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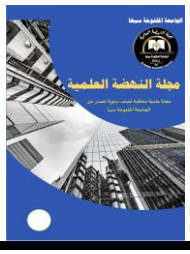

# “Agricultural Value Chains and Rural Livelihoods: A Socio-Economic Assessment of the Agricultural Situation in Three Municipalities in Southern Libya (2023)”

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**Abstract**

This study aims to assess agricultural value chains and rural livelihoods in three municipalities in southern Libya Sabha, Ubari, and Murzuk during 2023, based on field data collected from over 60 stakeholders through interviews, focus groups, and site visits. The findings reveal significant disparities in agricultural productivity, with wheat yields reaching 4.2 tons/hectare in Sabha compared to 3.0 tons/hectare in Murzuk, while post-harvest losses reached up to 40% for perishable crops due to the lack of cold storage and poor handling. Sabha scored the highest in input access (7.5/10) and market access (8.1/10), whereas Murzuk performed lower across indicators. The study applied Gross Value Added (GVA) [1] and Value-Added Ratio (VAR)[2] to measure economic performance; VAR for honey in Sabha reached 150%, while vegetable farming in Murzuk scored just 44%. The study recommends investment in cold chain logistics, cooperative revitalization, and expanded training—particularly in post-harvest practices. It also emphasizes empowering rural women and increasing youth engagement to support sustainable agricultural development in southern Libya.

**Keywords:** Agricultural Value Chains , Agricultural Inputs , Rural Livelihoods , Post-Harvest Losses . Value Added

# “سلاسل القيمة الزراعية وسبل العيش الريفي: تقييم اقتصادي اجتماعي للوضع الزراعي في ثلاث بلديات بجنوب ليبيا لعام 2023”

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**الملخص**

تهدف هذه الدراسة إلى تقييم سلاسل القيمة الزراعية وسبل العيش الريفي في أربع بلديات بجنوب ليبيا (سبها، أوباري، ومرزق) خلال عام 2023، استناداً إلى بيانات ميدانية جُمعت من أكثر من 60 جهة فاعلة عبر مقابلات ومجموعات نقاش وزيارات ميدانية. أظهرت النتائج تفاوتات واضحة في الإنتاجية الزراعية، حيث بلغت إنتاجية القمح 4.2 طن/هكتار في سبها مقابل 3.0 طن/هكتار في مرزق، مع وصول خسائر ما بعد الحصاد إلى 40% في المحاصيل القابلة للتلف نتيجة غياب التبريد وسوء المناولة. كما سجلت سبها أعلى معدل لوصول المدخلات الزراعية

[1] **(GVA) : Gross Value Added:** The net contribution of the agricultural sector, calculated by subtracting input costs from total agricultural output.
[2] **( VAR ): Value Added Ratio :** The percentage of a product’s value that is generated through local production activities; calculated as **(VAR = ( Output Value - Input Costs) / Input Costs) × 100**

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(7.5 من 10) وأفضل نفاذ إلى الأسواق (8.1 من 10)، بينما كانت مرزق أقل أداءً. استخدمت الدراسة مؤشري القيمة المضافة الإجمالية (GVA) ونسبة القيمة المضافة (VAR) لقياس الأداء الاقتصادي؛ حيث بلغ معدل VAR للعسل في سبها 150%، بينما لم تتجاوز 44% في زراعة الخضروات بمرزق. أوصت الدراسة بالاستثمار في سلاسل التبريد والتخزين، وتفعيل دور التعاونيات، وتكثيف التدريب الفني، خصوصاً في مرحلة ما بعد الحصاد. كما شددت على أهمية تمكين المرأة الريفية وتعزيز مشاركة الشباب في الأنشطة الزراعية لدعم التنمية المستدامة في جنوب ليبيا.

**الكلمات المفتاحية:** سلاسل القيمة الزراعية، المدخلات الزراعية، سبل العيش الريفي الفاقد بعد الحصاد، القيمة المضافة

## Introduction

Agriculture remains a vital pillar of Libya's economy, particularly in rural regions that face economic fragility and a lack of stable alternative sectors. Although only about 2% of Libya's total land area is considered arable (FAO, 2010, p. 7), the southern region possesses vast tracts of farmland and deep groundwater reserves, offering significant potential for agricultural development.

This study focuses on three key municipalities in southern Libya: The targeted cities in the study, especially in Sabha, Ubari, and Murzuk are located on migration routes from Southern African countries to the North. As of February 2023, IOM Libya's Displacement Tracking Matrix (DTM) programme identified a total of 23,276 migrants in Sabha, 12,750 migrants in Ubari, and 23,675 migrants in Murzuk. Most of migrants arrived from Niger, Chad, Nigeria, and Sudan and mostly work in agriculture sector. However, the lack of economic opportunities along with the struggling private sector, caused an increase in the unemployment rate among migrants, especially in Sabha. The unemployment for migrants could cause hunger and might push migrants to cultivate illegal and unofficial sources of income.

**Sabha** is the administrative and commercial hub of the Fezzan region, located approximately 780 km south of Tripoli. It has an estimated population of 210,000 residents and contains over 350,000 hectares of cultivated land, making it the largest agricultural zone in the south (WFP & REACH, 2023, p. 18). Agricultural activity in Sabha is diverse, including cereals, vegetables, fruit trees, livestock, and beekeeping.

**Ubari** lies 915 km from Tripoli and 135 km southwest of Sabha, with a population of about 30,000 people distributed across four main districts (REACH Initiative, 2021). It is known for high-quality grape production and vegetable cultivation. Farming in Ubari relies primarily on groundwater and drip irrigation systems. The area has suffered infrastructural damage due to past armed conflicts.

**Murzuk**, located 130 km south of Sabha, has around 22,000 inhabitants (REACH, 2021). Its agricultural activity includes tomatoes, peppers, and fodder crops, as well as livestock such as camels and goats. However, the municipality has seen a decline in basic infrastructure and services, especially following the 2019 conflict, which displaced over 15,000 people (IOM Libya, 2020).

Despite the natural resources and agricultural potential, these municipalities face significant challenges including poor infrastructure, limited storage and cooling systems, high post-harvest losses (reaching up to 40% in perishable crops), and weak market linkages (UNDP, 2021, p.

22). Input access scores vary, with Sabha scoring 7.5/10 and Murzuk only 4.0/10, while market access ranges from 8.1 in Sabha to 4.5 in Ubari.

The southern municipalities of Libya—specifically Sabha, Ubari, and Murzuk—face deep-rooted structural challenges that have severely impacted the agricultural sector and rural livelihoods. Since 2011, the protracted conflict and ongoing political fragmentation have eroded public investment and weakened the role of agricultural cooperatives and extension services, leading to a decline in productivity across most areas (World Bank, 2023). While Sabha has demonstrated some resilience due to improved irrigation systems and market access, Ubari and Murzuk remain relatively isolated and underdeveloped.

According to the World Bank, unemployment rates in the targeted municipalities range between 20% and 30%, with the majority of the unemployed being youth. Furthermore, over 85% of employed individuals work in the public sector, which is under strain due to persistent political and economic division (World Bank, 2024). The prolonged conflict has also caused extensive damage to livelihoods, unprecedented levels of unemployment, and the collapse of local economic and livelihood opportunities, especially within the agro-food sector. As a result, many unemployed youth have adopted negative coping strategies, including joining armed groups or engaging in illicit activities such as trafficking and smuggling (WFP, 2023).

In light of this context, there is a critical need to conduct a comprehensive analysis of agricultural value chains in the region. Such analysis would help identify existing inefficiencies and gaps, guide strategic interventions, and promote sustainable agricultural development. Ultimately, this could contribute to reducing unemployment, strengthening local economies, and improving resilience among vulnerable rural communities in southern Libya.

This study aims to understand the overall structure and performance of agricultural systems in the three municipalities by analysing key value chains and identifying institutional and technical challenges faced by farmers. It further explores geographic disparities in access to resources and services, highlights the role of women in agricultural activities, and offers practical, evidence-based recommendations to promote inclusive and sustainable rural development in southern Libya.

**The significance of this research** lies in its effort to document, analyse, and interpret the current state of agricultural production and value chains in these three municipalities. By combining extensive fieldwork—including interviews, focus groups, and direct observation—with critical analysis of value chain functionality, the study generates an integrated perspective on agricultural constraints and opportunities in the region. It not only fills a crucial knowledge gap in the literature on post-conflict rural development in Libya but also provides practical, context-sensitive recommendations for policymakers, NGOs, and donor agencies working in the sector.

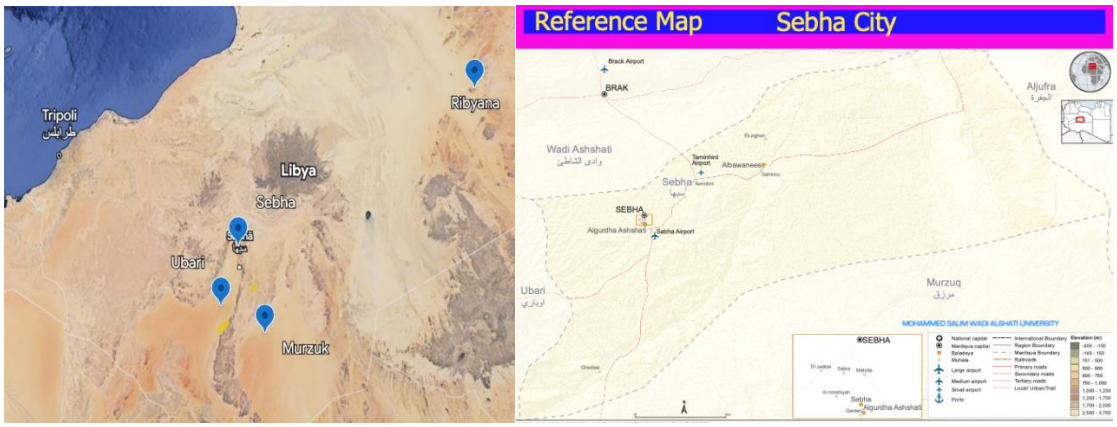


Figure 1: Location of Sabha, Ubari, Murzuk, and Ribyana, created by the author.

**Main Stakeholder**

The assessment is conducted through working with the following stakeholders:

- Municipalities of Sabha, Ubari, and Murzuk,.
- Ministry of Agriculture
- Agriculture Cooperatives and Associations
- Farmers
- Business owners and traders
- Higher Educational Institutions

**Assessment Methodology**

This study adopted a qualitative research methodology grounded in fieldwork conducted between April and December 2023. Data collection involved a combination of semi-structured interviews, focus group discussions, and direct field observations. Interviews were held with a diverse range of stakeholders, including farmers, agricultural input suppliers, cooperative members, and representatives of local authorities. Field visits were conducted across farms and agricultural facilities in the four target municipalities—Sabha, Ubari, Murzuk, and Ribyana—allowing for contextualized data gathering and firsthand insights into production systems, infrastructure, and market dynamics.

In each municipality, the assessment process began with semi-structured interviews conducted with representatives from the local municipal councils, particularly those overseeing the agriculture sector. Respondents were asked a series of general and technical questions (see Annex A), designed to provide an overview of agricultural systems, challenges, and institutional structures. The municipalities were also requested to recommend a list of farmers, businesses, cooperatives, and higher education institutions to be included in the study sample.

In parallel, the assessment team—drawing on its existing network—compiled an independent list of farmers and agribusinesses actively operating in the target municipalities. These individuals and entities were also interviewed to ensure a representative and balanced sample that includes both formal and informal actors in the agricultural sector.

To complement the interviews, at least one Focus Group Discussion (FGD) was conducted in each municipality, consisting of five to eight participants. These groups included a minimum of five livestock farmers, five vegetable producers, and five animal fodder growers per location.

In Sabha and Ubari, the team also conducted five key informant interviews each with livestock businesses, vegetable traders, and fodder suppliers.

In Murzuk, only two agricultural businesses were identified and interviewed due to the limited number of active enterprises in the area. In Ribyana, only one agribusiness was interviewed, reflecting the municipality's high level of market isolation and minimal commercial activity.

Regarding academic institutions, two professors from the University of Sabha and two instructors from the Agricultural Technical Institute in Ubari were interviewed to provide insights on agricultural education and extension services. Additionally, two farmer associations in Sabha and one in Ubari—along with the Fazzan Agricultural Cooperative—were consulted to understand their roles, capacities, and policy engagement.

From the governmental side, interviews were held with the National Centre for Cooperation and Agricultural Media, the body responsible for issuing publicity certificates for agricultural associations and cooperatives.

Figure 2 presents the total number of interviews conducted across all stakeholder categories and municipalities. All questionnaires used in the assessment were translated into Arabic and made available in Google Forms format to facilitate data collection, digital recording, and streamlined analysis. The complete list of stakeholder-specific questions can be found in Annexes A through E.

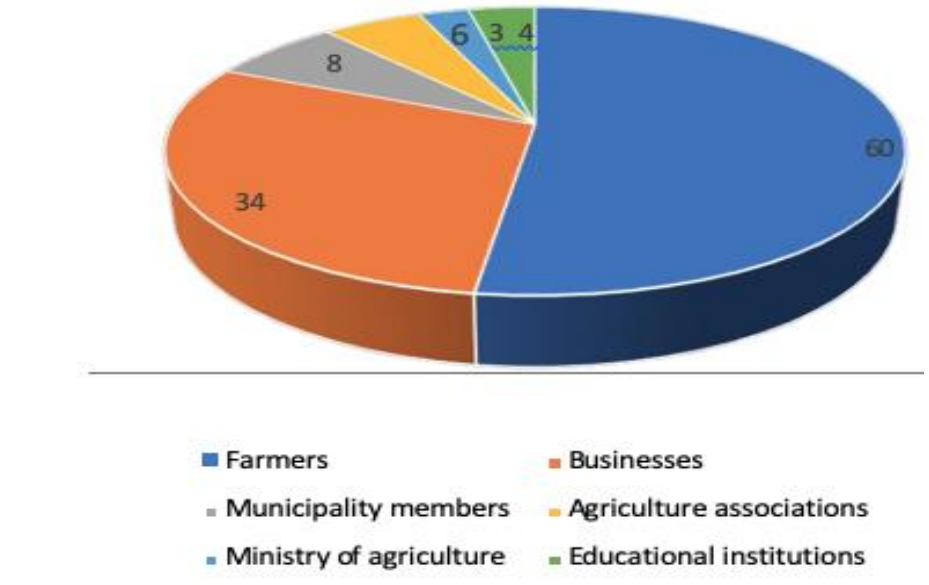


Figure 2: Number of interviews per stakeholder, created by the author

stakeholder Selection and Data Collection Procedures

**General findings Area and Locations**

Sabha is the largest city in the Southern part of Libya located around 780 Km south of Tripoli. The total population is estimated to be around 210,000 inhabitants according to the predictions

of the Libyan Bureau of Statistics and Census. Sabha municipality has 13 districts: Hijara, Abdul Kafi, Al Manshiya, Tahrir, Sakra, Al Qahira, Al Mahdiya, Sabha City Center, Al Thanawiya, Al Qardha, Al Nasiriya, Al Jadid, and Qodwa.

Ubari on the other hand is located around 915 Km away from Tripoli (135 Km Southwest of Sabha). The total population is estimated to be around 30,000 inhabitants. The city comprises four main districts: Dessa, Mashro, Ubari center, and Hattya (REACH Initiative, 2021).

Murzuk is located around 910 Km away from Tripoli (130 km to the South of Sabha) and has total population of around 22,000 inhabitants in five districts: Murzuk Almadena, Gowat, Haj Hajeej, Edleem, and Jezaw.
Finally, Ribyana is located around 1800 Km Southeast of Tripoli (150 km of unpaved road) and 135 km from Alkufra. The total population is around 10,000 inhabitants. About two thirds of the population is located in Gadersee and Shora districts (10 km from Alkufra) while about 3,000 inhabitants are located in Albahreyaa, Alhara, and Grana around the center of the city.

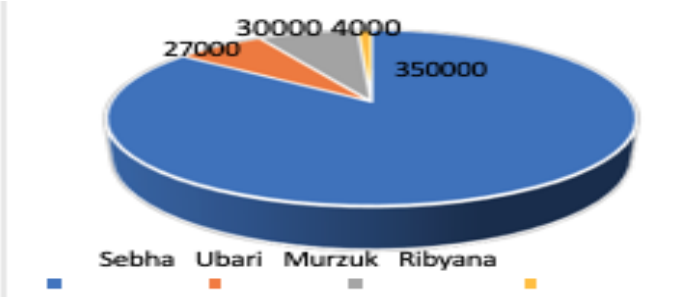


Figure 3: Approximate arable area in Sebha, Murzuk,

**Arable land size and types of crops**

The approximate size of arable lands in hectares in the targeted municipalities is as shown in Figure 3. As can be seen, Sabha is the city with the largest arable land of about 350,000 hectares and considered the largest agriculture hub in the South three types of farms can be found: large farms in circles of 40 hectares to 64 hectares each, mainly in Sabha, medium size farms with areas around 10 hectares each mainly in Ubari, Murzuk, and Sabha, and small farms with areas less than 5 hectares in all municipalities but very common in Ribyana. The large farms in Sabha are called circles and are dedicated to barley, alfalfa, and wheat. The yield obtained from one hectare of barley on average, 4 tons. Barley is among the most widely grown crops in Sabha. According to farmers, growing barely is relatively simple and requires less experience and a small quantity of fertilizers compared to alfalfa, wheat, tomatoes, cantaloupes, and watermelons. On average, barley farmers use a total of 400 kg of fertilizers per hectare for the entire season. Also, the amount of chemicals and sprays used for weeding control is relatively small. Additionally, the income generated from growing barley is high, especially after the eruption of the Ukraine-Russia war, thus limiting the imported goods into the country.

**Irrigation systems**

Larger farms in Sabha use circular irrigation as shown in image 1. Farmers explained that they prefer circular irrigation as it reduces the number of needed water pumps and water wells as compared to irrigation with sprinklers. Farmers use two water wells of 60m to 100m deep, and two submersible water pumps of 60 hp to power one circular irrigation unit that is capable of

irrigating 50 to 64 hectares. Farmers highlighted the need to dig at least five water wells and use five water pumps to irrigate the same area with sprinkler irrigation. Despite their relatively high prices, circular irrigation systems are available in the Libyan market. They can also be ordered from overseas through local distributors in Sabha, Tripoli, and Misrata. Medium size farms are very common in Ubari and Murzuk with size of 10 hectares each. Medium size farm owners also grow barley, alfalfa, and wheat but not on the entire farmland. They usually own one water well, that usually covers two to three hectares per season. They use water sprinkling systems as shown in Image 2 powered by 20 hp submersible water pump.

Image 1: Large farms in Sabha that use circle irrigation system (taken in Sabha), created by the author

Image 2: Sprinkling irrigation in Ubari, created by the author

**Type of Agricultural Production**

High percentage of medium size farms cultivate fruit trees as shown in images 3- 6 the most common trees in Sabha are oranges, grapes, olives, figs, and palm trees. Farmers explained that palm, fig, and grape trees have been cultivated in Sabha for a very long time. However, the widespread of olive and orange trees is driven by the good market price as well as the high demand especially in Sabha market. Farmers in Sabha noted that while there is widespread of planting olive and orange trees, there is less interest in growing palm trees as the market mainly relies on dates supplied from Alkufra which guarantees a better quality.

Ubari is recognized for its good quality grapes. Some farmers grow five hectares of grapes. A farmer explained that he put his production in the market, before the arrival of the grape from coastal regions, in order to gain good profit. Farmers reported that there are more palm trees in

Ubari compared to olives. Tree farmers in Sabha, Ubari and Murzuk use drip irrigation systems due to their time/cost efficiency.

Some medium size farms grow watermelons, cantaloupes, tomatoes, peppers, cucumbers, and eggplants. Watermelons and cantaloupes are planted under plastic protection in early January to ensure their maturity before the hot season that starts in May.
Also, the generated profit is better, if watermelons and cantaloupes are mature by the end of April because they will be sold earlier in the market. Farmers in Murzuk grow more tomatoes, peppers, and eggplants compared to other municipalities as shown in images 7-8. Farmers in general refrain from growing perishable vegetables because they lack good post-harvesting practices. Selling perishable vegetables and fruit during its peak season is not cost effective.

Image 3-6: Some of trees grown in Sabha, created by the author

Some farmers grow tomatoes, cucumbers, and peppers inside greenhouses, especially in Hejara and airport districts in Sabha. However, the greenhouses are only used during the period from November to March due to the high temperature which can reach 47 degrees during summer and even higher inside the greenhouse. There are very few farmers who use greenhouses in Sabha and Ubari.

In general, tomatoes, peppers, cucumber, and leafy greens are cultivated in small plots for household consumption. Small size farms are dominant in Ribyana as shown in image 9. Farmers in Ribyana do not grow large areas of barley, wheat, and alfalfa because of a severe lack of electricity and water. The electricity is supplied through a public generator. As for trees, most farmers in Ribyana grow palm trees due to their tolerance to dry soil. Like medium scale farms, small farms use sprinkler irrigation for alfalfa and barley. However, in Ribyana, farmers do not use drip irrigation but hoses irrigation system.

Image 7-8: Pepper and Eggplant in Murzuk, created by the author

Image 9: Alfalfa farms (Ribyana), created by the author

**Farm workers**

Agricultural work represents one of the oldest and most vital human activities, serving as the cornerstone of food security, economic stability, and rural livelihoods. In many regions, particularly in developing countries, agriculture remains a primary source of employment and income, shaping the social and cultural fabric of communities. Beyond food production, agricultural labour contributes to land management, environmental sustainability, and the preservation of traditional knowledge systems.

In the context of Southern Libya, agricultural work is not only a means of sustenance but also a pathway to resilience and community cohesion. Despite challenges such as climate variability, limited infrastructure, and market access barriers, many families continue to rely on agriculture—either directly through cultivation and herding or indirectly through seasonal employment and cooperative activities.

Agricultural Labour Force in Southern Libya: Integrated Analysis

**1. Farm Labour Structure**

The organization of agricultural labour in southern Libya varies based on farm size and operation type:

- Small farms are typically family-run, with no external labour employed.

- Medium and large farms often rely on seasonal migrant workers from Niger and Chad, paid daily wages ranging between 20–40 LYD.
- In some cases, workers from Pakistan, Bangladesh, Egypt, and Palestine are engaged under profit-sharing models, receiving 30% to 50% of the crop revenue instead of fixed wages. This labour structure is largely informal, based on verbal agreements and seasonal flexibility. It lacks legal protection and exposes workers to economic insecurity and potential exploitation.

**2. National Labour Force Context**

According to the Central Bank of Libya (2023) and the International Labour Organization:

- Libya's total labour force is estimated at 2.6 million, with 352,000 employed in agriculture.
- Agriculture contributes less than 9% of national employment, despite its importance in the southern regions. (El-Hawat & El-Shibly, 2021; Saadi, 2022) The low representation of agriculture in national employment reflects its declining attractiveness and underinvestment, especially among Libyan youth.

**3. Agricultural Employment Patterns**

In the southern municipalities, employment arrangements include:

- Seasonal hiring during planting and harvest seasons.
- Annual employment in a few large farms with year-round activity.
- Full-farm leasing, where landowners lease their farms to others (Libyan or non-Libyan) for a fixed fee, disengaging from direct production.

These practices indicate a shift from self-production to semi-outsourced farming, common in fragile economies with limited local workforce availability.

**4. Socioeconomic Implications**

- Cheap labour maintains production continuity but fails to support long-term rural development, due to lack of worker training, contracts, or insurance.
- Low Libyan participation in agricultural labour reflects declining interest among youth and a perception that agriculture is economically unstable. Without incentives and support systems for youth, the sector will remain dependent on transient and unprotected migrant labour.

5. Labour and Migration Dynamics

Libya hosts approximately 2.1 million migrant workers, many of whom are informally employed in agriculture, especially in the south.
Labour remittances exceed 12.5 billion LYD annually, underscoring the economic weight of foreign workers. While migrant labour sustains agriculture, its informality and volatility pose risks to food security and labour market stability.

Conclusion

The agricultural labour force in southern Libya is structurally fragile and under-optimized. It is dominated by informal migrant labour, low youth involvement, and minimal legal oversight. A

comprehensive strategy—combining skills development, youth engagement, migrant regulation, and rural economic incentives—is essential for sustainable agricultural growth and value chain upgrading.

Smallholder farmers work as a family business without hiring any additional worker. However, large, and medium scale farmers hire non-Libyan seasonal workers. Some farmers hire workers on a yearly term while others hire them only during the planting and harvesting season. Large farm owners usually pay a percentage of the generated income to workers as compensation for their work.

Most workers who are employed on a daily basis, are from Niger and Chad and their daily pay is between 20 and 40 LYD.

However, workers from Pakistan, Bangladesh, Egypt, and Palestine usually cultivate barley, wheat, alfalfa, watermelon and cantaloupe for 30% to 50% share of the generated income.

Some farmers rent their farms to Libyan and non-Libyan farmers for fixed amounts regardless of how much money they generate.

**Sales of Production**

Large farm owners usually sell their production in the field. The merchants buy the production on the spot, collect and package it and send it to the market in Tripoli and Misrata. Some farmers store their production during the peak season in summer, since the prices are low and injected into the markets when prices are good, especially during winter. Medium, and small size farmers do not own storage facilities and tend to sell the produce in its peak season at a lower price.

Farmers who grow cantaloupe, watermelon, grape, barely, wheat, claim to have profit percentage ranges between 50% and 100%. According to the farmers, the profit percentages for seasonal tomatoes, peppers and cucumbers range between 5% and 10%. Most barley farmers, claim that the profit for this year is less than last year. However, they are generally satisfied due to the stability of electricity and availability of liquidity in the banking system as compared to previous years. The percentage of income related to agriculture is estimated to be 80% for large farmers and less than 20% for small farms. Most farmers use agriculture as secondary income and only a few elderly farmers rely on agriculture for living.

All farmers except those in Ribyana (who can rely on to one generator), rely on public electricity grid, through Ubari power station. Farmers are supposed to pay 0.2 LYD per kilowatt per hour, however, very few farmers reported being consistent in paying electricity. Farmers reported that the electricity stability during the last year encouraged them to invest in more agriculture inputs and machinery.

**Livestock Farming**

Livestock farming is predominant especially in Sabha, Ubari, and Murzuk. Sheep and Goats are the most common livestock followed by Camels and Cows. The majority of small and medium farm owners have between 10 to 50 sheep and goats. Images 10-12 shows sheep and goats from farms in Ubari, Murzuk, and Sabha (REACH Initiative, 2021).



Image 10-12 below present Sheep and Goats farms Ubari, Murzuk Sabha. Created by the author.

Due to the limited rainfall in the targeted municipalities, most farmers rely on the animal feed produced on their farmland. Sheep and goats owners reported a percentage profit of more than 50% this year, compared to previous years due to the noticeable increase in meat prices.

Image 13: Camel herd in Sabha, created by the author

high percentage of farmers in Sabha, Ubari, and Murzuk own camels mainly for meat production. The herd size could be as large as 100 head as shown in image 13. According to farmers, camel herds are imported from Niger, Chad, and Sudan. However, due to the limited feed in those countries, imported camels are poorly fed and do not have enough meat. Therefore, farmers buy camels and feed them properly for three to six months in order to sell them at good prices to butchers in Sabha, Tripoli, and Misrata. The percentage of profit generated per camel is around 20%. There are farmers who raise cows for milk and meat in Sabha and Ubari. The reported cow herd size ranged between 2 and 10. Image 14 shows cow herds in Sabha. Farmers usually keep the female cow for milk and sell the male for meat. Cow owners reported selling the raw milk with 3 LYD per letter to small scale dairy factories in Sabha. Chickens are mainly raised on a small scale for domestic use. Farmers believe that raising chicken is very expensive and requires more knowledge compared to other livestock.

**Agriculture supplies businesses**

There is a very mature private sector that sells machinery in Sabha. Alfath for Importing Agriculture Supplies is among the largest companies in the area. Alfath is an authorized distributor for internationally recognized machinery companies including New Holland. Alfath reported increasing agriculture activities and better sales over the course of last year, especially for water pumps and irrigation systems. According to the sales manager, agriculture shops in Sabha have customers from all the cities in the south including Ubari and Murzuk. Images 15-

16 shows some of the machineries available in Sabha market. The largest hub for agriculture businesses in Sabha is located in the Al Qardha district. The approximate number of shops that sell machinery and other agriculture and livestock inputs in the four targeted municipalities is shown in Figure 4.

Image 15-16: agriculture businesses in Sabha, created by the author


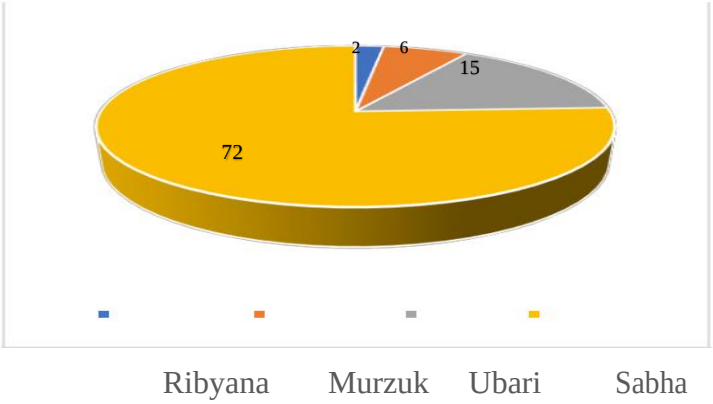


Figure 4: number of shops that sells machinery, agriculture inputs, and livestock inputs per municipality, created by the author

**Social composition of the agricultural structure**

**Sabha** has three main tribes namely *Tebu*, *Arab*, and *Twareg* (Barber). Arab is the biggest community and has more than 20 subtribes with *Qdadfa, Warfelaa*, and *Awlad Suliman* being the largest. Multiple clashes erupted between the different communities during the period from 2011 and 2019. However, the current situation is stable and there is an elected municipality.

Sabha municipality works with and receives support from the governments of Tripoli and Benghazi.
As for agriculture, the Arab community is more involved in farming, especially for large agriculture circles of barley and alfalfa. Tebu and Twareg farmers are more involved in farming and trading livestock. However, involvement of all communities is important for successful project implementation. **Ubari** is composed manly by three communities namely *Twareg*, *Tebu*, and *Arab*. However, the number of Tebu and Twareg is relatively high compared to that in Sabha. Like other cities in the country, Ubari experienced conflict during the 2011 revolution. However, the most extreme war in Ubari occurred in 2016 between Tebu and Twareg leaving more than 400 casualties and causing huge waves of displacement and destruction to the city infrastructure. Currently, most displaced people have returned to the city and the stability is restored with an elected municipality that works with the two governments in Tripoli and Benghazi.

**Murzuk** on the other hand has two communities: *Ahali* (Arab) and *Tebu*. War erupted between the two communities in 2019 leading to displacement of most of the Arab community. Most of the Arab community is still displaced all over the country. IOM estimated the total number of displaced Arab from Murzuk to be around 15,000 individuals. Currently, most of Murzuk residents are Tebu with few of Arab in Jezao, Edleem, and Haj Hajel districts.

Murzuk does not have an elected municipality but has a steering committee of seven members led by a member from Tebu community and includes three Arab members. The steering committee claims that they welcome any returnees from the Arab community if they are not responsible of any previous crimes. However, the displaced Arabs are hesitant to return as they believe that the violence could erupt any time, especially with the fragile political situation in the country. Additionally, a large part of facilities and electricity infrastructure have been destroyed. Displaced communities do not commit to return, until they receive governmental support to rehabilitate their homes and ensure their safety.

**Ribyana** used to be part of Alkufra municipality which is led by *Zwiaa (*Arab). However, the continuous conflict between Arab and Tebu led the latter to the foundation of a new municipality, Ribyana, managed by them. Two of the Tebu districts (Gadrsee an d Shora) are still located close to Alkufra municipality, but they considered themselves part of Ribyana municipality.

Like Murzuk, Ribyana does not have an elected municipality and is governed by a steering committee of seven Tebu members. The committee has a good relationship with both governments in Tripoli and Benghazi. However, the tension between Arabs in Alkufra and Tebu in Ribyana is still very high.

It is worthwhile to mention that some people from Tebu and Twareg communities do not have Libyan national ID and are being perceived by the public as non-Libyan.

### Challenges facing farmers

Farmers in the four municipalities reported multiple challenges. The major challenges are related to the continuous conflict and instability including roads closure and oil blockage. A farmer from Sabha reported that a road's closure due to a fight between armed militias last year prevented him from accessing his farm and livestock for days causing great damage. Also, there is an increase of oil blockage that supply the only source of electricity, Ubari station; this

situation causes electricity outage and leads to huge losses. Farmers also mentioned the impact of stability on market price as well as on agriculture inputs prices.

The high seeds and machinery prices continue to constrain medium and small farm owners' ability to cultivate larger areas. Agriculture input business explained that, since most agriculture inputs and machinery are imported from overseas, the increase of the exchange rate across the country at a rate of 4.85 LYD to 1 USD (was 1.4 LYD for 1 USD before 2011) caused inflation in prices. Farmers also highlighted the issue of low-quality pesticides and fertilizers in the market due to the absence of quality control from the government.

Figure 5 shows the main challenges facing the farmers in the four municipalities.

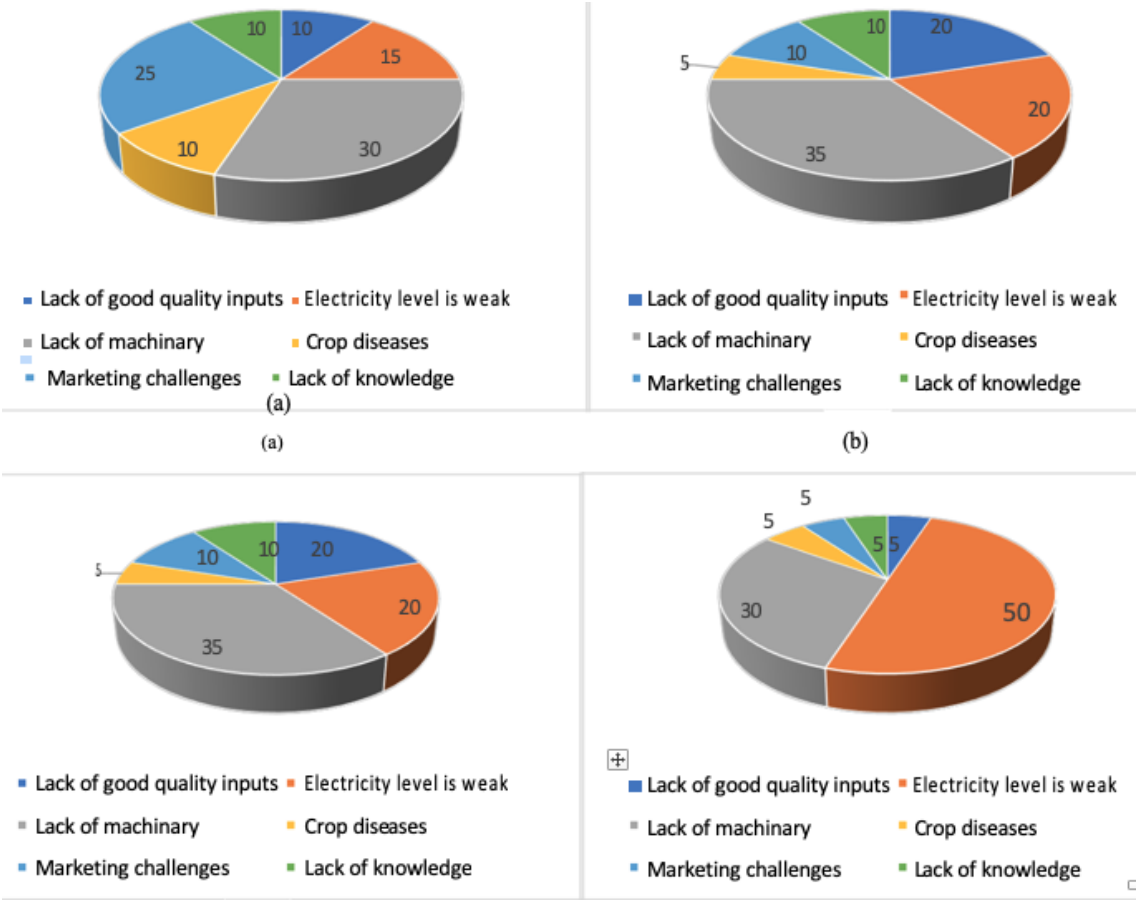


Figure 5: challenges outlined by farmers a). Sabha, b). Ubari, c). Murzuk, d). Ribyana, created by the author

Farmers who grow perishable fruits and vegetables lack storage and preservation facilities. A Farmers who grow tomatoes in Ubari claimed that they preferred to feed their livestock with their vegetables production last year, because the price of sales during the peak season didn't even cover the transportation cost.

Small and medium size farm owners who grow barley and wheat face issues finding harvesting machines for rental when they are in need. Harvesting machines renters prefer to work for large farms to avoid problems moving their heavy harvesting machines. This situation causes delays in harvesting and loss of yield and hay for small and medium farm owners.

Large farm owners in Sabha are facing difficulties with marketing. In one hand, they do not know the nutrients composition of their produce and hence its quality. On the other hand, they do not have connections with food and animal feed factories in the eastern and western part of the country to know their requirement. Therefore, factory owners keep importing seeds while farmers struggle to find local buyers.

The other main issue Ubari farmers mentioned is the degradation of the underground water supply, some must dig up to 170 m to obtain enough water. Farmers from Ahali who recently returned to Murzuk are facing issues with electricity since most of the infrastructure was destroyed or stolen after their displacement. Ribyana farmers have issues with electricity as they do not have governmental electrical grid so they are coping with trees that could survive with small amount of water such as palm trees.

Transboundary animal diseases from Chad and Niger are considered one of the biggest challenges for livestock production and development in Murzuk, Ubari, and Sabha. In addition to external diseases, there is a diffusion of Bluetongue in sheep which is considered as the deadliest disease. Farmers do not seem to find effective vaccination for Bluetongue in the Libyan market.

In Addition to the challenges highlighted above, a few farmers stated a lack of knowledge in agriculture as a challenge. Farmers lack knowledge of modern irrigation techniques, diseases prevention and detection, soil composition, and water composition.

The absence of communication and knowledge sharing among farmers and between farmers and other stakeholders including agriculture businesses, ministry of agricultures, and educational institutions seem to be one of the challenges.

**Agriculture inputs needs**

Small and medium size farm owners stressed the importance of good quality agriculture inputs, for example good quality crops, fertilizers, pesticides, water pumps, irrigation systems, and machinery. According to farmers, the good quality inputs are available in the Libyan market but relatively expensive compared to the obtained income. Some small farmers reported that they have abandoned agriculture because they cannot afford to buy good quality water pumps. Barley farmers had to postpone harvesting because of the lack of harvesting machinery.

Due to weather constraints, farmers in the four municipalities work only during the cold season which is only six months per year. Farmers expressed interest in growing crops that are compatible with the hot season. Providing farmers with seeds that are suitable for summer and training them on how to grow it will help farmers increase their income. Some farmers are interested in growing corn because they believe there is high demand in the market since corn is used in Libya as animal feed and as flour and oil. However, farmers lack the required knowledge and understanding of the multiple categories of corn such as flour corn, sweet corn, etc. Some farmers expressed interest in learning more about the corn lifecycle from choosing the seed up to post harvesting.

Farmers who grow grapes, figs, olives, and palm trees are struggling to find good pesticides to fight spider mites, olive psyllid, olive fruit fly, leaf curl diseases, etc. Farmers who grow olive trees are still exploring the best tree that could survive in hot and dry weather in Sabha and produce good quality olive oil. Farmers need olive trees that are suitable for their environment.

Farmers requested support with water well digging due to the continuous water level degradation. Some farmers had to use smaller water pumps to avoid digging another well which in return affected the level of production. According to key informants, digging an 80 m water well in Sabha cost around 50,000 LYD. This cost is attributed to drilling cost of 250 LYD per meter, well seal which cost around 150 LYD per meter, water pipes that cost around 150 LYD, electrical cable with cost of around 40 LYD per meter, and water pumps that cost around 5000 LYD for 20 hp water pump.

Large scale farmers who mainly grow barley and alfalfa require testing facilities to obtain information on the nutrition level of their products including calories, water, protein, sugar, and carbs. A farmer in Sabha reported that he had to drive to Tripoli to test samples of his barely and ensure that it contains good nutrients level for flour production. This information is important when choosing the seeds for planting as most flour and fodder factories in Tripoli and Misrata only buy Barley and Wheat with certain specifications. So, farmers need to test their seeds before planting to ensure that their produce meets the market needs. They also stressed the importance of soil and water testing facilities to apply pesticides and fertilizers efficiently.

Olive farmers highlighted the importance of olive oil production facilities and olive harvesting machines. Farmers use a primitive olive collection technique relying on manpower to harvest olives and that cost more than 40% of the generated income.

Farmers in Ribyana struggle to find all the machinery required for agriculture including tractors, plows, and harvesting machines.

The main challenges facing farmers in acquiring the agriculture inputs are increased prices of seeds and fertilizers, distance to sources of input, increased prices of machinery and lack of daily workers. The increase in prices of seeds is averages at 70% increase over the last 10 years, however, the increase in the price of fertilizers exceeds 300%.

**Skills needs**

Most farmers did not go through college to gain knowledge on agriculture, however some of them have gained good experience through practice. Most farmers expressed interest in training on how to maintain water pumps, irrigation systems, (used in circular irrigation) and generators. Farmers are also interested in learning how to read and understand soil analysis results and how to use the results to efficiently utilize fertilizers and water.

Agricultures businesses emphasized the importance of equipping farmers with knowledge on nutrients values and how to choose seeds, fertilizers, and pesticides to meet big food production qualities. A flour and pasta factory owner from Misrata explained that he imports wheat from Canada because local production does not meet the quality requirement. He expressed his interest in buying seeds produced locally if farmers could produce according to the required specifications.

Farmers who grow olive trees are interested in learning more on how to apply good pest and disease control. They're willing to acquire knowledge on pruning and grafting methodologies and best practices for olive harvesting. They also interested in learning about how to read olive nutrients test and determine its quality as compared to other countries such as Spain and Italy.

**Management skills for cooperative members and leaders**

Cooperatives have existed since the late 1970s. The management structure includes a manager, a financial officer, and at least 100 members. According to the Ministry of Agriculture, cooperatives should obtain certificate of publicity from them. After providing the certificate, the Ministry of Agriculture claimed that their role will only be monitoring. The government is the only source of funds for cooperatives. However, government support has ended since early 2000. Currently, cooperatives are inactive and have no accurate data regarding the number of members. In addition, most of them are built on a tribal basis and do not have youth or women members.

In **Sabha**, all agriculture associations are inactive. However, *Ajadeed* and *Qodwa associations* are still trying to work with Municipality and Ministry of Agriculture to provide support to farmers.

An active cooperative that operates in Fazzan region is called *Fazzan Cooperative for Organic Agriculture*. This cooperative was established in 2018 in Wadi Etba, around 100 Km south of Sabha. The organization focuses on promoting organic fertilizers and pesticides among other activities. It produces locally manufactured brands of organic fertilizers and claimed to be very effective. Fazzan cooperative has more than 350 members from Fazzan region, some have PhD degrees in the agriculture field. They gained good experience through working with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and Food and Agriculture Organization (FAO) on multiple projects. They also work closely with the ministry of agriculture and the ministry of economy and have women members who mainly work on post harvesting and post processing of agriculture produce.

There is another active cooperative called *Fazazan Cooperative for Cereal Farmers*. This organization was established in 2015 in Traghin (about 140 Km from Sabha). It has over 200 members from the entire Fazzan region including Sabha, Ubari, and Murzuk. They are specialized in supporting farmers who grow barley and wheat. Fazazan Cooperative for Cereal Farmers also registered with the ministry of agriculture and has its certificate of publicity.

Since Fazzan organizations operate in more than 20 municipalities in the south, it might be difficult to work with them to support members who are only from Sabha, Murzuk, and Ubari. In case, an integration of information and discussion with their management will be needed.

In **Ubari**, there are three agriculture associations among them, Desa *Association* is the most active and is working closely with the Municipality and international NGOs trying to obtain subsidized inputs for farmers.

In **Murzuk,** all agriculture associations are inactive since most farmers are displaced. There is one association called *Jezao Association* located in Jezao district in Murzuk. Even though the members of this association are not displaced, most of them are from Jezao district and do not represent other districts in the municipality.

**Ribyana** municipality has recently been established and there is no agricultural association for farmers. However, the municipality informed us that they are working with farmers and the Ministry of Agriculture to establish new agricultural association.

The *"Office of Entrepreneurship and Business Incubators"* under municipalities management structure has been introduced as part of the resolution of the Minister of Local Government No.

(1500) for the year 2022 on the adoption of a unified organizational structure for municipalities. According to the Ministry of Local Governance, this office is established to cooperate with civil society organizations and other relevant parties to spread the culture of leadership and initiative in society and to create the appropriate environment for the establishment of micro-projects. However, incubator offices in the targeted municipalities are still under establishment and have no clear structure. After discussions with Mayors of different municipalities, it seems that the best approach is to form a committee under the municipalities umbrella. The management structure of this committee should comprise a municipality member as a manager and the leaders of current cooperatives as well as the head of incubators office as permanent members. The permanent members as well as the head of incubators office should provide a list of candidates for the ToT training which Kafaa and ICU could choose from. They also should support in designing the best approach for equipment and agriculture inputs distribution which will be provided later within this project.

Trainings suggested for cooperative members (or the committee) should include technical trainings on different agricultural practices aimed to assist farmers in the area, some of these trainings may include water pump installation and maintenance, irrigation systems installation and maintenance, solar pumps installation and maintenance and water and soil nutrient solution analysis. In addition to the results obtained to determine the best vocations and trainings for farmers (below), further discussion with the cooperatives will help determine the best trainings for each municipality. Cooperative members will also undergo managerial training to optimize the chain of work and activities within the cooperative body.

**Post-harvest and marketing needs**

Farmers claim that a high percentage of produce is lost between harvesting and marketing due to the poor post-harvesting and handling practices. Most farmers in Sabha do not possess the transportation means to sell their produce beyond the Sabha market. Fruit and vegetable farmers explained that they lack proper cooling and storage facilities leading to degradation of produce quality and post-harvest losses. They believe that post harvesting practices are important to build and maintain strong partnerships with large traders who require reliable supply of quality and quantity. The lack of good post-harvesting practices triggered prices instability, in particular the low prices during the harvesting session caused by the oversupply.

Farmers across all four municipalities required similar equipment and machines to facilitate their post-harvest farming. Figure 6 shows post harvesting challenges.

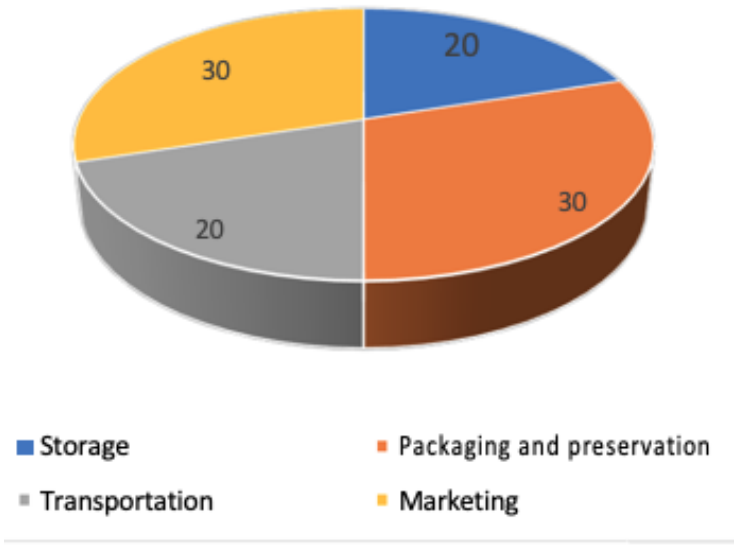


Figure 6: Post-harvest needs, created by the author

Most farmers have very limited contacts with traders outside the area and are unaware of quality standards required in markets and hence do not adopt appropriate seeds and fertilizers. As a result, many farmers suffer from low productivity, and are thus unable to sell produce to high-value markets.

Barley and wheat farmers are unaware of post harvesting demands in the market as well as the supply chain requirements. Some do not harvest the products at the correct maturity, and they do not use the proper packaging and do not ensure good workers' hygiene.

**Woman involvement in agriculture and awareness levels of agriculture within the youth**

For smallholder farm owners, both men and women aged between 10- and 60 years' work together as farming family business. Women mainly involved in harvesting of fruits and vegetables and in post harvesting such as food preservation and production.

Many women work on processing of date products, grains, dried fruits, spices, orange and grape juice and preservers. However, the social customs in the region prevent women from actively participating in the agriculture sector because this work is seen only for men.

Even though the unemployment rate is high among youth in the four municipalities, most of the work in the agriculture sector is conducted through non-Libyan workers. Few youths are seen driving tractors and harvesting machines. When asked about a job preference, most of them stated preferring governmental jobs as they believe it provides them with long term security and retirement benefits.

Youth explained that since most small and medium size farms are inherited through parents. According to the law, the land must be subdivided among all family members after their parents pass away. However, for youth from large families, their portion of the land is small and is not cost effective to use for farming. Yet, they are interested in learning how to make best use of the land through planting trees and using efficient and modern farming technologies such as hydroponic farming.

Farmers across the four municipalities suggested multiple activities that would increase the participation of youth in agriculture as shown in Figure 7.

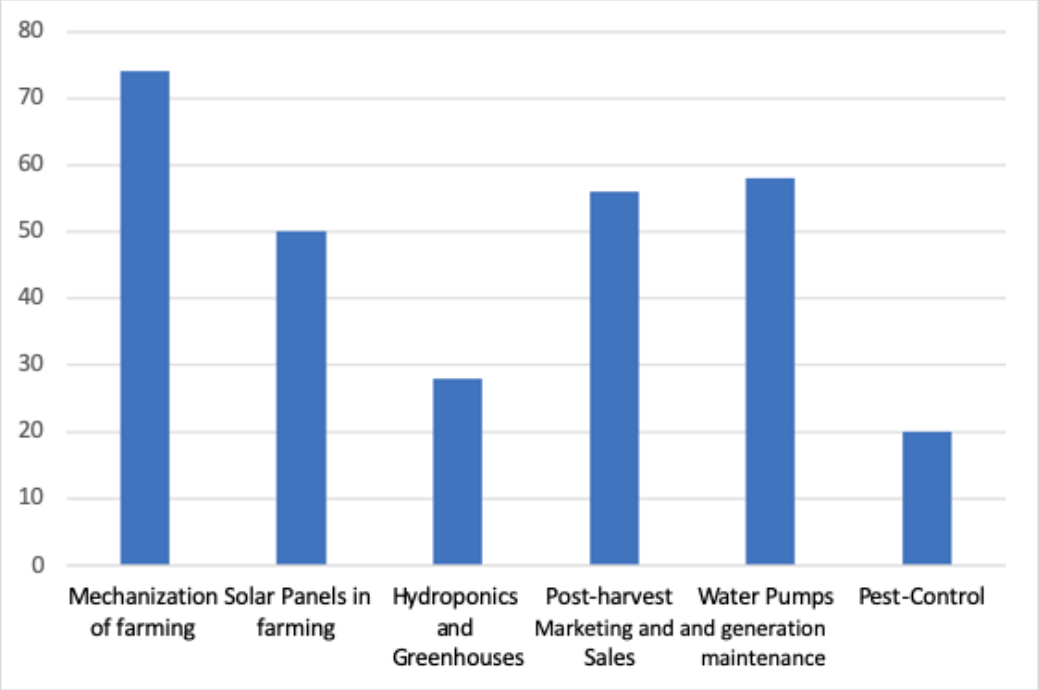


Figure 7: Activities suggested by farmers to increase youth participation, created by the author

## Value Chains for Agricultural Products in Southern Libya

### Introduction

Agricultural value chains represent a strategic lens through which the performance and resilience of rural economies can be analyzed, especially in geographically diverse and resource-constrained settings such as southern Libya. These chains encompass the full range of activities and actors involved in the production, processing, distribution, and marketing of agricultural goods—from input suppliers and farmers to processors, traders, and final consumers. (Al-Waheeb, 2020; Ghoneim, 2019)

In the municipalities of Sabha, Ubari, Murzuk, and Ribyana, value chains play a pivotal role in shaping rural livelihoods. However, these chains are often fragmented, informal, and poorly integrated with national and regional markets. The lack of infrastructure, weak institutional support, and limited access to finance or information has contributed to inefficiencies, high transaction costs, and suppressed value addition at the local level.

This chapter offers a systematic analysis of agricultural value chains across the four municipalities, focusing on six major products: wheat, vegetables, olives, fruits, honey, and livestock. It aims to identify the specific structural gaps across seven key stages—input supply, production, harvesting, post-harvest handling, processing, marketing, and consumption—and to assess the level of coordination, added value, and competitiveness within each chain. By highlighting both bottlenecks and best practices, this section provides insights into how value chain upgrading can serve as a pathway for inclusive agricultural transformation in southern Libya.

- Value Chain Analysis of Key Agricultural Products in Southern Libya

In post-conflict rural economies such as southern Libya, value chain analysis provides critical insight into how agricultural systems operate—from input acquisition and production to post-harvest handling, marketing, and final consumption. The four municipalities under study—Sabha, Ubari, Murzuk, and Ribyana—present significant agro-ecological potential, but remain constrained by fragmented infrastructure, limited access to markets, and high input costs. This chapter offers a comprehensive value chain analysis of the region's major crops and livestock, using both quantitative data and qualitative field insights gathered between April and December 2023.

## Quantitative Overview of Key Agricultural Value Chains

The table below summarizes the structure and performance of the main agricultural value chains in the target municipalities, including cultivated areas, average yields, estimated post-harvest losses, harvesting methods, and opportunities for value addition.

| Product | Production Area (ha) | Average Yield | Post-Harvest Losses | Potential for Value Addition | Harvesting Method |
|---|---|---|---|---|---|
| Barley & Wheat | 350,000 | 4 tons/ha | 30% | Processing, storage, feed factories | Manual & combine harvesters |
| Olives | 12,000 | 1.5 tons/ha | 25% | Oil pressing, branding, export | Manual |
| Grapes & Fruits | 8,500 | 5 tons/ha | 40% | Juicing, drying, cold chains | Manual |
| Vegetables | 9,500 | 8 tons/ha | 40% | Pickling, sauce production, packaging | Manual |
| Livestock | N/A | Camel: 1/year | 15% | Cold chain, vet services, meat certification | Live sale, local slaughter |
| Honey | N/A | 10 kg/hive | 10% | Packaging, labeling, export opportunities | Manual extraction |

## Value Chain Stages and Analytical Interpretation

The diagram below illustrates the seven key stages of the agricultural value chain relevant to southern Libya. Each stage reflects distinct performance gaps, inefficiencies, and opportunities for upgrading based on field observations and data analysis.

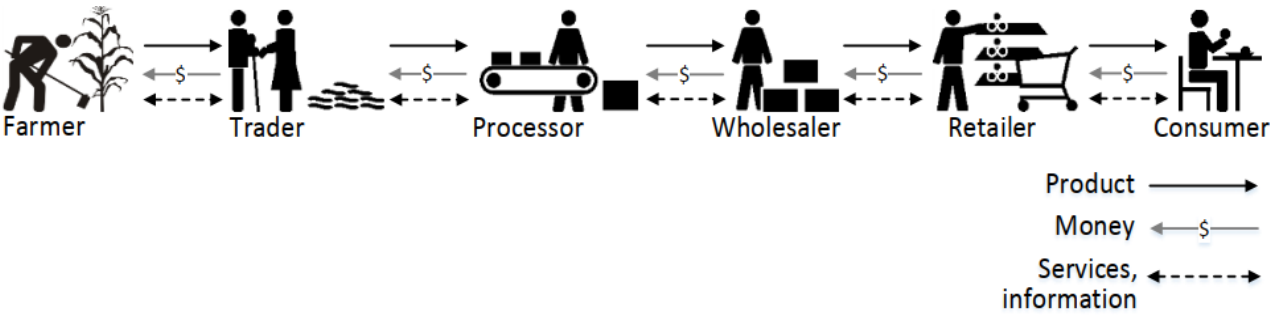


**Figure: (8)** Core stages of the agricultural value chain in southern Libya.

1. **Input Supply**
   Farmers in Sabha had relatively good access to seeds, fertilizers, and equipment, scoring 7.5/10 in input access. In contrast, Ribyana had very limited access (3.1/10), often relying on informal suppliers with no quality guarantees.

2. **Production**
   Yield variations between Sabha (4.2 tons/ha) and Ribyana (2.5 tons/ha) reflected differences in irrigation technology and technical knowledge. Farmers in Ubari and Murzuk reported delays in planting due to poor input availability.

3. **Harvesting**
   Manual harvesting dominated across all municipalities, increasing labor costs and time. In Murzuk and Ribyana, lack of skilled labor delayed harvesting, contributing to higher crop losses.

4. **Post-Harvest Handling**
   This is the most critical stage of loss. Vegetables and fruits showed losses of 35–40% due to lack of cold storage and improper packaging. Only Sabha had limited access to basic post-harvest infrastructure.

5. **Processing**
   Value-added processing was largely absent. For instance, olives were sold raw due to the absence of local oil presses. Honey and meat lacked standard packaging or branding, limiting market potential.

6. **Marketing**
   Sabha benefited from proximity to trade hubs, scoring 8.1/10 on market access. Ribyana and Murzuk lacked structured market linkages, and farmers sold products at minimal margins.

7. **Consumption**
   Most products were consumed locally or in nearby towns. Due to weak distribution networks, rural consumers had limited access to diverse or processed foods, especially in Ribyana.

## 3.3 Crop- and Product-Specific Value Chain Analysis

### 3.3.1 Cereal Value Chains: Barley and Wheat

Barley and wheat are cultivated predominantly in Sabha, with over 350,000 hectares under production. Large-scale farms employ circular irrigation systems, while medium farms rely on deep wells (up to 80 meters) powered by 20-horsepower pumps. Average yields reach 4 tons per hectare, though rising input costs—fertilizers have increased by 300% since 2011—pose a significant challenge.

Harvesting is performed using both manual labor and combine harvesters. Migrant labor is common, with workers earning LYD 20–40 per day or sharing 30–50% of profits. Post-harvest losses of around 30% are mainly due to the absence of storage and grain testing labs. Farmers are often unaware of protein and moisture standards required by mills, which limits access to larger markets.

Value addition could be realized through investment in community silos, mobile grain testing units, and farmer training programs. Integration with national feed mills and flour processors would substantially enhance income security.

### 3.3.2 Olive and Olive Oil Value Chains

Olive production spans approximately 12,000 hectares in Sabha and Murzuk. Despite high demand for olive oil, production remains underdeveloped due to reliance on manual harvesting and the absence of oil pressing facilities. With no cold pressing technology or quality testing labs available, farmers typically sell unprocessed olives at low market rates.

Post-harvest losses are estimated at 25%, and harvesting costs represent up to 40% of total expenditures. Opportunities for value addition include introducing mobile oil presses, farmer training in harvesting and pruning, and establishing a local brand identity backed by quality certification. Similar interventions in Tunisia increased olive oil export values by over 35% (FAO, 2022).

### 3.3.3 Fruit Value Chains: Grapes and Other Seasonal Fruits

Grapes and seasonal fruits such as figs and citrus are widely cultivated in Ubari and Sabha, across an estimated 8,500 hectares. Yields average 5 tons per hectare. The absence of cold storage and poor handling practices result in 40% post-harvest losses during peak season. Harvesting is entirely manual and lacks coordination.

Farmers often sell early-season produce at discounted prices to avoid spoilage. However, investing in cold storage, packaging units, and inter-municipal transport networks could significantly enhance market access. The introduction of juice processing facilities and raisin production could double the value of raw grapes.

### 3.3.4 Vegetable Value Chains

Vegetables such as tomatoes, peppers, and eggplants are cultivated primarily in Murzuk and Sabha, with around 9,500 hectares under production. Average yields reach 8 tons per hectare under drip irrigation and plastic tunnels. The production season runs from November to March to avoid extreme summer temperatures, which can exceed 47°C.

Harvesting is manual, and the lack of storage infrastructure causes up to 40% of produce to be discarded or fed to livestock. Post-harvest handling is minimal, and products are sold locally at low prices. Interventions such as cooperatively-managed cold storage, small-scale processing for sauces and pickles, and training in packaging would enhance shelf life and profitability.

### 3.3.5 Livestock and Meat Value Chains

Livestock—including sheep, goats, camels, and cows—is raised across all municipalities, though data on herd sizes varies. Some households in Ubari and Murzuk own up to 100 camels or 50 goats. Camels are typically sold live at local markets without veterinary certification or standard slaughter procedures, resulting in post-slaughter losses of up to 15%.

There are no cold chains or formal slaughterhouses. The development of mobile slaughter units, meat grading systems, and refrigerated transport would increase competitiveness and open access to high-end meat markets in Tripoli and Benghazi.

### 3.3.6 Beekeeping and Honey Value Chains

Beekeeping is gaining popularity, particularly among youth in Sabha and Ubari. Each hive produces about 10 kg of honey annually, with local market prices ranging from LYD 60–100 per kilogram. Honey is harvested manually, and post-harvest losses are estimated at 10% due to improper storage and packaging.

Despite its high market value, the absence of modern beekeeping equipment, standardized jars, and labelling prevents access to national and export markets. Training in hive management, product certification, and branding could unlock significant income potential.

**5. Impact on Value Chains**

The current labour setup affects the value chain in key ways:

- Untrained workers contribute to high post-harvest losses, poor grading, and reduced product quality.
- Irregular seasonal labour leads to harvest delays and poor market timing.

Policy Insight: Enhancing value chain efficiency starts with labour improvement. Suggested interventions include targeted training in:

- Good Agricultural Practices (GAP)
- Proper harvesting and packaging
- Post-harvest handling and cooling techniques

**Quantifying Value Addition:**

Value addition in agriculture refers to the increase in economic value that a product gains as it moves along the stages of the value chain—from raw production to final consumption. It quantifies how much more a product is worth after undergoing harvesting, processing, packaging, branding, or transportation.

**Equation 1: Gross Value Added (GVA)**

**GVA = Output Value - Intermediate Input Costs**

:

• Output Value = Total revenue generated from selling the product
• Intermediate Input Costs = Costs of seeds, water, fertilisers, fuel, and labor

**Equation 2: Value Added Ratio (VAR)**

VAR = ((Output Value - Input Costs) / Input Costs) × 100
This expresses the value added as a percentage of the input costs, useful for comparing across crops or municipalities.

**1: Value Added in Sabha for Wheat**

• Yield: 4 tons/ha
• Price per ton: 700 LYD
• Total Revenue (Output Value): 4 × 700 = 2,800 LYD/ha
• Input Costs: 1,500 LYD/ha

GVA = 2,800 - 1,500 = 1,300 LYD/ha
VAR = (1,300 / 1,500) × 100 = 86.7%

**Interpretation**: Each 1 LYD invested in wheat production returns an added value of 0.87 LYD in Sabha.

**2: Value Loss in Ribyana Due to Post-Harvest Inefficiencies (Vegetables)**

• Yield: 8 tons/ha
• Market price per ton: 500 LYD
• Total Output Value (ideal): 4,000 LYD
• Post-harvest loss: 40%
• Actual Revenue: 60% × 4,000 = 2,400 LYD
• Input Costs: 1,800 LYD

GVA = 2,400 - 1,800 = 600 LYD/ha
VAR = (600 / 1,800) × 100 = 33.3%

Interpretation: Due to post-harvest losses, Ribyana's vegetable producers retain only 33% value addition on input investments—a significant underperformance.

- Municipalities with high post-harvest losses (Murzuk, Ribyana) can increase value added by simply reducing spoilage, not increasing yields.
- Sabha's success in wheat shows how investment in irrigation and access to markets improves GVA and VAR.
- These calculations allow for prioritized investment decisions—targeting stages where the most value is lost.

| Municipality | Yield (tons/ha) | Post-Harvest Loss (%) | Input Access (10 pt scale) | Market Access (10 pt scale) | Value Added Ratio (VAR %) | API |
|---|---|---|---|---|---|---|
| Sabha | 4.2 | 15 | 7.5 | 8.1 | 86.7 | 6.74 |
| Ubari | 3.5 | 25 | 5 | 6.5 | 65.2 | 4.75 |
| Murzuk | 3 | 35 | 4 | 4.5 | 44 | 3.1 |
| Ribyana | 2.5 | 40 | 3.1 | 2.9 | 33.3 | 1.95 |

**Intepretation of the Agricultural Performance Index (API) Table**
The Agricultural Performance Index (API) offers a composite scoring mechanism that integrates multiple variables affecting agricultural productivity and value creation across four southern Libyan municipalities: Sabha, Ubari, Murzuk, and Ribyana.

This index combines five core components:
• Crop Yield (tons/ha) – an indicator of productivity.
• Input Access (10-point scale) – reflects how easily farmers access seeds, water, fertilisers, etc.
• Market Access (10-point scale) – reflects physical and institutional ease of selling products.
• Value Added Ratio (VAR %) – economic efficiency in converting inputs into value.
• Post-Harvest Loss (%) – deducted from the score due to negative economic impact.

**Key Findings:**

1. **Sabha** (API = 6.74) – Leading Performance
   • Highest crop yield (4.2 tons/ha)

• Best access to inputs (7.5/10) and markets (8.1/10)
• Lowest post-harvest losses (15%)
• Strong value-added performance (VAR = 86.7%)
• Interpretation: Sabha demonstrates a relatively efficient and integrated agricultural system, likely due to better infrastructure, irrigation schemes, and market connectivity.

2. **Ubari** (API = 4.64) – Moderate but Promising
   • Fair yield (3.5 tons/ha)
   • Moderate access to inputs and markets
   • Value addition is fair (VAR = 65.2%), but post-harvest loss is higher at 25%
   • Interpretation: Ubari has the potential for improvement, particularly by reducing spoilage and enhancing cooperative organization.

3. **Murzuk** (API = 3.52) – Underperforming
   • Lower yield (3.0 tons/ha)
   • Limited access to inputs (4.0/10) and markets (4.5/10)
   • High post-harvest losses (35%) significantly reduce efficiency
   • Interpretation: Murzuk's agricultural performance is hindered by systemic weaknesses in logistics, farmer skills, and access to basic services.

4. **Ribyana** (API = 1.95) – Critical Underperformance
   • Lowest yield (2.5 tons/ha)
   • Weakest input (3.1/10) and market access (2.9/10)
   • Extremely high post-harvest losses (40%)
   • Lowest VAR (33.3%)
   • Interpretation: Ribyana's agricultural sector is under severe stress, facing compounding challenges in equipment, skills, and market integration.

**Policy Insight:**
This table helps prioritize intervention:
• Sabha can be a pilot site for value chain expansion.
• Ubari and Murzuk need targeted post-harvest and cooperative support.
• Ribyana requires emergency agricultural recovery programs including equipment, cooling infrastructure, and training.

The current structure of agricultural value chains in southern Libya is characterized by fragmentation, informality, and systemic inefficiencies. The lack of post-harvest infrastructure and limited market integration prevent rural producers from capturing added value, sustaining livelihoods, or accessing competitive markets. Upgrading these chains requires coordinated investments in training, infrastructure, market development, and cooperative strengthening—tailored to the needs of each crop and municipality.

The value chain analysis reveals that the majority of economic losses in southern Libya's agricultural sector occur post-harvest, primarily due to the lack of infrastructure and technical capacity. Despite strong natural resource endowments and high market demand, the region remains unable to capitalize on its comparative advantages. Strategic investment in processing facilities, cold chains, cooperative governance, and youth-focused training programs is essential for transforming the region's agricultural economy and enhancing food security.

**Vocations needed by farmers to increase income**

A large percentage of the interviewed farmers in the four municipalities expressed interest in learning how to fix water pumps as they believe that there are job opportunities in this area of profession. A farmer from Qodwa said that he must drive 70 km to take a broken water pump to a maintenance shop due to the lack of water pump maintenance shops in the area.

Large farm owners are interested in hiring people who have good knowledge in fixing circular irrigation systems. Businesses who sell circular systems also expressed interest in hiring part time employees to help with installation of the irrigation systems on farmers' lands. Therefore, training farmers on circular irrigation systems maintenance and installation could provide them with a good job opportunity.

Farmers in Ribyana reported that the entire city is supplied by electricity through diesel operated generators. However, there are no trained people in Ribyana who can conduct regular maintenance for those generators. Sometimes they stay days in the dark until the government sends a technician from Alkufra (135 km). Also, a high percentage of people in all municipalities own small diesel generators that are used during electricity cuts. Those generators need regular maintenance which presents good job opportunities for those who have good generators fixing skills.

Bee keeping is among the sought-after jobs by farmers especially in Ubari and Sabha. Farmers believe that bee keeping could potentially help them generate income if they acquire the right skills. Farmers reported that the price of one kilogram of honey is anywhere between 60 and 100 LYD.

Female could obtain good job opportunity if they learn skills such as food packaging and food preservation. Farmers from Sabha and Ubari reported that proper packaging of grape and other fruits make huge difference in the market. There is also good job opportunity for women in dairy products business. Women could generate good income if they acquire skills on making cheese and yoghurt using cow and goats' milk which is available in Sabha and Ubari farms.

## Conclusion and recommendation

The agricultural sector in Sabha, Ubari, Murzuk, and Ribyana faces significant challenges that impede productivity, economic growth, and food security. Addressing these issues through targeted interventions, capacity-building programs, infrastructure improvements, and policy reforms will foster a more resilient and sustainable agricultural ecosystem in Libya. Enhancing agricultural education, promoting technology adoption, and developing strong market networks will be essential in driving long-term progress and economic stability. Therefore, the study recommended several ideas as follows:

1. Enhance and develop agricultural infrastructure, taking into account the developmental disparities among the three targeted municipalities.
2. Provide agricultural production inputs at affordable prices to ensure the sustainability of farming activities.
3. Encourage local initiatives in sustainable agriculture and strengthen community engagement.
4. Improve farmers' competencies through regular training programs tailored to local agricultural needs.
5. Develop local agricultural marketing systems by linking municipalities with effective distribution networks and major commercial centers.

6. Improve access to agricultural services, both technical and logistical.
7. Expand access to agricultural financing on favorable terms, especially for small and medium-sized initiatives..

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## Annex A

**Questions to Municipality/Ministry of Agriculture, Livestock and Marine Resources General Overview**

Total number of populations
Breakdown of Population:

% male, % female, %under 35, % under 18, % over 60 Total number or % of unemployed

Total number or % migrants Total number or % farmers

Main Source of livelihood (% for each) Agriculture based/ livestock based/ Government job/ shopkeeper, trader or business/ other
Are there agriculture representatives within the municipality? (Name and Contact)

**Cooperative analysis**

How many agriculture associations or cooperatives within the municipality? (Name and Contact) Roles of agriculture cooperatives

Number of members in each agriculture cooperative Roles of members in agriculture cooperatives

What are the main functions of the cooperatives/associations? For instance, centralize input purchase, aggregate production for sale, share technical assistance…

What's the most active agriculture association within the municipality? Are members in cooperatives from one tribe or diverse?
Number of women associations
Number of agriculture business owners and their division within the areas.

**Detailed Farmer Breakdown**

Number of hectares of arable land in the municipality (specify the areas) Average hectares per farm

Number of hectares dedicated to livestock Number (or percentage) of

man farmers Number (or percentage)
of women farmers
Number (or percentage) of migrants working in farming
Number (or percentage) of young people (under 35) working in farming

What is the average % of farmers working in vegetable and fodder farming vs livestock farming? What's the average % of farmers working in greenhouses?

What percentage of households have adequate income to buy animal feed? What are the main sources of food in your community?

**The following questions are intended for the objectives:**

- Determine challenges facing the farmers
- Determine Agricultural needs in the municipality

**Vegetable Farming:**
What's the climate of the region and how does it affect the crops grown ?
What are the key factors affecting crop yield and quality
what kind of soil is present and what is its nutrient content
What are the potential opportunities for expanding agriculture in the region?

What are the main sources of water for agriculture (How deep)
List the main challenges facing vegetable farmers in the municipality ( in order of importance)

Main agricultural needs: Seeds/ hand tools/ animal feed/ animal fodder/ livestock vaccine and medicine/ farm machinery repair/ restocking poultry/ restocking livestock/ irrigation structures repair/ labor force/ agricultural services/ well repair/

Is it foreseen any type of training or capacity building activity for local authorities, community-based associations and organizations?

**Livestock Farming:**

Are there any signs of animal diseases outbreaks in the community ? (external parasites/ internal parasites/ respiratory diseases/ indigestion
Is there any veterinary care system in the area?

Are the veterinary drugs and vaccines available in the municipality area?
List the main current challenges facing livestock farmers? (In order of importance)
List main equipment and machines required by the vegetable farmers (in order of importance)

List the main equipment and machines required by livestock farmers (in order of importance)

**The following questions are intended for the objective:**

- Determine skills needs of

farmers What is the main type of farming?

What are the main crops grown in the municipality area? Please specify the sectors and the percentage of crops cultivated for each sector

What are the main types of livestock in the municipality area? Please specify the sectors and the percentage of livestock for each sector

List main skills required by the farmers to increase their productivity (in order of importance) Percentage of people with access to income-generating activities in the agriculture/ livestock sectors What measures should be taken to reduce the level of unemployment among youngsters?

**The following questions are intended for the objective:**

- Determine woman involvement in agriculture and how to increase their participation What's the % of females working in farming (of all farmers)?

Are females more involved in farming or post-harvest?
How can female participation in agriculture be increased?
What trainings can increase female participation in agriculture?

**The following questions are intended for the objective:**

- Determine awareness levels of agriculture within the youth

In your opinion, what % of farmers are under the age of 35?

In your opinion, how can people under 35 be encouraged to participate in farming?
In your opinion, what types of agricultural training would be of interest to people under 35?

In your opinion, rate the following areas based on the interest of youth in them. from 5 = high interest,
to 1= not of interest at all
Mechanization of farming

Solar Panels in farming
Hydroponics and Greenhouses
Post-harvest Marketing and Sales
Water Pumps and generation maintenance
Pest-Control

## Annex B

### Questions to Cooperatives

**Cooperative breakdown:**
What are the main functions of the cooperative?
Which services do you provide to farmers (i.e., trainings, inputs…)?
Please describe the organizational structure and bodies of your cooperative
How many people are in the organization bodies and what are their roles?

What are the main external factors involved in the field of agriculture you work with? Are they
Associations, Ministries, etc.? Please specify

Number of farmers in your cooperative
Number of women farmers.
Number of young farmers (under 35 years old)?

Are the farmers members also owners of their farms or do they pay a rent to the landlord? How much is it (£/ha)

Which is the educational and technical level of farmers in the cooperative?
What is the average annual income of a farmer?
Number of agriculture seasonal workers enrolled
Type of contract for seasonal workers, if any
How many of them are migrants or refugees (from countries outside Libya)?

Number of returnees workers in the agricultural sector
Do you know other cooperatives working in your area? If yes, please specify
Do you have land owned by the cooperative for the installation of a greenhouse?
How could a farmer become a member?

**The following questions are intended for the objective:**

- Determine skills needs

What is the main type of farming in the municipality?
What kind of services do you offer to farmers?

Do you also have supplementary productive activities in your cooperative (i.e. beekeeping, fishery,…). Please list?
What alternative productive activities do you need to complement farming?

What are the main crops cultivated by the cooperative farmers members? Please specify the sectors and the percentage of crops cultivated for each sector

What are the main food items available on the market of target sub-districts or mostly consumed by the local population?
List main skills required by the farmers to increase their productivity (in order of importance)

Percentage of people with access to income-generating activities in the agriculture/ livestock sectors
What measures should be taken to reduce the level of unemployment among youngsters?

**The following questions are intended for the objectives:**

- Determine challenges facing the farmers.
- Determine Agricultural needs in the municipality.

**Vegetable Farming:**

Are good quality inputs (seeds, fertilizers, etc) available in your cooperative for farmers? If yes, what is the average price?

Are machines and equipment available in your cooperative for farmers? If yes, what's the average price?
What is the price of fertilizer on average?

Main current challenges in crops and fruit trees production (put the items in order of importance) Main current needs crops and fruit trees production (put the items in order of importance)

Seeds/ hand tools/ animal feed/ animal fodder/ livestock vaccine and medicine/ farm machinery repair/ restocking poultry/ restocking livestock/ irrigation structures repair/ labor force/ agricultural services/ well repair/

What are the main current challenges to access irrigation?

What are the main sources of electricity for farmers?
Are there any solar water pumps used by farmers?
What are the main current challenges to access electricity?

**Livestock Farming:**

What are the main types of livestock? Please specify the sectors and the percentage of livestock for each sector
Are the veterinary drugs and vaccines available in the area?

Are refrigerators to store livestock products available for farmers?
Main current challenges in livestock production (put the items in order of importance)
Main current needs in livestock production (put the items in order of importance)
Please, make a list of agricultural inputs, tools and equipments your cooperative needs

Is irrigation water availability ensured? And how? For instance, availability of irrigation equipment, infrastructure in good conditions

**The following questions are intended for the objective:**

- Determine training needs by cooperative members.

Would you be interested in creating a group of trainer experts to support your associated members? Regarding the management of a cooperative: do you think you need to strengthen your technical and management skills as an agricultural cooperative? If yes, please list one with a topic in particular (i.e. financial, accounting, marketing, …)

Rate the following training from 1 = not important to 5 = extremely important Need of training on water effective management
Need of training on resilient good agricultural practices

Need for training on modern farming techniques: greenhouse cultivation and other techniques related to planting, irrigation, tree pruning, fruit reaping, disease and pest control, etc.
Need for training on post-harvest handling and other value-added practices and treatments, such as packing, packaging, cold chain (precooling, refrigerated transport and storage) etc.
Need for training on reducing food loss and waste

Need for training on treatments, food safety, quality and nutritional standards, pesticipe use and precautions.

Need of training on marketing marketing strategies (commercialization, sale and post-sale) and access to national and export markets
Need for training in export regulations and promotion.

Need of training on Business Plan and support to financial services and loans and credits Is it possible for farmers to have access to loans or credit?

**The following questions are intended for the objective:**

- Determine Post-harvest and marketing needs. How are the products marketed and distributed?

What are the costs involved in the production and what is the profitability of the farm? What are the environmental impacts of farming practices?

What are the policies and regulations affecting agriculture in the region?

What are the trends in production and consumption of agricultural products in the region? how many shops sell agricultural inputs in the area.
What's lacking in the shops?

What are the potential opportunities for expanding agriculture in the region? What are the main sources of water for agriculture?
What are the main sources of food in your community?

price changes (before and after): fertilizer, seeds, animal fodder. closest source of agriculture inputs
**The following questions are intended for the objective:**

- Determine woman involvement in agriculture and how to increase their participation! What’s the % of females working in farming (of all farmers)?

Are females more involved in farming or post-harvest?
How can female participation in agriculture be increased?
What trainings can increase female participation in agriculture?

**The following questions are intended for the objective:**

- Determine awareness levels of agriculture within the youth. In your opinion, what % of farmers are under the age of 35?

In your opinion, how can people under 35 be encouraged to participate in farming?
In your opinion, what types of agricultural training would be of interest to people under 35?

In your opinion, rate the following areas based on the interest of youth in them. from 5 = high interest, to 1= not of interest at all

Mechanization of farming
Solar Panels in farming
Hydroponics and Greenhouses
Post-harvest Marketing and
Sales

Water Pumps and generation
maintenance Pest-Control

## Annex C

## Questions to farmers

### General Overview

What type of vegetables and seeds do you grow?
Why did you choose this type?
How many years have you been growing this type of seed?

What type of irrigation systems do you use?
Where do you buy the irrigation systems from?
Who will install the system for you?
What is your source of water?
How deep is the water?
Do you own the source of water?
Do you own the land?

How many hectares do you have?
Was the land given to you through the government or did you inherit it?
Do you use daily workers?
Do you hire immigrants with a monthly salary?
How do you market your produce?

What is the percentage of profit obtained in one season?
What type of skills do you think you need to learn in order to increase your production?
% of farm and non-farm income are you getting?

% of expenditure? Food/ household items/ Clothing/ Education/Health & Medicine/ Agriculture input/Productive assets/ animals/ other?

% Food Sources? Own production/ market purchase/

### Vegetable Farming overview

Are the seeds available in the market?
Where do you get the seeds from?

Seeds source (country)

What is the unit price of 1 kg of seeds on average?
What type of fertilizers do you use?
What is the estimated number of fertilizers used per month?
Where do you buy fertilizers?

What is the cost of fertilizers per 100 Kg?

What kind of pest control measures do you use? Do you spray all year or at the beginning of the season, or only as needed?
What are the major diseases affecting your crops and vegetables?

What is the average cost of pesticides per season?
Are machines and equipment available? If yes, what's the average price?
What type of machines do you use for preparing the land?

What type of machines do you use to harvest crops?
Do you own the machines, or do you rent them?
In case you rent machines How much do you pay for renting the machines per hour?
Who helps you on the farm?
What is the level of mechanization on the farm?

What are the labor requirements and how are they managed? Their wage?

**The following questions are intended for the objectives:**

- Determine challenges facing the farmers.
- Determine Agricultural needs in the municipality.

**Vegetable Farm**

What are the main current needs in the agricultural sector?

Main current challenges in crops and fruit trees production (put the items in order of importance) Main current needs crops and fruit trees production (put the items in order of importance) Seeds/ hand tools/ animal feed/ animal fodder/ livestock vaccine and medicine/ farm machinery repair/ restocking poultry/ restocking livestock/ irrigation structures repair/ labor force/ agricultural services/ well repair/

What are the main current challenges to access irrigation?

What are the main sources of electricity for farmers?
Are there any solar water pumps used by farmers?
What are the main current challenges to access electricity?
What's the climate of the region and how does it affect the crops grown?
What are the key factors affecting crop yield and quality?

What kind of soil is present and what is its nutrient content?
What kind of irrigation system is used?
What are the main pest and disease problems and how are they managed?

Main agricultural needs (rate by importance): Seeds/ hand tools/ animal feed/ animal fodder/ livestock vaccine and medicine/ farm machinery repair/ restocking poultry/ restocking livestock/ irrigation structures repair/ labor force/ agricultural services/ well repair/

What approaches (operational, agronomic, genetic, supplemental irrigation schemes, fertility management, winter rainfall storage) can be developed to increase water use efficiency in agriculture and what is the cost-effectiveness of these approaches?

What are the most practical and economic methods for managing soil fertility?

**Livestock Farming**

What are the main types of livestock in the municipality area? Please specify the sectors and the
percentage of livestock for each sector
What are animals fed?
Is good quality input (animal feed etc) available? If yes, what is the average price?
Is there any veterinary care system in the area?

Are the veterinary drugs and vaccines available in the municipality area?

Are there any signs of animal diseases outbreaks in the community? (External parasites/ internal parasites/ respiratory diseases/ indigestion
What are the main current challenges in the livestock sector?
What are the main current needs in the livestock sector?

For how many days do you think the current animal fodder is sufficient?
are any food/ fodder/ agro inputs price hikes observed?

**The following questions are intended for the objective:**

- Determine Post-harvest and marketing

needs. How are the products marketed and
distributed?

What are the costs involved in the production and what is the profitability of the farm? What are the environmental impacts of farming practices?
What are the policies and regulations affecting agriculture in the region?

What are the trends in production and consumption of agricultural products in the region? how many shops sell agricultural inputs in the area.
What's lacking in the shops?

What are the potential opportunities for expanding agriculture in the region? What are the main sources of water for agriculture?

What are the main sources of food in your community?

price changes (before and after): fertilizer, seeds, animal fodder. closest source of agriculture inputs

**The following questions are intended for the objective:**

- Determine skills needs of farmers.

What alternative productive activities do you need to complement farming?
What post-harvest equipment do you need to increase your income?

**The following questions are intended for the objective:**

- Determine woman involvement in agriculture and how to increase their participation. What's the % of females working in farming (of all farmers)?

Are females more involved in farming or post-harvest?
How can female participation in agriculture be increased?
What trainings can increase female participation in agriculture?

**The following questions are intended for the objective:**

- Determine awareness levels of agriculture within the youth. In your opinion, what % of farmers are under the age of 35?

Do you have people under the age of 35 working on your farm?
In your opinion, how can people under 35 be encouraged to participate in farming?
In your opinion, what types of agricultural training would be of interest to people under 35?

In your opinion, rate the following areas based on the interest of youth in them. from 5 = of very interest, to 1= not of interest at all

Mechanization of farming
Solar Panels in farming
Hydroponics and Greenhouses
Post-harvest Marketing and Sales

Water Pumps and generation maintenance Pest-Control

Are you owner of your farm or do they pay a rent to the landlord? How much is it ( £/ha) ? What is your average annual income?
Do you enroll seasonal workers? Number of agriculture seasonal workers enrolled per year?

## Annex D

### Questions to agriculture business owners

**The following questions are intended for the objectives:**

- Determine challenges facing the farmers.
- Determine Agricultural needs in the municipality.

Are good quality inputs (seeds, fertilizers, etc) available? If yes, what is the average price?
Are machines and equipment available? If yes, what's the average price?
What is the unit price of 1 kg of seeds on average?
What is the price of fertilizer on average?

Are good quality inputs (animal feed etc) available? If yes, what is the average price?

Are the veterinary drugs and vaccines available in the municipality area?
What are the main current challenges in the livestock sector?
What are the main current needs in the livestock sector?
What are the main pest and disease problems and how are they managed?
What are the trends in production and consumption of agricultural products in the region?

What are the potential opportunities for expanding agriculture in the region?
are any food/ fodder/ agro inputs price hikes observed?
price changes (before and after): fertilizer, seeds, animal fodder.
closest source of agriculture inputs

Main agricultural needs: Seeds/ hand tools/ animal feed/ animal fodder/ livestock vaccine and medicine/ farm machinery repair/ restocking poultry/ restocking livestock/ irrigation structures repair/ labor force/ agricultural services/ well repair/

**The following questions are intended for the objective:**

- Determine woman involvement in agriculture and how to increase their participation. Do you have female customers?
What products are usually bought by female customers?

In your opinion, how can we increase female involvement in agriculture? In your opinion, what trainings are needed by female farmers?

**The following questions are intended for the objective:**

- Determine awareness levels of agriculture within the youth. In your opinion, what % of farmers are under the age of 35?

Do you have farmer customers under the age of 35, if yes, what are their interests? In your opinion, how can people under 35 be encouraged to participate in farming?
In your opinion, what types of agricultural training would be of interest to people under 35?

In your opinion, rate the following areas based on the interest of youth in them. from 5 = of very interest, to 1= not of interest at all

Mechanization of farming
Solar Panels in farming
Hydroponics and Greenhouses
Post-harvest Marketing and
Sales

Water Pumps and generation
maintenance Pest-Control

## Annex E

## Educational Institutes

### General

Do you have staff that can work as trainers?
What are the specialties of the people working in the institutes?
How many of the people working in institutes have experience in farming?

In your opinion, what training should be provided to farmers in the area to increase their farm productivity?

Do you or your colleagues have the capacity to conduct the mentioned training?
In your opinion, what equipment provided to farmers can increase their income?
Do you or your colleagues have the capacity to train on using the mentioned equipment?

In your opinion, what training should be provided to farmers in the area to improve their post-harvest marketing?

Do you or your colleagues have the capacity to conduct the mentioned training?
Do you have halls/ land that can be used for training?
Do you have equipment that can be borrowed by farmers?

**The following questions are intended for the objective:**

- Determine Post-harvest and marketing

needs. How are the products marketed and
distributed?
What are the costs involved in the production and what is the profitability of the farm?

What are the environmental impacts of farming practices?
What are the policies and regulations affecting agriculture in the region?

What are the trends in production and consumption of agricultural products in the region? how many shops sell agricultural inputs in the area. What's lacking in the shops?

What are the potential opportunities for expanding agriculture in the region?
What are the main sources of water for agriculture?

What are the main sources of food in your community?
price changes (before and after) : fertilizer, seeds, animal fodder.
closest source of agriculture inputs

**The following questions are intended for the objectives:**

- Determine challenges facing the farmers.
- Determine Agricultural needs in the municipality.

Are good quality inputs (seeds, fertilizers, etc) available? If yes, what is the average price?

Are machines and equipment available? If yes, what's the average price?
What is the unit price of 1 kg of seeds on average?
What is the price of fertilizer on average?
Are good quality inputs (animal feed etc) available? If yes, what is the average price?
Are the veterinary drugs and vaccines available in the municipality area?
What are the main current challenges in the livestock sector?
What are the main current needs in the livestock sector?

What are the main pest and disease problems and how are they managed?
What are the trends in production and consumption of agricultural products in the region?
What are the potential opportunities for expanding agriculture in the region?
are any food/ fodder/ agro inputs price hikes observed?
price changes (before and after): fertilizer, seeds, animal fodder.

closest source of agriculture inputs

Main agricultural needs: Seeds/ hand tools/ animal feed/ animal fodder/ livestock vaccine and medicine/ farm machinery repair/ restocking poultry/ restocking livestock/ irrigation structures repair/ labor force/ agricultural services/ well repair/

**The following questions are intended for the objective:**

- Determine woman involvement in agriculture and how to increase their participation. Do you have female Agriculture students/staff?

In your opinion, how can we increase female involvement in agriculture? In your opinion, what training is needed by female farmers?

**The following questions are intended for the objective:**

- Determine awareness levels of agriculture within the youth. In your opinion, what % of farmers are under the age of 35?

Do you have Agriculture students/staff under the age of 35, if yes, what are their interests? In your opinion, how can people under 35 be encouraged to participate in farming?
In your opinion, what types of agricultural training would be of interest to people under 35?

In your opinion, rate the following areas based on the interest of youth in them. from 5 = of very interest, to 1= not of interest at all

Mechanization of farming
Solar Panels in farming
Hydroponics and Greenhouses
Post-harvest Marketing and Sales

Water Pumps and generation
maintenance Pest-Control