



Wheat production value chain in Northeast Syria

April 2022

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Preface

Due to its importance in achieving food security, providing job opportunities for the rural population, and its crucial contribution to the agricultural sector, wheat is a primary strategic crop in Syria. Between 2000-2011, the annual production was approximately 3.85 million tons with an average local consumption of 2.5 million tons, which allowed an export surplus of 1.35 million tons. This contributed to an increasing proportion of wheat in Syria's exports. Soft wheat accounted for 47% of the 2011 total, with rain-fed just 16%.¹ Statistics indicate that production fell sharply to 1.2 million tons in 2018, or less than half of domestic demand. This decline is due to several factors, including lack of support for wheat cultivation, lack of rainfall, destruction of irrigation infrastructure and water pumps, difficulties in providing fertilizers, seeds, and agricultural tools, and a drop in agricultural labor due to security conditions, migration, asylum, and displacement.²

The provinces of Al-Hasakah and Al-Raqqa are considered to be the most important wheat growing areas in Syria. Their production in 2011 was about 1.76 million tons or about 45% of Syria's total. In 2018, it dropped to about 0.5 million tons 42% of the total, which fell by 71%.³ In 2020, production in these two governorates rose as the rainy season improved to about 1.1 million tons, with wheat production in the total Syrian areas rising to 2.7 million tons.⁴

This study analyzes the wheat production process in Hassakeh and Raqqa, considering the radical changes that have occurred in the agricultural sector in this region during the crisis. The analysis is based on an understanding of all the activities and actors involved in the wheat production value chain, including the production inputs, the production process, as well as sales and distribution processes. Based on the results, the research seeks to develop proposals to stabilize the production process in terms of quantity and quality. It also suggests avenues for making the price of wheat commensurate with consumer purchasing power and is profitable for farmers.

The first section of the study provides an overview of the literature on the value chain, the methodology, and the analytical framework for research. The second section focuses on the inputs to the process of wheat production, including agricultural land, seeds, manure, pesticides and agricultural medicines, fuel, and water. The third section analyzes the production process in terms of operators, technical and technical support provided, and agricultural tools and equipment. The fourth section examines the process of selling and

¹ Ministry of Agriculture and Agrarian Reform: Agricultural Statistical Series 2011. Available at: http://www.moaar.gov.sy/site_ar/agristat/2011/2.pdf

² Food Agriculture Organization and World Food Program (2018): "Special Report: FAO/WFP Crop and Food Security Assessment Mission to the Syrian Arab Republic." Available at: <http://www.fao.org/3/ca1805EN/ca1805en.pdf>

³ Ministry of Agriculture and Agrarian Reform: The Agricultural Statistical Series 2011 and 2018 are available at: <https://bit.ly/3fmZvw5>

⁴ Food and Agriculture Organization (2020): "GIEWS Country Brief: The Syria Arab Republic", May 2020. Available at: <http://www.fao.org/giews/countrybrief/country/SYR/pdf/SYR.pdf>

distributing wheat, which requires an understanding of the actors, pricing policies, prices and facilities provided to farmers, the final destination of wheat, and the profitability of the farmer and buyer. The latter section proposes some recommendations based on the results of the analysis of previous sections and the viewpoint of the experts interviewed for this research.

Section I: Methodology and analytical framework for research

The concept of an industry value chain was first used by Michael Porter in 1985 to analyze the cumulative activities to develop a final product. His strategic chain includes inputs from the raw materials, the production process, the output phase, and sales to the ultimate consumer. Each activity has a set of actors, sources, and dynamics that influence the effectiveness and sustainability of the activity. The methodology is typically used as an analytical tool to identify the costs of each production chain activity that creates a value, the factors that increase or decrease those costs, and to understand the dynamics of the relationship with suppliers and consumers and thus the competitive advantage of the enterprise.⁵

The use of the value chain concept has evolved to include analysis at the industry or sectoral level and a focus on complex relationships within an extensive network of actors, including producers, regulators, traders, suppliers, and consumers in the industry or sector. The power relations between these actors reflect the governance of the value chain, which determines how financial and human resources are allocated along the continuum.⁶ Many organizations have adopted a value chain methodology to analyze production processes at the sectoral level, including the Food and Agriculture Organization of the United Nations (FAO-UN). This organization applied a value chain analysis to understand bottlenecks and catalyze competitive advantages in the cycles of food and agricultural commodity production.

This study analyzes the value chain to understand the process of production of wheat in Al-Hasakah and Al-Raqqa. The value chain of wheat is defined as a series of activities in the first phase, which includes obtaining inputs for production, including agricultural land, seeds, fertilizers, agricultural medicines, water, and fuel. The second phase is the process of growing wheat and the accompanying use of labor force and agricultural equipment and obtaining technical and technical support. The third and final phase is the sale and marketing of wheat from farmers to buyers. At each of the three stages, this study identifies the network of actors and the nature of their relations, understands each other's policies in determining the value of the material or service provided and their sources of access, and examines legislation and decisions governing, if any, activities affecting the process of wheat production.

⁵ Porter, Michael. E. (1985): "Competitive advantage: Creating a Sustaining Superior Performance", pp. 75-85, The Free Press, New York.

⁶ Kaplinsky, R. and Morris, M.(2003): "A Handbook for Value Chain Research", International Development Research Center (IDRC)

In addition to the secondary information available through published studies and reports on wheat production in Syria, particularly in the northeast, the study relies primarily on qualitative information obtained through lengthy interviews with key individuals from the region who are directly involved in wheat production.⁷ The interviews were conducted on a four-part open-ended questionnaire that adopted a value chain analysis methodology. The first section contains general information on the expert interviewed in terms of occupation, age, and educational level. The second section includes questions on the land under wheat in terms of area, productivity, and ownership. This section also contains questions on seeds, fertilizers, pesticides, fuels, and water in terms of the official and non-official bodies controlling the market for these materials and the relations between them. These are the pricing policy of each side, the demand and adequacy of the supply of these materials, technical and technical support, if any, in addition to decisions affecting the availability and prices of these materials. The second section contains questions on the agricultural labor available in terms of cost and skill, the availability and prices of the necessary agricultural tools and the entities providing them, and the technical support during wheat cultivation and the provider. The final section includes questions about who is responsible for the purchase and marketing of wheat from farmers and the policies for purchasing, transporting, pricing, and selling them.

The interviews included five key individuals who were experts on wheat production in Hassakeh and Raqqa and can be categorized into three groups: 1) wheat farms, 2) wheat dealers and farming materials, 3) responsible parties for the agricultural sector in the Autonomous Administration. The research sought to derive results from an analysis of these data and its intersection with secondary material to arrive at practical policy recommendations for each activity on the value chain in a way that maximizes benefit to farmers and provides wheat to the consumer in a fair way in terms of price, quantity, and quality. The analysis of the wheat value chain on which this study focuses is the first and key part of understanding the bread value chain, which also includes activities associated with mills, bakeries, and bread sellers.

⁷ Data collection took place in 2021.

Section II: Inputs to the process of wheat production

This section includes research on the activities and materials needed in the cultivation of wheat, how they are affected by the actors' decisions, and their impact on the final value of wheat. It will also address the effectiveness of financial and technical support provided by the responsible parties in the studied region.

1) Agricultural Land

In 2011, the total area under wheat cultivation in Hassakeh and Raqqa governorates was around 775 thousand hectares, down to 675 thousand hectares in 2019.^{8,9} The proportion of land cultivated with wheat varies according to the region. One key farmer put it at 70% in the Qamishli area, and another said it was only 50% in the Raqqa area. Some people also linked the two keys between the area of land cultivated by wheat and its material returns to farms. One of the investors in the agricultural land in the Al-Derbasiyah area said that the continuous decrease in the return of wheat farmers could lead to a decrease in the percentage of land planted with this crop to less than 35% of the total agricultural land in the Jazira area.

The total production of the region's wheat land is affected by several interrelated factors, the most important of which is rain, wheat cultivation returns, and the technical support provided. Wheat production exceeded 1.75 million tons in 2011, while it declined to less than half a million tons in 2018. Wheat production varies widely between rain-fed and irrigated, with key people indicating that the average production of wheat is about 160 kilograms for one dunum of rain-fed land. The average production of each irrigated dunum is about 315 kilograms of wheat.

Ownership of agricultural land, including those cultivated with wheat in the studied area, is complex and sometimes affects the sustainability of production. Key people have pointed out that there are different forms of ownership, such as ownership of "taking possession," which has led many farmers since the beginning of the Syrian state to acquire agricultural land from the original owners for an agreed percentage of production given by the farmer to the owner of

⁸ Ministry of Agriculture and Agrarian Reform: Agricultural Statistical Series 2011. Available at: http://www.moaar.gov.sy/site_ar/agristat/2011/2.pdf

⁹ Food Agriculture Organization and World Food Program (2019): "Special Report: FAO/WFP Crop and Food Security Assessment Mission to the Syrian Arab Republic." Available at: <http://www.fao.org/3/ca5934en/ca5934en.pdf>

the land. This percentage varies from one village to another, averaging about 12%. At times, especially in low-production seasons, disputes between landowners and farmers occur over the percentage to be paid, which affects the profitability of wheat farms. The Autonomous Administration usually does not intervene in these disputes, which are often resolved informally by regional notables.

The area under study also has state-owned land, which is invested in by the Self Administration through agricultural associations, so that the farmers of these associations can benefit from the return on production. In addition, there is land owned by the so-called “Arab Al-Ghumar”, which dates back to the 1960s and 1970s. At the time, the Syrian government took agricultural land from its original owners in the area and redistributed it exclusively to Arab families from Al-Raqqah and the residents whose land was flooded by the Euphrates

Dam. Land was also owned to the south of Al-Hasakah for some of the original families in the area through what is known as “the right of use”. The term "Arab Belt" refers to the Syrian government's redistribution of agricultural land along the border with Turkey to Arab peasants from Raqqa and Aleppo.¹⁰ It should be noted that since taking control of the region, the Autonomous Administration has not made any fundamental changes with regard to ownership of agricultural land, particularly with regard to the subject of submersion and use.

One key factor in the Al-Darbasiyah area is that the size of his village and surrounding villages used to be 3,000 hectares. Currently, as a result of the division of inheritance among brothers, the largest land property is only 300 hectares, and with the average area of agricultural ownership being reduced, what is known as "economies of scale," meaning the advantages of the low cost of production for large-scale land, are reduced”.¹¹ The total size of agricultural properties in the studied area is also affected by access, with a number of key people pointing to the difficulty of accessing land near the front lines between the Syrian Defense Force (SDF) and Turkish forces in the areas of Zarkan, Tal Tamr, Ain Issa, and Tal Abyad. Turkey's incursion into Ras al-Ain has left about 440 thousand dunums of agricultural land out of the control of the Autonomous Administration and therefore unable to reach owners. One expert interviewed said that these lands produced about 250 thousand tons of wheat, which were sent in full to Turkey.

These results indicate that some farmers have a competitive advantage on the land issue, namely private ownership, large land, and a high percentage of irrigated land to rain-fed, while the nature of ownership is a burden on other farmers such as those who have a "taking

¹⁰ Kose, Humbervan (2019): "The Arab Belt: The Story of Syria's Biggest Demographic Change," Platform 22. Available at: <https://bit.ly/2KCTpBq>

¹¹ Economies of scale in the context of wheat production mean a reduction in the cost of producing wheat per dunam as the volume of production and the area of cultivated land increase.

possession" and have to pay a proportion of their production to the original owners. In order to achieve equity in terms of ownership of the means of production, the responsible parties can offer a competitive advantage to farmers whose ownership or form of land is disadvantaged through a fair and effective system of fees and taxes. For example, a specific levy on the share of wheat may be imposed on the landowners who do not work on it. The proceeds of such taxes are used to support the wheat farmers, especially those who own the land by "taking possession". The total size of agricultural properties in the studied area is also affected by access, with a number of key people pointing to the difficulty of accessing land near the front lines between the Syrian Defense Force (SDF) and Turkish forces in the areas of Zarkan, Tal Tamr, Ain Issa, and Tal Abyad. Turkey's incursion into Ras al-Ain has left about 440 thousand dunums of agricultural land out of the control of the Autonomous Administration and therefore unable to reach owners. One expert interviewed said that these lands produced about 250 thousand tons of wheat, which were sent in full to Turkey.

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2) Seed

Before the crisis, the Syrian Government's General Establishment for Grain Production was responsible for producing and marketing improved seeds to farmers. During this period, production reached about 300 thousand tons, which dropped dramatically in the years of the crisis and plummeted as low as 35 thousand tons in 2018. During the war, there were only 30 seed production units in Syria, one in Hama and one in Daraa.¹²¹³ Thus, in recent years, there has been a real problem in securing sufficient quantity and quality of wheat seed for all Syrian regions, including NES.

¹² Food and Agriculture Organization (2019): "FOA and DFID Collaboration to Recover the Seed Multiplication System in the Syrian Arab Republic." Available at: <http://www.fao.org/emergencies/fao-in-action/stories/stories-detail/en/c/1201280/>

¹³ Food Agriculture Organization and World Food Program (2019): "Special Report: FAO/WFP Crop and Food Security Assessment Mission to the Syrian Arab Republic." Available at: <http://www.fao.org/3/ca5934en/ca5934en.pdf>

Key informants said that Autonomous Administration is one of the most important actors in securing wheat seeds for farmers through the Agrarian Community Development Company, which has a “seed multiplication” department and is responsible for distributing, disinfecting, and sifting the seeds before selling them to farmers. The company contracts with a specific number of farmers to obtain the necessary seeds, sell part of them and store the other part in reserve warehouses for the coming years. One expert explained that the company offers some farmers’ incentivizing contracts to produce improved seeds at a purchase price of 385 Syrian pounds per kilogram. The Seed Multiplication Department then sterilizes the seeds and packages them at the cost of SYP 40 per kg. Based on this year's figures, the Autonomous Administration is cost 425 Syrian pounds per kilogram of seed, and all key people have confirmed that the sale price to the farmer is 360 Syrian pounds. That is, the administration subsidizes the price of the wheat seed distributed to farmers by 65 Syrian pounds per kilogram.

The Agrarian Community Development Company distributes wheat seeds at subsidized prices to licensed agrarian associations. Owners of the Agrarian Land who have licenses also have access to subsidized seeds. One key informant working for the Autonomous Administration noted that the licensing procedures were relatively easy and there were no obstacles for farmers to obtain a farmland license. Even if the farm's credentials were incomplete, the committees concerned would only check the land and verify the farmer's ownership of the land, and thus give him the license, they said. However, a number of key informants stressed that the process of granting a license might be marred by some difficulties related to the size, location, and ownership of the land. Part of the land was therefore unlicensed and could not obtain the seed at the subsidized price.

The self-Administration determines the quantity of seed granted per farmer by area, but on average, it provides 30 kg for irrigated land and 20 kg for rain-fed land. However, some key informants have pointed out that the land may require 40 or 45 kilograms of seeds, so many farmers, even those with an agricultural land license, have to resort to the traders or use the seed self-stock that some of them have. The department is also currently unable to sell the seed to all farmers in order to ensure that some of them who cannot afford the seed directly have to buy it from market dealers who can sell the seed in debt. The market price of a kilogram of wheat seed ranges between 450 and 500 Syrian pounds. Merchants buy seeds from farmers, store them for the coming seasons and sell them at a price about 25% higher than the price of Autonomous Administration, without the latter being able to impose price controls and sanctions on offending merchants. Some key informants explained that some traders were smuggling large quantities of wheat seeds into Syrian government areas that refused to cooperate with the Autonomous Administration in this regard.

The results of the interviews indicate that there is a problem with the quality of the seeds available, and a farmer in Qamishli confirmed that the quality is unacceptable and greatly affects production. This reality reflects the damage that years of war have caused to the process

of growing seeds and developing improved seeds. It also points to the lack of technical and material resources available to the department to address this issue. Although it has a research center in Qamishli to develop new types of seeds and laboratories to improve the quality of existing seeds, it still needs a lot of equipment to reach the desired results of improved seeds.

The above findings suggest that the competitive advantage of wheat seeds should be monopolized by Autonomous Administration and that the Administration should redistribute them fairly and effectively to all farmers in the region without exception. This monopoly can be reached through the production and proliferation of improved seeds by the Administration that reflect positively on the quantity and quality of wheat production. Technical and financial support from international organizations and international agricultural research centers are necessary. If they have the necessary expertise, they should cooperate with private sector institutions. The production of improved and qualitative seeds, not just the process of reproducing them, will inevitably lead to demand by farmers and traders for them. Ideally, a quantity of the improved seed should be offered at subsidized prices to meet the needs of all farmers in the region. However, limited financial capacity and the inability to sustain seed material support leads to the need to open channels of communication with traders to sell part of the improved seed at cost and to agree to sell the farmers at an acceptable and defined profit margin.

3) Fertilizers

Before the crisis, fertilizers were well-available to farmers in all areas of Syria by the General Establishment for Fertilizer in Homs even when prices were liberalized in 2008. However, domestic production of fertilizer declined by about 90% during the first crisis years, gradually increasing since 2018. This decline has led to a lack of sufficient fertilizer and a surge in prices. This has led a large proportion of farmers not to use or use fertilizers in small proportions, which has affected the quantity and quality of wheat production.¹⁴

A number of key people have pointed out that the Autonomous Administration is working to secure fertilizer for wheat farmers in the region at a price about 20% lower than the market. However, the amounts raised by the administration and displayed only on licensed agricultural land cover less than half of the farmers' need for such materials, which makes most of them rely on the market and traders to secure what is left of their fertilizer needs. One key informant, an official in the Autonomous Administration, explained that the administration is experiencing great difficulties in securing fertilizer, especially after the suspension of the purchase of fertilizers from the Syrian government two years ago. This suspension forced it to rely on merchants and intermediaries to import from Turkey and Iran in hard currency, knowing that

¹⁴ Ibid.

there are some traders in the region who get fertilizer from Turkish-controlled areas inside Syria and sell it at market price. High fertilizer prices due to dependence on the outside and weak market control are among the main reasons for the increase in agricultural costs in Syria's northeast region, the official said.

Interviews indicate that there is a clear difference between farmers in the amount of fertilizer used, the methods used, and the types used to fertilize the land. Part of the difference may be related to the nature of the land and the agricultural area, but a large part is related to farmers'

satisfaction with the extent of the fertilizer's effectiveness and efficiency. One farmer from Qamishli explained that he relies on his own expertise in agriculture to determine how to make use of fertilizer and indicated that he needs about 25 kilograms of fertilizer per dunum of land, while another farmer from rural Raqqa said that based on his long practice of farming, he estimates his fertilizer needs at 75 kilograms per dunum. The control of farmers' personal views on how fertilizers are used reflects the large absence of effective technical support from Administration. The key informant, who is an official at the Autonomous Administration, explained that a small percentage of farmers benefit from the services of the guidance units of the administration to determine the quantity and quality of fertilizers needed for their land due to the lack of staff and limited capabilities. A number of key people stressed the lack of technical support to farmers on the issue of the use of fertilizers, and one of them indicated that the support is limited to what the Seed Multiplication department provides to its contractors.

The above analysis shows that traders currently have a competitive advantage in providing fertilizer to wheat farmers in the studied area, as Autonomous Administration also depends on them to secure fertilizer from abroad and sell it at a subsidized price. This reflects negatively on the cost of wheat production as traders can exploit the situation and put a high profit margin on the composting trade. The cost of importing in hard currency can also impose a significant burden on the region's economy, especially as the value of the Syrian pound continues to deteriorate. To shift the competitive advantage to farmers, international organizations could assist the Autonomous Administration in providing farmers with technical and technical support on fertilizers, enabling them to know the quantity and quality required to increase productivity and thus estimate the cost of importing it from abroad and compare it with the possibilities available. The department could cooperate with the private sector to import the required product with an acceptable profit margin, accompanied by tightened price control in the domestic market. In the long term, support and resources should be allocated to local fertilizer production, thereby limiting the impact of increased prices of imported fertilizers on the cost of wheat production.

4) Pesticides and Agricultural Medicines

Prior to the crisis, a major part of pest and insect control operations affecting wheat crops was carried out directly and with the full support of the Ministry of Agriculture. At the

research level, there was coordination between the Ministry's Scientific Committee for Agricultural Research and the International Center for Agricultural Studies in Dry Areas (ICARDA). Several research projects and studies were carried out on optimal methods to combat wheat pests such as the Sunn pest. Agricultural directorates throughout Syria usually formed committees of technicians from the Protection Department of the Ministry's Directorate for Plant Protection to monitor the spread of agricultural pests and inform the directorates if the ministry needed to intervene with pesticides and agricultural medicines. It is worth noting that the intervention of the Ministry of Agriculture at the time was just to avert the threat of widespread pests only and did not support agricultural medicines. Most of these were purchased by farmers from the private sector. The use of some pesticides by the ministry occasionally harmed the productivity of wheatland.

The Autonomous Administration official explained that the Administration is currently trying to secure pesticides to fight the dangerous pests like the Sunn pest and provide them free of charge to some farmers, but it does not have enough financial means to secure pesticides and medicines for all agricultural pests, which forces the farmer to resort to the special agricultural pharmacies. The official also pointed to the weakness of cooperation at the level of the region with regard to pest control. For example, during the previous season, Turkey sprayed repellent pesticides to the Sunn pest, pushing it to the Al Hasakah. This increased the burden of combatting this insect on the administrative agencies and the farmers in this region.

Other key informants confirmed that the Autonomous Administration does not provide medicines and pesticides. Most farmers buy them from private agricultural pharmacies in agricultural areas. The pharmacies are purchased by wholesalers and merchants, who rely on imported goods entering the region from the Kurdistan region of Iraq and through crossings inside Syria with Turkish and Syrian government areas, one key informant said. The main source of these goods is a variety of Turkish, Chinese, and Iranian goods and Syrian pesticides. Another key informant, who is an owner of an agricultural pharmacy, considers Chinese goods to be the best quality and cheapest, while a wheat merchant said that pesticides packaged in Syria were the best and cheapest, followed by Chinese pesticides. Pricing is done adequately by wholesalers and owners of agricultural pharmacies, with no price control by Autonomous Administration. Prices of pesticides and agricultural medicines are linked to a number of factors, including prices in the country of origin and import costs, profit margins for wholesalers and retail merchants, exchange rate fluctuations as well as the quantities placed on the market. A wheat merchant in the Al-Derbasiyah area explained that with the beginning of the season in February, pesticides and medicines are available, but in April, the quantities start to run out, and the price of the remaining goods will rise.

In addition to the lack of price controls, several key people said the Administration does not provide technical support to farmers on the quantity and quality of pesticides and medicines to be used, other than what agricultural extension units provided before the crisis. The official

explained that, due to limited resources, they are currently focusing their efforts on combating the main pests and verifying the validity of the medical and agricultural medicines that enter the area through laboratories in the city of Al-Hasakah. The official noted that some expired medicines were destroyed last season after they were monitored and tested by committees affiliated with the Autonomous Administration.

Merchants are considered one of the most important players in the market for pesticides and agricultural medicines in the studied area. They have the competitive advantage in this commodity because they have the ability to control prices and impose the appropriate profit margins, especially from the big merchants who are in contact with the suppliers. This can be done in cooperation with international organizations by expanding the technical staff of the Administration in quantity and quality to provide technical support to all farmers in the field of pesticides and agricultural medicines. This will help determine market requirements, so the Administration can cooperate directly with the traders in importing the required quantities and types and submitting them to the market while giving an acceptable profit margin to the traders, which will reduce the randomness of the market and pressure the rest of the traders to lower their prices.

5) Fuel and Water

Fuel has played a key role in increasing the cost of wheat production since 2008, when the Syrian government began a gradual liberalization of fuel and fertilizer prices. But the crisis has led to unprecedented spikes in fuel prices due to significant shortages, which have directly affected the agricultural sector through a significant rise in production costs. During the crisis, irrigation systems were destroyed, and many farmers were unable to irrigate their land. This was especially true in light of the fuel shortage, the absence of spare parts and maintenance services for water pumps, and the theft and sabotage of these pumps.¹⁵

The results of the interviews indicate that there is currently no problem in terms of the availability of fuel and water among the farmers of the area studied. However, most pointed to increased production costs as a result of the purchase of fuel from the market due to the inadequacy of local authorities' provisions at the subsidized price. The quantity of fuel required is linked to the lack of rainfall to operate the well pumps. An Autonomous Administration official indicates that they are providing gasoline at a subsidized price under the wells and tractors' licenses at the equivalent of 25 liters per dunum of land whose wells require large pumps and 15 liters per dunum of land with superficial wells. This is in addition to allocations for licensed tractors amounting to 200 liters of diesel at the subsidized price for every 24 hours of work. However, farmers who own large amounts of land and have the required licenses have confirmed that the quantities of fuel oil provided at the subsidized price do not always reach the quantities indicated by the Administration official. Often, it covers just half of the necessary oil.

¹⁵ Food and Agriculture Organization (2019): "FOA and DFID Collaboration to Recover the Seed Multiplication System in the Syrian Arab Republic." Available at: <http://www.fao.org/emergencies/fao-in-action/stories/stories-detail/en/c/1201280/>

It should be noted that those who do not have the licenses, (a population in NES), do not receive the subsidized allocations. The price of a liter of fuel oil subsidized in the last season was 75 Syrian pounds while the price on the free market reached 250 Syrian pounds.

Most key informants considered that the availability of water and its share of the cost of producing wheat depends on several factors, including the geographical location of the land. For example, the Autonomous Administration official noted that the areas near dams in Al Raqqa receive part of their water needs through supporting the Administration of these areas with irrigation canals and electric pumping stations. In return, the farmer pays the administration an irrigation fee of 1,000 Syrian pounds for each hectare, and each owner has the right to water once every two days. Most of the wheat lands in the region depend on well water and rainfall to irrigate their crops. This is why the abundance of water is linked to the abundance of the rainy season, the cost of getting water from wells is related to the price and availability of fuel, and these costs are greatly affected by the high prices of spare parts in case they break down due to the exchange rate of the dollar. One of the key informants, a wheat merchant from the Al-Darbasiyah area, noted that a large proportion of water pumps in Al-Hasakah are out of operation because the farmer could not afford maintenance costs and stopped watering his land sufficiently.

The Autonomous Administration plays a key role in providing fuel and water to farmers by subsidizing the price of fuel and rehabilitating irrigation systems. However, the limited resources do not allow this support to include all farmers and cover all their needs sustainably. This may result in the administration losing its competitive advantage in terms of fuel and water security, thus pushing farmers to rely more on the market and buy at high prices. To this end, consideration could be given to adjusting the price of subsidized fuel to farmers in order to achieve a sustainable price that could be higher than the current subsidized price and lower than the market price, with the quantities at the new subsidized price covering the entire fuel needs of farmers. This process may contribute to a decrease in the price of fuel in the market as a result of low demand from farmers in the event that they obtain their full needs from the administration. The Autonomous Administration should also play a greater role in ensuring the continuation of water pump work among farmers, as it can reactivate pump repair tablets. In the absence of financial liquidity, the Administration can conclude cooperation agreements with the private sector to repair pumps and set aside the amounts owed to farmers under the guarantee of the administration. In parallel, cooperation with international organizations and bodies should continue to repair and develop modern irrigation systems, surface water collection and storage systems to service the lands of the region and alleviate the uncertainty surrounding the rainy season.

Section III: Production process

This section includes research on the activities during the process of growing wheat. This comprises agricultural work and the effectiveness of available agricultural equipment, in addition to the technical support provided to agricultural workers and landowners during planting. Consideration is also provided as to how these activities are affected by the actors and the decisions taken by them in the studied area.

During the pre-crisis years, Syria saw a significant drop in the number of people working in the agricultural sector. While the sector boasted about 1.4 million employees in 2001, less than 660 thousand remained by 2011.¹⁶ This decline was attributed to a number of factors, including the migration of agricultural workers and the low profitability of agricultural work, especially after the liberalization of fuel and fertilizer prices in 2008. Several studies on the agricultural sector in Syria before the crisis also indicate that the agricultural workforce suffered from widespread illiteracy and a low level of technical skills, coupled with a weak agricultural extension system and a small number of technicians.¹⁷

During the crisis, the problems related to agricultural labor, especially skilled ones, worsened. One of the key informants, an agricultural pharmacy owner, and an agricultural practitioner, explained that the studied area witnessed large waves of migration, including the migration of skilled agricultural workers. In addition, many workers in the agricultural sector went to work in emerging Autonomous Administration entities, especially with the decrease in the efficiency of agricultural work. Most key informants emphasized the significant role of migration in increasing the difficulty that owners of agricultural land face in securing workers during the crisis years. Migration has also contributed significantly to the increase in the wages available despite the limited skill levels necessary for the labor. An Autonomous Administration official explained that they had identified a list of workers' wages before the start of the wheat season to reduce the rise in prices, but that was not accompanied by real monitoring and effective follow-up by the Administration, although any farmer could file a complaint to punish non-compliance with this list.

Some landowners give them a piece of wheat production, about 7%, while others pay them in daily installments of about 6 thousand Syrian pounds for the full day of work or about 3 thousand pounds for each dunum. These payments were seen by two key farmers as an additional burden on the wheat farmers, leading a large part of them to try to rely on themselves and their family members to finish the work. It should be noted that all key informants pointed out the complete absence of any kind of technical support by the Administration to improve the

¹⁶ Central Bureau of Statistics, Labour Force Surveys 2001-2011, Damascus, Syria

¹⁷ Hebron, Fadi (2009): "The agricultural sector in Syria: Analytical Study", University of Tishrin Journal of Scientific Research and Studies, Economic and Legal Science Series, Vol. 31, No. 1

level and qualification of agricultural workers through training courses supervised by agricultural specialists.

As for agricultural equipment and machinery, all key informants indicated that farmers rely on the private sector to secure this equipment without any support from the Autonomous Administration. The AA only intervenes in setting prices and requesting compliance with them. For example, the harvesting work allowance is set at 2,000 Syrian pounds per dunam or 3% of production, but there is little commitment to these prices due to the absence of monitoring and follow-up by the Administration. Farmers often rent their supplies, which sometimes add a heavy burden to production costs, as a farmer from Qamishli reported that the cost of sowing seed alone is about 8 thousand Syrian pounds per hectare. A farmer from the countryside of Raqqa said there is support from some international organizations that rent farmers agricultural machines for nominal amounts, but this is limited and only supports a relatively small number of farmers in certain areas.

Reaching production that serves the interests of farmers requires a consideration of them as the primary actor in agricultural inputs, granting farmers a competitive advantage in the process of wheat production, and that other actors provide the necessary support services to farmers. However, the above results indicate that the wheat farmers in the studied area are subject to the market trends and pressures. This is both in terms of obtaining the required labor and using the appropriate agricultural equipment in the absence of any effective intervention by the Autonomous Administration. In this context, the Administration can support the farmers through three tracks. The first is to cooperate with international organizations to provide technical and technical qualification courses for agricultural workers and those involved in agricultural work by farmers and their families. The second is to enter the agricultural equipment market by entering into agreements with the private sector in order to secure this equipment and lease it to the farmers at an acceptable profit margin that limits exploitation and randomness in the market. The third path is to impose effective control on the costs of workers and equipment considering the financial capacity of farmers.

Section IV: Selling and marketing wheat

This section includes the activities related to the sale and marketing of wheat by farmers in terms of buyers, including Autonomous Administration, merchants, the Syrian Government, pricing mechanisms, transport and purchase facilities, and the method of payment recognized in the studied area. The section also addresses the final destination of the wheat crop and the profitability of the farmer during the season.

The key informants explained that the Autonomous Administration is the main buyer of the wheat crop in the region and estimated that it accounts for about 80% of the total production. An official in the Autonomous Administration noted that at the beginning of each season, the Administration takes several measures to buy wheat, including determining the total budget available, preparing silos and delivery points. In addition, it determines the price of wheat based on lengthy discussions with the agriculture committees and studies implemented by subcommittees spread throughout the studied area. The administration considers wheat a necessary immediate need to be distributed to mills and a strategic commodity that is important to be stored for years to come. It has rehabilitated and allocated about 25 grain silos to this end. Although there are a number of press reports that indicate that the Administration in 2020 sold part of the wheat crop after it was bought from farmers to the Syrian government with a profit margin of about 6%, the Administration official confirmed to the research that there is no quantity sold to the government since it does not recognize the Administration bodies as an official party with which to negotiate.¹⁸ The same official also confirmed that the Administration does not prevent farmers from selling the crop to traders. It determines the purchase price and leaves the farmers to estimate the most appropriate price for it.

Part of the crop goes to the traders who buy the wheat from the farmers, especially the relatively small producers, at a price that is about 10-20% lower than the administration price, depending on the type of crop. The traders are the ones who will bear the costs of transport and sale. Most of them have the advantage of paying the farmer's dues directly, so they do not have to wait long to get the value of their crop. Traders sell wheat to private mills, Autonomous Administration, or government centers after taking advantage of economies of scale that allow them to buy and assemble large quantities of wheat from small farmers. Some key informants pointed out that a small percentage of farmers sell directly to the Syrian government centers

¹⁸ An example of these reports is the Beladi News website (2020): "On the Bread Crisis: The Autonomous Administration is selling wheat to the Syrian regime." Available at: <https://bit.ly/37eOJED>

located in the area. A farmer from Raqqa's countryside said that a good portion of farmers gave their entire crop to creditors to cover their accumulated dues and that a significant proportion of total wheat farmers were storing a portion of the crop for subsequent sale.

The farmer bears the costs of transporting the crop to the delivery centers of the Autonomous Administration. He pays between 10 and 15 thousand Syrian pounds for the transport of one ton of wheat, together with the costs of loading and unloading, depending on the distance of the center from his land. He is obliged to pay an additional amount of about 7% of the total wage for each day when the truck stops at the turn of the delivery centers. The waiting period may exceed more than one week, according to two key farmers. Each season, the Autonomous Administration is trying to reduce the cost of transportation. In an agreement with the Transport Union, a fee of 3,000 was set for transporting one ton of wheat, but the drivers did not comply with the price. As fires spread between 2019-2020, farmers feared that they would not be able to transport and sell their crops as quickly as before, leading to overcrowding at centers, said informants in Amuda.

Last season, the Autonomous Administration fixed the price of a kilo of wheat at \$0.17, which was equivalent to about 425 Syrian pounds on the exchange rate at that time. The administration official noted that farmers, wishing to avoid the impact of any collapse in the value of the Syrian pound, demanded and agreed to set the purchase price in dollars when the bill was received. During this period, the value of the lira rose to US \$0.17, equivalent to SYP 350. The farmers tried to force the administration to renege on the SYP 425 commitment announced at the time of pricing. However, the administration did not respond and continued to buy the crop at the new value of the lira, considering that the decision to tie the price to USD was made at the farmers' request in the first instance, and thus the farmers lost about 20% of the value of their crop. It should be noted that the Syrian government was buying wheat at an estimated SYP 450 per kilo, so some farmers tried to sell their crops to the government despite the administrative difficulties and the costs of transport.

The Autonomous Administration has the ability to determine trends in the wheat market through its pricing. If it offers a competitive price, it can capture a major share of the crop in the region. But if the price doesn't align with farmers' needs, many of them will turn to other players to sell their crop. The administration must therefore set a purchase price that provides a fair profit to farmers while giving them a competitive advantage in the wheat market. Based on the key informants, the purchase price set by the administration is one of the main factors determining the profit rate of wheat farmers, which currently ranges, according to their estimates, from 10 to 35%. The administration can motivate farmers to sell their crops to it by implementing steps that

have a positive impact on the activities associated with the sale. These could include effectively controlling transport costs and providing more facilities in the transport process, especially for small farmers. Other measures could include enhancing the administrative and resources available and easing procedures so that farmers' dues could be handed over with fewer bureaucratic obstacles. International organizations could contribute by providing the necessary technical and financial support to these steps.

Policy recommendations

The results of this study of all activities across the wheat value chain indicate various constraints that negatively affect the efficiency and sustainability of production. Key informants have directly pointed to many of these constraints, including high prices of fertilizer and seed, a lack of technical support and agricultural stewardship committees, lack of financial loans for farmers to support the production process, slow maintenance of water systems, the need for locally-based fertilizer production plants, and a lack of large silos as a result of war damage. Also mentioned is the migration of professional expertise and agricultural workers, a weak presence of international organizations supporting wheat production in the region, a lack of monitoring and follow-up on the implementation of decisions in support of farmers, and delays in the payment of farmers' dues after the delivery of the crop.

In determining the price of wheat, the Economic and Agriculture Committee in the Autonomous Administration relies on studies and proposals submitted by the autonomous and civil administrations and the economic and agriculture committees in different regions. However, many farmers consider the pricing process to be not based on clear scientific grounds and influenced by the views and individual interests of the participants. These farmers believe that the administration should be more transparent in determining a unified price for wheat and rely more on technicians and experts in this field. Within the framework of the actors in the governance of wheat cultivation, the Autonomous Administration relies on the private sector extensively to secure the inputs of this cultivation, but this is not accompanied by effective control or intervention mechanisms that control prices in the market. International organizations do not provide any effective support to the Autonomous Administration in the process of wheat production because most of these organizations deal only with official governments or licensed non-government organizations (NGOs). This impediment to direct cooperation can be overcome by supporting and facilitating the establishment of active civil NGOs interested in the agricultural issue in Northeast Syria and strengthening cooperation between these institutions and international organizations, thus opening channels of indirect cooperation between the Autonomous Administration and international organizations.

The reliance of a large part of the population on wheat cultivation for income, its contribution to food security, and its strategic importance renders it crucial to overcome bottlenecks in the value chain that this research paper has outlined. The policy and practical measures that can be adopted by local authorities can be summarized as follows:

- Developing and reforming the tax system on the sale of agricultural land so as to achieve greater justice for farmers working on land owned by others such as "taking possession." For example, an agreement can be obtained between farmers and landowners to impose a specific and calculated tax on the share of owners of wheat used to provide technical and financial support to wheat farmers who do not have what can be considered a competitive advantage in means of production such as large agricultural land with high productivity.
- Cooperate with international bodies and international research centers to improve the production of seeds to cover the needs of farmers. Seeds should be provided at subsidized prices, especially benefiting small farmers. In parallel, the administration could cooperate with the private sector to sell them a portion of the improved seeds and agree with them to sell the farmers with a low and determined margin of profit, which would control the randomness of the current market and help stabilize the prices.
- Work to reduce the burden of the prices of fertilizers and agricultural medicines. This can be achieved through cooperation between non-governmental organizations in the region and international institutions to provide appropriate training to the administration and civil society cadres. Given adequate capacity-building, the administration can help farmers know the quantity and quality of fertilizers and medicines needed to increase productivity and determine what is to be imported from abroad, thus better estimating the total cost. Cooperation with the private sector can take place in importing the required items, which should be accompanied by tightened price controls on the local market. In the long run, resources must be allocated to produce fertilizer locally, thereby reducing production costs and dependence on imports.
- The subsidized price of fuel to farmers should be adjusted to reach a sustainable (higher) price that covers the needs of farmers. This also contributes to reducing the price of fuel on the black market as a result of low demand. In terms of water, the administration should play a greater role in ensuring the continuity of water pumps work among

farmers. It should also reactivate pump repair tablets, cooperate with international bodies to repair water networks, and develop modern irrigation systems, which will increase the productivity of the land.

- Facilitate cooperation between local NGOs and international institutions to provide technical training courses for agricultural workers and those involved in agricultural work. In addition, agreements should be made with the private sector to secure agricultural equipment and lease it to farmers at an acceptable profit margin, with effective control of labor and agricultural equipment costs to be committed at specific prices.
- With regard to the sale and marketing of wheat, administration agencies, in cooperation with local and international expertise, can effectively reduce the cost of transporting wheat to delivery centers and provide more facilities in this area, especially for small farmers. They should also seek to regulate the process of delivering the crop, thus reducing the waiting period by enhancing the administrative and human resources available. This should take place in addition to easing procedures and removing obstacles that prevent the direct delivery of financial benefits to farmers.

The above proposals require a transparent institutional environment and the rule of law, effective monitoring and monitoring tools, and the participation of all actors in the planning and implementation process, including the private sector, farmers, and agricultural associations. The appropriate institutional environment encourages international actors to provide the necessary technical and financial support. International research centers are also encouraged to provide the necessary assistance to increase the productivity of wheat lands and thus their yield to all actors, especially farmers. Secondary data and information from key persons indicate that the average production of a watery hectare in the studied area is about 3 tons of wheat. In a number of wheat-producing countries, the average is about 4.5 tons.¹⁹ Increase production by 50% to align with the international average can increase profits, support the strategic wheat stock in the region, with the surplus wheat exported in through cooperation with the local private sector.

¹⁹ Purdy, R. and M. Langemeier (2018): "International Benchmarks for Life Production", *farmdoc daily* (8):124, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign. Available at: <https://farmdocdaily.illinois.edu/2018/07/international-benchmarks-for-wheat-production.html>