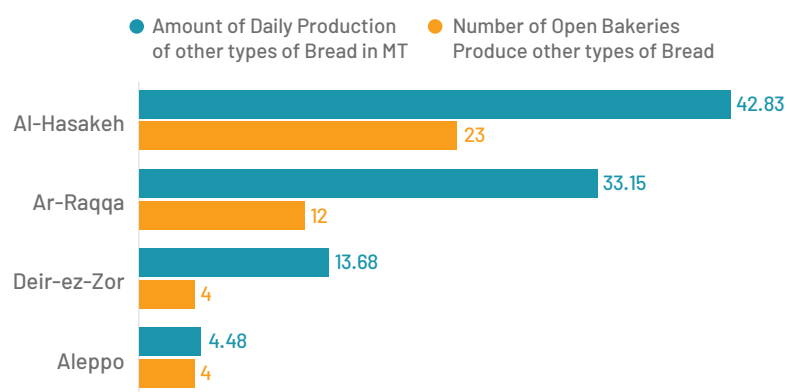


Figure 21: Other Types of Bread in NES

Bakeries Production cost and source of flour

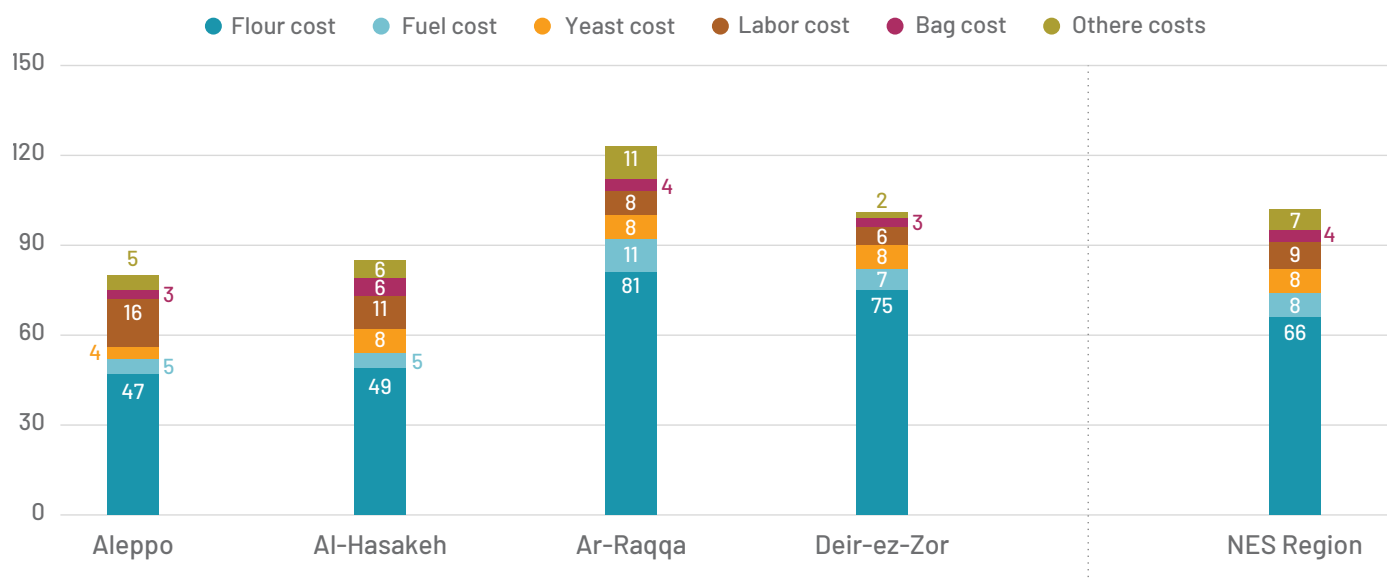


Figure 22: Cost of Producing 1 MT of Bread in NES

The average cost of producing one MT of bread in NES region was reported to be 97 USD (equal to 243,533 SYP). Figure 22 presents the cost of producing one MT of bread; Ar-Raqqa governorate had the highest reported cost with 123 USD/ MT of bread, this was followed by Deir-ez-Zor governorate with 101 USD/MT, then Al-Hasakeh governorate with 84USD/ MT, and Aleppo governorate came last with 80USD/MT.

It is worth mentioning that the lowest average flour cost for producing 1 MT of bread was reported in Aleppo governorate with 47 USD, while the highest flour cost for producing 1 MT of bread was reported in Ar-Raqqa governorate with 81 USD. Likewise, fuel cost was 11 USD/MT of bread in Ar-Raqqa whereas, it was 5 USD/ MT of bread in Aleppo and Al-Hasakeh governorates. In contrast, Aleppo governorate recorded the highest labor cost with 16 USD/ MT of bread as compared to other governorates in NES.

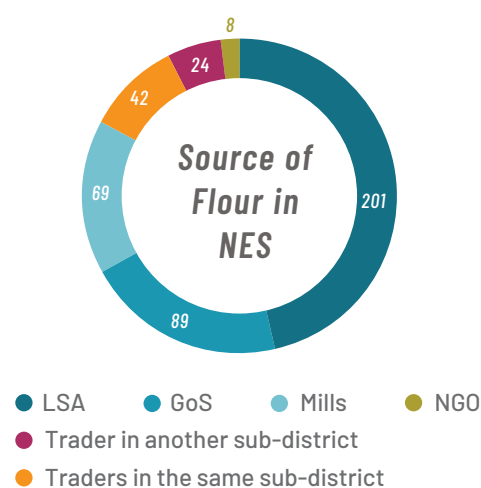


Figure 23: Source of Flour in NES

In terms of the type of flour used; all open bakeries reported that they used locally milled Wheat-flour, however, there were only 18 bakeries (16 in Ar-Raqqa and 2 in Deir-ez-Zor governorates) reported they also used imported Wheat-flour from Turkey in addition to the locally milled Wheat-flour. Figure 23 present the source of flour that the assessed bakeries got the flour from in NES; 46% of bakeries (201 bakeries) got the flour from Local Self Administration, this followed by Government of Syria with 21% (89 bakeries) reported that they got the flour from GoS, then Mills came at third rank in terms of source of flour with 16% (69 bakeries). It is worth mentioning that 36 bakeries out of the 408 reported that they got the flour from two sources.

GOS as a source flour for bakeries was mainly in Al-Hasakeh governorate. Figure 24 illustrates the source of flour at governorate level.

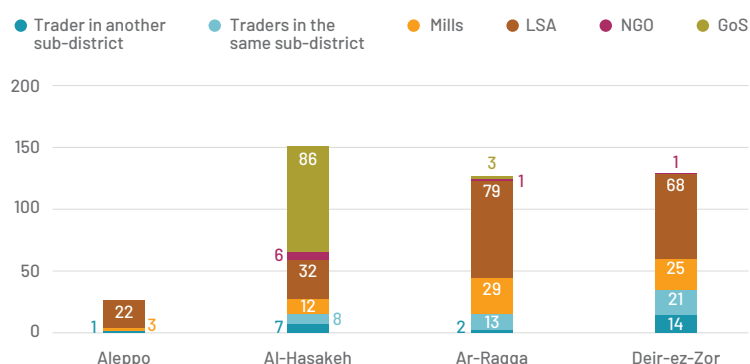


Figure 24: Source of Flour at Governorate Level

Used Currency in Bakery transactions

In terms of used currency, all bakeries reported that they sold the produced bread using SYP, however there were 9 bakeries in Ar-Raqqa governorate (8 in Ar-Raqqa and 1 in Karama sub-districts) which reported that they used both SYP and USD in the selling transactions of produced bread. However, bakeries reported that buying the bread production inputs was not limited to SYP currency, instead it expanded to foreign currency as well, mainly USD. Half (50 %, 205 bakeries) of the interviewed bakeries reported that they only use SYP, while (45%, 182 bakeries) reported that they used SYP and USD. Only one bakery reported that a Turkish lira was used in buying bread production inputs. Figure 25 illustrates the used currencies in buying bread production inputs by bakeries at governorate level in NES.

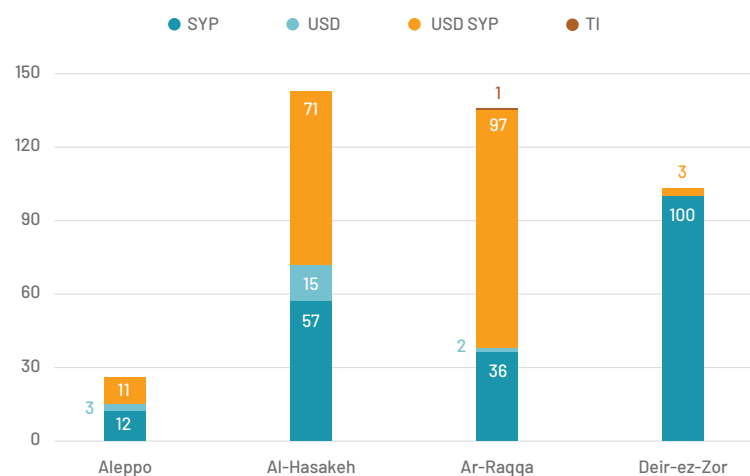


Figure 25: Currency of Bakery Production Inputs

Bakery production capacity against the sub district population

Using the FSLcluster standard, the daily need of bread per person is 330g. Hence based on this formula, collected data showed that across the 36 assessed sub-districts, the total number of population was 2,706,863 persons, hence, the daily needs of bread in the assessed areas was 893 MT whereas the daily produced subsidized bread was limited to 684 MT of bread. **This indicates that 23% of the population in NES (n= 635,625 person) did not have access to subsidized bread.** It is worth mentioning that bakeries at 4 out of the 36 assessed sub-districts reported that they did not produce subsidized bread (Be'r Al-Hulo Al-Wardeyyeh, Al-Malikeyyeh, Amuda, and Qumishli).

Daily needs of bread in an area = area population* 330g.

Eleven sub-districts (9 in Al-Hasakeh, 3 in Aleppo, and 2 in Deir-ez-Zor) reported shortage in the bread production. Menbij and Deir-ez-Zor sub-districts reported highest needs with 33 MT for each sub-district as daily production gap. The total daily production gap at these 11 sub-districts were 188 MT, which indicates that 569,697 persons lack access to local produced bread in their sub-districts.

Bakery Support

Sixty-three percent (257 bakeries) of the open bakeries in the assessed 36 sub-districts reported that they were receiving support during the reporting period. Figure 26 illustrates the number of bakeries receiving support at governorate level in NES; Al-Hasakeh governorate reported the highest number of bakeries with 87 bakeries, this was followed by Ar-Raqqa governorate with 77 bakeries, then Deir-ez-Zor governorate with 70 bakeries and Aleppo came last with 23 bakeries.

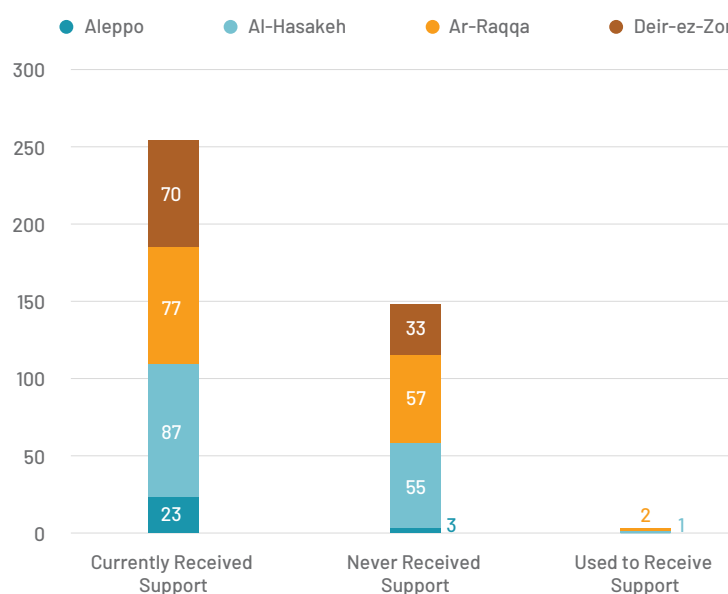


Figure 26: Bakery Support in NES

In terms of source of support, three sources were identified in the assessment, Local Self-Administration (LSA) came first with 175 bakeries reported that their source of support was LSA, this was followed by Government of Syria where 74 bakeries reported that GoS was their source of support, and NGOs came last with only 15 bakeries reported that they had access to support from NGOs. Figure 27 illustrates the support source at governorate level.

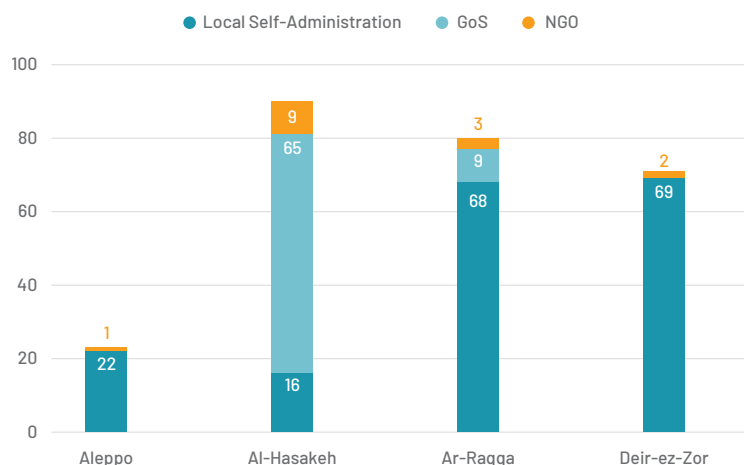


Figure 27: Source of Bakery Support

The main types of received support by bakeries were classified into four main types; building rehabilitation, operational support which include and not limited to fuel/electricity and maintenance, flour support and yeast support. Operational support was reported as the common type of support that bakeries received where operational support represent 43% (271 bakeries) of the received support, this was followed by flour support with 38% (255 bakeries), Yeast support came next with 15% (89 bakeries), and the rehabilitation came last with 4% (13 bakeries). Figure 28 illustrates the type of received support by bakeries at governorate level.

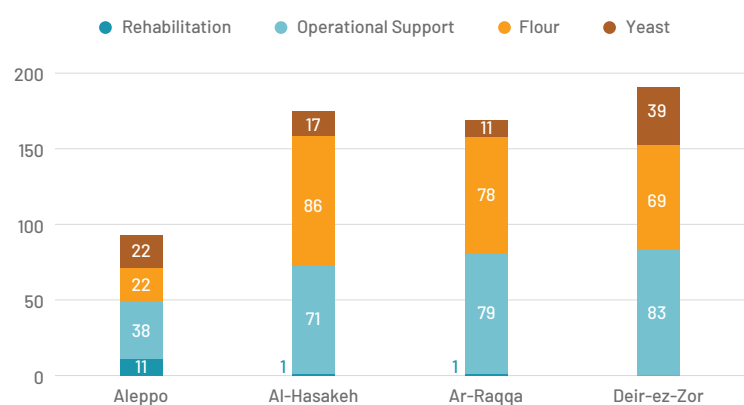


Figure 28: Type of Received Support by Bakery in NES

Lab Testing

Overall, 94% of the interviewed bakeries reported that there were no lab tests carried out in their area for the bread production inputs such as flour and yeast. Few bakeries, 6% reported that they have equipment for testing production inputs quality, and this included manual examination, LSA examination, lab testing, and supply inspector examination. At a governorate level, in Deir-ez-Zor, most bakeries 82% reported that there was production input testing equipment in their area. On the other hand, in Ar-Raqqa, only one facility indicated that production input testing equipment was available in their area.

COVID-19

Around 60% of bakeries in all governorates indicated that their work was not affected by the COVID-19 pandemic, mainly because bread production was not affected by the lockdown measure as it is considered an essential and staple food. On the other hand, 40% of bakery workers reported that their work was affected. The affected bakeries reported that they underwent a noticeable change in their workflow driven by the increase in demand for bread, increase in production costs, increase in work pressure, decrease in labor, and increase of fear and worry. Bakeries indicated that people demanded more bread for storage as they feared to go out in public multiple times; also, employees feared working in crowded places. The employees' fear coupled with restricted functioning hours generated increased work pressure on the bakeries. Also, bakeries reported that the supply of raw material was affected by the lockdowns and restricted movement, leading to an increase in production costs. See figure 29.

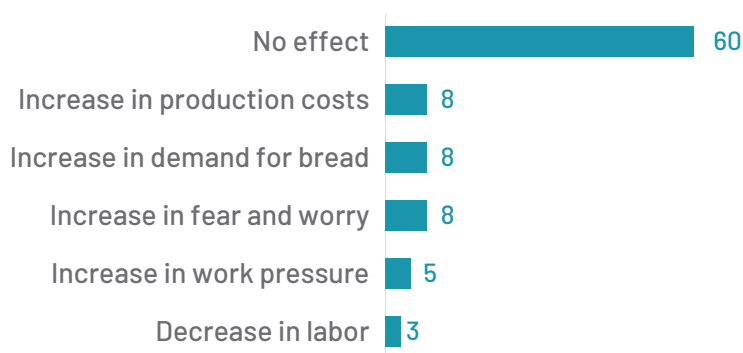


Figure 29: COVID-19 Impacts on Bakeries

At a governorate level, an evident increase in production costs and bread demand was evident in Al-Hasakeh governorate. While in Aleppo governorate, there was an increase in fear and worry of the public including employees which had probably led to a decrease in labor working hours in crowded bakeries. Furthermore, bakeries in Ar-Raqqa governorate reported witnessing an increase in work pressure and an increase in demand for bread.

Overall, to decrease the impact of COVID-19, many bakeries (76%) prioritized hygiene, raised awareness about social distancing and required their employees to wear gloves and masks. Also, to ensure a steady flow of bread, some bakeries contracted distributors to deliver bread to households.

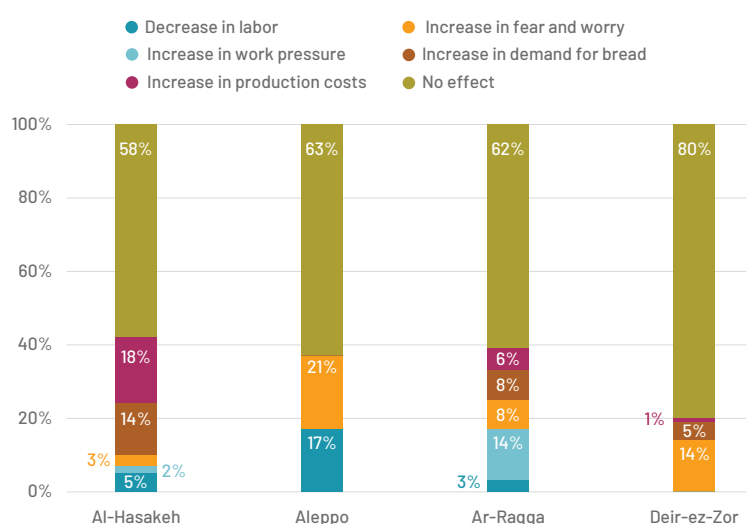


Figure 30: COVID-19 Impact on Governorate level

Displacement and Bakeries

When bakeries were asked about the impact of receiving new Internally Displaced Persons IDPs, many points were raised. Many interviewed bakeries (83%), reported that their work was affected by increased demand and increased production and sales. However, many bakeries (43%) faced challenges, especially when they did not have the capacity or the means to meet the increased demand especially when the LSA does not provide the support/aid for the IDPs. This led to a shortage of bread across some market-places and increased work pressure on the bakeries. Furthermore, some bakeries reported facing overcrowding people next to their facilities, which led in certain instances to conflicts. See figure 31.

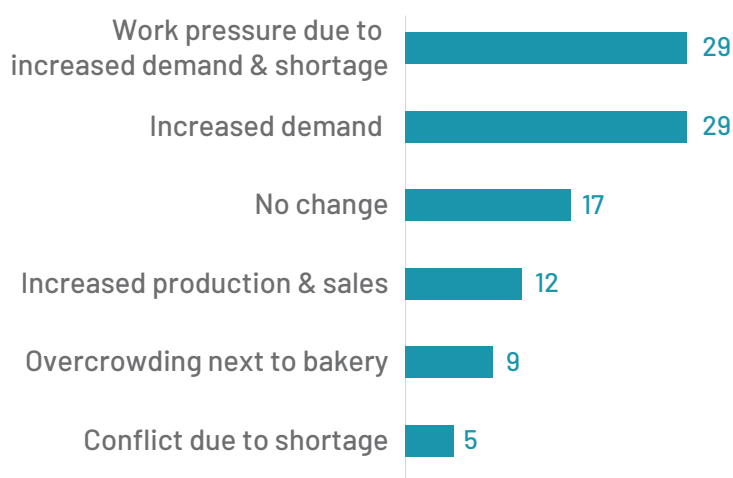


Figure 31: Impact of Displacement on Bakeries

At a governorate level, bakeries in Aleppo governorate reported the least impact of receiving new IDPs, while bakeries in Deir-ez-Zor governorate indicated a considerable increase in bread demand, production, and sales. On the other hand, bakeries in Ar-Raqqa and Al-Hasakeh governorates compared with bakeries in other governorates, reported more negative impacts induced by the arrival of new IDPs. Both governorates pinpointed that with increasing IDPs, work pressure increases due to increased bread demand and shortages, overcrowding of people next to bakeries, and conflicts due to bread shortages given the increasing human population.

Fact Sheets;

With the aim to visualize the key findings of the bread facilities mapping exercise, iMMAP created four factsheets that illustrate the main study indicators at governorate level. See figures (32, 33, 34 and 35). These fact sheets have three sections: Bakeries, Mills, and Silos.

- Under the Bakery section, data was accumulated at governorate level to present the Bakery status in terms of functionality and ownership, Type of produced Bread, production capacity V.s population needs, Currency used, Lab testing, Bakery management Style, Availability of bread and production inputs, Humanitarian aid in terms of access to support, type and source of support, and finally the source and price of flour.
- Under the Mill Section, data was accumulated at governorate level-as well-to present the Mills' status in terms of functionality and ownership, milling maximum V.s minimum capacity, reasons for limited capacity, source of wheat, in addition to the Market actors who were supplied flour by mills.
- Under the Silo section, similar to the bakery and mills sections; data was accumulated at governorate level to present the silos status in terms of functionality and ownership, reasons for closure and limited functionality, Maximum storage capacity, the type and cost of the needed support, in addition to the source of wheat.

Figure 32: Aleppo Fact-Sheet

Mapping of Wheat-to-Bread Processing Facilities

Aleppo November 2020



WHOLE OF SYRIA (WoS)
FOOD SECURITY SECTOR
Strengthening Humanitarian Response

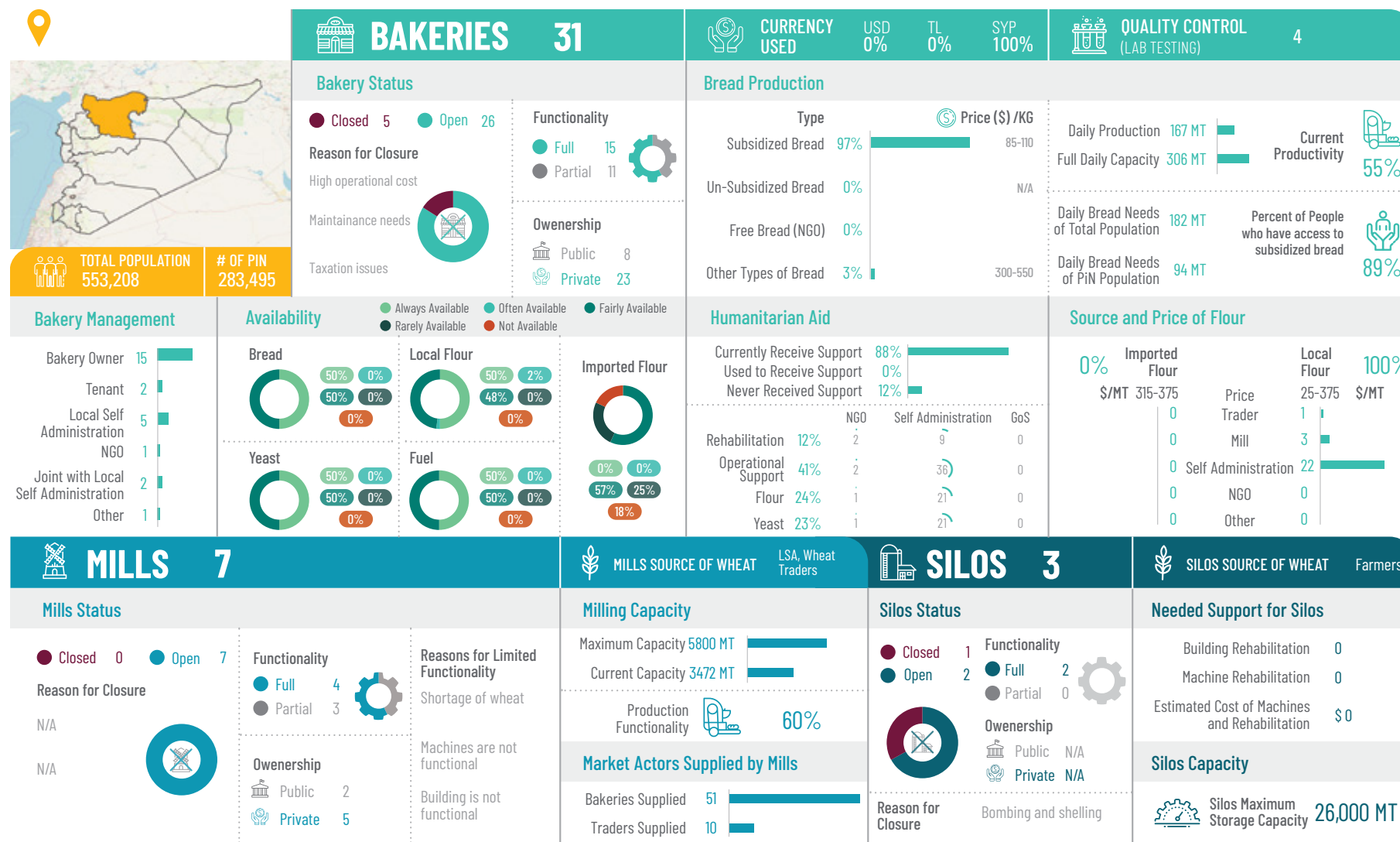


Figure 33: Al-Hasakeh Fact-Sheet

Mapping of Wheat-to-Bread Processing Facilities

Al-Hasakeh November 2020



WHOLE OF SYRIA (WoS)
FOOD SECURITY SECTOR
Strengthening Humanitarian Response

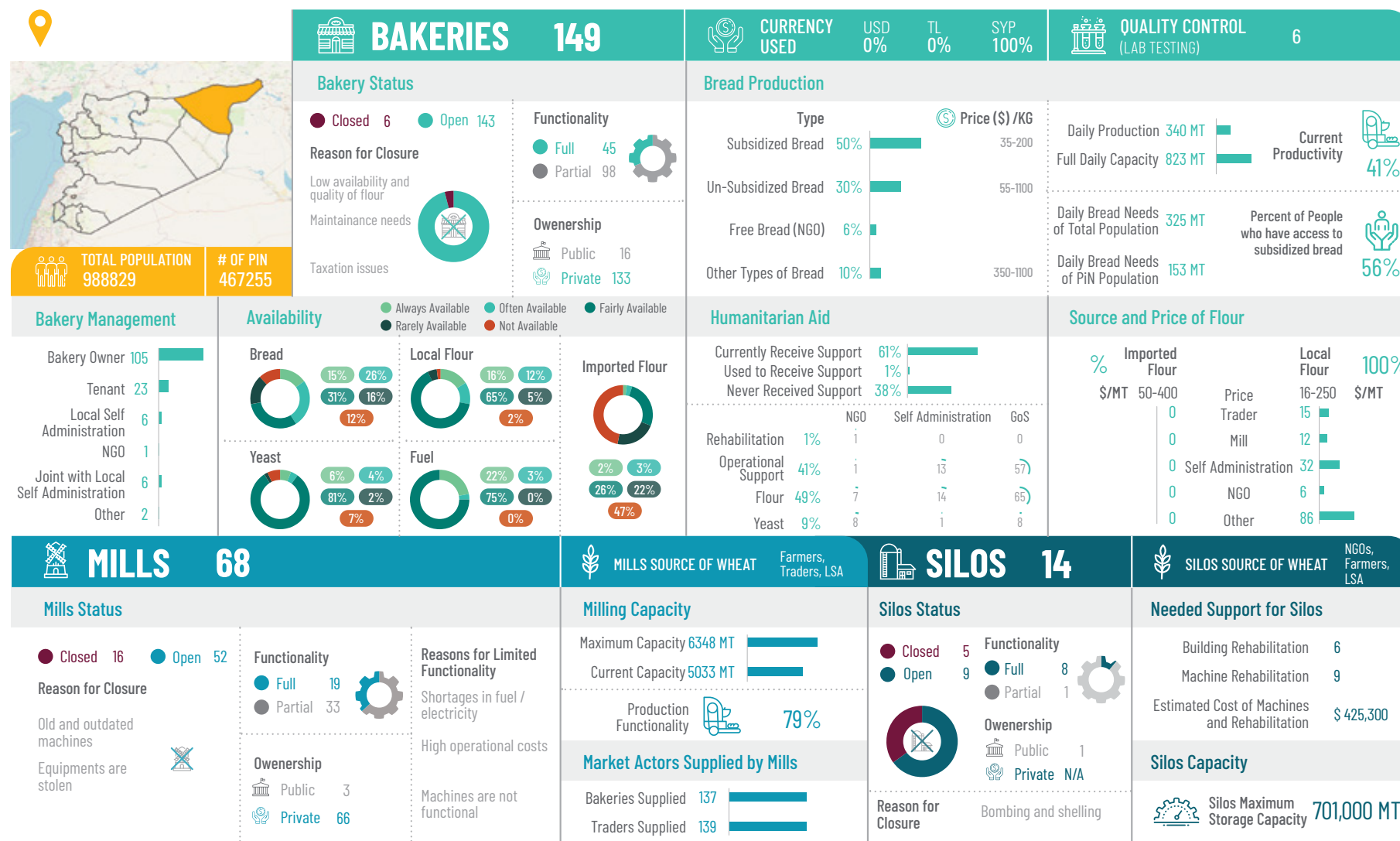


Figure 34: Ar-Raqqa Fact-Sheet

Mapping of Wheat-to-Bread Processing Facilities

Ar-Raqqa November 2020



WHOLE OF SYRIA (WoS)
FOOD SECURITY SECTOR
Strengthening Humanitarian Response

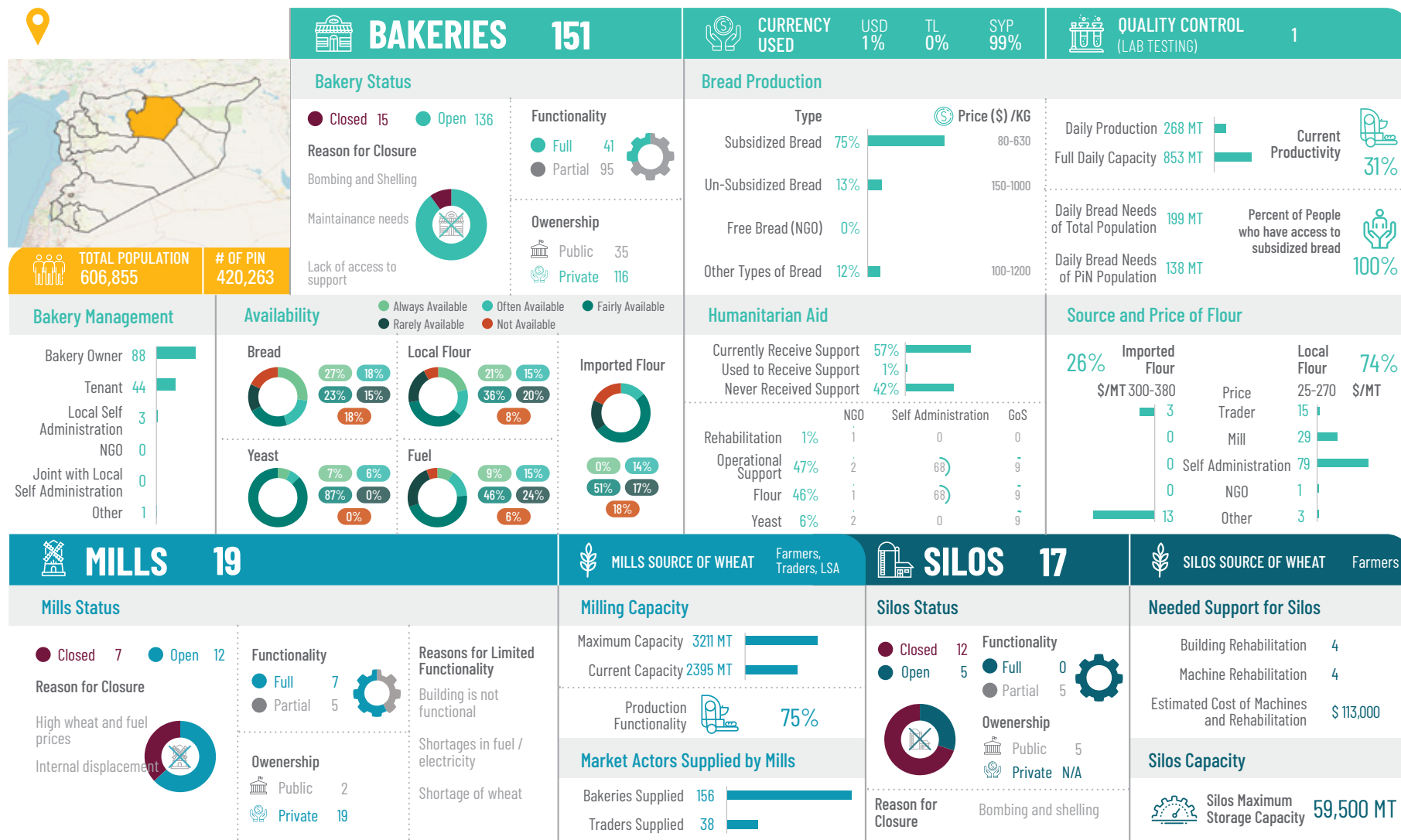


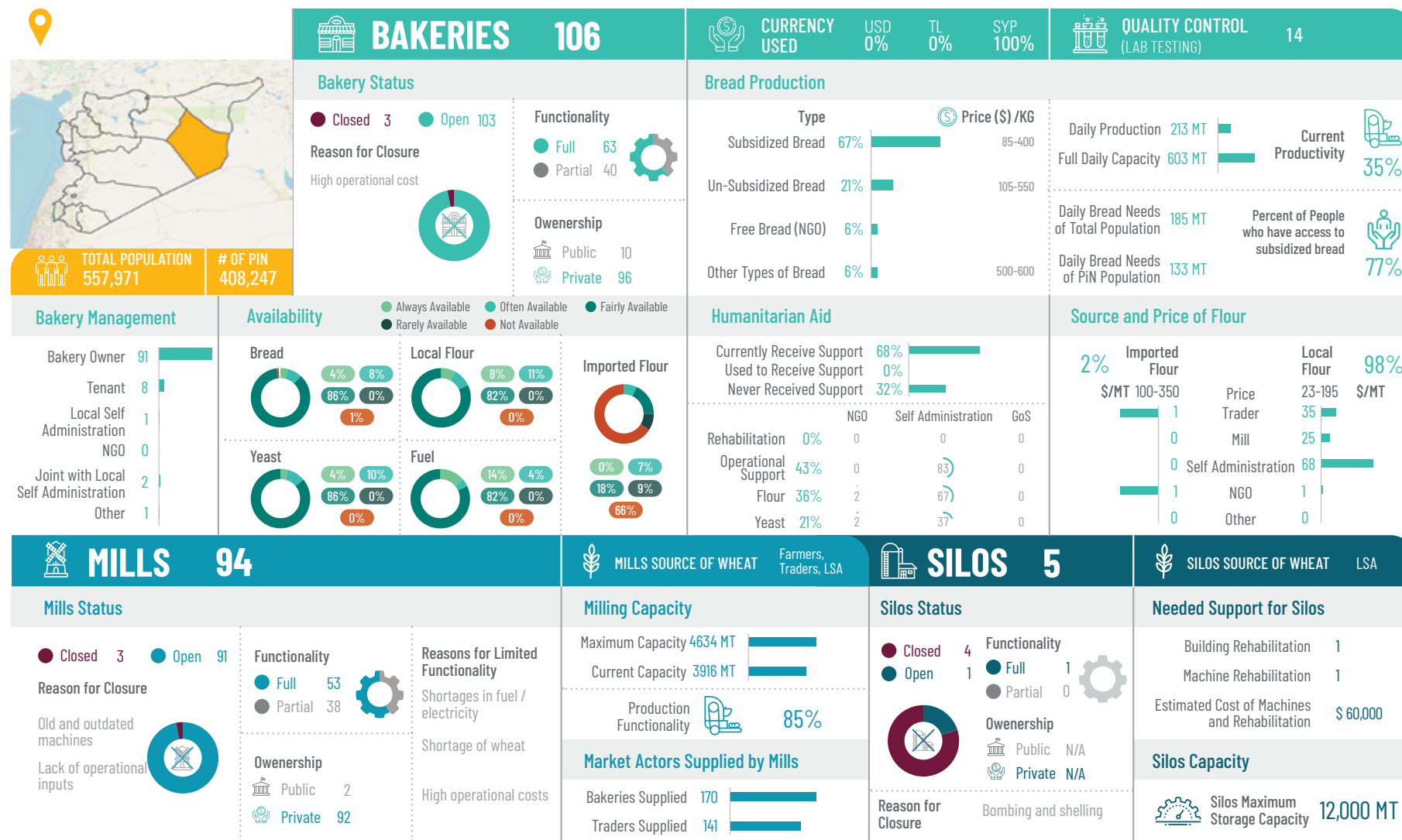
Figure 35: Deir-ez-Zor Fact-Sheet

Mapping of Wheat-to-Bread Processing Facilities

Deir-ez-Zor November 2020



WHOLE OF SYRIA (WoS)
FOOD SECURITY SECTOR
Strengthening Humanitarian Response



Recommendations

Extend Wheat-to-Bread Support in Aleppo and Al-Hasakah governorates

Access to subsidized bread is not consistent across governorates, the assessment showed that people's access to subsidized bread was as high as 100% in Ar-Raqqa, while in Aleppo, Al-Hasakeh and Deir-ez-Zor access was only 89%, 56%, and 77 %, respectively. This showed a need to extend flour support to areas where there is limited access to subsidized bread.

Strengthen Coordination with the Local Authorities

The wheat-to-bread value chain in NES is relatively centralized and controlled by the Local Self Administration, who provides input and focuses their efforts to ensure stable bread prices in the market. Therefore, it is recommended for partner organizations to coordinate closely with the local authorities to ensure better facilitation of flour distribution and at the same time, fill the gaps that local authority is unable to cover. This way, access to bread for subsidized prices would be more uniformly distributed across the different governorates.

Introduce and Expand Lab Testing at the Bakery Level

The assessment revealed that 94% of interviewed bakeries reported that they had no access to laboratories for bread production inputs testing, yet it is important to test inputs such as flour and yeast for improved quality production of bread. Clearly, there is a need for a more reliable quality control system in all the governorates. The current quality control practices at the bakery level were very limited and confined to conventional manual examination and LSA examination, with very few facilities providing laboratory testing for flour and yeast.

Further Studies and Continuous Market Monitoring

The wheat-to-bread market system is highly volatile and constantly faces changes and challenges given the ongoing conflicts and considering the current COVID-19 pandemic. Therefore, it is recommended to collect data on silo, mill, and bakery operations regularly. This will ensure that the existing programs are aligned with recent political, market trends and evolving challenges. Moreover, this will help further understand the local context to address gaps and output estimates and allow for trend analysis to continuously inform project designs for the wheat-flour to bread interventions.

Furthermore, wheat-to-bread infrastructure [facilities] retain high political significance, as proved by many facilities destroyed through targeted bombing. Thus, any significant programming change should be accompanied by a contextual risk assessment.

Continue Support for Local Wheat Production

Local wheat production is critical for the resilience of the wheat-to-bread market systems. Therefore, it is recommended to continue providing farmers with subsidized inputs to ensure the continuation of the local wheat supply chain all the way to the bakeries and end consumers.