



# Crop Monitoring and Food Security Situation Report

## Wheat and Barley

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## EXECUTIVE SUMMARY

Northwest Syria (NWS) grapples with intricate challenges in wheat and barley production, heightened by ongoing crises and climate shocks. The main concerns revolve around the accessibility and economic viability of vital agricultural inputs, specifically fuel and fertilizer. Limited access to fuel not only poses challenges for farmers but also impedes the adoption of sustainable farming practices. Furthermore, water scarcity remains a critical issue, necessitating modern irrigation methods for effective crop growth. Challenges in accessing high-quality seeds and harvesting equipment impact crop yields and labor efficiency during harvest.

This comprehensive report engaged wheat and barley farmers through focus group discussions and consulted local council representatives and agricultural experts to identify these challenges. The study's holistic approach ensures that proposed interventions are well-informed and tailored to the specific needs of NWS's farming community.

To address these challenges and enhance food security in the region, targeted interventions are crucial. Furthermore, the study underscores the roles of local councils, institutions, or NGOs in supporting NWS's agricultural sector through cohesive plans and collaboration with local stakeholders.

By strengthening agriculture in NWS, the overall food security situation in Syria can be improved, contributing to the well-being and stability of the entire nation. This report provides insights and recommendations for policymakers and humanitarian organizations to design effective measures supporting Northwest Syria (NWS) farmers, mitigating the impact of shocks, and alleviating food insecurity.

## INTRODUCTION

Northwest Syria (NWS) boasts a rich history as a pivotal region for wheat and barley crop production, playing a vital role in upholding the country's food security.<sup>1</sup> However, the agricultural sector in NWS has faced substantial disruptions due to the ongoing crisis and a series of other challenges.

In response to the urgent food security situation and the need to understand the status of wheat and barley crops, iMMAP conducted a comprehensive Crop Monitoring and Food Security Situation Update report in collaboration with the Food Security and Livelihood (FSL) and Agricultural Technical Working Group (ATWG) in NWS. The primary objective of this study is to evaluate the impact of various shocks on wheat and barley cultivation in NWS, encompassing wildfires, droughts, and water resource scarcity. These challenges, coupled with persistent issues arising from armed conflict, such as fuel scarcity and a shortage of production inputs, have woven a complex web of obstacles for farmers in the region. Compounding these difficulties, Syria's economy has rapidly deteriorated since the beginning of the year, with the situation escalating further following the devastating earthquakes in February 2023. As a result, the Syrian pound and Turkish Lira have significantly depreciated, intensifying levels of food insecurity and exacerbating the already challenging living conditions for the population. According to the World Food Program (WFP),<sup>2</sup> food prices in Syria have surged dramatically, witnessing an astonishing increase of 532% between 2020 and 2022. This surge in food prices has not only burdened farmers but has also heightened food insecurity across the Northwest Syria (NWS) region.

To address these multifaceted challenges and explore potential solutions, this study primarily focused on conducting qualitative assessments through engaging focus group discussions with wheat and barley farmers. Additionally, key informants were consulted to gain valuable insights into the current situation on the ground. By comprehending the unique challenges faced by farmers amidst wildfires, droughts, and economic struggles, the report aims to identify targeted interventions that can enhance the resilience and sustainability of agriculture in Northwest Syria (NWS).

With the results and recommendations from this comprehensive study, policymakers and humanitarian organizations will be better equipped to design effective measures to support Northwest Syria farmers, mitigate the impact of shocks, and better contribute to alleviating food insecurity in the region. The study's holistic approach and emphasis on engaging local stakeholders will ensure that the interventions proposed are well-informed and address the specific needs of the farming community in Northwest Syria. Indeed, strengthening the agricultural sector in this pivotal region bears significant promise for enhancing Syria's overall food security situation. By focusing on improving the productivity and resilience of crops like wheat and barley, the nation can take strides toward mitigating food scarcity and promoting stability. Such agricultural enhancements not only fortify local food production but also support economic growth and social stability, which are crucial elements for the well-being and progress of the nation.

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1 FAO. Special Report: 2021 FAO Crop and Food Supply Assessment Mission to the Syrian Arab Republic. Reliefweb. [Online] December 2021. <https://reliefweb.int/report/syrian-arab-republic/special-report-2021-fao-crop-and-food-supply-assessment-mission-syrian>.

2 WFP. Syria: life in the time of food insecurity. European Commission. [Online] October 2022. [https://civil-protection-humanitarian-aid.ec.europa.eu/news-stories/stories/syria-life-time-food-insecurity\\_en#:~:text=Syria%2C%20a%20country%20that%20used,and%20the%20upward%20trend%20continues.](https://civil-protection-humanitarian-aid.ec.europa.eu/news-stories/stories/syria-life-time-food-insecurity_en#:~:text=Syria%2C%20a%20country%20that%20used,and%20the%20upward%20trend%20continues.)

## Study Objectives

The objective of this study is to provide a comprehensive qualitative insight of the crop situation in Northwest Syria, focusing on the 2022–2023 season, particularly for wheat and barley crops, and to investigate the impact of fires, water resources, and other factors on agricultural production and the entire wheat and barley value chain. The primary objectives of the study are as follows:

1. **Understanding Farmers' Perspectives:** Explore wheat and barley farmers' perspectives, challenges, and opportunities of wheat and barley cultivation in 2022–2023 agricultural season.
2. **Identify Factors Influencing Production:** Identify and understand factors and shocks influencing wheat and barley production, including access to high quality seeds, availability and affordability of fertilizers, agricultural inputs, water availability, climate conditions, fuel for irrigation and transportation, and pests and disease.
3. **Assess Food Security Context:** Evaluate the food security situation in the Northwest Syria region, focusing on wheat and barley availability and access.
4. **Impact of climate shocks:** Investigate the impact of high temperature and drought on wheat and barley crops, and their consequences on agricultural productivity and food security.
5. **Market Dynamics and Import Impact:** Qualitatively analyze market dynamics for wheat and barley, including price trends, trading norms, and the role of imported grains in the local market.
6. **Seasonal Trends in Agricultural Production:** Analyzing 2023 seasonal findings in comparison to previous years (2019 to 2023) and conduct a trend analysis to understand any notable changes in agricultural production over the mentioned years.

## METHODOLOGY

The study methodology implemented a mixed and participatory design to gather insight from multiple perspectives to ensure a comprehensive understanding of the wheat and barley crops production in Northwest Syria. This approach involved a literature reviews, as well as conducting focus group discussions (FGD) with wheat and barley farmers from all Agro-ecological zones of Northwest Syria to understand their experiences, challenges, and perspectives on crop production, food security, and the impact of climate shocks on their crops and the value chain. Also, key informant interviews (KII) were conducted with local councils representatives and agricultural experts involved in the wheat and barley value chain.

The FGD protocol/s and KII questionnaire/s were developed by iMMAP in close coordination with the Food Security and Livelihood (FSL) Working Group and the Agriculture Technical Working Group (AWG) in Northwest Syria.

Fourteen focus group discussions (FGD) were held across 14 subdistricts in the governorates of Aleppo, Idlib, Ar-Raqqa and Al-Hasakeh through FSL AWG partners. Twenty-eight key informant interviews were held with members of the Agricultural Offices and the General Organization for Seed Multiplication GOSM, Agricultural Engineers, and Agricultural Pharmacist across 14 subdistricts.

## Farmers Selection Criteria

Farmers for the FGD were selected based on a set of predetermined criteria as follows:

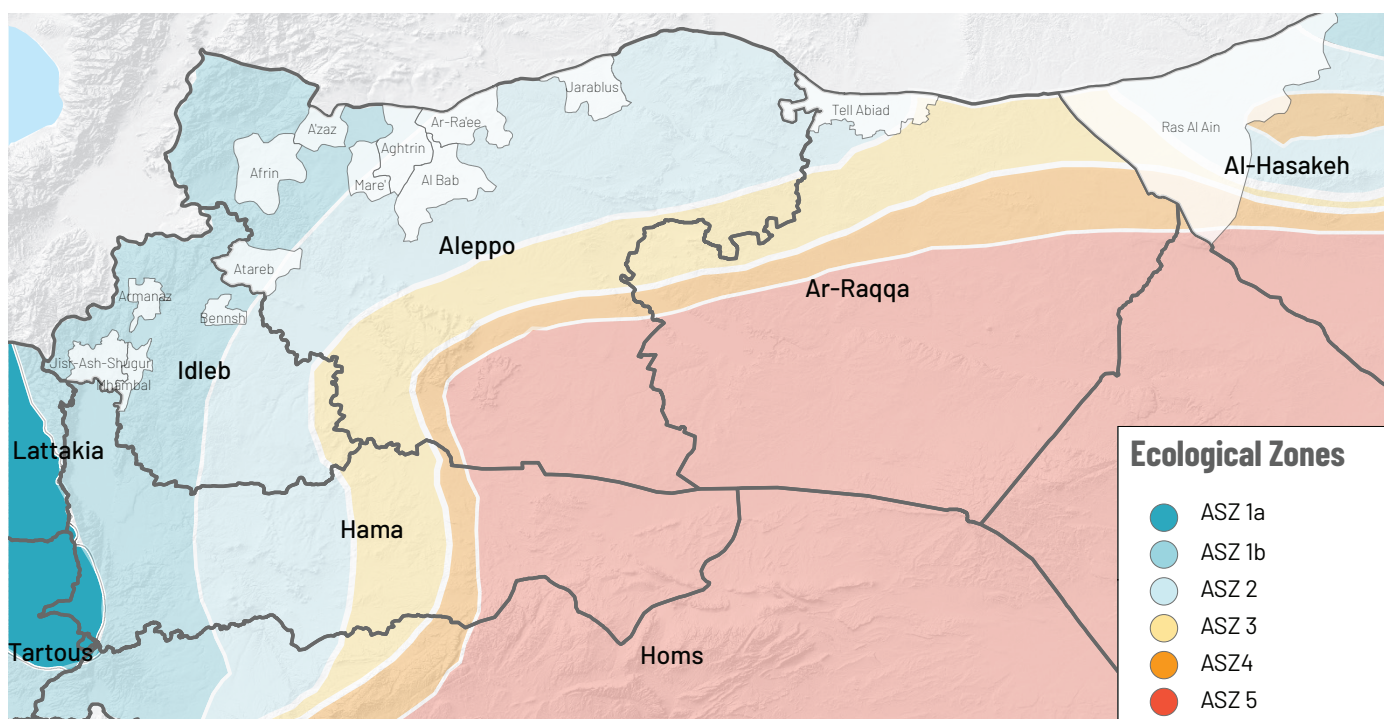
- **Geographical Diversity:** Select farmers from different subdistricts within Northwest Syria to ensure representation of various agricultural zones.
- **Farmers who cultivate wheat and/or barley,** as well as those who may concentrate exclusively on either of these crops, comprised each focus group, with a targeted size of 5 to 8 participants per group.

## BACKGROUND AND CONTEXT

### Agro-ecological Zones in Syria

The Syrian Arab Republic is divided into the following five Agro-ecological zones (AEZs) based on the level of annual precipitation received.<sup>3</sup> The zones are defined in terms of suitability for rainfed crop production, and to some extent the probability of rainfall.

- **Zone 1:** Annual average rainfall of over 350 mm, covering 14.6 percent (2 698 000 hectares) of the country's area, is divided into two regions:
  1. Areas with an annual average rainfall over 600 mm where rainfed crops can be grown successfully.
  2. Areas with an annual average rainfall between 350 to 600 mm, but not less than 300 mm during two-thirds of the monitored years, suitable to grow two successful crops every three years. The main crops are wheat, legumes and summer crops such as melon and watermelon.
- **Zone 2:** Annual rainfall of 250 to 350 mm in not less than two-thirds of the monitored years. Covering 13.4 percent (2 473 000 hectares) of the country's area, suitable to grow two barley crops every three years. In addition, wheat, legumes and summer crops are grown.
- **Zone 3:** Annual rainfall of 250 to 350 mm with not less than 250 mm during half of the monitored years, covering 7.1 percent (1 306 000 hectares) of the country's area, suitable to grow one or two crops every three years. The main crop is barley and to a lesser extend legumes.
- **Zone 4:** A marginal zone between the arable zones and the desert zone with an annual rainfall between 200 and 250 mm and not less than 200 mm during half of the monitored years covering 9.8 percent (1 823 000 hectares) of the total area, suitable only for barley or for permanent grazing.
- **Zone 5:** Desert and steppe zone, covering 55.1 percent (10 218 000 hectares), not suitable for rainfed cropping. Some areas in this zone adjacent to rivers allow for irrigated agriculture, but most of this zone provides only sparse natural rangeland. With decreasing rainfall towards the interior of the country, the zone becomes desert.



Map 1: Map of Agro-ecological zones in Northwest Syria

## Cultivated Land

Based on Normalized Difference Vegetation Index (NDVI) findings, the distribution of wheat and barley cultivated land percentages varies significantly among geographical areas. Tell Abiad and Bennsh subdistricts had the highest percentage of cultivated land at 95% and 94%, respectively. A'zaz and Atareb also demonstrated substantial cultivation rates at 67% and 62%, while Jarablus, Al Bab, and Afrin exhibit slightly lower but still noteworthy percentages of 52%, 51%, and 56%, respectively. Conversely, Ras Al Ain denotes a slightly lower percentage of cultivated land at 46%.

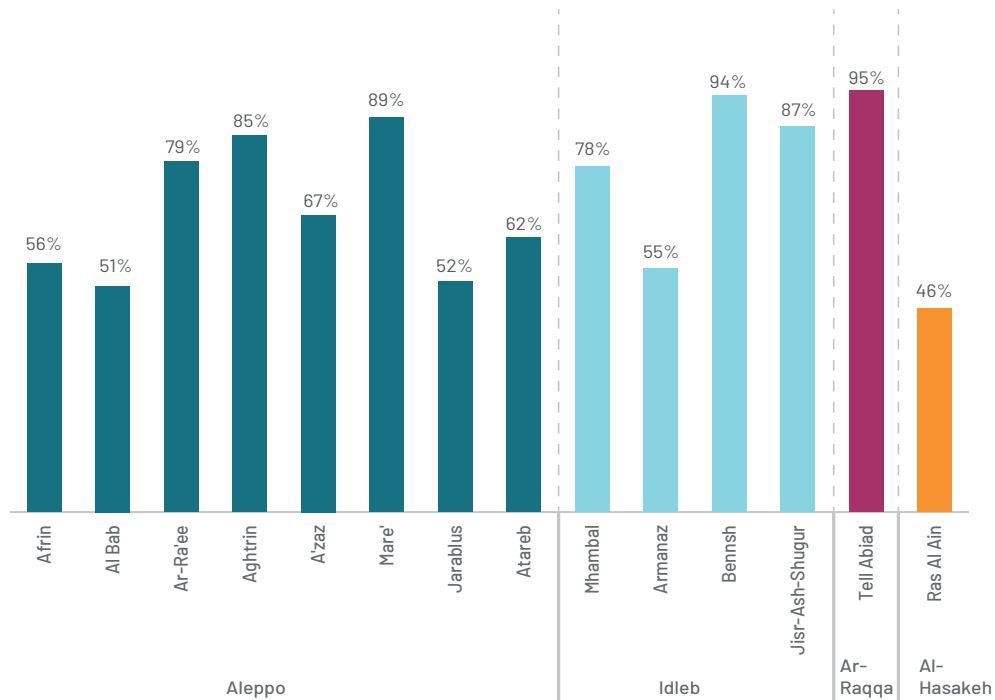
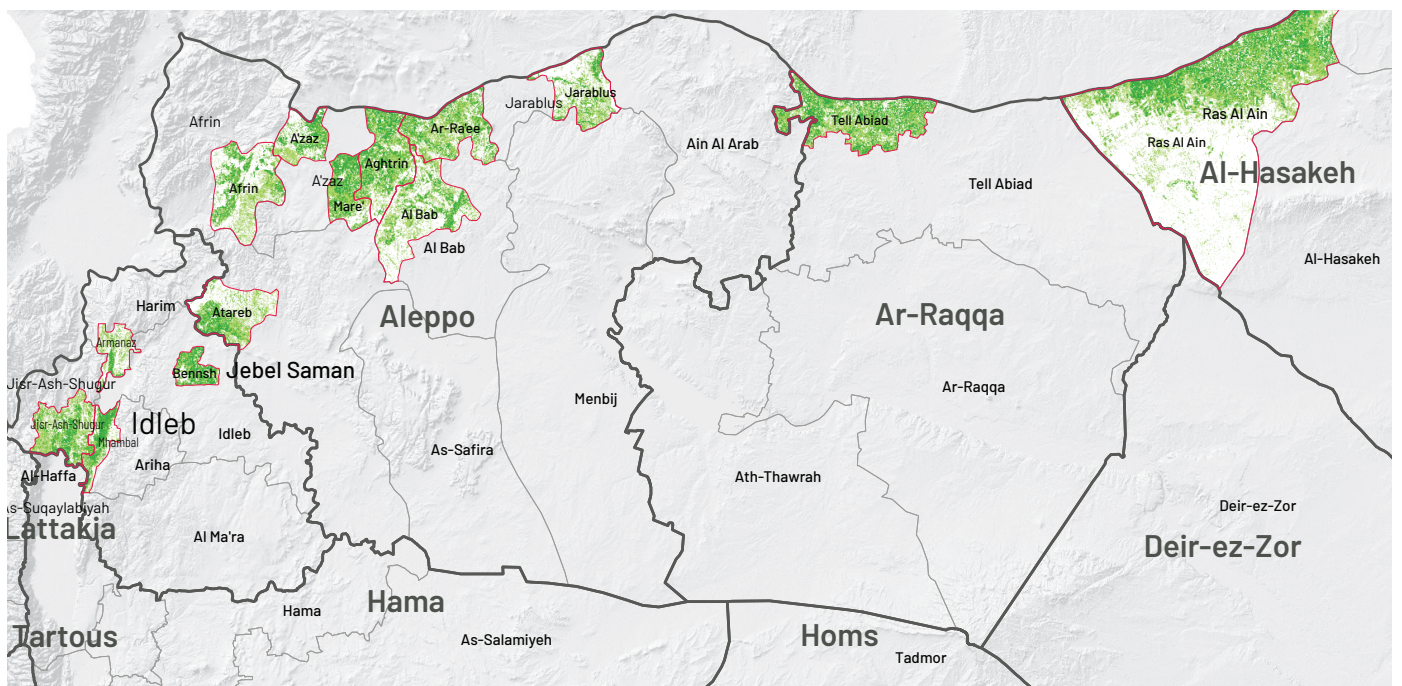


Figure 1: Percentage of Cultivated Land Area per district and governorate



Map 2: NDVI Map Represent the Cultivated Area in Northwest Syria



Wheat and barley farmers exhibit a diverse spectrum of land sizes, showcasing fluctuations over the past five years. Some farmers have cultivated for numerous decades, while others for several years, with land sizes ranging from a few dunums to more extensive plots, approximately 5,000 in size. Noting that Wheat and barley exhibit notable differences in their agricultural requirements. Wheat, recognized for its higher water needs, thrives in regions with ample rainfall or irrigation. It tends to have elevated nitrogen requirements, responding well to nitrogen fertilizers, particularly during the tillering stage. Wheat is adaptable across various agro-ecological zones, spanning temperate, subtropical, and tropical climates. In contrast, barley, known for its drought tolerance, is suitable for regions with lower water availability. Barley generally has lower nitrogen needs compared to wheat, and it can withstand cooler temperatures, making it a versatile choice in higher altitudes. Additionally, barley is often more forgiving in terms of agricultural operations, providing flexibility in planting and harvesting timings. Farmers make decisions based on these distinctions, tailoring their choices to the specific climate, soil conditions, and water availability in their respective regions.

The observed trend over the last five years shows fluctuations and reductions in the overall area of cultivation due to several factors such as high fuel costs, drought conditions, low returns, and the impact of conflicts, causing migration away from agricultural areas. Farmers in Mhambal subdistrict highlighted a notable reduction, such as the decrease from 8,000 dunums to 4,500 dunums over the past five years.

Local councils representatives and agricultural experts reported that there are various challenges and considerations linked to land use that significantly impact farmers' agricultural practices, particularly regarding soil quality, land tenure, and access to suitable land. Soil quality affects crop growth and health; as it is essential for ensuring the availability of nutrients, promoting water retention, and creating a conducive environment for beneficial microbial activity, while land tenure and access to suitable land influence the long-term stability and cultivation scope. Land fragmentation also plays a role in the practicality of farming, as it can limit contiguous and efficient land use. Additionally, high land rents and agricultural costs, coupled with water scarcity and insufficient support, pose further challenges that directly impact agricultural operations and productivity.

## Seasonal Rainfall

Syria ranked among the 25 countries most likely to face extreme water stress by 2040. Since late 2020, the country has been facing a drought that studies estimate to be the worst in 70 years. Driving factors include the impact of climate change on rainfall and temperature. As a consequence, and with upstream countries building dams, Syria is witnessing unprecedented low water levels of the Euphrates River, affecting over 5 million people who rely on it for drinking water, irrigation, and electricity.<sup>4</sup>

In Aleppo, Idleb, Ar-Raqqa, and Al-Hasakeh, the changes in rainfall totals from 2019 to 2023 have shown a sharp decline. Districts such as Afrin, A'zaz, and Jarablus also experienced varying degrees of reduced rainfall during this period. These reductions in rainfall percentages were particularly notable in 2023, demonstrating a substantial decline of approximately 48% to 50% in some regions compared to 2019. On the contrary, Tell Abiad and Ras Al Ain witnessed a slight increase in rainfall in 2022, based on district-level rainfall statistics derived from the Syria WFP VAM Seasonal Monitor.<sup>5</sup>

**Overall, these fluctuations signify a concerning trend of decreased precipitation in most areas,** as depicted in Figure 4, which could potentially impact agricultural productivity, water resources, and the livelihoods of communities dependent on consistent rainfall for their day-to-day activities and farming practices.

4 Cluster, Shelter. Shelter Response Profile. <https://sheltercluster.org/north-west-syria-hub/documents/shelter-response-profile>. [Online]

5 VAM, WFP -. DataViz - World Food Programme. Dataviz Visualizations: Seasonal Explorer: Rainfall and Vegetation. [Online] Sep 25, 2023. <https://dataviz.vam.wfp.org/version2/climate-explorer>.

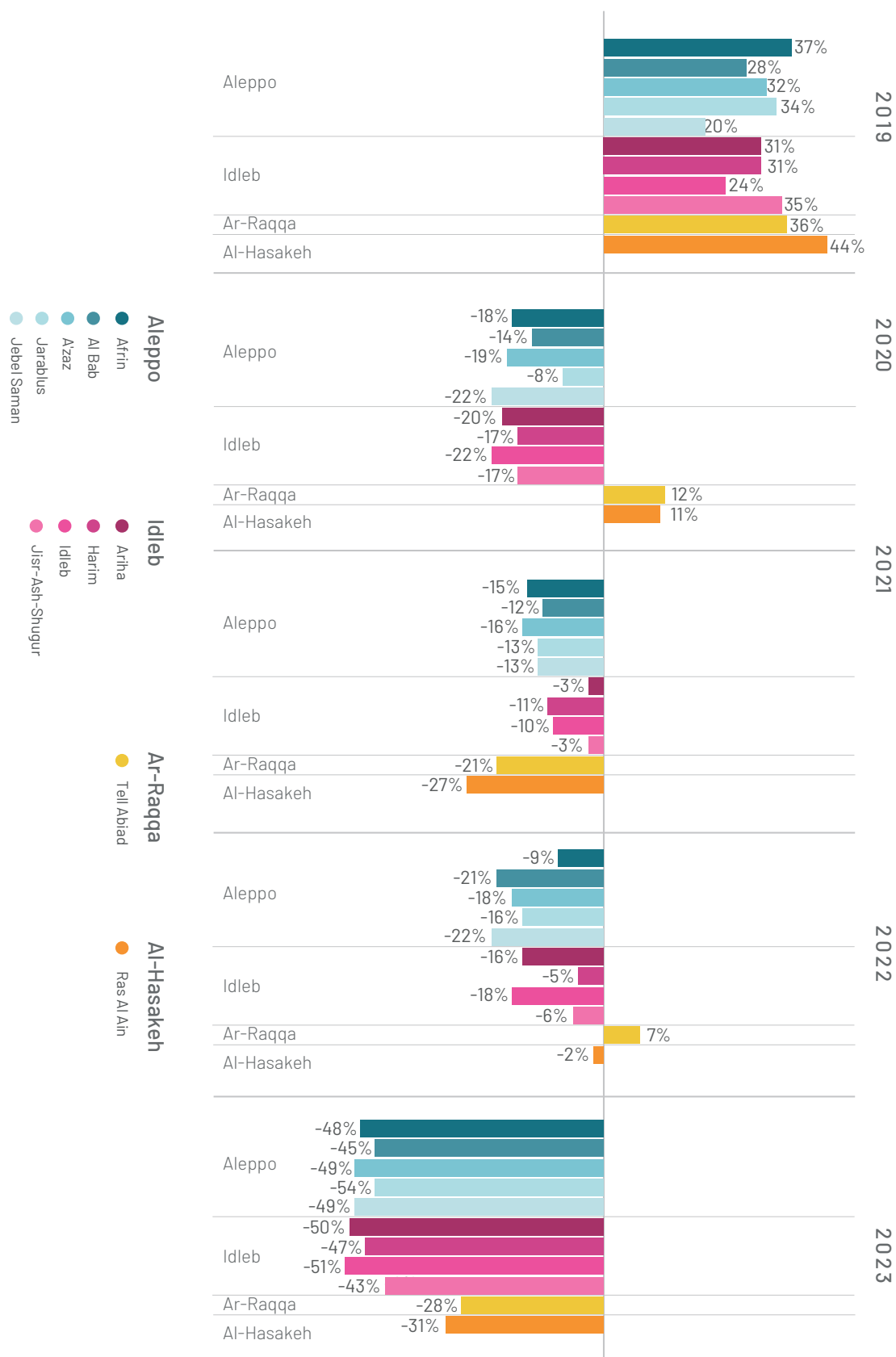


Figure 2: Percentage Change in Rainfall Totals in Northwest Syria by District 2019-2023

## Syrian Pound Exchange Rate

The Syrians are experiencing a deteriorating economic crisis and its consequences include escalating household expenses, the scarcity of commodities and services, and the devaluation of the Syrian pound (SYP)<sup>6</sup>. From June 2022 to June 2023, the SYP experienced significant notable fluctuation against the US dollar (USD)<sup>7</sup>. It began at 3,975 SYP/USD in June 2022 and rose slowly, hitting 4,200 SYP/USD in August. Later in 2022, the rate kept changing, reaching 5,370 SYP/USD in November. In January 2023, there was a big rise to 6,500 SYP/USD – a 21% increase from November 2022. It's worth mentioning that the residents of the Northwestern Syria (NWS) region have transitioned to relying on the Turkish Lira (TL), and they have encountered the fluctuations of the TL currency as well.

Throughout 2023, the exchange rate continued on an unpredictable trajectory. It increased to 7,450 SYP/USD in March, followed by 7,640 SYP/USD in April. This trend persisted, with the rate reaching 8,400 SYP/USD in May and peaking at 9,000 SYP/USD in June. **These fluctuations vividly reflect the challenging economic conditions in Syria, impacting the purchasing power of its citizens and posing significant challenges to overall economic stability.** The Syrian Pound's devaluation against the US dollar underscores the urgency of addressing the economic crisis and its implications for the country's food security and livelihoods.

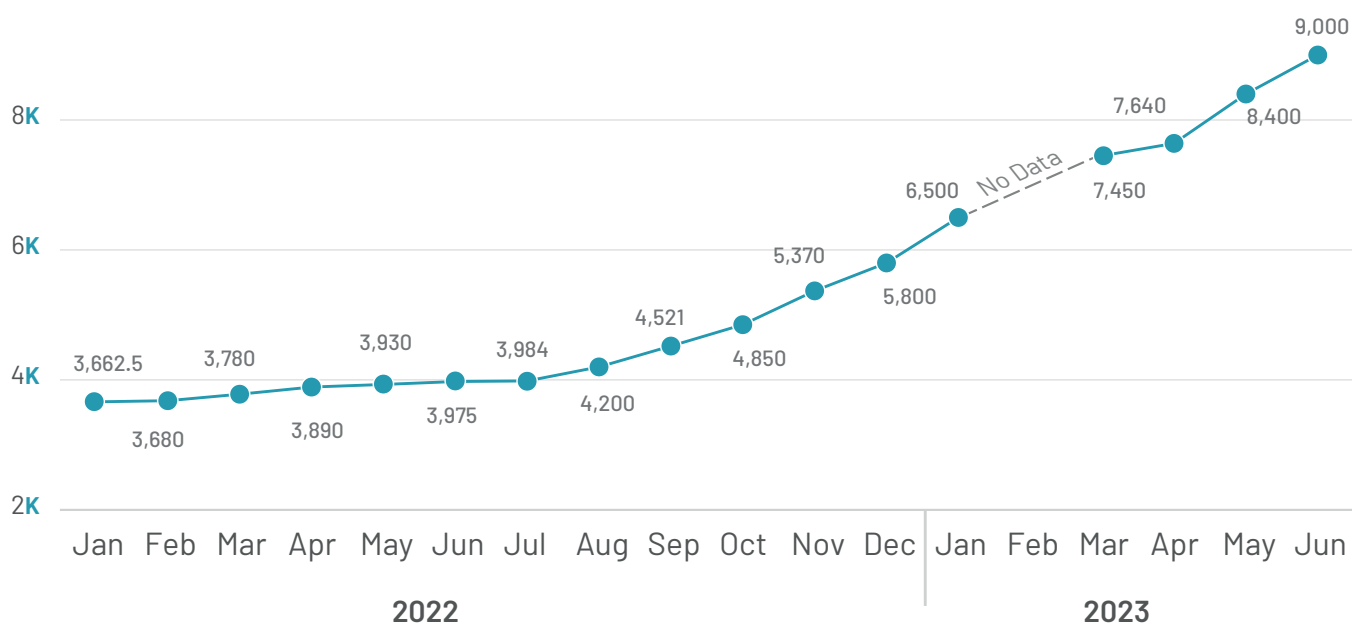


Figure 3: Average SYP Exchange Rate against USD (Jan 2022 – June 2023)

It is crucial to recognize that the devaluation of the Syrian Pound against the US dollar is closely intertwined with the protracted conflict, Western sanctions, the loss of oil-producing territories, and a host of other contributing factors.<sup>8</sup> Overall, the ongoing financial crisis has exacerbated the suffering of the Syrian population and imposed significant obstacles to the nation's economic recovery as well as food security.

6 ACAPS. ACAPS Thematic Report: Northern Syria - Key crises to watch. ReliefWeb. [Online] <https://reliefweb.int/report/syrian-arab-republic/acaps-thematic-report-northern-syria-key-crises-watch-4-august-2023>.

7 REACH. CWG/REACH JMMI Factsheet and Dataset for Northwest Syria conducted 5 - 12 June 2023. <https://reliefweb.int/report/syrian-arab-republic/cwgreach-jmmi-factsheet-and-dataset-northwest-syria-conducted-5-12-june-2023>. [Online]

8 Agencies, News. Syrian pound sinks to historic low on the parallel market. Aljazeera. [Online] July 19, 2023. <https://www.aljazeera.com/news/2023/7/19/syrian-pound-sinks-to-historic-low-on-the-parallel-market>.

## PRODUCTION AND HARVEST

### Access to Agricultural Inputs

The availability of wheat production inputs plays a crucial role in agriculture. According to iMMAP Integrated Market Monitoring Initiative (IMMI).<sup>9</sup> Soft and hard wheat seeds are readily available to farmers and some depend on seeds from the previous year's crop, despite the decreased productivity witnessed in subsequent generations. Organic and chemical inputs, like fertilizers and pesticides, are also relatively available with constant access.

The responses from farmers during the Focused Group Discussions (FGD) shed light on the challenges and dynamics surrounding wheat and barley production in Northwest Syria for 2023. Regarding the availability of seeds for cultivation, respondents highlighted that **wheat and barley seeds were generally accessible, concerns arose regarding their quality and high prices**, especially for certified seeds. Moreover, farmers in Aghtrin subdistrict explained that these challenges were often exacerbated by the presence of monopolies held by certain merchants and traders in the seed market, leading to inflated prices and limited access during critical planting seasons. The farmers in A'zaz subdistrict also decried the concerns over the lack of reliable sources for local seeds and the need for significant water resources for the certified imported seeds pose substantial challenges. The consistency in these responses reflects the dual narrative of availability but at a considerable expense, with the preference for more cost-effective local seeds and limited confidence in imported varieties.

Farmers acknowledged the presence of suitable seed varieties for the region, expressing contentment with the adaptability of local seeds to the prevailing weather conditions. However, they also voiced concerns about the purity and yield of these seeds.

The availability of good-quality seeds at reasonable prices tends to expand the cultivated areas and subsequently increase the overall production quantity, both in terms of the overall yield and on a per-unit area basis. However, fluctuations in seed prices, particularly during certain years, may affect the feasibility of agricultural practices in the region. The timely availability of wheat and barley seeds supports proper planting schedules, as highlighted by farmers in Aghtrin subdistrict. The consensus among participants is that accessible seeds contribute positively to increased production levels. Some farmers mention challenges, such as poor productivity and susceptibility to diseases, impacting agricultural practices. The higher cost of seeds drives some farmers to seek cheaper, lower-quality alternatives, which ultimately decreases the total production quantity. Additionally, the availability of seeds at all times without hurdles is considered beneficial, while the lack of good-quality seeds is cited as a reason for declining production, decreased yields, increased pest issues, and the inability to enhance overall production.

**Farmers reported difficulties in accessing affordable fertilizers and pesticides, often citing poor quality and high prices as key concerns.** along with issues regarding the lack of a reliable source and the absence of a certificate of origin, which raises concerns about quality control as highlighted by farmers in Ar-Ra'ee subdistrict. Farmers express various challenges and observations regarding the use of fertilizers and pesticides in wheat and barley cultivation. Many indicate dissatisfaction with certain pesticides, citing inefficiency in eliminating pests and even adverse effects that negatively impact crops. This leads to increased costs without commensurate benefits for farmers. Farmers in Aghtrin subdistrict prefer imported urea fertilizers due to the remarkable effectiveness in enhancing agricultural production. In Mhambal subdistrict, the mention of Jordanian compound and monophosphate surfaced, while in Jisr-Ash-Shugur subdistrict, phosphorus and potassium were noted as critical elements. However, the instances of high fertilizer prices have resulted in reduced accessibility, compelling farmers to seek cheaper alternatives or explore other crop options. while farmers in Armanaz subdistrict stress the necessity for expert guidance in identifying and rectifying quality issues pertaining to agricultural inputs.

Farmers noted various changes in the past five years. Some expressed a positive change in the abundance of agricultural inputs, while others highlighted variations in specifications due to the lack of control over these materials. Several Farmers in Ras Al Ain and Tell Abiad subdistricts pointed out that the situation regarding inputs was more favorable before 2019, accessible from various Syrian governorates. However, after 2019, the availability primarily relied on imports from Turkey. Furthermore, farmers in Mhambal subdistrict reported that there were disruptions in imported inputs due to market diversification, unreliability, and risk, particularly after the Ukraine crisis, leaving farmers with untested alternatives that lacked credibility. **Overall, during the past five years, agricultural inputs have generally remained consistently available. However, there have been growing concerns regarding reduced quality and increased prices. Factors such as high prices,** fluctuations in exchange rates, variations in seed types, and shortages of fuel have all contributed to hindrances in accessing these vital agricultural inputs.

In addition, insights gleaned from discussions with local council representatives and agricultural experts reveal that **wheat and barley seeds are accessible. However, the primary concern centers on the substantial cost** linked to procuring these seeds. This financial hurdle places strain on the farmers, subsequently limiting their ability to execute their cultivation plans as intended. As emphasized by agricultural experts in Atareb District, the price for a ton of wheat seeds have surged to \$700 per ton.

Furthermore, the availability and cost of agricultural inputs, including fuel, pesticides, fertilizers, and seeds, hold considerable influence on the wheat and barley value chain. While their widespread availability at reasonable prices leads to increased cultivation and higher productivity, the high cost negatively impacts cultivation, reducing cultivated areas and increasing production expenses. This situation has led to losses for many farmers, as the costs of inputs often surpass the financial returns from the crops.

The major challenges faced in obtaining agricultural inputs, particularly fuel, pesticides, fertilizers, and seeds, as highlighted by local council representatives and agricultural experts are predominantly related to the high costs associated with these inputs. Additionally, the scarcity or lack of fertilizers and the high prices of certified seeds pose significant challenges in accessing these essential agricultural inputs. Furthermore, issues related to the quality of available inputs and the weak purchasing power of farmers contribute to the difficulties in obtaining these resources.



Figure 4: Farmers Challenges for Obtaining Agricultural Inputs

## Water Sources and Irrigation Practices

In the Northwest Syria region, a diverse range of water sources and irrigation practices are employed by farmers to sustain wheat and barley cultivation. **The primary water sources identified by farmers include rainwater, artesian wells, and water pumping from the Euphrates River.** However, the dependence on seasonal water, especially during droughts, often poses challenges. The cost of water access, particularly in dry seasons, remains a barrier for certain farmers who cannot afford the expenses related to tapping into other sources like wells. This reliance on a mix of water resources mirrors the adaptation strategies to address the irregularity of rainfall and seasonal changes in the region.

Cultivating barley requires lower water consumption compared to wheat, which is an important consideration in this context. Farmers reported utilizing various energy sources for irrigation techniques, with diesel-powered agricultural pumps being the predominant choice. Solar energy also plays a crucial role, primarily due to the high costs associated with fuel, leading many to opt for solar solutions for irrigation. While in the past five years, various shifts in water sources have been observed in Northwest Syria. Some areas faced significant challenges due to climate change, experiencing a notable decrease in water levels in wells, which was primarily attributed to reduced rainfall. This reduction has particularly impacted the reliability of water sources, affecting farming practices that rely on these supplies for irrigation. Additionally, Farmers in Mhambal subdistrict reported the drying up of springs, specifically in the southern Roj Plain. While some regions reported no discernible changes in water sources.

Farmers have adopted various strategies in response to water availability challenges when irrigating wheat and barley crops. There have been changes such as a shift to spray irrigation to conserve water, decrease the number of irrigation cycles, and reduce the hours for each irrigation session, also using solar system in irrigation in the NWS, regulation of well drilling, irrigation by sewage water. Additionally, farmers in Mare' and Al Bab subdistricts reported that they may dig deeper wells or create water reservoirs to collect and utilize a larger water supply. However, in certain cases, especially for rain-fed lands or due to a lack of water resources, farmers have shifted entirely to rain-fed systems or implemented irrigation systems that are reliant on rainfall or available water from wells. This shift towards rain-fed practices (mainly cash crops or species crops) and water conservation methods is a response to the limitations in water availability.

Most farmers generally consider the water used for irrigation as suitable, a few face challenges due to poor quality like high limestone content or the presence of sulfur, which causes soil-related problems, as highlighted by farmers in Al Bab subdistrict.

Local councils' representatives and agricultural experts highlighted initiatives aimed at enhancing water use efficiency, such as promoting modern irrigation methods like sprinkler. These initiatives have been somewhat effective in conserving water, with guidance sessions encouraging farmers to adopt these practices.

## Role of Fuel in Production

Farmers across Northwest Syria have reported significant challenges related to fuel that pose significant obstacles to wheat and barley cultivation. They have highlighted **concerns such as high fuel prices and poor-quality fuel**, which make it difficult for farmers to obtain the necessary resources for irrigation and other agricultural operations. **Farmers have also pointed out limited availability due to several factors such as market monopolization, security situation impacting supply interruptions, and closures of crossings.**

On the other hand, local councils' representatives and agricultural experts confirmed that fuel shortages or price fluctuations have significantly impacted the marketing and trade of agricultural products, particularly wheat and barley. The unavailability or price volatility of fuel has led to increased cost of production, changes in cultivation practices, and even losses for farmers.

Overall, the availability and cost of fuel significantly impact various aspects of agricultural activities and production processes. When fuel is accessible at reasonable prices, it leads to an increase in agricultural production and related operations such as irrigation, use of agricultural equipment, transportation, and harvesting mechanisms. However, when fuel prices are high, it results in a reduction in the cultivated area, increased production costs, and heightened financial burdens on farmers.

## Harvested Wheat and Barley Grains in Northwest Syria

**Most of the farmers expressed decrease in the production in comparison with the previous season (2021/2022),** which often due to factors like drought, irregular or inadequate rainfall, frost, poor quality seeds, and high prices of agricultural necessities like seeds and fuel. Climate changes and adverse weather conditions seem to have negatively impacted production in some areas. **Farmers who reported increase in production, attributed their success to favorable factors such as increased rainfall, the adoption of new seed varieties, better irrigation methods, and lower production costs.**

Farmers provided diverse responses regarding the wheat and barley yields per Kg/Dunum. As per Table 1, the lowest wheat yield in irrigated lands was noted in Ras Al Ain subdistrict, while the highest was documented in Mare' and Afrin subdistricts. In rain-fed lands, the least yield was reported in Ras Al Ain and Afrin subdistricts, with the highest yield recorded in Atareb. Similarly, the lowest barley yield in irrigated land was observed in Tell Abiad, whereas the highest was in Afrin. For rainfed lands, the minimum yield was reported in Ras Al Ain and the maximum in Armanaz. Noting that farmers in Jarablus and Atareb subdistricts mentioned the absence of barley irrigated lands in these regions.

Yield	Minimum	Average	Maximum
<b>Wheat Irrigated Lands</b>	275	416	600
<b>Wheat Rain-fed Lands</b>	100	213	330
<b>Barley Irrigated Lands</b>	NA	338	550
<b>Barley Rain-fed Lands</b>	75	188	375

**Table 1:** *Wheat and Barley Yields (Kg/Dunum)*

Based on Normalized Difference Vegetation Index (NDVI) study findings, figure 7 indicates the proportion of land in each subdistrict that is under irrigation and the percentage of land that relies on rainfall for moisture and sustenance (rain-fed). For instance, subdistricts such as Bennsh, Mhambal, and Mare' have a higher percentage of irrigated land compared to rain-fed, while in Armanaz, a larger portion of the land relies on rainfall for cultivation, which aligns with the reported highest and lowest yields in the region.

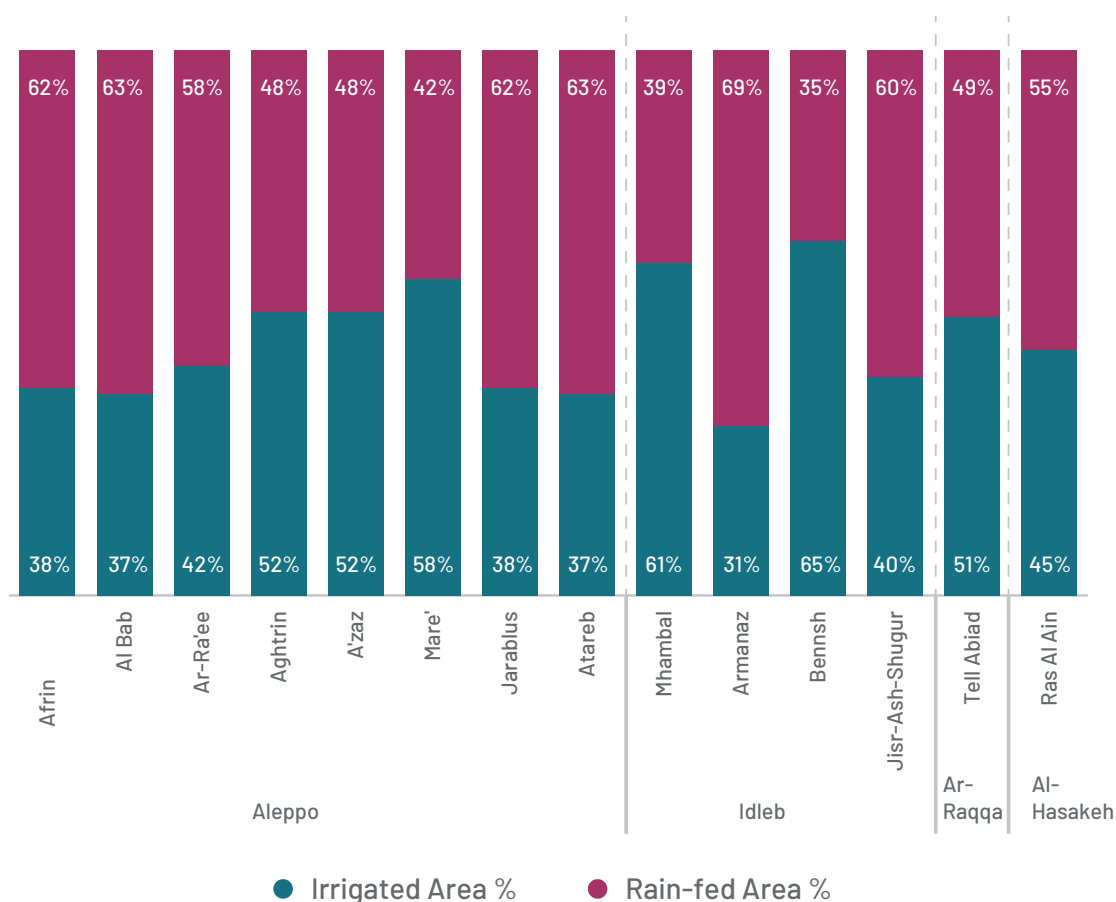


Figure 5: Proportion of Cultivated Lands Under Irrigation and Rain-fed Conditions

Farmers employ various strategies to manage pests and diseases in their wheat and barley fields. Some opt for periodic or as-needed use of pesticides, particularly when there is an infestation or the onset of diseases. For irrigated lands, insecticides are utilized when necessary. Rain-fed lands, on the other hand, might see periodic pesticide use limited to infected areas. The application of herbicides, fungicides, and insecticides is carried out based on the specific needs and conditions, with some farmers in Al Bab district following guidance from agricultural engineers or utilizing a program according to the prevalent pests for each season. However, the prevalence of the sunn pest in wheat and barley fields varies, as reported by different farmers. Some mentioned that the spread of the pest is very limited, while others indicated it is a widespread issue, as reported in Ar-Ra'ee, A'zaz, Ras Al Ain, Tell Abiad and Mhambal districts. The sunn insect, which is known as the most destructive wheat pest in West and Central Asia and East Europe,<sup>10</sup> as the farmers highlighted its negative impact on the crop yield. It can cause various issues such as a reduction in production, poor quality of the grains formed, and a decrease in both the quantity and quality of the crop.

On the other hand, local councils representatives and agricultural experts have reported various factors affecting wheat and barley production in their region in comparison to the previous season (2021/2022). Out of 28 key informants, 9 of them indicated an increase in production owing to better rainfall or rainfall distribution and lower production costs due to reduced reliance on irrigation. On the contrary, the remaining reported decreased production due to factors like drought, irregular or lack of rainfall, high costs of fertilizers and fuel, absence of support such as pesticides and certified seeds, weather fluctuations, earthquakes affecting groundwater levels, and the impact of specific issues such as frosts, and wildfires. These elements, along with reduced purchasing prices, have led to a decline in agricultural areas and, subsequently, in production.

10 Sources of wheat resistance to Sunn pest, *Eurygaster integriceps* Puton, in Syria. Mustapha El Bouhssini, Ken Street, Abdallah Joubi, Zakaria Ibrahim & Fawzi Rihawi. 2009, Vol. 56. [https://www.researchgate.net/publication/225126332\\_Sources\\_of\\_wheat\\_resistance\\_to\\_Sunn\\_pest\\_Eurygaster\\_integriceps\\_Puton\\_in\\_Syria](https://www.researchgate.net/publication/225126332_Sources_of_wheat_resistance_to_Sunn_pest_Eurygaster_integriceps_Puton_in_Syria)



## Post-Harvest Losses and Storage

Harvest and storage losses are estimated at 15 percent of production for both wheat and barley.<sup>11</sup> According to the local councils' representatives and agricultural experts, the post-harvest losses in the wheat and barley sector vary significantly among different regions. Some reported minimal losses not exceeding 10% due to proper storage practices, while others highlighted higher losses, reaching up to 30% or even 100% in extreme cases. These losses stem from various factors such as inadequate storage conditions, pests, diseases, and rodent infestation. Factors contributing to losses included long-term storage due to low market prices, low purchasing power affecting planting decisions for the next season, reduced grain values, and widespread market fluctuations.

Regarding the contribution of climate shocks to losses in the wheat and barley sector and the estimated percentage of affected farmers, key informants emphasized a significant impact. A key informant from Ar-Ra'ee subdistrict highlighted that **high temperatures during the critical growth stages and extreme cold can lead to significant losses, sometimes resulting in the complete loss of the crop.** Others provided estimates ranging around 40% of the value of losses, with approximately 70% of farmers in the region being affected.

When questioned about the measures taken to minimize post-harvest losses and uphold the quality of the harvested wheat and barley crops, the responses from farmers exhibited a wide array of techniques and strategies. These encompassed an assortment of approaches such as meticulous attention to storage conditions, with an emphasis on well-ventilated, clean, and dry warehouses situated far from potential sources of moisture or rodent intrusion. Sterilization processes are also key, treating both harvested crops and the storage environment to prevent infestation and spoilage. Farmers in A'zaz subdistrict highlighted to pay close attention to the timing of their harvest, aiming to prevent spoilage by ensuring grains are not overly wet or prone to rot. Additionally, various methods are utilized, such as insulation underneath stored grains, proper packaging, seed treatment before planting, and selective selling strategies that balance immediate sales with subsequent storage under favorable conditions. These collective practices are implemented to preserve the quality of crops and reduce post-harvest losses, even in cases where support in the form of pesticides and fertilizers may be limited.

Regarding post-harvest storage mechanisms, farmers employ various based on their individual circumstances and preferences. Some farmers utilize grain silos, their homes, or small warehouses to store crops, ensuring cleanliness, ventilation, and moisture-free conditions. The storage period varies, sometimes extending for up to four months. Others prefer to directly sell their crops, while a few keep their produce for different durations, depending on market prices.

## Role of NWS Local Authorities in Enhancing Agricultural Resilience

In response to the query about local councils, local institutions, or NGOs that offer agricultural support or guidance, the feedback varies among farmers. Some farmers noted support from organizations like, IYD, Global Communities, and Qatar Charity, which aid in different aspects such as providing seeds, fertilizers, diesel, and covering harvest wages. For some, the local councils, by their agricultural offices, offer guidance and essential provisions, like seeds at subsidized rates or reliable pesticides, as highlighted in Afrin and Jarablus subdistricts. Agricultural associations were acknowledged for organizing awareness sessions, consultations, offering loans, and facilitating crop purchases at favorable rates from merchants, as highlighted by farmers in Atareb subdistrict. While farmers in A'zaz reported that they are receiving support from Syrian Public Establishment for grain (SPEG). However, several farmers indicated a lack of support from any local entities or non-governmental organizations.

Regarding the collaboration with local experts and institutions, farmers agreed that it plays a vital role in enhancing agricultural practices. By availing agricultural guidance and insights from specialists, farmers can anticipate and manage potential issues such as diseases and pests efficiently, resulting in the adoption of best practices at reduced costs. This partnership often leads to increased agricultural productivity and lower expenses, especially concerning the selection of high-quality seeds and the proper use of fertilizers and pesticides. Furthermore, these collaborations provide an avenue for innovation and the implementation of development projects tailored to the specific needs of wheat and barley crops in the region, addressing challenges related to irrigation and storage, consequently refining farming techniques and expertise.

From the key informants' point of view, local authorities and agricultural institutions play a vital role in mitigating the impact of fuel availability on wheat and barley production and trade. Their efforts encompass diverse strategies such as subsidies and support, ensuring a stable fuel supply chain, and promoting alternative energy sources to reduce dependency on traditional fuels. Market access facilitation, investment in infrastructure development, financial assistance programs, and training initiatives also help farmers adopt fuel-efficient practices. Additionally, fostering technology adoption and exploring alternative markets contribute significantly to minimizing the susceptibility of wheat and barley production to fuel availability challenges. These measures, collectively initiated by local authorities and agricultural institutions, aim to stabilize and fortify the agricultural sector against the fluctuations in fuel availability, thereby supporting sustainable and resilient farming practices.

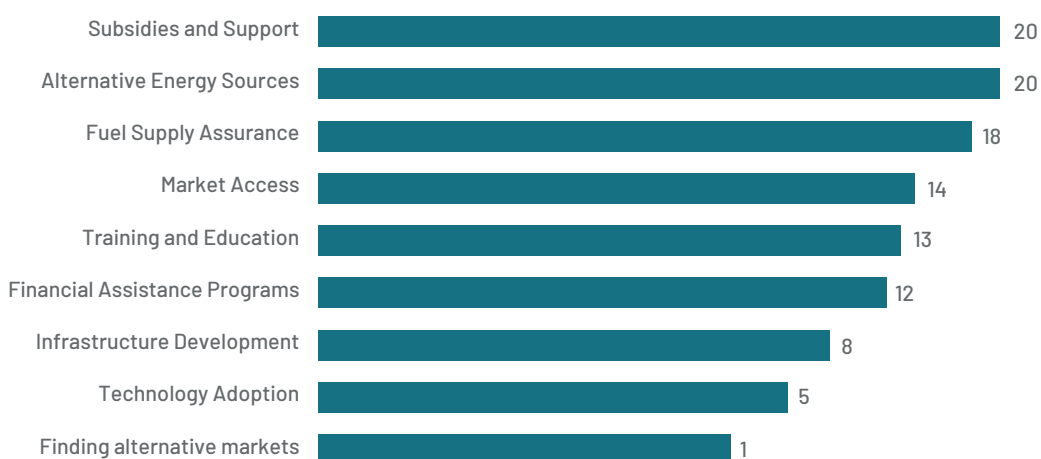


Figure 6: Role of Agricultural Institutions in Mitigating Fuel Availability Issues

## IMPACT OF CLIMATE SHOCKS

### Overview of Climate Shocks in Northwest Syria

Northwest Syria (NWS) region has been experiencing a number of climate shocks in recent years, including droughts, floods, and extreme heatwaves. These shocks are having a significant impact on the region's economy, food security, and water resources.

The 2022-2023 season presented a mixed scenario regarding climate shocks affecting wheat and barley cultivation from farmers perspective. Some areas experienced significant setbacks due to abnormal weather conditions. Heatwaves and frost were cited as the primary contributors to crop damage, with irregular or decreased rainfall, accompanied by high temperatures, posed challenges, leading to reduced production. However, other regions indicated limited impact compared with the last season (2021/2022), mentioning relatively normal weather patterns without significant climate shocks like Mare', Ras Al Ain, Tell Abiad, and Atareb subdistricts. These varying climate conditions affected different localities to different extents, resulting in fluctuations in the overall success of wheat and barley cultivation.

**Earthquake** impacts were felt across Northwest Syria (NWS), causing damage and displacement.<sup>12</sup> Farmers reported that the earthquake in the region had various consequences on agricultural practices and infrastructure. Several wells and irrigation sources experienced a drop in water levels, with some completely destroyed, impacting irrigation capacities. Additionally, fissures in the land and damage to seed storage warehouses were observed, influencing the preservation and availability of seeds for future crops. However, there were instances where farmers mentioned they were not significantly affected by the earthquake, especially in Ras Al Ain and Tell Abiad subdistricts.

Regarding **wildfires**, most farmers reported a decrease in the occurrence of wildfires that adversely affected wheat and barley crops. This reduction is attributed to various factors, including improved adherence to safety protocols, better awareness among the local population, and an enhanced understanding of fire prevention measures. The implementation of preventive measures and heightened caution has notably contributed to the decrease in fire incidents, resulting in better protection of the vital crops.

The **irregular rainfall** patterns have impacted wheat and barley cultivation in various ways as reported by farmers. The absence or delay of rainfall during critical growth stages affected the overall crop development, leading to weak plant growth and lower production levels. Furthermore, the irregular distribution of rain negatively affected the yield, causing problems such as weakened crops, flattened ears, and in some cases, destruction of the crop. This variability in rainfall not only affected the growth of the crops but also contributed to a decrease in water availability, impacting overall productivity. Additionally, farmers expressed concerns about delayed planting due to irregular rain, resulting in reduced productivity. Also mentioning that some pests were reported to have spread due to these variations, leading to additional damage to the crops.

Prolonged **drought** periods have indeed impacted the crops in the region. Farmers have employed several strategies to cope with limited water resources and mitigate the effects of drought on their yields. Some farmers adopted modern irrigation methods to optimize the use of water. In cases where drought has led to a decrease in rainfall, farmers faced challenges in maintaining production levels. The challenges posed by drought have required innovative solutions, such as renting water tankers for irrigation, deeper well digging, and seeking alternative water sources, although the impact varied among farmers and seasons.

Local councils representatives and agricultural experts reported the recent climate-related shocks that have affected wheat and barley production for this season include a decrease in rainfall, heatwaves, erratic rainfall patterns, frost events, and prolonged periods of drought. Other impactful occurrences involve unseasonal weather patterns and out-of-season rains, an increase in rainfall, hailstorms, windstorms or increased wind, wildfires, earthquakes, and flooding.

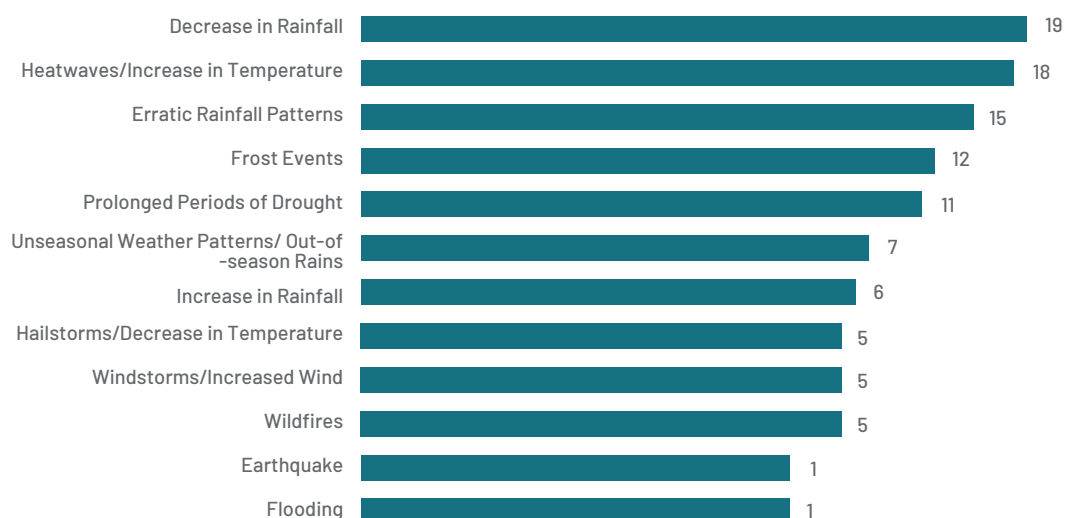


Figure 7: Climate Shocks that Impacted Wheat and Barley Production this season (2022/2023)

## Adaptation Strategies

In response to climate-induced challenges, farmers reported adaptation strategies included the use of resistant crop varieties, adjusting planting times, implementing modern irrigation methods such as sprinklers or drip systems, water harvesting, and adopting new farming techniques. Additionally, treating pests with pesticides was noted as effective strategies. It's fascinating to note that farmers in Bennsh subdistrict have collaborated to implement collective pest control measures, coordinating efforts to manage pests not only on their lands but also on their neighboring farms. Moreover, strategies such as securing irrigation resources, depending on other crops, and using quality seeds resistant to weather factors were identified as fruitful. Nonetheless, the absence of adequate support has hindered the successful implementation of several necessary strategies, notably in pest control and water provision.

Based on the information provided, the agricultural practices involving Climate-Smart Agricultural (CSA) techniques include several methods adopted by the farmers in the region. Techniques like crop rotation, minimum soil tillage, and using organic fertilizer have been highlighted as effective strategies by most farmers. Mentioning other techniques include water harvesting, incorporating residue, composting, using certified seeds, organic manure, employing herbicides, pesticides, and various irrigation methods such as spray. It's notable that there are diverse methods used across different agricultural practices such as wheat and barley cultivation, each tailored to the specific needs and conditions of the region.

On the other hand, local councils representatives and agricultural experts highlighted farmers and traders needs to enhance their resilience to future climate-related shocks. Some of the key requirements include providing certified, climate-resistant seeds that are adapted to local conditions and offering these seeds at subsidized or reasonable prices. Modern irrigation networks, as well as assistance in acquiring them, are crucial for adapting to changing weather patterns. Financial support. Supporting the drilling of wells, providing fuel or renewable energy systems for irrigation during droughts, and ensuring adequate agricultural inputs such as fertilizers and pesticides are paramount for successful farming. Additionally, guidance, awareness sessions, and training courses for adapting to climate changes are highly beneficial for both parties involved in agricultural practices. Moreover, establishing regulatory measures and providing stability in market conditions, preventing monopolies, and supporting wheat value chain initiatives would help ensure financial stability and security for farmers and traders in the region.

When it comes to access to early warning information in the local language, the local councils representatives and agricultural experts shared various approaches. Almost in all regions, weather forecasts play a pivotal role in disseminating weather and climate information from available sources to farmers. In contrast, farmers in Aghtrin, Mare', and Al Bab subdistricts receive agricultural guidance through social networking sites. However, there are a few contrasting opinions emphasizing that although weather forecasts are available, they might not significantly influence the crops or may not be particularly useful for wheat and barley, which are considered longer-term crops, as highlighted by the key informants in Mhambal and Jisr-Ash-Shugur subdistricts. This mixed response suggests the varying levels of usefulness and reliance on available weather forecast information among farmers in the region.

## Support of NWS Agricultural Institutions in Enhancing Climate Resilience

In the discussions with local farmers, to understand the current landscape of support and perspectives on climate change adaptation, **all respondents except those in A'zaz subdistrict reported receiving no form of support from local authorities or organizations concerning climate change adaptation.** Farmers in Azaz were the only participants who mentioned receiving such support, such as diesel support for irrigation operations. Moreover, **instances of farmers encountering losses due to crop damage or market challenges without receiving support were also highlighted.** Additionally, they emphasized the importance of providing high-quality inputs and reducing their prices, compensating for damages resulting from climate-related shocks. financial and in-kind support. Fuel support for irrigation was also highlighted as essential.

Local councils representatives and agricultural experts offered significant perspectives regarding the role that local authorities and agricultural institutions can play in mitigating the impact of water availability on wheat and barley production and trade. These include actions like drilling and licensing wells, establishing irrigation projects, providing agricultural guidance on modern irrigation methods, and executing agricultural plans tailored to local needs. Moreover, offering alternative energy support, and providing awareness sessions for growing crops that require less irrigation are significant steps. Supporting farmers by subsidizing fuel, extracting water from various sources like the Euphrates River. Overall, these actions aim to secure water resources and optimize agricultural practices in the region.

## Role of NWS Local Authorities in Mitigating Climate Challenges

Local councils representatives and agricultural experts provided insights into the pivotal role played by the Agriculture Authority in assisting farmers in facing various challenges. The key informants emphasized the Authority's guidance and efforts to improve methods of using production inputs. Additionally, the **Agriculture Authority secures essential resources for farmers, including subsidized fuel, reasonably priced fertilizers, and necessary pesticides.** It plays a crucial role in purchasing crops at prices that consider the cost and losses incurred by farmers while also providing seeds at nominal prices. Moreover, as the key informants highlight, the Agriculture Authority is actively involved in organizing agricultural activities, such as distributing seeds, fuel, and pesticides to combat agricultural pests. **It extends support to farmers by granting seed loans.** Encouraging the adoption of modern irrigation methods and offering agricultural guidelines are integral aspects of their assistance.

Furthermore, the authority actively guides and advises farmers, keeping them informed about weather conditions and organizing agricultural seminars. In addition to these efforts, as the key informants underscore, the Agriculture Authority plays a crucial role in insuring agricultural supplies. They disseminate technical bulletins that promote the use of scientific methods in agriculture to minimize production losses. Their support extends to various aspects of production requirements, contributing to the resilience of the agricultural sector. However, there are also key informants who express dissatisfaction, stating that the Agriculture Authority has limited capabilities and doesn't effectively provide support or assistance, as highlighted in Aghtrin, Tell Abiad and Ras Al Ain subdistricts.

## ASSESSING FOOD SECURITY CONTEXT

### Prevalence of Food Insecurity

The food security situation in Syria has significantly worsened in 2023, with an estimated 15 million people, or 68% of the population, needing food and agriculture assistance.<sup>13</sup> This crisis is driven by economic instability, currency devaluation, rising prices, drought-like conditions, and the Ukraine crisis.

In June 2023, the food security situation remained dire as food prices continued to surge, exacerbating the challenges faced by the already vulnerable population. The national average price of the World Food Programme's (WFP) standard reference food basket witnessed a staggering 27 percent increase during the first half of 2023. This alarming rise in food costs is a stark reminder of the ongoing crisis in the region.<sup>14</sup>

During the FGD, the local farmers provided valuable insights into the prevalent food insecurity challenges. The farmer respondents specifically pointed out the weakness of food security, primarily due to inadequate local production and heightened dependence on imports, leading to interruptions in the supply chain and consequent price increases. This deficiency affects not only human consumption but also has repercussions for livestock. The situation has continued to deteriorate, compelling individuals to adopt negative coping strategies.

**It's noteworthy that a significant majority of Northwest Syria (NWS) region farmers struggle with the burden of high prices and low incomes, making it increasingly challenging to meet basic needs.** These challenges are further compounded by complex factors such as political issues, exchange rate fluctuations, and migration, as highlighted by the respondents. When asked about sensitive periods when food needs become particularly challenging to fulfill, the respondents consistently pointed to the winter season. During this time, coupled with potential crop losses, there is a decrease in the availability of supplies and a decline in purchasing power.

In our KII, agricultural key Informants provided valuable insights into the challenges affecting food security in the Northwest Syria (NWS) region. These encompassed **climate fluctuations, high costs, lack of support, and market monopolization.** They also highlighted challenges like discouraging agriculture, diseases, high input costs, lack of loans, and reduced youth involvement due to migration. Key Informants also discussed climate-related challenges such as drought, on top of fuel shortages, high input prices, and external factors affecting water resources.

Key Informants noted significant impact which climate shocks have on crops, leading to reduced food security, decreased production, sometimes resulting in complete crop loss. Additionally, climate shocks can impact crop prices, which in turn affect the purchasing power of the population and may lead to increased bread prices, making food less accessible to the community.

### Role of Wheat and Barley in Local Food Security

The feedback from farmers regarding wheat and barley production's capacity to meet the basic needs of Northwest Syria's (NWS) communities is mixed. The majority of participants emphasized that these crops are indeed essential for fulfilling the community's daily requirements. They highlighted the crucial role these grains play in providing sustenance, generating income, and yielding materials. Furthermore, barley's contribution to animal husbandry enhances overall food security in the region.

However, it's important to acknowledge that not all responses were uniformly positive. **In Mare' and Bennsh subdistricts, for instance, there was a consensus that the current production levels were insufficient to meet the community's needs.**

13 OCHA. Syrian Arab Republic: 2023 Humanitarian Needs Overview. ReliefWeb. [Online] Dec 2022. <https://reliefweb.int/report/syrian-arab-republic/syrian-arab-republic-2023-humanitarian-needs-overview-december-2022-enar>.

14 WFP. WFP Syria Situation Report. Reliefweb. [Online] June 2023. <https://reliefweb.int/report/syrian-arab-republic/wfp-syria-situation-report-6-june-2023>.

Local councils representatives and agricultural experts highlight the critical role of wheat and barley production in addressing food security concerns in the region. These grains are fundamental staples for both human consumption and livestock. Wheat is a crucial element for flour used in bread, which is a dietary staple, ensuring a vital source of nutrition for the local population. Similarly, barley is essential in the feed industry, sustaining the needs of livestock, particularly in providing fodder. The robust production and stability of wheat and barley directly impacts the food industry, livestock, and, consequently, the local economy. This production cycle not only supports sustenance but also generates employment opportunities, boosting the community's economic stability and purchasing power as highlighted by key informants in Mhambal subdistrict. Overall, the cultivation of these grains plays a pivotal role in enhancing the region's food security by ensuring self-sufficiency and stability in both human and animal nutritional needs.

While the average family income has not increased, food prices skyrocketed by almost 800% between 2019 and 2021.<sup>15</sup> This upward trend in food prices persisted throughout 2022.<sup>16</sup> By June 2023, food prices witnessed a nearly twofold surge within a span of just 12 months.

Families' dependence on buying wheat for homemade bread face challenges when prices are elevated. As of September 2023, the observed price for wheat flour stood at SYP 9,027 per kilogram.<sup>17</sup> Furthermore, when wheat and barley prices experience an increase, as noted by some key informants, certain farmers could face difficulties intending to their fields, potentially resulting in diminished production.

The price fluctuations, according to key informants significantly impact food security in the region. Vulnerable groups, especially those with limited income, are particularly affected by these price fluctuations. The rise and fall of prices significantly affect families who heavily rely on wheat and barley cultivation for their livelihoods. This situation becomes even more critical for families, where the increased cost of fodder significantly influences livestock, directly impacting their overall food security.

## Role of NWS Local Authorities in Mitigating Food Security Challenges

The insights provided by local councils representatives and agricultural experts shed light on crucial aspects of the region's food security and agriculture. According to these informants, the **Agriculture Authority plays a pivotal role in addressing food security challenges and harnessing opportunities in the agricultural sector.** Their responses emphasize the Authority's support for agricultural and livestock projects, which includes securing agricultural products and inputs at subsidized prices, particularly grains used for producing bread during crises. They actively coordinate with organizations, conducting awareness sessions and advocating for support to empower farmers. Quality control is another significant function, involving efforts to ensure the quality of agricultural products and supporting irrigation practices.

Despite certain limitations, the Authority plays an educational and advisory role, offering guidance, developing agricultural plans, and providing instructions for farming practices. Additionally, they facilitate and coordinate efforts with various organizations, advocating for the wheat value chain's essential role in strengthening food security in the region.

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15 Ramadan in Syria: Rising food prices push basics out of reach. WFP. [Online] April 2022. <https://www.wfp.org/stories/ramadan-syria-rising-food-prices-push-basics-out-reach>.

16 WFP Syria Price Bulletin. FScluster. [Online] Aug 2022. <https://fscluster.org/syria/document/wfp-syria-price-bulletin-august-2022>.

17 WFP Syria Price Bulletin - September 2023. <https://fscluster.org/gaziantep/document/wfp-syria-price-bulletin-september-2023>.

## MARKET DYNAMICS AND IMPORT IMPACT

### Current State of the Market

The current trends in wheat and barley prices display varying patterns across the regions, as shown by farmers. While some regions observe a decrease in prices, others note stability or a slight rise, particularly with the approaching sowing date. Globally, wheat prices are experiencing an upward trend, contrasting with local fluctuations that rely on the local production's performance. In Tell Abiad subdistrict, a decline in prices has led to considerable losses for farmers. These fluctuations can cause uncertainty among farmers regarding future improvements in the prices of wheat and barley.

Moreover, the changes in wheat and barley prices have indeed influenced agricultural approaches for many farmers. There's a noticeable shift in cultivation preferences toward aromatic commercial crops such as *Nigella sativa*, cumin, coriander, and anise, which have a high demand for exports, as highlighted in A'zaz subdistrict. Some have diverted to rain-fed agriculture to save on expenses, as highlighted in Ar-Ra'ee subdistrict. Additionally, some farmers have turned to solar energy-based irrigation systems, as highlighted in Ras Al Ain subdistrict. However, some farmers have not altered their methods despite the price changes, as highlighted in Agthrin and Bannah subdistricts.

The market prices and fluctuations of agricultural produce, particularly wheat and barley, are influenced by multiple factors, as underscored by insights from local councils representatives and agricultural experts. These include supply and demand dynamics, the availability of the product, as well as the conditions affecting cultivated areas. Import and export activities, exchange rates, and the political and security situation in the region also play a significant role, as highlighted in Afrin and Al Bab subdistricts. Additionally, factors such as the quality of seeds, the influence of merchants and traders, and climate fluctuations, as well as the operational status of domestic and internal and external crossings, contribute to the variability of market prices. Furthermore, changes in global prices and international agreements, along with challenges in demand and sales, influence the local market significantly. Finally, the cost of inputs, such as seeds, fuel, and irrigation, directly affects sales prices, causing fluctuations in the market.

From the key informants perspectives, the Black Sea Grain Agreement has had a varied impact on the pricing process and the availability of imported wheat and barley in the region. For the majority, it led to a significant decrease in the price of grains, affecting the local market by lowering prices and causing financial losses for farmers due to decreased profitability. However, for some farmers, the effect was not as pronounced, and it did not influence the pricing process in the local market, as the local prices were already lower than international ones. Additionally, the agreement affected the market by introducing a greater quantity of imported wheat and barley, resulting in lower prices compared to previous seasons, causing disruptions, and impacting both merchants and farmers. Overall, the impact of the agreement included both price decreases and increases in the availability of imported grains, leading to varying consequences for different stakeholders in the agricultural market.

### Demand, Supply and Price Trend

The experiences shared by participants in the region have highlighted several insights regarding the demand, supply, and price trends of wheat and barley. Recent years have shown fluctuations, with some periods experiencing stable and average prices, while others have seen an increase in demand and subsequently higher prices. However, the most recent period revealed a significant decrease in prices for grains. The impact of the Black Sea Grain Agreement was notable, leading to a decrease in prices for wheat and barley. Participants observed that the agreement significantly affected the local market by increasing the supply of imported grains and lowering the demand. This resulted in reduced prices domestically. Merchants' control over the market, particularly through importing grains, has influenced the reduced profitability for local farmers and caused price decreases due to surplus availability in the market.



Various factors contribute to the fluctuations in demand, supply, and prices for wheat and barley as reported by farmers. These factors include the fluctuation in international grain prices, the monopoly of merchants affecting the cost of seeds, pesticides, and fertilizers, and the impact of security and stability on agricultural decisions. The decisions for cultivating wheat and barley are influenced by price fluctuations and market dynamics. Additionally, the availability of supportive conditions, such as competitive agricultural inputs, supportive institutions, and ideal storage conditions, also affect the decisions of farmers. However, external factors such as imports and the closing of borders also play a role, impacting farmers' decisions regarding the cultivation of wheat and barley in the region.

Representatives from local councils and agricultural experts generally perceive the demand and supply trends for wheat and barley as being subject to various influential factors. Their insights are grounded in multiple elements, such as market instabilities, and governmental policies regarding import and export. Moreover, the fluctuating demands and supplies are influenced by factors including local and international market conditions, geopolitical crises such as the ongoing conflict in Ukraine, the level of support provided to farmers, and the security situation in the areas where these crops are cultivated.

These representatives and experts note the diverse trends, ranging from periods of oversupply during harvests to increased demand during sowing seasons and the winter. There's a reflection of opinions that discuss a rise in supply with relatively low demand, while others emphasize the effects of prices on the decrease in demand. The perceptions outlined by these local councils and agricultural experts highlight the nuanced, multifaceted nature of the market trends for wheat and barley, depicting a landscape sensitive to a myriad of local, national, and global factors.

The observations and reports from local council representatives and agricultural experts paint a clear picture of the notable impact of fluctuating fuel prices on the agricultural landscape and market dynamics. The rise in fuel costs has indeed caused considerable challenges for farmers. This escalation has resulted in negative repercussions, disrupting planned agricultural activities and transactions within the sector.

The high fuel prices have imposed restrictions on various essential agricultural operations, notably affecting irrigation, harvesting, and other fundamental agricultural practices. Additionally, these price fluctuations have led to the closure of certain agricultural projects, as highlighted in Mare' subdistrict, and have contributed to a reduction in the total cultivated land area. The instability and substantial increases in fuel costs have significantly inflated agricultural expenses for farmers. These increased production costs have evidently impacted on the overall supply chain, creating ripples throughout the agricultural sector and market dynamics.

Lastly, the sensitivity of wheat and barley prices to climate shocks, such as extreme weather events or prolonged droughts, has been highlighted by key informants. These climatic variations impact the biological processes of crops, affecting both their quality and quantity of production. When faced with climate shocks like frost waves, drought, or pests, the production of wheat and barley tends to decrease. This reduced output results in a decrease in supply despite relatively stable demand, leading to a subsequent increase in market prices. However, it's worth noting that while there is sensitivity to these climatic events and their impact on agricultural production, the relationship between these events and market prices can be influenced by several other factors. In certain cases, although climatic events led to reduced local production, there was no improvement in prices due to the dominance of imported products in the local market, as highlighted in Mhambal subdistrict. Overall, these instances demonstrate that climate shocks significantly affect the production, quality, and subsequently the prices of wheat and barley, but the market's response is also intricately connected to various other economic factors and trade dynamics.

## Role of Imported Grains

Farmers in Northwest Syria (NWS) has been highlighted the availability and affordability of imported grains, which is significantly influence the decision-making processes concerning planting, production, and market engagement for wheat and barley. The impact varies, but certain consistent patterns emerge. If imported grains are available at prices considerably lower than the cost of producing local grains, it renders the local agriculture infeasible due to the high competition.

Many farmers rely on the affordability and accessibility of local seeds, as they are notably cheaper compared to imported ones. If local grains are cheaper, it minimizes the inclination for using imported seeds, which are often more expensive and present uncertainties regarding their quality and effectiveness for the farmer. However, in cases where imported grains offer better quality and yield, it can positively impact the productivity and quality of the crops. Nevertheless, there is consensus among farmers that the availability of imported grains tends to lead to a reduction in the areas cultivated with wheat and barley. This trend is often associated with challenges such as increased competition and a subsequent decrease in local grain values, leading to losses for local producers. These factors collectively shape farmers' choices and the dynamics of the wheat and barley market.

Local councils representatives and agricultural experts have underscored the vital significance of imported grains in managing the decline in local yields of wheat and barley due to climate-related issues. They noted that **when crop production faces reductions, local markets pivot towards imports as an alternative supply solution.** The primary avenue often involves importing these grains from Türkiye (Turkey) and Ukraine to offset the shortfall. Meanwhile, key sources of information highlighted that local markets in Afrin and Jisr-Ash-Shugur subdistricts preserve reserves from prior years, whereas in the Al Bab subdistrict, they may depend on supportive entities or organizations. Furthermore, the proportion of local seeds versus imported seeds can range from 80% reliance on imports, as highlighted in Armanaz subdistrict, to much lower figures, such as 10%, as highlighted in Atareb subdistrict.

Regarding the imported seed varieties, key informants highlighted the diverse range of options available to NWS. They pointed out specific varieties such as Burgaz and Altai for wheat, as well as Ukrainian and Beta for barley. These imported seed varieties, they highlighted, contribute significantly to enhancing the region's seed diversity and strengthening its agricultural resilience.

## Role of NWS Local Authorities in Supporting Wheat and Barley Value Chain

Key informants across various subdistricts in Northwest Syria (NWS) provided insights into the crucial role played by local authorities in supporting the wheat and barley value chain. Specifically, they highlighted that these authorities are actively involved in securing the production requirements, ensuring fair pricing, conducting guided tours for farmers, offering organizational direction to support agriculture, or providing some agricultural guidance, delivering agricultural machinery to farmers, and waiving fees. However, coordinating with external supporting organizations and providing loans were highlighted be key informants in Atareb subdistrict. All these roles collectively enhance the durability and longevity of the wheat and barley value chain.

## FUTURE OUTLOOK

### Future of the Wheat and Barley Value Chain

The future of wheat and barley cultivation in the region, as described by local farmers during the FGD, appears to be facing significant challenges due to climate events and increasing climate shocks. Farmers anticipate a decrease in the areas dedicated to planting wheat and barley if appropriate support, including access to suitable varieties and necessary resources, isn't provided. The lack of support from local authorities and organizations continues to negatively impact production and pricing, risking a reduction in cultivation for these essential crops. **Continuous exposure to climate-related challenges presents a grim outlook, indicating a gradual decline in planting areas for wheat and barley.** If this trend of insufficient support and persistent climate shocks continues, it could further diminish the cultivated lands for these crops. The situation could worsen significantly, as a majority of farmers foresee reduced cultivation and output. Despite these challenges, potential improvements in the future seem unlikely without adequate support and measures.

The outlook for the wheat and barley value chain in the forthcoming years varies among local councils representatives and agricultural experts. Some anticipate that **the sector could witness significant development, primarily driven by the support provided to local farmers** with advancements in irrigation techniques, particularly a shift towards solar energy for irrigation instead of fuel. However, others believe that without significant support and improvement in agricultural methods, the wheat and barley value chain might either witness minimal development or could even decline due to factors such as climate change, reduced water levels, and overall insufficient solutions to agricultural challenges. In contrast, some respondents highlight the negative development with a reduction in cultivated areas and a shift towards cultivating more profitable crops like aromatic varieties. The development is contingent on the climate conditions and support extended to the area.

Furthermore, key informants identified several factors that they believe will be crucial in shaping the future of this sector. Stability in security and political conditions is vital for the sector's growth, alongside the necessity of opening export channels for market expansion. Advancements in irrigation networks and access to water are fundamental for enhanced productivity. Support for agricultural inputs, such as seeds, fertilizers, and pesticides, is essential to maintain crop quality and compete with expensive imported produce. Additionally, shifting towards solar energy, educational programs on alternative energy, and awareness about efficient irrigation methods are seen as crucial for future development. Ensuring reasonable prices for production inputs, controlling market prices, and developing new markets are additional strategies to support the wheat and barley sector's sustainable evolution.

The challenges faced by stakeholders in the wheat and barley value chain, as highlighted in the Key Informant Interviews (KII), are multifaceted. High prices and the closure of borders have emerged as significant obstacles, impacting the availability and affordability of essential resources like agricultural inputs, fuel, and electricity. Climate fluctuations, unavailability of quality seeds and fertilizers, and the rising costs of servicing wheat and barley crops further compound the challenges faced by farmers, merchants, and families involved in the value chain.

**Despite these challenges, there are untapped opportunities for improving production and trade,** as highlighted by key informants. Activating the roles of agricultural institutions, such as General Organization for Seed Multiplication (GOSM) and Syrian Public Establishment for Grain (SPEG), as highlighted in Ar-Ra'ee and A'zaz subdistricts, and aligning regulations for import and export could significantly boost trade efficiency. Additionally, utilizing solar-powered wells and expanding water extraction to certain areas could bolster production. The replacement of fuel with solar energy systems in irrigation practices stands as a key opportunity for resource optimization. Rehabilitation of irrigation canals and networks, especially in areas like the Al-Roj Plain, as highlighted in Mhambal subdistrict. Equipping silos, facilitating passage through crossings, and enhancing investment in available water resources represent potential areas for further development within the sector.

## Northwest Syria Agricultural Contributions

Local councils representatives and agricultural experts highlighted several vital functions of the Agriculture Authority in the region. Some functions include offering guidance and agricultural advice to farmers. This involves disseminating knowledge about new agricultural methods, providing insights into the use of new items, and supplying seeds. However, due to resource limitations, their support often remains limited. They face challenges in fully supporting farmers, particularly in providing extensive aid, including a wider range of agricultural supplies, machinery, and essential resources.

Their capacity is further constrained in facilitating improved seed varieties and adequate agricultural inputs due to financial limitations or administrative hurdles. As a result, their current role mostly involves educational and advisory tasks, such as conducting awareness sessions and dispensing information about modern agricultural practices. While they attempt to coordinate with external organizations to extend some support, the assistance offered is often limited, such as providing essential items like fertilizers and seeds. This shortfall in resources limits their capacity to offer more substantial support in tackling the challenges and harnessing opportunities within the wheat and barley agricultural sector.

## Main Challenges Faced Wheat and Barely Productivity

The challenges faced in wheat and barley production in Northwest Syria (NWS) encompass a range of critical issues that affect both farmers and the agricultural value chain.

- **Access and Affordability of Agricultural Inputs:** A significant hurdle for farmers in Northwest Syria (NWS) is the accessibility and affordability of essential agricultural inputs, notably fuel and fertilizer. These inputs are often costly, placing a substantial financial burden on farmers and impacting crop productivity. Addressing these issues is crucial to ensure sustainable agricultural practices.
- **Access to Energy Resources:** Adequate and reliable energy sources are essential for various aspects of agricultural activities, including irrigation, mechanization, and post-harvest processing. Insufficient access to energy hinders the adoption of modern and efficient farming practices, impacting productivity and overall crop yield. Addressing the energy needs of wheat and barley farmers is crucial for sustainable and resilient agricultural systems in the face of evolving challenges and climatic conditions.
- **Water Scarcity and Irrigation Methods:** Water scarcity is an ongoing concern in the region. Limited access to this vital resource underscores the pressing need for modern irrigation methods to effectively sustain crop growth. Traditional practices have proven insufficient, necessitating a shift toward more advanced approaches to water management.
- **Seed Varieties and Harvesting Equipment:** Farmers' access to high-quality seed varieties is hampered by both availability and cost. Strategic interventions are imperative to alleviate this challenge, as the quality of seeds directly influences crop yields. Additionally, the difficulties in accessing modern harvesters contribute to increased labor costs and reduced efficiency during the harvest period.
- **Climate-Related Shocks and Early Warning Information:** Climate-related shocks, such as extreme weather events, pose a significant threat to agricultural stability. Respondents recommend the establishment of a support fund for farmers during such conditions, coupled with crop insurance. Access to early warning information is essential but is currently inconsistent across different regions.
- **Market Complexities:** The Northwest Syria (NWS) wheat and barley market is intricate and influenced by various factors. Traders wield control, while high input costs, trade restrictions, and declining wheat prices compared to the global market present challenges. Exchange rate volatility and the impact of imports further complicate market dynamics.
- **Stakeholder Challenges in the Value Chain:** Multiple stakeholders in the wheat and barley value chain, including farmers, merchants, and families, confront a myriad of obstacles. These encompass high prices, crossing closures, fluctuations in climate, availability and affordability of quality seeds and fertilizers, and numerous other challenges that impact the region's agricultural resources.
- **Lack of Support:** Limited assistance from local agricultural authorities, insufficiencies in terms of guidance, subsidies, and resources pose significant challenges for farmers and stakeholders.
- **Security and Stability:** Conflict and insecurity create an unstable environment for agricultural activities, hindering farmers' ability to cultivate and harvest their crops safely. The risk of damage to fields, machinery, and infrastructure due to conflict disrupts the farming process.

## Recommendations

In light of the significant challenges encountered in wheat and barley production, several recommendations have been formulated to enhance agricultural practices in Northwest Syria (NWS).

- **Quality Seed and Inputs:** Provide high-yield and drought tolerant seeds with high productivity and quality specifications, ensuring they come from reliable sources. Supporting farmers with essential agricultural inputs like fertilizers, pesticides, and good-quality fuel at reasonable prices to enhance productivity.
- **Market and Pricing Support:** Facilitate a clear and competitive market for the sale of grains, ensuring fair and encouraging prices for farmers to maintain profitability and sustainability. Also, local authorities could purchase wheat and barley at fair market prices to support farmers.
- **Modern Farming Techniques:** Implement modern irrigation methods to conserve water while maximizing crop yield and quality. Developing sustainable energy solutions, such as solar energy systems, for efficient and cost-effective farming practices.
- **Agricultural Extension and Collaboration:** Encourage agricultural extension programs by experts to provide technical expertise, new crop introductions, and guidance. Collaboration with agricultural authorities and local support organizations can significantly benefit the sector.
- **Investment in Infrastructure:** Invest in infrastructure by rehabilitating irrigation networks, enhancing fuel efficiency, and adopting alternative energy sources to support sustainable agriculture.
- **Incentivizing Production:** Provide incentives for wheat and barley production through cash vouchers, support for harvest wages, and investment in large-scale agricultural projects.

By incorporating these recommendations into agricultural policies and practices, there can be significant improvements in wheat and barley cultivation, supporting farmers and creating a more sustainable and productive agricultural sector in the region.