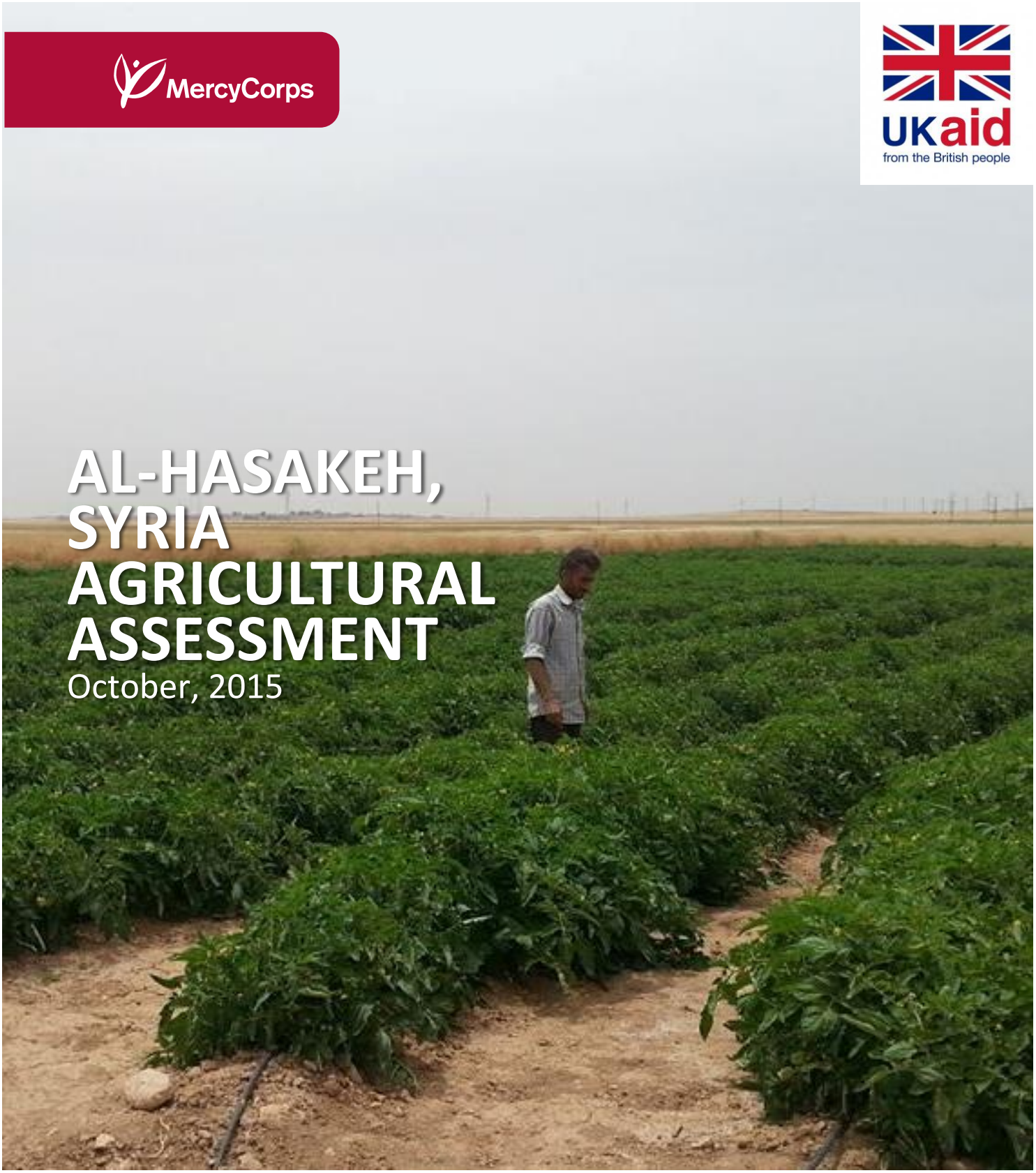

AL-HASAKEH, SYRIA AGRICULTURAL ASSESSMENT

October, 2015

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Acknowledgements

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Within Mercy Corps, we would like to thank the North East Syrian team for their important support and contributions.

Ed Brooks
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Introduction

Benefiting from deep top soils and environmental conditions well-suited for dry-land (i.e., non-irrigated) grain production, the Al-Hasakeh region has supported human populations for an estimated 7,000 years, and in modern times has been considered a major breadbasket for the Syrian economy. As a large regional player in the Syrian agricultural economy (and to some degree as an oil producer given its local reserves), pre-crisis Al-Hasakeh was a relatively modern, industrial-style agricultural producer in a middle income country, with large tracts of farmland in relatively large plots, modern machinery and equipment, storage and processing facilities, and a fairly sophisticated distribution network.

Pre-crisis, the Syrian government was a major player in the local agricultural economy – both as a provider of agricultural inputs and services (including seeds, fertilizers, herbicides, pesticides, extension services, etc.), and as sole legal buyer of key agricultural products such as wheat and cotton. Today, the Syrian government still remains sole legal buyer of wheat but no longer buys Al-Hasakeh-produced cotton, and has decreased its level of agricultural support[1]. This change in Syrian government support - along with the continual impact of the Syrian conflict to the economy and trade flows - has had a strong, lasting and generally negative impact on the Al-Hasakeh agricultural economy, outlined in detail below. However, there are opportunities for strong, positive interventions, which can make the lives of those living in Al-Hasakeh measurably better whilst capitalizing on existing resources and skills.

Methodology

As part of its on-going effort to meet the emergency, recovery, and economic development needs of North East Syria, Mercy Corps undertook an agricultural survey on May 23 – 31, 2015, in the governorate of Al-Hasakeh (to the top right in Map 1), within the districts of Al-Malikeyyeh, Qamishli and Ras Al Ain, and sub-districts of Jawadiyah, Maabada, Qamishli, Ya'robiyah, and Amuda.

Map 1: Syria

In preparation for the survey, and following an extensive desk-survey of the agricultural sector of the region, the assessment team conducted a two-day training for enumerators in value chain and market system development concepts, plus a review of the results of a similar survey performed the previous year in North Syria. The team then developed a survey to better understand opportunities and constraints in the Al-Hasakeh agricultural sector. The purpose of the survey was to inform the development of impactful, market-driven livelihood interventions.

As a group, the enumerators selected six agricultural products and value chains to assess, based on their perceived current and future economic impact and growing importance to the Al-Hasakeh agricultural economy. The six agricultural product value chains selected were **wheat, cotton, coriander, bovine dairy products, shoats, and tomatoes.**

[1] Please note that "post-crisis" here refers to present day Al-Hasakeh after the on-set of the civil war in 2011, in that, while civil war continues in Syria, some level of normalcy in which markets function at a certain level presently exists in Al-Hasakeh.

Survey questionnaires were created for each specific value chain, as well as for specific value chain actors. The total sample size was 248 survey respondents, comprised of agricultural input providers, producers, traders/wholesalers, transportation providers, and administration officials (the latter consisting of present and former Syrian government, and local Kurdish government officials).


Grain storage outside of Derik, Al-Hasakeh, Syria - Mercycorps

In addition to the general survey questionnaires, additional questions were included for survey respondents within specific value chains: per the following:

- Wheat: Jawadiyah District
- Cotton: Ras Al Ain District
- Coriander: Maabada District
- Bovine Dairy Products: Qamishli District
- Shoats: Ya'robiyah District
- Tomatoes: Amuda
- Plus Qamishli City for all product processors, transporters, etc.

Caveats to Findings

Although the goal of every assessment is to receive as much helpful, actionable, and impactful information as possible, the environment of North East Syria at the time created some challenges, including the following:

- *Medium to high insecurity within Al-Hasakeh*: Relative to other governorates of Syria, Al-Hasakeh at the time of the assessment was one of the most secure areas given that armed groups were relatively inactive, military support against such armed groups from international allies was present, and the governorate appeared to be administered effectively by the local Kurdish government. However, mobility during the assessment remained difficult with some areas inaccessible due to security concerns.
- *The changing, kinetic, and volatile environment within Syria beyond Al-Hasakeh:* The ever-changing Syrian environment may impact survey results given that this assessment is a snapshot at one point in time. One example is the impact environmental factors on trade flows as armed groups shift their locations and economic activity change in response.
- *Low levels of and/or conflicting information among Value Chain Actors*: One of the challenges within (and between) the selected value chains of Al-Hasakeh is that, given its generally rural geographical nature, and relative lack of modern communication technology (for example, the relatively low use of mobile phones and internet), there were at times conflicting information reported by survey participants. For example, many reported that exporting outside of Syria from Al-Hasakeh is difficult to impossible, while others suggested that exporting is possible depending on the specific agricultural product (for example, livestock and coriander appear easier to export than other products). Other information was consistent between surveyed value chain participants, including the difficulty in accessing key product inputs.

Key Findings

OPPORTUNITIES

Overall, the agro-ecological conditions of Al-Hasakeh are favorable to large-scale, modern, and globally competitive agricultural production, and particularly regarding dry land winter crops (i.e. mostly rain-fed crops planted and harvested between October and June). Such winter crops include winter wheat, barley, lentils, beans, (and other legumes), cumin, and, increasingly coriander.

During the dry hot summer months (between June and October), and where water is available, Al-Hasakeh also produces irrigated maize, sorghum, livestock feed/fodder, vegetables, and (decreasingly) cotton, through the application of irrigation water primarily from wells. However, since the crisis began 4.5 years ago, fuel to run well pumps has become both scarce and expensive. This in turn has greatly decreased the ability to apply irrigation water to local fields, the ability to cultivate and harvest such crops, and therefore greatly disrupted summer crop production, markets, ancillary value chains (such as input providers, traders/wholesalers and processors), and the agricultural and local economy more broadly.

For example, wheat and cotton production, was heavily supported by the Syrian government before the crisis but has had little to no support post-crisis, and has been strongly negatively impacted. The production levels of such crops have decreased significantly, especially cotton. In response, producers have, at least in part, moved toward more profitable crops which require fewer agricultural inputs - such as coriander, which is produced primarily for export to markets outside of the governorate - and which is much more adaptable to the new economic and security environment.

In terms of product sales in general, with very few exceptions most producers sell their products on the open-market, which can expose them to market risk. Most producers sell directly to traders (who function primarily as wholesalers), and rarely engage in contract farming with the exception of some coriander and dairy producers. Even those selling ultimately to the government, such as wheat farmers, sell their product via traders. Likewise, buying and selling on credit is rare throughout the value chains assessed.

Regarding exports, while borders between Syria and Turkey are allegedly closed, they appear to remain porous. Some consumer goods from outside Al-Hasakeh continue to cross into North East Syria (local shops are stocked with Pepsi and Pringles, for example). Along with consumer goods US dollars are readily available as most Syrians convert their Syrian pounds to US dollars when possible as a hedge against inflation. The Syrian-Iraqi border is open at Peshkhabour where a one lane floating bridge is used for commercial trade, while a small boat is used for passenger traffic.

It is also interesting to note that a very large agricultural machinery and equipment rental industry exists in Al-Hasakeh - most survey respondents claim they rent machinery and equipment - reflecting how extensive the agricultural service industry is in the area, even post-crisis.

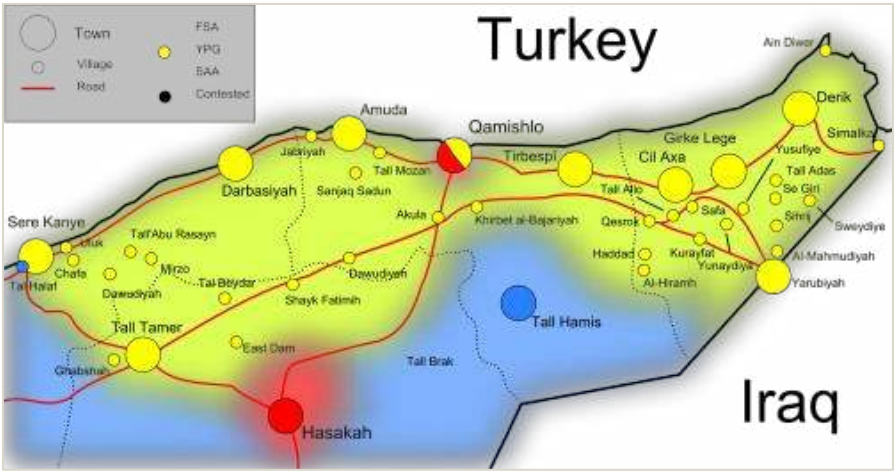
A synopsis of findings per product is detailed below, with additional information available in the Annexes.

Wheat field and top soil, Al-Hasakeh, Syria – Mercycorps

In the 4.5 years since the crisis began, the agricultural and food systems in have been highly disrupted, per the following:

- *High insecurity outside of Kurdish-Controlled areas*: The Kurdish controlled area of North East Syria/Hasakeh, and especially as seen around Derik is surprisingly secure, with little visible crime or violence. However, trade of locally-produced Al-Hasakeh agricultural (and other) goods is impacted by the lack of security in the rest of Syria. ISIS and other armed groups control the main highways linking Al-Hasakeh with primary Syrian business centers (Aleppo in particular) and the port of Latakia, which creates personal security concerns among Kurdish Al-Hasakeh-based traders (see **Map 2** below). Traders are focusing their efforts to Syrian Arab traders to move products to markets in and outside of Syria (through the port of Latakia) however this carries a substantial cost. This high cost is partly due to checkpoint "fees" paid to ISIS (and perhaps other armed groups) to move products from Al-Hasakeh to Aleppo and beyond. Such fees are often set and made public, and now considered by the Al-Hasakeh agricultural industry as a "new normal" cost of doing business. Such fees also impact the movement of agricultural goods both ways, i.e., the cost of moving product out of Al-Hasakeh, and the amount, cost and quality of goods moving in (including agricultural inputs).

Map 2: Al-Hasakeh Governorate, Kurdish, Syrian Government and Rebel Controlled Areas[2]



- *Decreased role of Syrian government* in Al-Hasakeh as a provider of high-quality agricultural inputs and technical services, especially in the wheat and cotton sectors. While the government continues to provide wheat production inputs at a cost to be reimbursed when wheat is sold back to the government after harvest in May and June, the quality of such products has dropped to the point of "being useless", as stated by a number of survey participants. Additionally, the Syrian government provision of agricultural technical and extension services has reportedly completely disappeared. This includes the caseation of large-scale aerial spraying of wheat fields against Sunn Pest. Such services have not been taken over by the private sector.

  As mentioned previously, the decrease in agricultural support has led to what appears to be a near-collapse of the cotton industry, which has a very strong negative impact on ancillary value chain actors such as input

[2] Red denotes loyalist control, yellow Kurdish control, and blue rebel control.

suppliers, processors, traders/wholesalers, and the livestock feed industry (which relies on cotton ginning by-products as a protein supplement to livestock feed).

- *Lack of access to Inputs and Equipment*: Certified fertilizers, pesticides, and herbicides specifically are difficult to access due to high prices. The high prices are in part due to border controls, in addition to a drop in the Syrian pound vs. the US dollar. There is also a general lack of certification as this was previously done by the government. Farmers commonly complain about the poor quality of fertilizers, pesticides and herbicides and that they do not function as advertised; with agricultural input providers commonly claiming that they are not responsible for product input results at the farm level. In terms of machinery and equipment spare parts, one wheat processor mentioning that he would mill more flour if he could get the parts needed to upgrade his mill.

- *Lack of labor*: A lack of labor was mentioned to some extent in the data, with anecdotal evidence suggesting that a shortage of men of productive age translates into a lack of labor and consequently higher labor costs. The understanding is that most men have left the region to fight on the front or have left the country in search of work.

- *Lack of irrigation water, particularly for summer cropping*: The shortage of affordable fuel to run well pumps has had detrimental effects on the ability to irrigate, impacting the ability to grow summer crops - and with ancillary effects on related industries like food processing, wholesaling, etc. Summer crops include maize, vegetables, feed, and fodder. This leaves large areas of available agricultural land idle during summer, which equates to a loss of productive economic opportunities.

- *Low cash liquidity*: The weakness of the Syrian pound, lack of credit and banking services, and the use of remittances which are prioritized for house construction leads to low available liquidity for agricultural purposes. The local economy uses both Syrian pounds and US dollars, with Syrian pounds used for day-to-day transactions, and extra Syrian pounds converted to US dollars to avoid inflation. As such, the deteriorating exchange rate between the Syrian pound and US dollar has had a very strong impact on the ability of local farmers - and others within local agricultural value chains - to invest. Furthermore, there are no banks in Derik (although there are government facilities which provide funds for the payment of wheat), and relatively few banks in the rest of Al Hasakeh. The few banks which do exist in Al-Hasakeh are reportedly run by the Syrian government.

  Simultaneously, there is a very large construction boom in Derik which is reportedly fueled by remittances, and is viewed as a way to store value in an area where banks do not exist, or are not trusted. Such capital, however, is an indication of available funds to be potentially invested into agriculture as opportunities arise.

- *Significant lack of technical information to producers*: There appears to be a surprising lack of technical information from outside the governorate used by farmers, who when asked where they receive agricultural information often state "*from what I see on my farm*". In parallel, the provision of extension services previously performed by the Syrian government apparently no longer exists. One farmer mentioned that he listens to weather reports on the BBC, and therefore advanced his wheat and coriander harvest forward a couple of days in order to optimize his harvest. Only one producer out of the 120 surveyed mentioned getting outside information in this manner, which demonstrates a very large opportunity for the provision of information to growers. Opportunities include: information on modern production methods, market information, effective bookkeeping, business management, etc. It should be mentioned that when asked if they had access to mobile phones or the internet, most value chain actors said they did not.

- *Lack of literacy and numeracy skills*: While agricultural accounting is usually common in mid-level-to-advanced agricultural economies, it seems that not all producers are familiar with bookkeeping. Some producers indicated that they do their own bookkeeping given that they cannot read and write, while others stated that they do not have basic numeracy skills. Some producers mentioned that they do their own

bookkeeping as they live alone in rural areas and do not have access to outside assistance. This can be viewed as both a constraint and a training intervention opportunity, addressed further below.

SPECIFIC VALUE CHAINS

- *Cotton:* The lack of Syrian government support, in addition to the high cost and low quality of agricultural inputs (seeds, fertilizers, fuel, etc.) has reportedly led to the near-collapse of the production of cotton in the governorate, negatively impacting not only producers but also input suppliers, traders, processors, and livestock producers. The latter of whom pre-crisis commonly used high-protein cotton-ginning as an inexpensive and productive feed. Of the six value chains assessed, cotton is viewed by those within the chain as the least profitable in the post-crisis environment. Although some cotton production exists on smaller plots and at a much reduced level, one respondent noted, "If the government doesn't support cotton production, nobody will grow it."


Wheat field, Al-Hasakeh, Syria — MercyCorps

- *Wheat:* In contrast to cotton, those who continue to grow and sell wheat generally claim it to be a profitable business post-crisis - albeit less profitable than coriander, to which many growers have moved. The Syrian government continues to buy wheat at a price which growers still find profitable - despite complaints of currency price manipulation.[3] While accessing high-quality, affordable agricultural inputs is a serious challenge (including fertilizers, pesticides, seeds, and machinery and equipment spare parts), wheat continues to be produced as part of a larger dry-land winter crop diversification and crop rotation effort, which includes alternating wheat with coriander, barley, legumes (including lentils), and/or cumin. Any intervention efforts, therefore, should be created with this larger crop-system approach in mind, and is addressed further below under *Key Intervention Opportunities.*

Wheat Bags

Wheat bags, made of canvas and red striped, are provided by the government. Without such wheat bags farmers cannot sell their wheat to the government (the sole legal buyer, although sold to the government via traders), and therefore in theory cannot sell the product at all. However, the provision of such bags is highly inefficient - while large growers can still access them, many smaller growers cannot due to lack of availability and high prices (large growers often sell their bags to smaller growers). It should be noted, however, that elsewhere in the world large-tract wheat production as seen in Al Hasakah usually involves the harvest of wheat in bulk, i.e., without bags, which is much more economically efficient.

- *Coriander:* As a response to a decrease in Syrian government support to traditional crops (primarily wheat and cotton) post-crisis, coriander production has increased from a reported 0.8% of arable land in Al-Hasakeh to 80% in three years. Aside from its reported advantages in cash-generation - virtually the whole production is sold for cash to traders who buy the product at the "farm-gate" - coriander production does not require heavy inputs (in particular pesticides and herbicides), which helps make it a more profitable crop than wheat. However, heavy coriander production can reportedly deplete the soil of its nutrients over time, and needs to be rotated with other dry-land winter crops after no more than two consecutive seasons to help maintain soil fertility. Reportedly, a common local dry-land winter crop rotation cycle is coriander (two years), wheat (one year), cumin (one year), lentils or legumes (one year), and then back to coriander. Coriander has become such an important crop to certain areas within Al-Hasakeh that a key learning from the assessment

[3] The Syrian government is accused of pegging the Syrian pound to the US dollar at below global market rates during harvest.

is the intervention opportunity to facilitate crop rotation with other crops to help maintain a sustainable dry-land winter crop agricultural system inclusive of soil health, encourage crop diversification and market risk mitigation in general, and to avoid over-production and a potential drop in the local price of coriander.

- *Shoats:* Another long-standing and traditional product in the region is shoats (i.e., sheep and goats, which are often grazed together in Syria). Despite post-crisis market disruptions, local market demand appears to have remained stable within Al-Hasakeh. Additionally, a sizable shoat export business exists between North East Syria and Iraqi Kurdistan via the Al-Hasakeh governorate crossing at Peshkhabour (aka "Samelka"). Informal reports state that many of the shoats exported through this point are produced in areas further west in Syria, including near Aleppo and the surrounding area.

  Anecdotally, one afternoon the assessment team saw five trucks of shoats and two trucks of dairy cattle crossing into Iraq from Syria over a half an hour period. Despite this volume of commercial traffic, Al-Hasakeh shoat producers report serious production challenges given the lack of affordable, high-quality inputs including livestock medicines and vaccines, livestock medical services, feed and fodder, access to historical pastures (now constrained due to insecurity), and lack of greater access to both domestic and export markets outside of Al-Hasakeh.

Wheat bulgur, Al-Hasakeh, Syria – Mercycorps

Tomatoes ripening on the vine, Al-Hasakeh, Syria - MercyCorps

- *Bovine Dairy Products*: Another value chain which has suffered significantly post-crisis is cow dairy production. The primary reasons, like the other value chains assessed, is a lack of affordable and high-quality inputs (feed, fodder, medicines, vaccines and livestock medical services), and disrupted access to markets.

- *Tomato Products:* Profitability of tomato products production has also suffered significantly post-crisis, with the primary reasons cited as lack of affordable, high-quality inputs (seeds, fertilizers, pesticides, herbicides, and fuel to run well irrigation pumps), and poor access to markets.

Key Intervention Opportunities

It is recommended that agricultural interventions in Al-Hasakeh consider overall cropping systems for the region rather than individual crops. As mentioned previously, the dry land winter cropping system in Al-Hasakeh at present generally consists of planting coriander (two seasons in a row), followed by any combination of wheat, barley, lentils (or other legume), perhaps cumin, and then back to coriander. Given the large amount of land farmed in this manner, this cropping system is assumed to have a large, appreciable, and positive impact on the local economy and therefore individual livelihoods. As such, coriander and wheat are therefore strong candidates for specific individual crop interventions – with a specific emphasis on increasing access to high quality and affordable inputs.

Simultaneously, summer irrigated crops are sometimes farmed on winter crop land, but in much smaller areas given the heavy constraints of using irrigated well water. Such crops include cotton, tomatoes, feed, fodder, and vegetables. Additionally, the livestock system should be considered as complementary to the crop systems as both are mutually reinforcing in terms of using manure for crops, and grain (and cotton by-products) used as animal feed.

Within these three systems (winter cropping, summer cropping, and livestock), and given a set of criteria, the products selected for further analysis and which offer the most potential are wheat, coriander, shoats, and bovine dairy products, per the matrix below. These value chains offer not only strong economic opportunities in the current context in terms of profit generation and future growth, but also generally contribute to the diversification of household diets, and allow women and girls to be engaged in the production and/or marketing process.[4]

Table 1:
Agricultural Product Selection Matrix

PRODUCT	Growth in Demand	Profitability	Constraints Relatively Easy to Alleviate	Balanced Gender Roles	Potential Nutritional Gains
WHEAT	Moderate	Yes	Yes to Moderate	Yes	Limited
CORIANDER	Strong to Moderate	Yes	Yes to Moderate	Yes	No
SHOATS	Moderate	Yes to Moderate	Yes to Moderate	Unlikely, but not clear	Yes
DAIRY	Moderate	Yes to Moderate	Yes	Yes	Yes

STRENGTHEN INPUT SUPPLY

Throughout the three agricultural systems, one of the strongest opportunities is to increase the access of value chain actors to high-quality, affordable inputs and equipment. This means:

- In the short term - develop voucher programs to spur the use of quality inputs at affordable prices.
- In the medium to long term – assist private input providers in expanding their goods services to the region, potentially through credit programs and/or loan guarantees to encourage investment, plus technical assistance in marketing their products and services. Additionally, there would be opportunities to advocate for more efficient input supply policies and enabling environment and additionally to an opportunity to facilitate the provision of solar powered irrigation pumps (and their servicing) where applicable.

STRENGTHEN TECHNICAL AND BUSINESS CAPACITIES

- In the short term - facilitate the provision of agricultural technical training as well as the provision of basic business management training to producers and others throughout the value chains.

[4] Please note that as of this writing, coriander producers are waiting for a final price at which to sell their product, and which will determine coriander profitability for the season.

- In the medium to long term – facilitate the development of an agricultural extension system either through farmer associations, cooperatives, professional groups, and/or input suppliers; and promote the dissemination of information through radio or mobile phones, depending on locally available technology.

  Also, facilitate the use and adaptation of technology to expand the knowledge base and entrepreneurial opportunities of local value chain actors, including the use of smart phones (with access to the internet, where available), and desktop internet availability.

  Finally, review opportunities to work with farmer cooperatives regarding farm and cooperative management, business management, group buying of inputs, contract farming, and group sales for economies of scale, and cross fertilization of knowledge.

EXPLORE OPPORTUNITIES TO INCREASE FINANCING

- In the short term – facilitate training and the provision of value chain finance.
- In the medium to long term - explore opportunities of specialized agricultural finance such as warehouse receipts or "warrantage", and contract farming, among others.

Other Considerations

GENDER

Given the industrial commercial scale of the agriculture sector, gender roles did not appear to be a primary constraint to increased agricultural production and livelihoods - and in fact, local Kurdish forces have both male and female army units fighting rebel groups. However, and especially given that women appear to be provided opportunity within Kurdish society, all efforts should be made to facilitate equal opportunities among both women and men.

NUTRITION

Most crops grown in the region are primarily cash crops/products for commercial sale, as opposed to household sale or consumption. Exceptions might include wheat, shoats, tomatoes, and some dairy products. The potential exists for kitchen gardens, but this would require further assessment to determine which products best meet local nutritional needs, and also match both local culture and agro-ecological conditions.

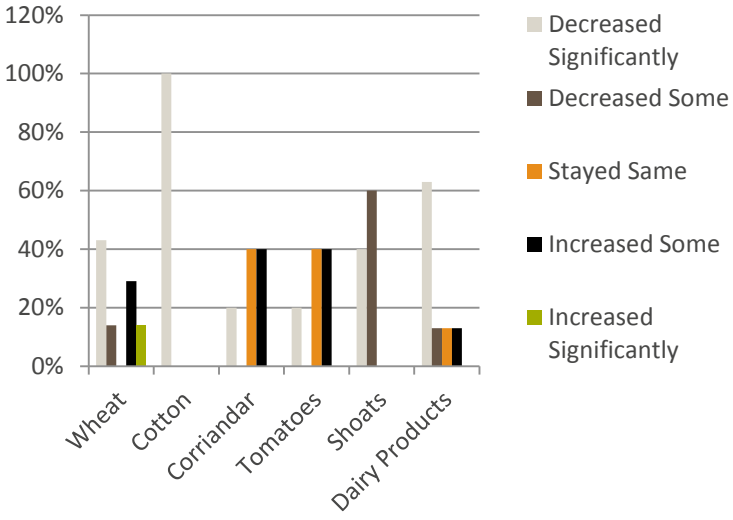
Annex 1: Selected Assessment Data and Analysis

Below are graphical representations and analysis of selected assessment data, and key learnings from such data.

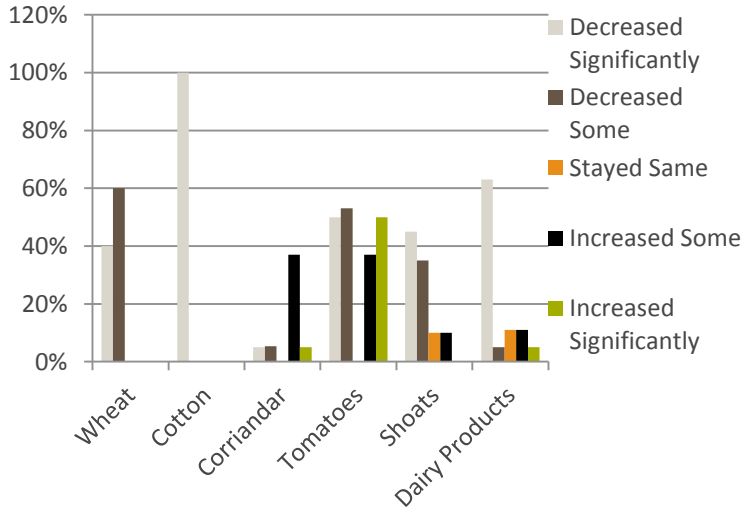
1) How is business?

Agricultural input providers, producers, processors, traders, and transportation providers were asked to provide a quick assessment of the current health of their business. Overall, there is a strong negative impact on the profitability post-crisis of cotton, wheat and dairy, with some decrease in the shoat business. The tomato sector has remained stable, and coriander has seen a slight increase. Please note – there has been a significant decrease in the cotton business throughout the value chain.

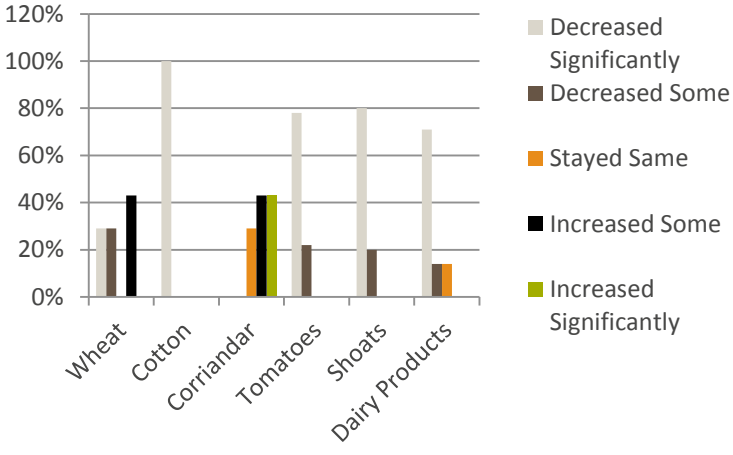
Processors



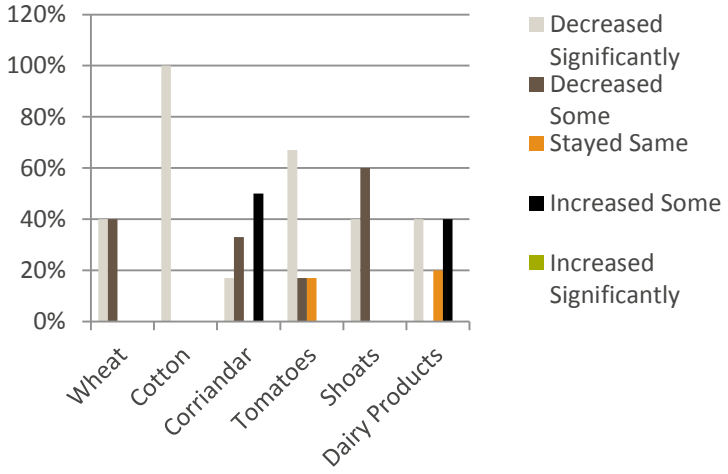
Producers

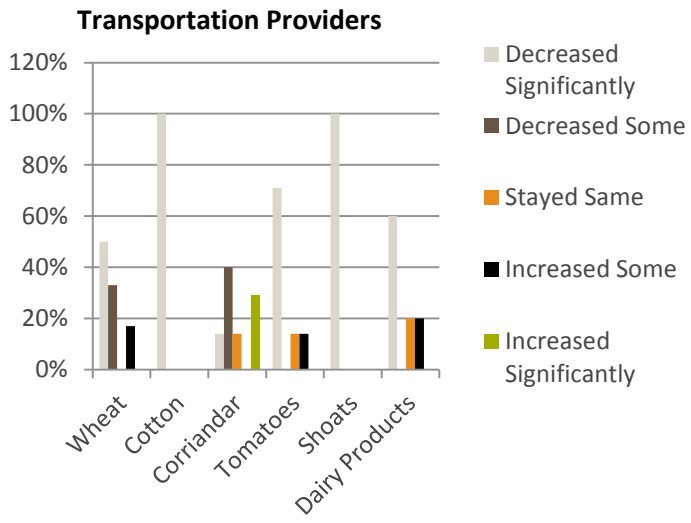


Traders



Agricultural Input Suppliers

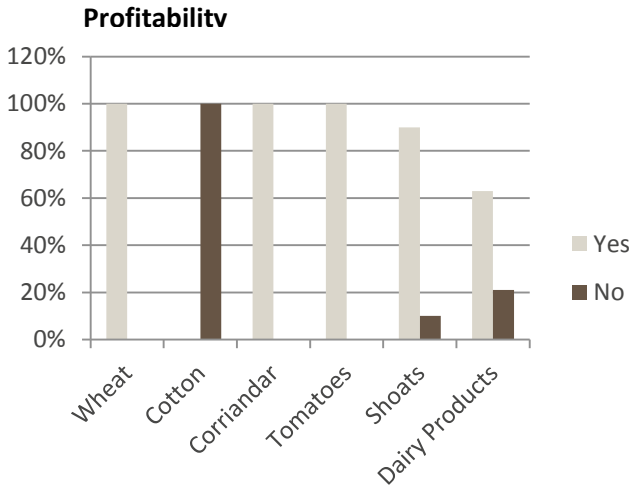




Two Tractors (One Dated and in Need of Repair), and Grain Wagon, Derik, Syria - Mercycorps

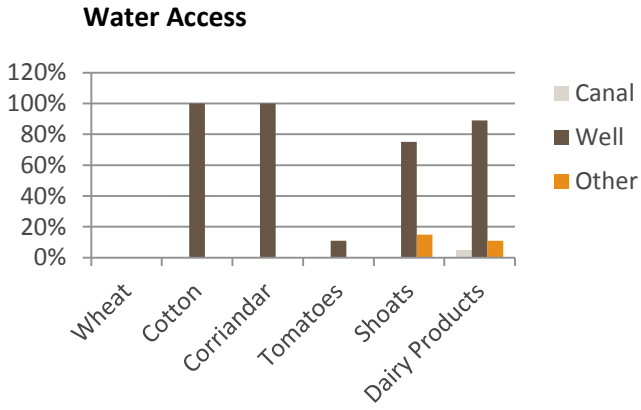
2) Is growing/producing crop/product profitable?

Post-crisis, at production level, there has been a strong perceived decrease in the profitability of growing cotton, with bovine dairy products and shoats production viewed generally negatively but somewhat mixed; and wheat, coriander and tomatoes viewed positively.



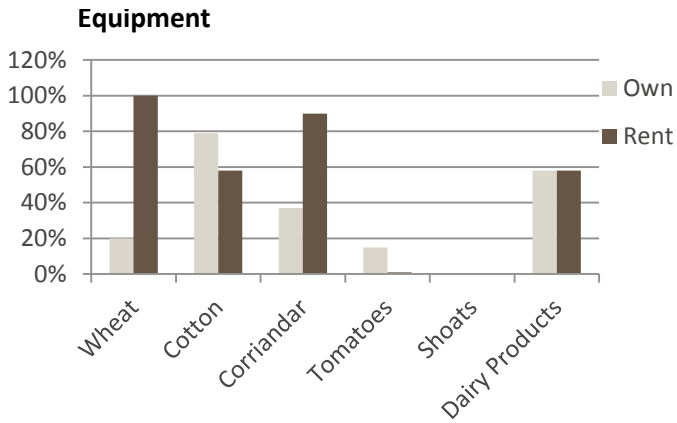
3) Where do you access irrigation water?

While there had been some speculation that irrigation canals were common to the area, and had become damaged and/or generally unusable due to lack of maintenance since the crisis, most irrigation water used by those surveyed comes from wells. One critical restraint is a general lack of affordable fuel and/or electricity to run the pumps.



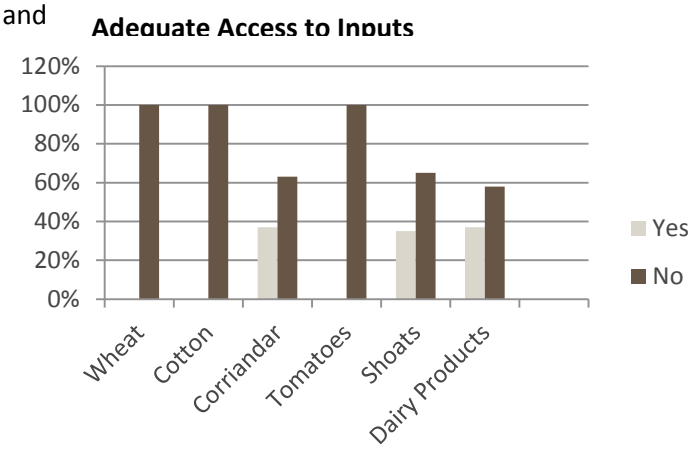
6) Producers: Do you rent or own your machinery & equipment?

Please note: numbers do not necessarily add to 100% given that many producers both rent and own machinery and equipment. Producers reported that a large machinery and equipment rental industry exists, which may be a statement of how extensive the agricultural services industry is in the region, even after the crisis. This also suggests an intervention opportunity through the facilitation for more rental machinery and equipment service providers to service the area.



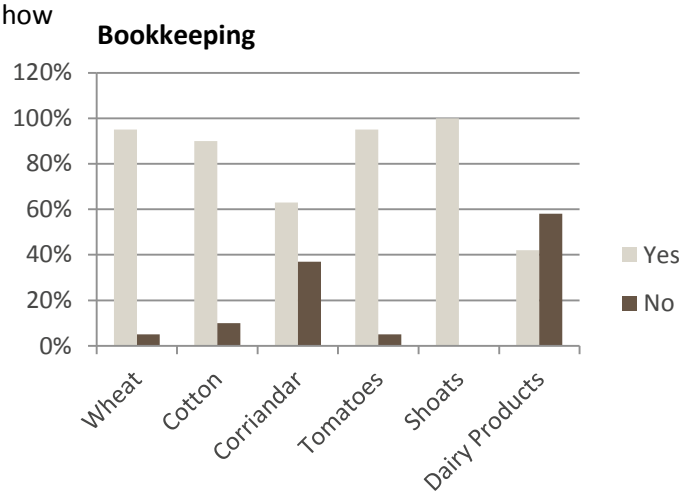
7) Can you access the agricultural inputs in the quality and quantity needed?

Most producers report they are not getting the quantity and quality of inputs they need (fertilizers, pesticides, herbicides, fuel, labor, veterinary medicine and vaccinations, etc.), or if they do, it is for a very high price. Please note that coriander uses relatively few inputs (specifically fertilizers, pesticides and herbicides) compared to other crops, especially wheat, which has helped drive a switch in production from wheat to coriander.



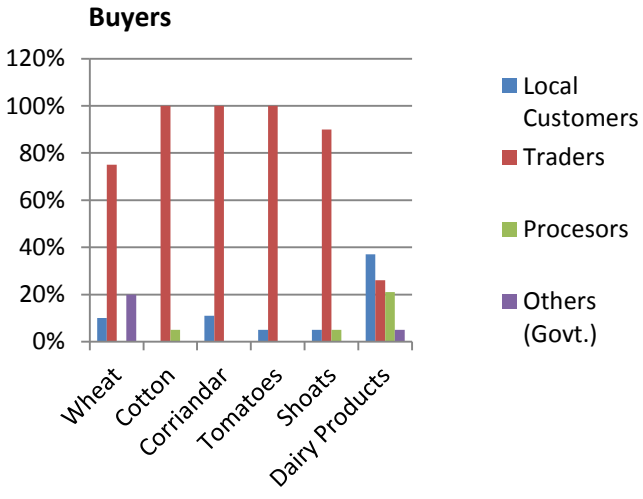
8) Do you do your own bookkeeping/accounting?

The purpose of this question was to get a sense of how sophisticated the agricultural business economy is in Al-Hasakeh, and in particular whether an agricultural accounting industry exists (common in some mid-level to advanced agricultural economies). Interestingly, it looks like this service may exist given that not all producers do their own. However, some producers mentioned that they do not do their own accounting given that they cannot read and write, or do not have basic numeracy skills. Others mentioned they do their own accounting/bookkeeping as they live remotely and do not have access to help. This can be viewed as both a constraint, and an intervention opportunity.



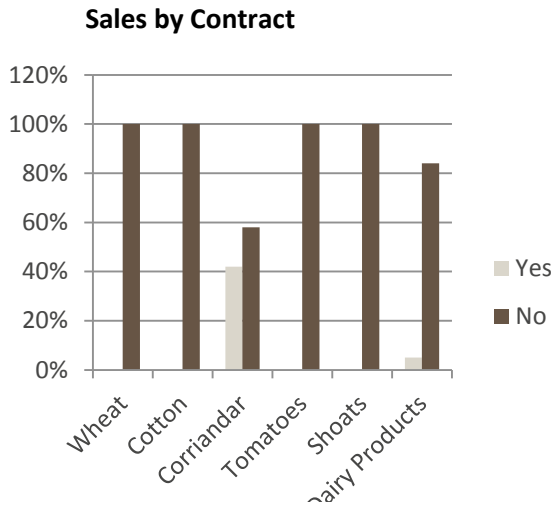
9) Who do you sell to?

Traders are a key part of the agricultural marketing system in the six value chains surveyed, with the possible exception of dairy products (although traders are still important within the chain). Even among those chains heavily supported by the Syrian government (i.e., wheat), traders are still used as a primary market intermediary by the Syrian government. This shows a potential opportunity for producers to organize themselves as associations (reportedly common in Syria) to "vertically integrate" and fill the trader role themselves, and capture margins otherwise earned by traders. It should be noted, however, that traders are often part of larger syndicates, which can be very protective of their business. Therefore this would need to be further investigated within the context of Al-Hasakeh.



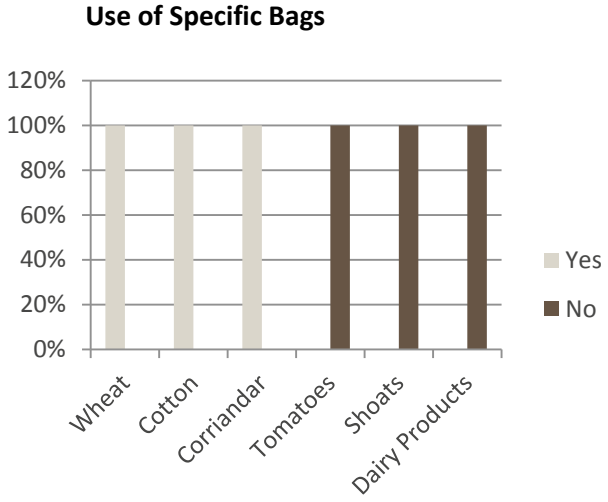
10) As a producer, do you sell by contract?

Middle-income agricultural economies, like that of Al-Hasakeh, often have contract buyers who guarantee a certain price to grower who in return provide a pre-determined quantity and quality to those buyers. Essentially, this is the role the Syrian government plays in the wheat market, and the cotton market pre-crisis. Interestingly, beyond the coriander and to some degree the dairy products value chain, contracts are not commonly used. Such contracts can also be used as a type of collateral to obtain loans from financial institutions.



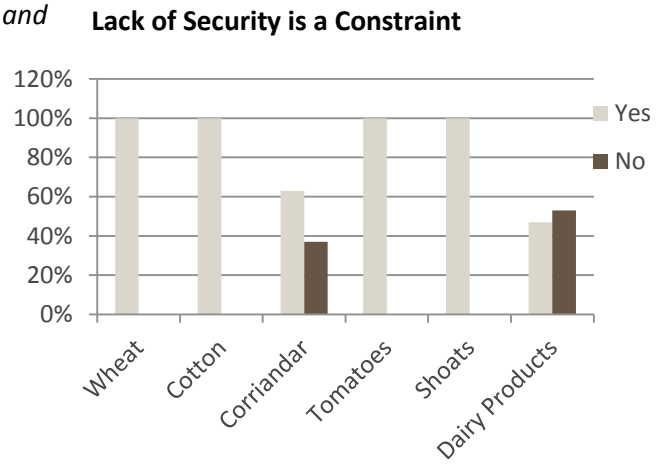
11) Use of a specific type of bag during harvest?

Producers of wheat, coriander and cotton all need harvest bags to be able to harvest and market their products, and in some cases (wheat and coriander specifically) the use of specific types of bags are needed to sell products. Given that the distribution of such bags is presently inconsistent and inefficient, the facilitation of the provision of such bags could become a key intervention opportunity.



12) Is lack of security a significant constraint to the production and marketing of your product?

With the exception of producers of bovine dairy products, and to some degree coriander, lack of security is generally viewed as a very large constraint both in terms of the ability to market product beyond Al-Hasakeh (which is Kurdish-controlled and generally secure), and the inability to get agricultural inputs (including fuel, machinery and equipment, and spare parts) to Al-Hasakeh.



Annex 2: Findings by Crop

WHEAT

Wheat has been successfully cultivated in the Al-Hasakeh region for centuries, and is a major reason why the governorate is considered a breadbasket for Syria. In particular, the deep, rich top soils combined with (generally but not always) adequate winter moisture, and warm (and dry) early summer temperatures (when the wheat is harvested) makes it a nearly ideal dry land winter wheat growing area. It should be said however, that winter moisture in the region can be somewhat variable, and there has been some concern about adequate moisture in recent years. However, the 2014/15 winter had ample moisture, which led to a relatively large harvest in 2015.

As mentioned previously, pre-crisis the Syrian government served as both a monopoly buyer of Syrian wheat (which continues today in Al-Hasakeh), and a primary provider of agricultural inputs and services. However, since the crisis, while it continues to nominally provide some agricultural inputs such as fertilizers and wheat harvest bags, the volume and/or quality of such inputs has decreased dramatically, and created a major disruption of wheat production (see wheat crop calendar below). Despite this disruption, wheat (and its by-products such as flour and livestock fodder) is still considered one of the more profitable crops in the area.

WHEAT CROP CALENDAR

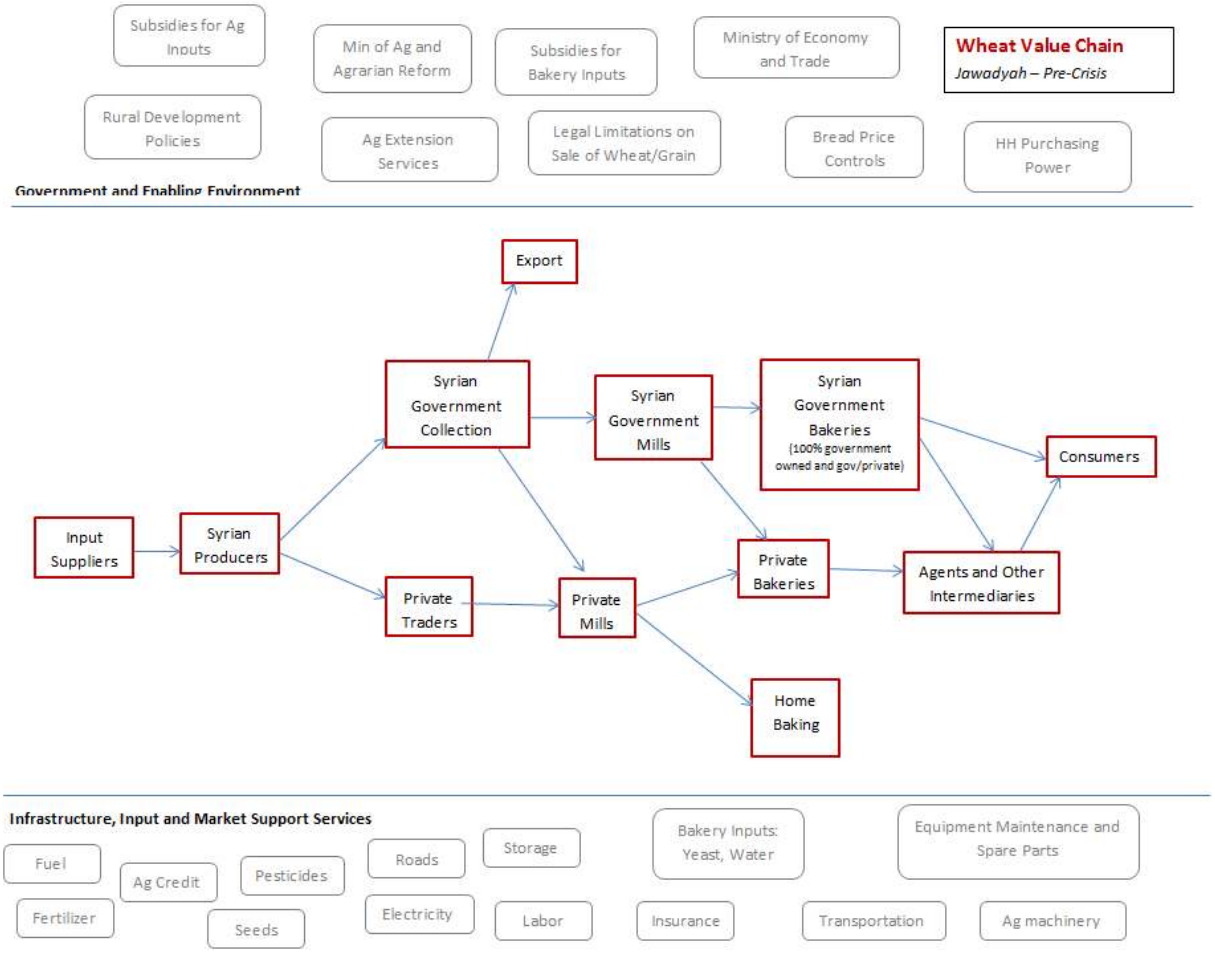
Activities		Monthly Crop Calendar for Dry Land Wheat; Jawadyah, Syria											
		Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Land Preparation	Bef.												
	Aft.												
Initial Fertilization	Bef.												
	Aft.												
Sowing/Planting	Bef.												
	Aft.												
Second Fertilization	Bef.												
	Aft.												
Weeding (Incl. Herbicide Application)	Bef.												
	Aft.												
Pesticide Application	Bef.												
	Aft.												
Harvest	Bef.												
	Aft.												
Sales (to Regime via Trader)	Bef.												
	Aft.												
Transportation	Bef.												
	Aft.												
Processing (Flour, Seeds)	Bef.												
	Aft.												
Transportation (Grain, Seeds, Flour)	Bef.												
	Aft.												
Growers Receive Payment	Bef.												
	Aft.												

Occurs and/or available

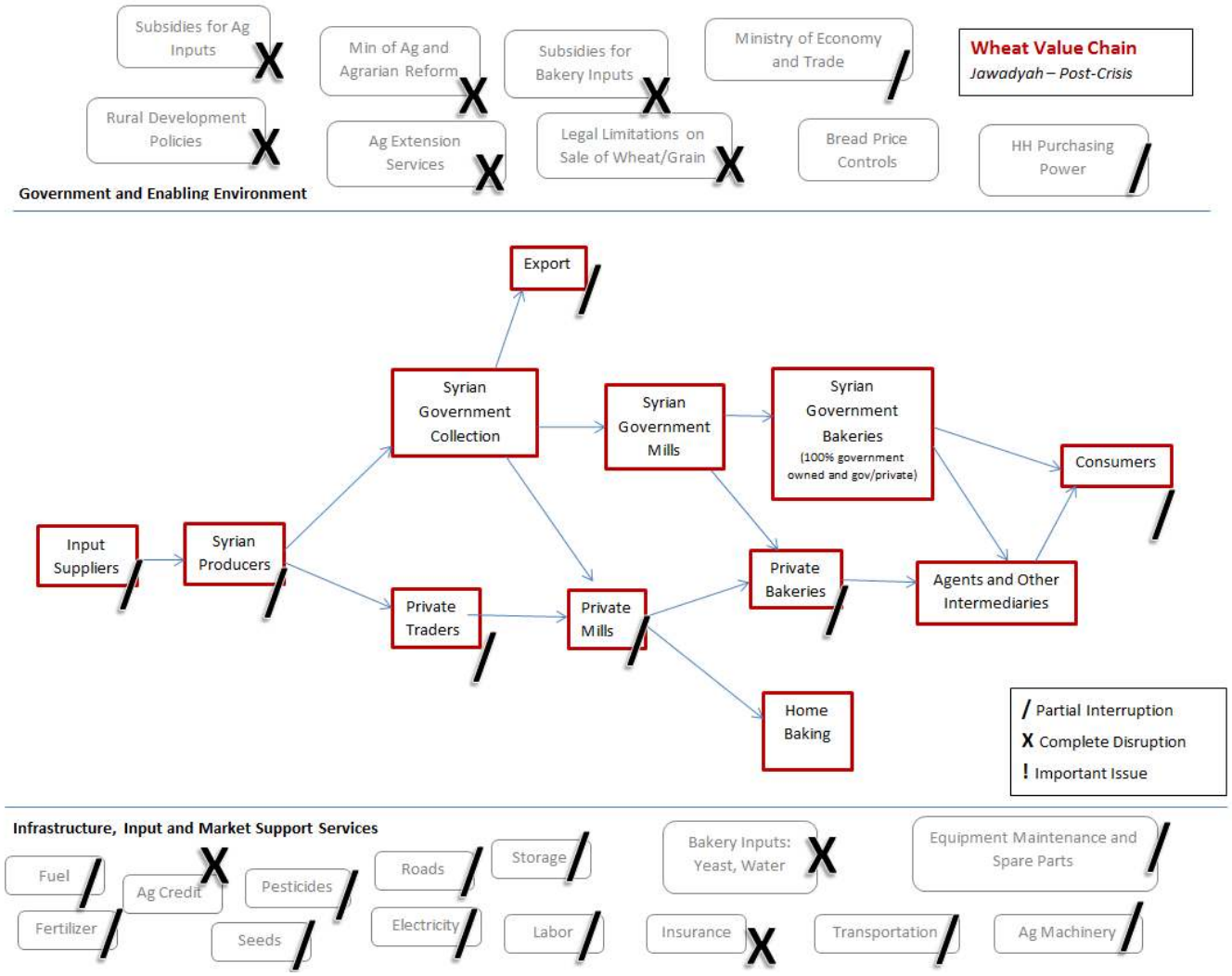
Not available or strongly impacted

The crops calendar above is typical for that of dry land winter wheat crop found in latitudes similar to that of Syria, e.g., North America and Afghanistan. However, please note that lack of agricultural inputs is a major disruption, which is also indicated in the pre- and post-crisis Al-Hasakeh wheat value chain diagram below.

Wheat Value Chain Map, Pre-Crisis



Wheat Value Chain Map, Post-Crisis



The assessment results are similar to those from the wheat value chain EMMA assessment conducted last year by Mercy Corps in North Syria. Specifically, the value chain has been highly disrupted post-crisis due to the Syrian government no longer providing subsidized agricultural services, and a lack of high-quality agricultural inputs including fertilizers, machinery and equipment, and credit. This phenomenon was amplified by the disruptions in trade caused by internal conflict within Syria, and closed borders with most neighboring countries. Although not specifically listed here, please also note that the disruption has led to a large number of wheat farmers converting their production in recent years to coriander, which uses far fewer inputs, does not rely on the Syrian government as a buyer, has a ready cash market via local traders, and has a large market outside of Syria which is accessed via the Syrian port of Latakia, via Aleppo.

Grain Storage Facilities; Outside of Derik, Syria - Mercycorps

Further discussion of the Al-Hasakeh wheat value chain, post-crisis

Is the crop/product profitable to the producer, and, if so, why, and if not, why?
Yes, it is profitable, as the crop is rain-fed, does not depend on irrigation from wells (which is costly), and the price provided by the Syrian government is profitable. And wheat is a good match for the local soils and climate.

Who is the final consumer of this product, and where are they located?
The final consumers are primarily the Syrian public. Wheat is provided by the Syrian government to Syrian mills, which in turn provide flour to bakeries. As there are reportedly no flour mills in the immediate area (although bulgur mills are located within Al-Hasakeh), the Syrian government transports the wheat outside of Al-Hasakeh to be milled into flour, and then ships the flour back to Al-Hasakeh.

Has the profitability of the crop/product changed since the crisis, and if so, how much (significantly, not significantly), and why?
Yes, the profitability of the wheat has changed dramatically from pre- to post-crisis. Reportedly, the profitability of producing wheat has dropped an estimated 50%, due to a two-fold increase in the price of agricultural inputs since the crisis. In turn, many farmers have decreased their use of most inputs (including fertilizers, herbicides, pesticides, etc.) not only to decrease expenses, but also because the quality and effectiveness of such products has dropped dramatically. There has also been a decrease in the use of credit - most agricultural transactions now occur in cash, which impacts the ability of farmers to purchase inputs. In parallel, given that most of those in Al-Hasakeh convert available Syrian pounds to US dollars as a hedge against inflation, the decrease of the value of the pound relative to the dollar has negatively affected farmers' purchasing power. There are reports that the Syrian government decreases the value of the Syrian pound specifically during the wheat harvest to decrease the US dollar cost of the wheat, and to in turn therefore sell part of the wheat on the international market at therefore higher profits.

*What are the major **opportunities** for increased profitability for wheat producers?*
Increasing the availability of high-quality, affordable agricultural inputs.

*What are the major **impediments** for increased profitability for wheat producers*?
The Syrian government continues to control the wheat price (linked to but not equivalent to the global price), which creates a significant local market distortion. In parallel, high-quality agricultural inputs are unavailable and/or costly relative to pre-crisis (and reportedly purchased primarily through the "black market").

Who benefits most financially in the wheat value chain, and why?
- The processors, whose profit margins are reportedly greater than those of farmers.
- Traders, who are experiencing strong profits with relatively little risk or operating costs.
- The Syrian government, which buys wheat at approximately half the global price (in part due to currency manipulation), and then allegedly sells a portion in the international market, while not providing significant ancillary agricultural inputs or services.

Who benefits the least financially in the wheat value chain, and why?
The producers. The Syrian government controls the price of wheat and does not support farmers to the level it did pre-crisis; the cost of inputs has increased dramatically; the quality of inputs has fallen markedly; and new crop diseases have allegedly resulted in crop losses (although such diseases have not been named specifically beyond Sunn Pest, which is common to the region).

What are the three most impactful, positive interventions which Mercy Corps could do in this value chain to improve beneficiary livelihoods (net incomes), and why?

Most farmers suggested greater access to the following products, in a high-quality form:

- Fertilizers (two types were specifically mentioned: "Nitrate" and "phosphorous);
- Improved and "processed" seeds (i.e., consisting only of the wheat variety labeled, and no other wheat varieties or others species such as oats, barley, thistle, mustards, etc.); and -
- Pesticides and herbicides.

Are there interventions that can be done which will benefit multiple crop/product producers?
Increasing wheat production would benefit livestock producers, who use wheat chaff as fodder for livestock. The sales of wheat chaff provides significant income to wheat farmers.

Who is the final consumer of the local wheat?

- Wheat processors, and in particular for flour, bulgur, then bakeries, and ultimately local consumers.
- Farmers, who use a portion of the wheat crop as seeds for the following season.
- Livestock producers who use the chaff for feed.

What are the main challenges faced by local wheat growers in the area?

- High cost of inputs.
- Lack of seeds, seed preservatives (used to preserve seeds in storage), fertilizers, pesticides and herbicides.
- Difficulty in acquiring wheat bags (nylon and red striped), a specific type which must be used to ensure the wheat is purchased by the Syrian government, and which are provided by the Syrian government inconsistently, and at volumes which do not always match production volume.

What is the relative profitability of local value chain actors?

- Traders' profits increased post-crisis given that the government now seldom buys the crop directly from farmers, but rather buys from traders or from particular large producers. Essentially, traders have become middlemen post-crisis between wheat farmers and the sole client, the Syrian government. Pre-crisis, there were 12 Syrian government wheat purchase centers in Al-Hasakeh. Post-crisis, however, there are now only two, both in Qamishili, too far for most farmers to access given high transportation costs.
- Al-Hasakeh processor profits increased after the crisis. Most of their competitors from the other governorates left the business due to insecurity, and in particular those in Aleppo and rural Damascus.
- Transportation company profits have decreased post-crisis due to increased road insecurity and the poor quality of fuel.

What are the primary intervention opportunities that would help make wheat production more profitable?

- Provision of fertilizers of good quality, followed by seed "preservatives" (i.e., apparently a fungicide which decreases wheat seed loss in storage, although one producer mentioned that most preservatives now available are expired and therefore of poor quality);
- Access to high quality, affordable seeds (most seeds available now are of mixed wheat strains, and are contaminated with barley seeds, decreasing the quality of the wheat harvested); and
- Access to affordable, high quality herbicides and pesticides.

Wheat Field - Evidence of Poor Quality Seed Due to Infusion of Barley, Coriander in Background; Derik, Syria - Mercycorps

COTTON

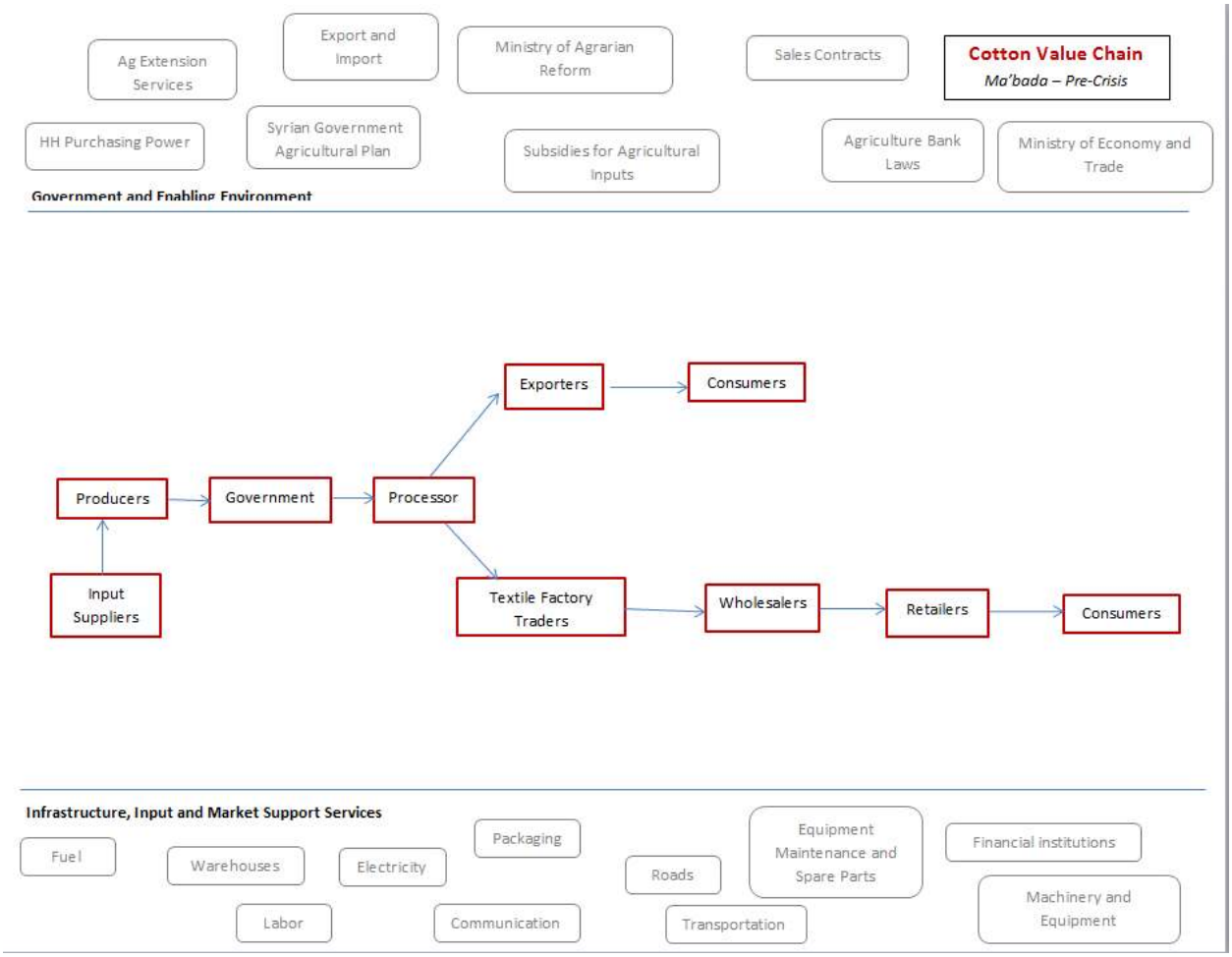
Pre-crisis, cotton had been an important summer irrigated crop, and like wheat, the Syrian government was a strong market player, both buying the crop and providing subsidized agricultural inputs. However, post-crisis neither the Syrian government nor the local government (i.e., the Kurdish government) are supporting the production of cotton. As a result, nearly the entire cotton value chain has collapsed due to a lack of viable markets, and lack of quality agricultural inputs (including adequate amounts of fuel and/or electricity to run irrigation well pumps). Of the six agricultural product value chain surveyed, actors within the cotton value chain all mentioned a decline of their business. The impact of this collapse goes beyond the cotton value chain itself (which includes cotton spinners, transporters, etc.) to impact the local livestock industry, which uses cotton seed extensively for protein-rich livestock feed.

This change is reflected in part in the crop calendar below, which otherwise mirrors cotton production found in the Northern Hemisphere at similar altitude and latitude.

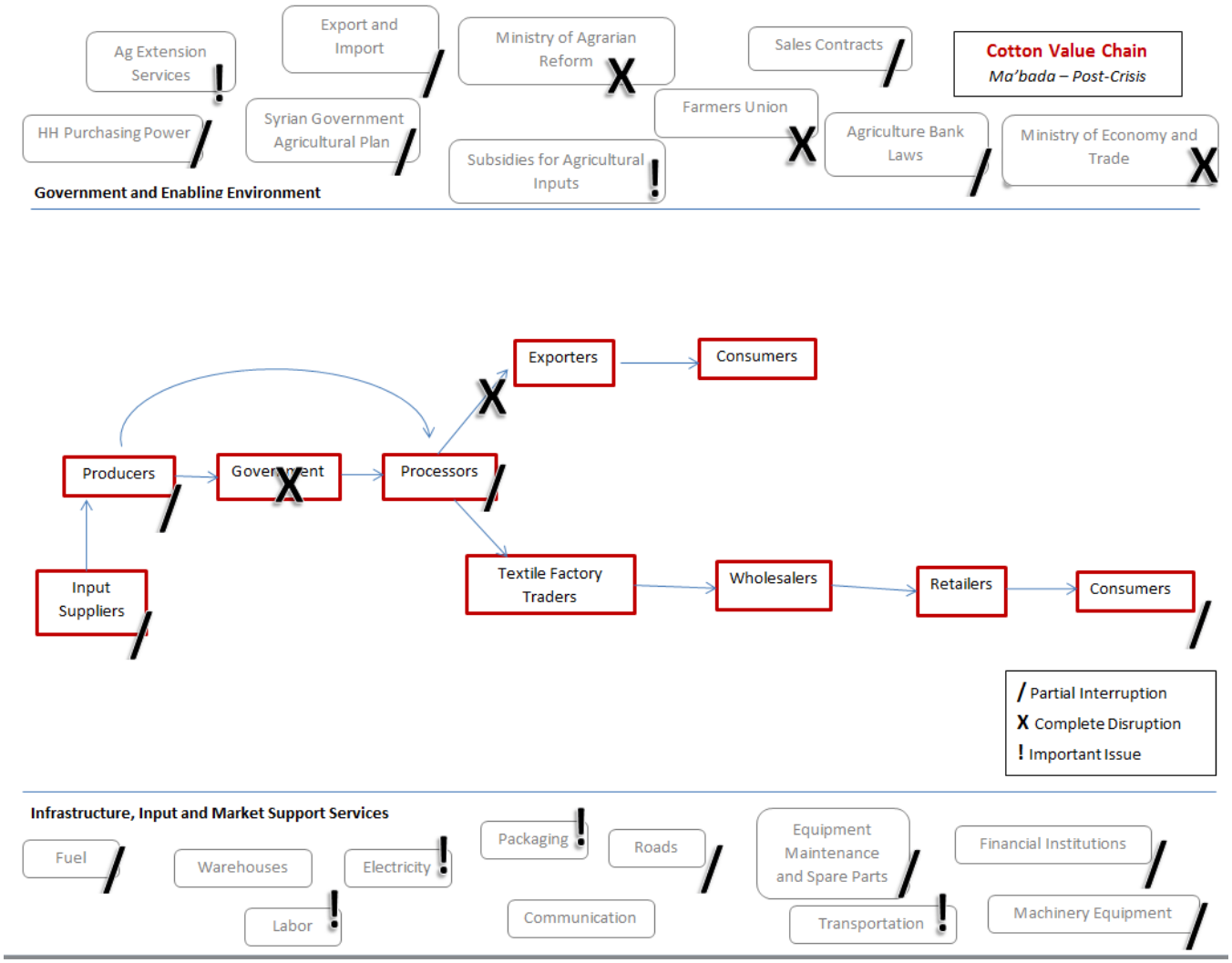
Activities		Monthly Crop Calendar for Cotton; Ras Al Ain, Syria											
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Land Preparation	Bef.												
	Aft.												
Initial Fertilization	Bef.												
	Aft.												
Sowing/Planting	Bef.												
	Aft.												
Irrigation	Bef.												
	Aft.												
Second Fertilization	Bef.												
	Aft.												
Pesticides Application	Bef.												
	Aft.												
Herbicides Application	Bef.												
	Aft.												
Pre-Harvest Activities	Bef.												
	Aft.												
Harvest (Labor)	Bef.												
	Aft.												
Storage	Bef.												
	Aft.												
Transportation (Raw Product)	Bef.												
	Aft.												
Growers Receive Payment	Bef.												
	Aft.												

Occurs and/or available *Not available or strongly impacted*

Cotton Value Chain Map, Pre-Crisis



Cotton Value Chain Map, Post-Crisis



In the value chain map above, note the impact of changes post-crisis in government services, including crop sales contracts (here, called "sharecropping contracts"), agricultural extension services, and a collapse in "outside of Syria" export markets (as opposed to export outside of Al-Hasakeh but still within Syria).

Further discussion of the Al-Hasakeh cotton value chain, pre and post-crisis

According to input suppliers, the blockade by armed groups of the city of Ras Al-Ain prevents them from bringing agricultural inputs from Aleppo and Damascus directly (the main sources for such inputs). An alternative is to bring inputs by air, which is very costly. Other inputs were previously imported and were of "good" quality, but are now being produced within Syria and are said to be of poor quality.

According to transportation companies, they previously hauled a wide range of goods (agricultural crops, gas cylinders, fuel, construction material, etc.) within and between all Syrian governorates. Post-crisis, such companies are reportedly working primarily with agricultural products within the governorate of Al Hasakeh, resulting ultimately in a decrease of income.

According to cotton traders, marketing their crops is difficult due to the control of local roads by armed groups. As Kurds, they are unable to move safely to the primary markets of Damascus and Aleppo, and therefore prefer to sell their products to Arab traders working outside Al-Hasakeh who do have access to such markets.

According to cotton processors, the poor quality of cotton seeds (by-products of ginned cotton are used, given that cleaned and processed seeds for planting are not available) negatively impacts the production of good quality cotton.

Who benefits the least financially in the Al-Hasakeh cotton value chain, and why?
The producers. Pre-crisis they received agricultural inputs (i.e., seeds, fertilizers, harvest sacks, and cash loans) from the Syrian government at good quality and relatively low prices, and paid the Syrian government back when they harvested their products. The Syrian government in turn purchased all cotton produced in Al-Hasakeh. Post crisis, however, the Syrian government is neither providing subsidized agricultural inputs, nor purchasing cotton.

Is cotton profitable to the producer, and why?
Cotton production is generally not profitable to growers, given that the Syrian government is no longer purchasing cotton. Farmers now sell to independent traders at lower prices, and at prices which many growers claim are not profitable.

Who is the final consumer of this product, and where are they located?

A) Spinning factories (although pre-crisis the sole buyer was the Syrian government).
B) Syrian markets outside of the Al-Hasakeh governorate.

Has the profitability of cotton changed since the crisis, and if so, to what extent (significantly, not significantly, etc.), and why?
Cotton crop profitability dropped dramatically post-crisis, in part due to increases in the cost of agricultural inputs and the low exchange rate between the Syrian Pound and the US dollar.

What are the major opportunities for increased profitability for Al-Hasakeh cotton?
Major opportunities include access to good quality agricultural inputs at affordable prices, and access to more profitable markets.

What are the major impediments to increased profitability for this crop/product?

- Lack of good quality seeds.
- High prices and low quality of other agricultural inputs.
- Lack of access to profitable markets.

Who benefits most financially in the Al-Hasakeh cotton value chain, and why?
Syrian traders located outside of Al Hasakeh, who have greater access to roads and markets.

Who benefits least financially in the Al-Hasakeh cotton value chain, and why?
The producers, due to high cost and low quality of inputs, and low product prices.

What are the most impactful interventions which MC could do in this value chain to improve beneficiary incomes, and why?

- Facilitate the provision of good quality and affordable inputs, including fuel for irrigation pumps.
- Facilitate access to new and productive irrigation technologies.
- Improve producers' access to Syrian and export markets.

Coriander is a common dry land (i.e., non-irrigated) winter crop in Al Hasakeh. Its production has increased tremendously in Al-Hasakeh in recent years post-crisis, from an estimated 0.8% of available crop area, to a reported 80%. While the Syrian government pre-crisis had set limits on how much growers could plant (reportedly due to concerns that it may damage soil fertility over time), no such limits exists today and growers have responded by planting large tracts. Coriander is a low-input, cash business, with high demand both from Syrian and international markets. One constraint is that its deep roots deplete soil from its nutrients more than alternative crops, thus the need to rotate with other crops every two years. A common rotation schedule is coriander (two years), wheat (one year), and cumin (one year), with the addition of a legume (lentil or beans) to add nitrogen to the soil.

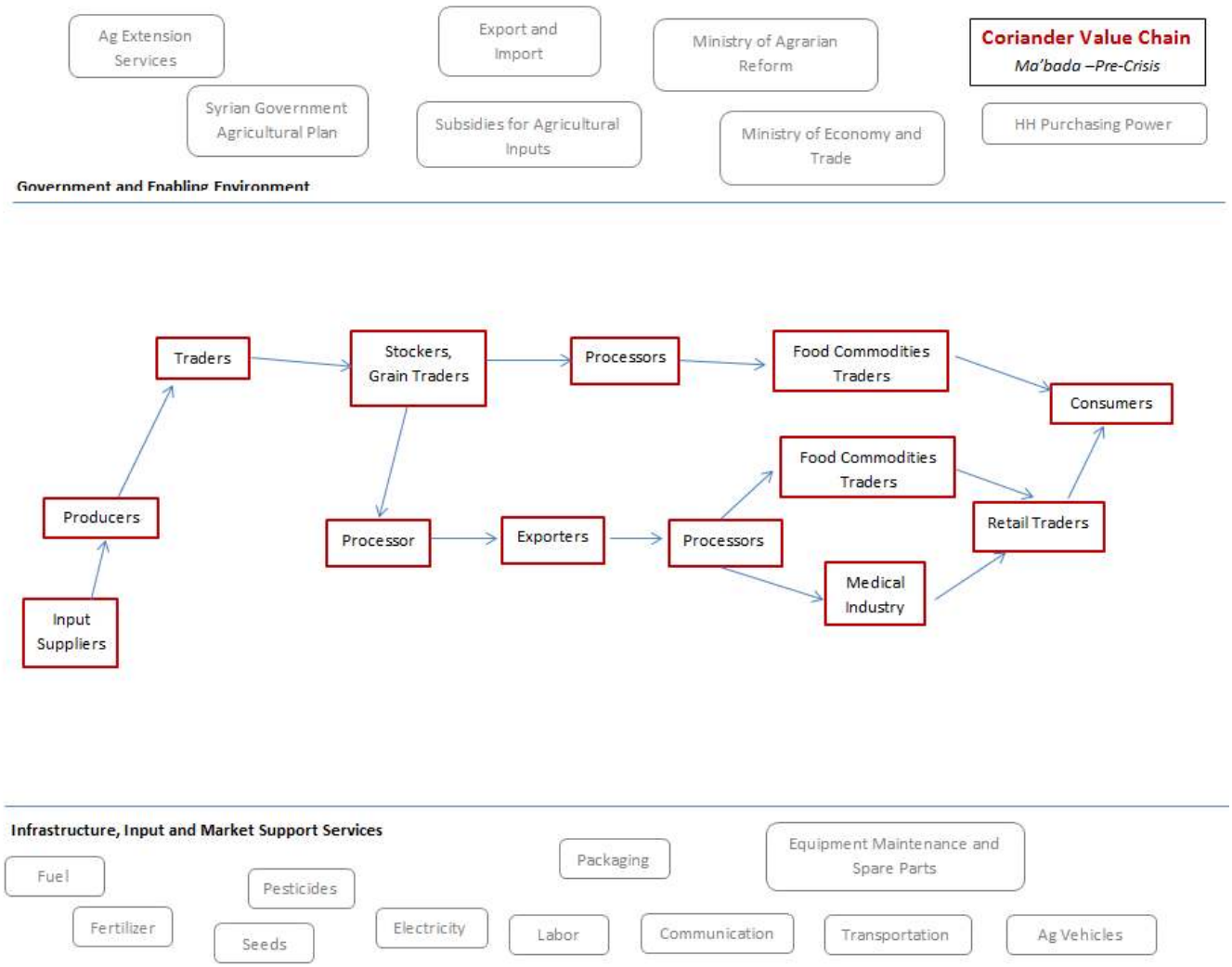
Below is a typical coriander crop calendar for Al Hasakeh, which mirrors other dry land winter crops typically planted in the region (i.e., wheat, barley, etc.)

Activities		Monthly Crop Calendar for Coriander; Ma'bada, Syria											
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Land Preparation	Bef.												
	Aft.												
Initial Fertilization	Bef.												
	Aft.												
Sowing/Planting	Bef.												
	Aft.												
Top-Dressing/Fertilization	Bef.												
	Aft.												
Pesticide Application	Bef.												
	Aft.												
Herbicide Application	Bef.												
	Aft.												
Pre-harvest	Bef.												
	Aft.												
Harvest	Bef.												
	Aft.												
Storage	Bef.												
	Aft.												
Transportation	Bef.												
	Aft.												
Processing	Bef.												
	Aft.												
Transportation	Bef.												
	Aft.												
Sales/Marketing	Bef.												
	Aft.												
Grower Receives Payment	Bef.												
	Aft.												
Labor	Bef.												
	Aft.												

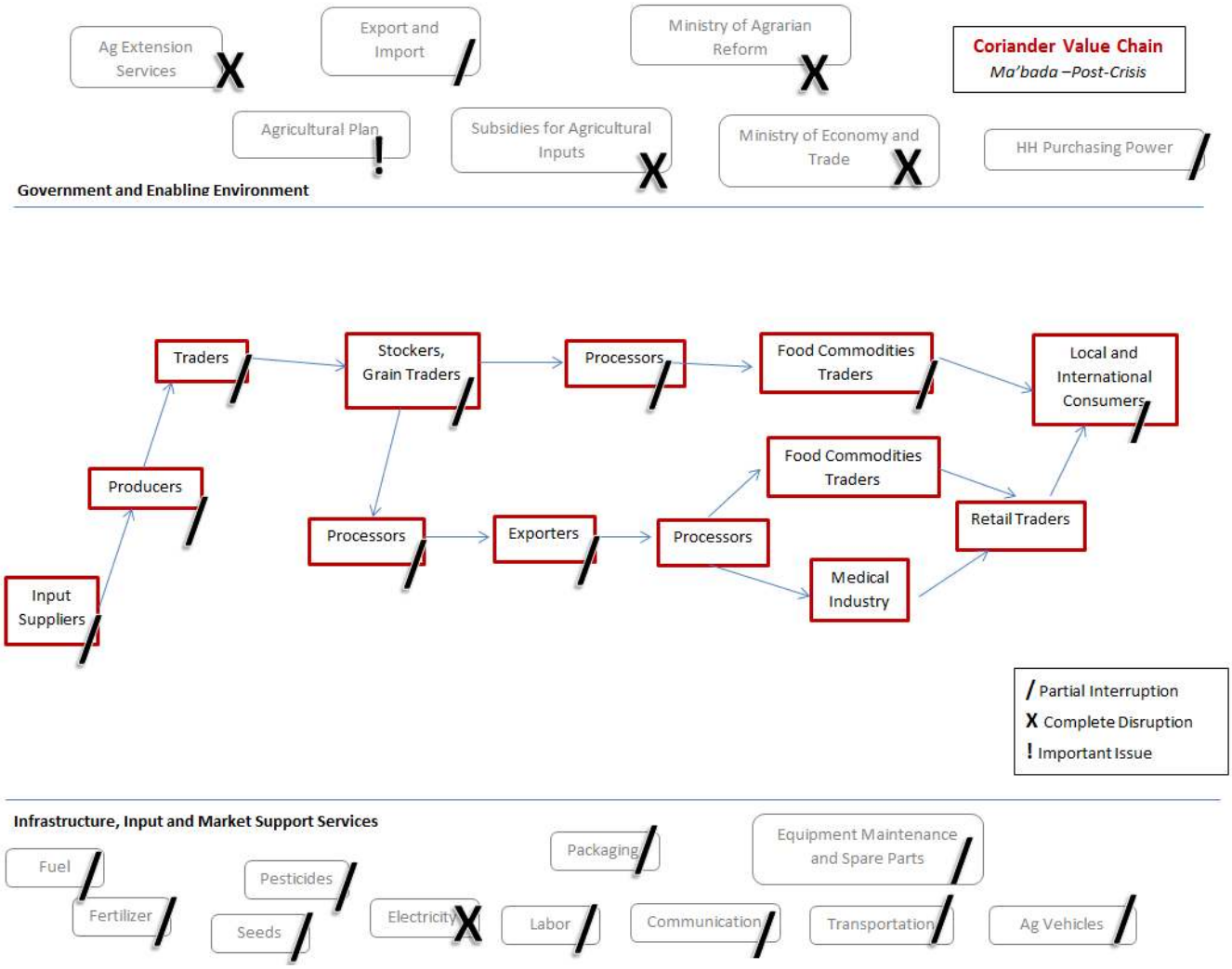
Occurs and/or available *Not available or strongly impacted*

Coriander production has been impacted post-crisis by the lack of agricultural inputs, including labor, electricity for processing, and transport. As a result, while coriander was shipped previously to Al Bab (near Damascus) for processing, it is now processed directly in Al Hasakeh, and then sent to Latakia for export.

Coriander Value Chain Map, Pre-Crisis



Coriander Value Chain Map, Post-Crisis



As the Syrian government had a limited role in the coriander value chain pre-crisis, the chain has had fewer major disruptions in general post-crisis.

Further discussion of the Al-Hasakeh coriander value chain, pre and post-crisis

When those working in the coriander value chain were asked who benefits the most economically within the value chain, the general consensus was that all actors along the chain benefit from its production. However, there was a feeling that growers take greater risk than others in the chain as they tend to concentrate on one product only, whereas traders (for example) have a more diversified portfolio of products.

When asked who benefits the least in the coriander value chain, while there is immediate cash benefit to growers, there is concern that the crop deteriorates the soil in the long term, and that costs for replenishing the soil of its nutrients are not captured in the sales price.

Potential intervention opportunities along the value chain include:

- Technical assistance and information to producers to optimize production, including the correct use of herbicides and pesticides, and potentially looking at the production and use of organic fertilizers to compensate for the lack of other fertilizers.[5]
- Increased access to agricultural inputs, and assistance in the diversification of crops. Although coriander is profitable, it was suggested that interventions support diversification of dry land winter crops, including wheat, lentils and cumin. Cumin is perceived as more profitable than coriander, reportedly depletes soil nutrients less than coriander, and is drought tolerant.
- Increased access to coriander harvesting equipment as the mechanical harvesters who used to be rented from Kobani and Menbij are no longer available, due mainly to the lack of security.
- Greater access to more efficient processing sieves as, while more expensive, the also use less electricity, less labor, and process coriander in less time.

Un-harvested Coriander Field (and Invasive Thistle) Outside Derik, Syria - Mercycorps

Coriander Harvest, Ma'abada, Syria - Mercycorps

Field Crop Seeder, and Other Grain and Coriander Production Implements, Derik, Syria - Mercycorps

[5] For example, one common practice mentioned was the present habit of mixing herbicides and pesticides before application, (which is not considered an optimal practice). Such practices leads to poor outcomes (i.e., more crop infestation than is optimal, and less healthy crops in general), and reportedly damages the processing sieves via pests-infected crops

SHOATS

The production of shoats (sheep and goats) is a traditional practice in the region as a way to economically use land not otherwise suited to crop production, due to low rainfall, poor soils, and/or challenging terrain. Shoats are also grazed in wheat fields in the spring to increase tillering (the production of wheat stems with the potential to grow wheat "heads", or seeds) and therefore to increase wheat yield; and are also placed in fields post-harvest as a way to economically utilize grain and plant material inadvertently left in the field (in addition to the value of deposited shoat manure).

Although not as profitable as pre-crisis, shoat products still represent 50% to 70% of the producers' income (i.e., from live animals, plus milk, lard, cheese, and wool). However, the industry is suffering from a lack of agricultural inputs, and in particular medicines, vaccines, medical care, feed, fodder, and access to historical pastures.

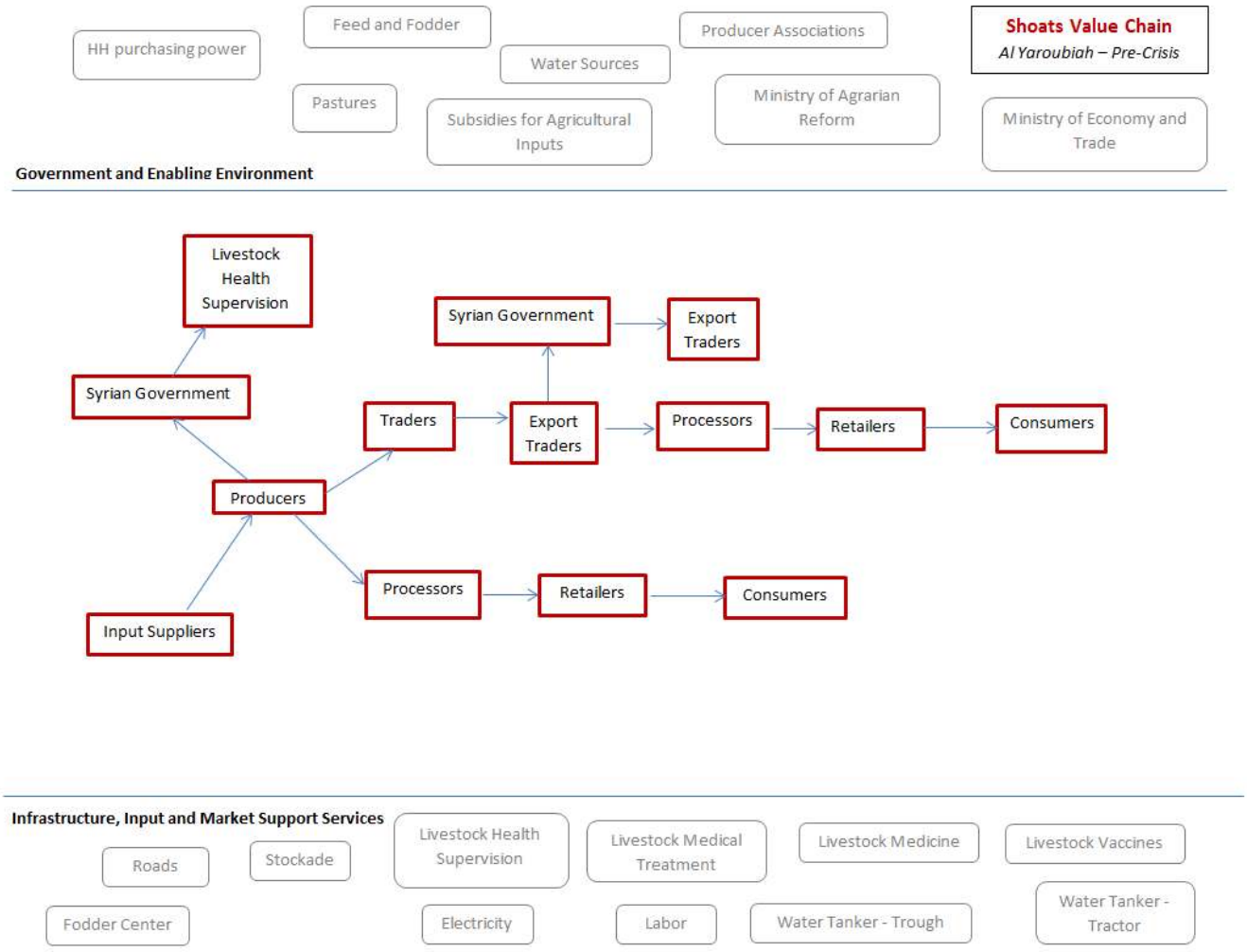
The following is the shoat production calendar for the Al-Hasakeh region, pre and post-crisis.

Activities		Monthly Calendar, Shoats; Al Yarubiyah, Syria.											
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Animal Health													
Treatment of Sick, Injured Animals	**Bef.**												
	Aft.												
De-Worming	**Bef.**												
	Aft.												
Stomatogastric Vaccination	**Bef.**												
	Aft.												
FMD Vaccination	**Bef.**												
	Aft.												
Pasteurella Vaccination	**Bef.**												
	Aft.												
Animal Nutrition													
Distribution of Mineral Concentrates	**Bef.**												
	Aft.												
Distribution of Compound Feed	**Bef.**												
	Aft.												
Summer Feed/Forage Crop Production													
Corn	**Bef.**			P							H		
	Aft.			P							H		
Cotton	**Bef.**			P							H		
	Aft.			P							H		
Winter Feed/Forage Crop Production													
Barley	**Bef.**					H					P		
	Aft.					H					P		
Vetch	**Bef.**					H					P		
	Aft.					H					P		

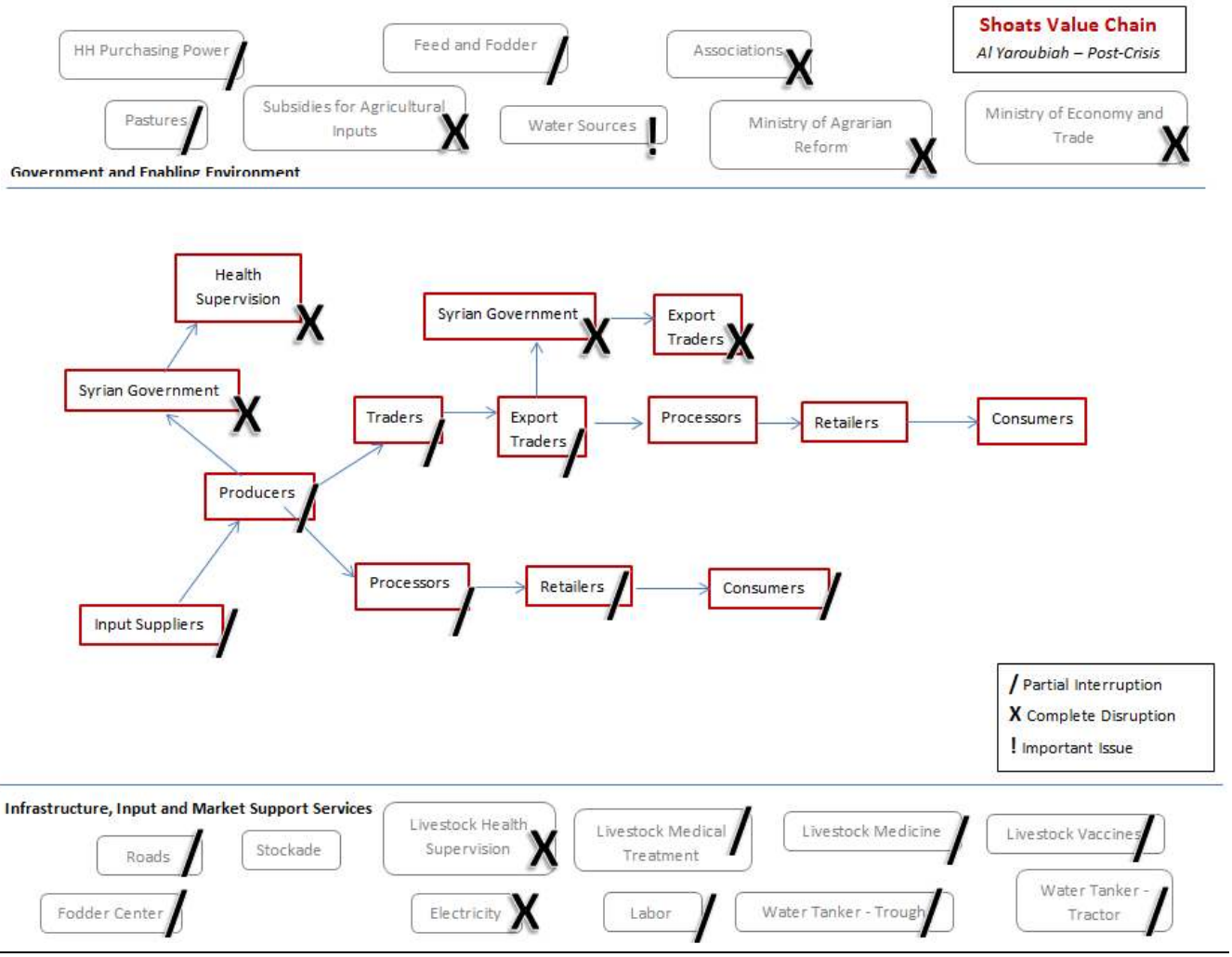
Occurs and/or available *Not available or strongly impacted* *Available but less effective*

P = Planting
H = Harvest

Shoat Value Chain Map, Pre-Crisis



Shoat Value Chain Map, Post-Crisis



The primary impact of the crisis has been the loss of agricultural inputs and markets, and more specifically:

- Lack of livestock feed and fodder, due in part to a strong decrease in crop production used as feed/fodder (including wheat and cotton);
- Lack of access to traditional pasture due to insecurity, and the difficulty of herd movement;
- High cost of transportation (due to increased fuel costs, and road check point "fees") to livestock market centers like Qamishli and Derik;
- High cost of machinery and equipment used in shoat production/transport (i.e., tractors, water tankers, trailers).
- Difficulty in exporting shoats and their products (milk, cheese, etc.), although Peshkhabour functions as a crossing point into Iraq. For example, Al Badya, near the Syrian coast, is a strong market outside of Al-Hasakeh, but is now difficult to access;
- Poor quality livestock medicines, and in particular those bought illegally via the black market;
- Lack of financial support from the government through "public centers", which pre crisis were providing fodder at subsidized price.

Further discussion of the Al-Hasakeh shoat value chain, pre and post-crisis

A strong export shoat business exists between North East Syria and Iraqi Kurdistan, given constant movement of trucks into Kurdistan at the crossing at Peshkhabour. Reports are that the shoats are produced in areas further west (including near Aleppo), but that due to the closure of borders, the shoats are being exported via Peshkhabour instead.

Who is the final consumer of this product, and where are they located?
Consumers include farmers, laborers and employers, located in both rural and urban areas. However, traders purchase 90% of shoats produced locally, according to survey data.

Has the profitability of shoat production changed since the crisis, and if so, how much (significantly, not significantly, etc.), and why?
Profitability of shoat production has decreased post-crisis by an estimated 40% due to the increased price of feed and fodder, livestock vaccines and medicines, and transportation. Some types of feed traditionally used such as wheat bran and ksbaa (processed cotton seeds) are often not available. Other challenges include less available water for livestock, fewer border crossings for export, and historical pastures now difficult or impossible to reach due to insecurity.

What are the major opportunities for increased profitability for this crop/product?
Increasing access to livestock medicines, vaccines and veterinary care at affordable prices is needed, as well as low-cost access to pasture. Additionally, increasing access to export markets for live animals and by-products (milk, cheese, wool, and lard) would result in an increase in revenues.

Who benefits most financially in the shoat value chain, and why?
The traders, whose business can be very profitable when able to export to Iraq via the Peshkhabour border crossing.

Who benefits the least financially in the shoat value chain, and why?
The producers. High input costs (for fodder, medicine, livestock health treatment, etc.) coupled with a relatively low sales price make this business not always profitable.

Potential intervention opportunities along the value chain include:

- Assist farmers to grow yellow maize for both a diversified source of revenue and feed;
- Assist in the provision of irrigation water for the cultivation of alfalfa and barseem clover[6] as crops which can be used as forage year round in the North East Syrian climate;
- Assist in vetch[7] cultivation in drier areas to be used as livestock fodder for shoats (as well as cows, horses, and camels);
- Facilitate greater access to markets external to Al Hasakeh;
- Increase access to affordable livestock medicines and vaccines;
- Increase access to affordable feed not found in the market place post-crisis (in particular bran cake[8]); and -
- Facilitate the provision of facilities for the export of products, and increase the number of export crossings beyond Peshkhabour.

[6] http://www.mccc.msu.edu/documents/managingccprof/ManagingCoverCropsProfitably_berseemclover.pdf
[7] https://en.wikipedia.org/wiki/Vicia
[8] http://www.feedipedia.org/node/726

BOVINE DAIRY PRODUCTS

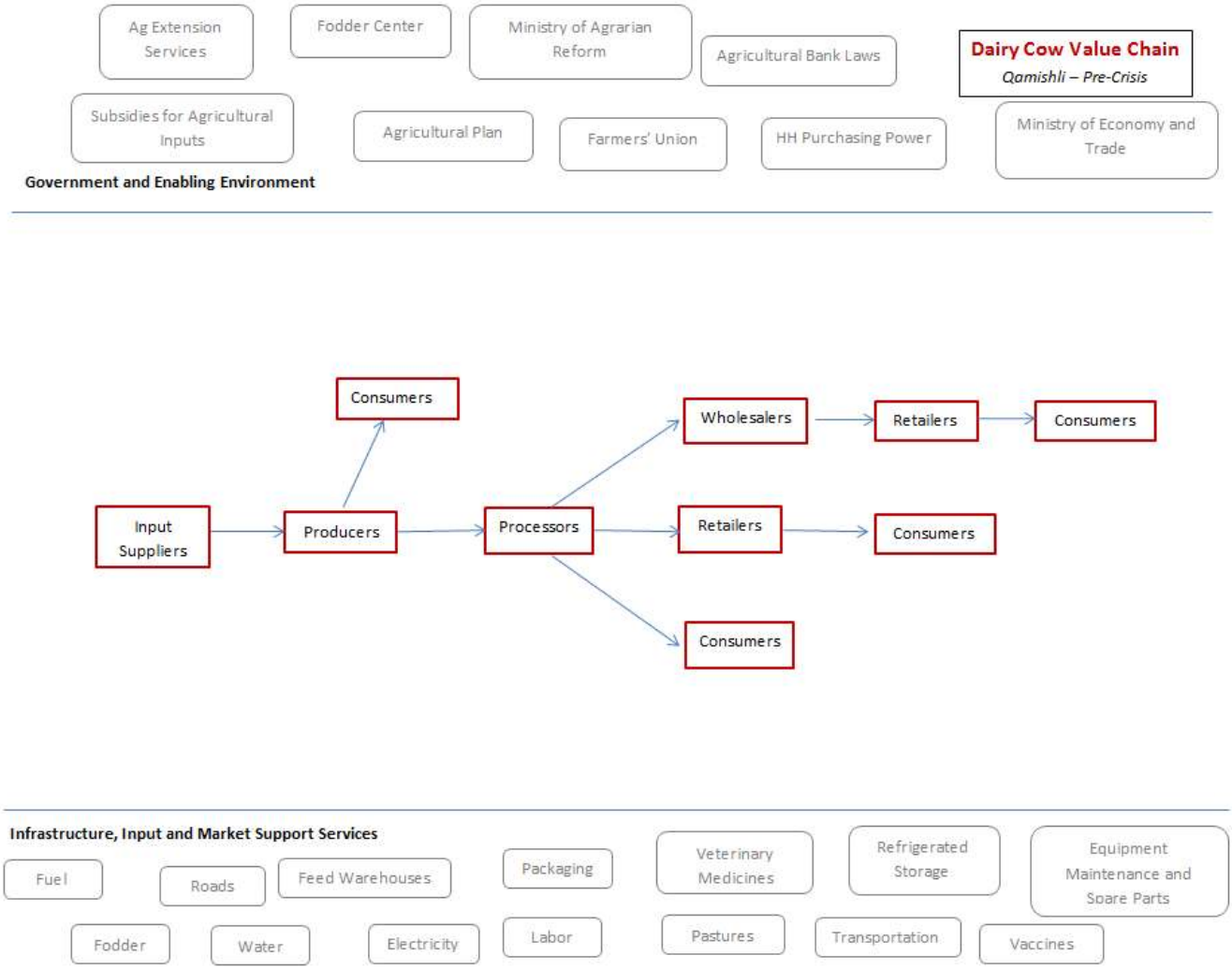
Bovine dairy production is an important part of the Al-Hasakeh agricultural economy, but similar to the shoat business has had strong setbacks post-crisis due primarily to the lack of affordable agricultural inputs (medicines, vaccines, feed, and fodder). This is demonstrated in the before and after crisis list of activities in the production calendar below.

Activities		Monthly Calendar for Bovine Dairy Production; Qamishli, Syria.											
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Animal Health													
Treatment of Sick, Injured Animals	**Bef.**												
	Aft.												
Treatment for Foot and Mouth Disease	**Bef.**												
	Aft.												
Treatment Against "Plague"	**Bef.**												
	Aft.												
Treatment Against Pasteurella	**Bef.**												
	Aft.												
Treatment for Jaundice	**Bef.**												
	Aft.												
Animal Nutrition													
Distribution of Mineral Concentrates	**Bef.**												
	Aft.												
Distribution of Compound Feed	**Bef.**												
	Aft.												
Summer Forage Crops													
Corn for Fodder, Stubble	**Bef.**				P							H	
	Aft.				P							H	
Vetch	**Bef.**				P							H	
	Aft.				P							H	
Alfalfa	**Bef.**				P			H					
	Aft.				P			H					
Winter Feed Crops													
Corn for Feed	**Bef.**				P							H	
	Aft.				P							H	

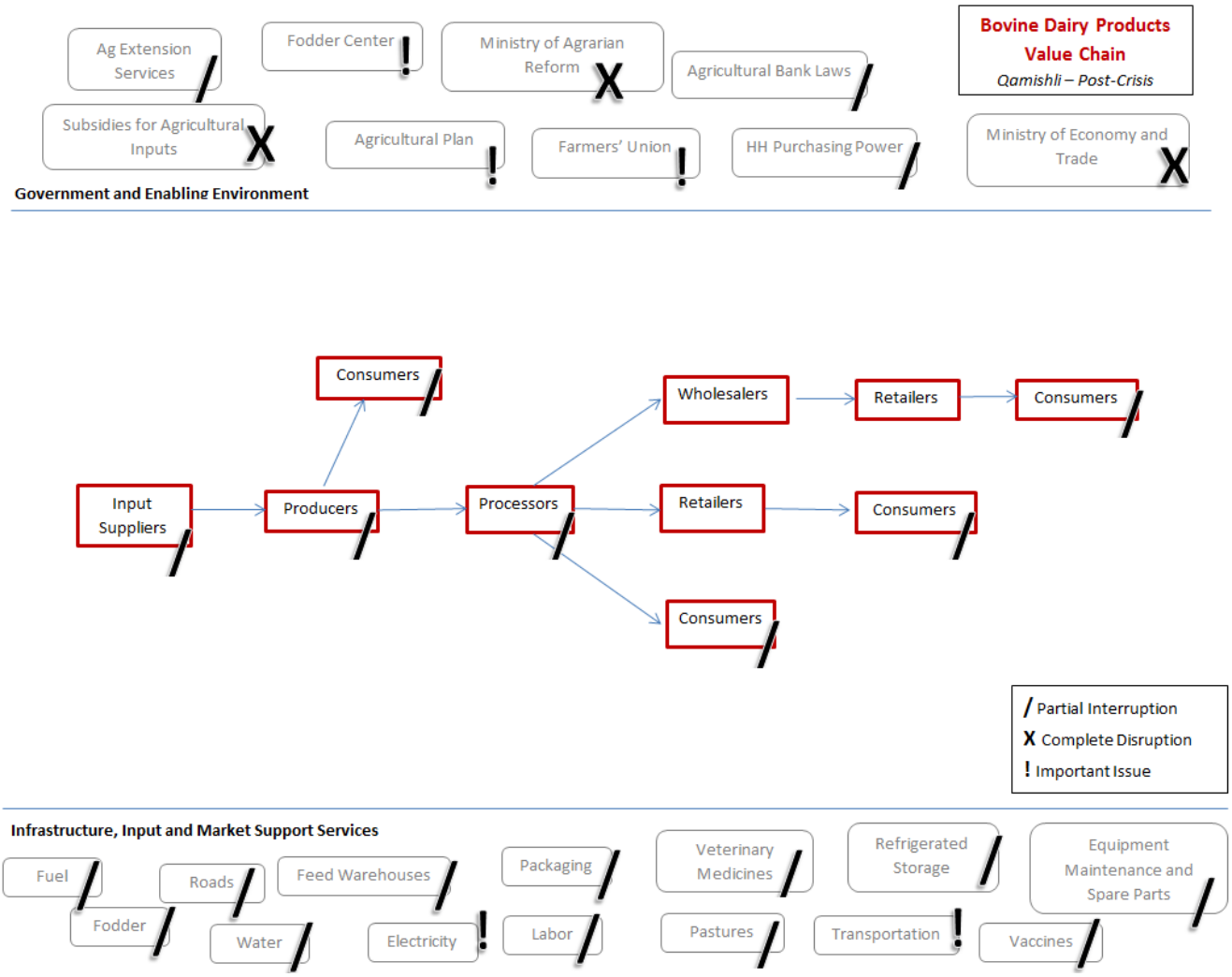
Occurs and/or available *Not available or strongly impacted* *Available but less effective*

P = Planting
H = Harvest

Bovine Dairy Value Chain Map, Pre-Crisis



Bovine Dairy Value Chain Map, Post-Crisis



Similarly to the other value chains, the crisis decreased producers' access to agricultural inputs (feed, fodder, vaccines, medicines, agricultural extension, and electricity) as well as access to markets due to insecurity. Specifically, the lack of effective, certified, and affordable feed and fodder stems from a decrease in summer crops due to a lack of access to irrigation water, as well as a post-crisis lack of government product certification.

Further discussion of the Al-Hasakeh bovine dairy value chain, pre and post-crisis

Is dairy production profitable, and why?

Dairy production is currently not viewed as particularly profitable (profits are down 50 to 70%) due to:

- High price of fodder (wheat, barley and bran);
- Unavailability of improved types of fodder better suited for improving milk production;
- Poor availability of pastures due to insecurity;
- Poor availability of milk processors in the area;

- Incidence of livestock illnesses such as brucellosis (can also spread to humans[9] -), and lack of needed vaccines;
- Poor availability of transportation, and limited access to markets.
- Limited to no support received from the government regarding fodder, vaccines and credit.

Who are the final consumers of bovine dairy products?

- Local consumers (in Qamishli & Qahtaniya).
- Retailers (in Qamishli).
- Ice cream factories (in Qahtaniya).

What are the main economic challenges faced by dairy producers?

- High prices of feed/fodder, and the lack of certain productive types of feed.
- Lack of needed vaccines, leading to the unnecessary death of some cows.
- Insecurity: the unstable security situation has forced some farmers to close their farms.
- High price of production inputs (fodder, electricity, labor and transportation).
- Lack of livestock stables in the area with proper equipment.

Who benefit most economically from the bovine dairy value chain?
The traders, as they are those with the most substantial profit margin.

Who benefit the least from the bovine dairy value chain?
The producers. Given the lack of processors in the area, many are processing milk on their farms at high cost and with little return on investments.

Potential intervention opportunities along the value chain include:

- Facilitate technical assistance in dairy production;
- Improve the quality of the fodder (alfalfa) which can increase both production yield and profits;
- Facilitate access to affordable, high-quality medicines/vaccines and veterinarian services;
- Support dairy processors through the provision of needed tools and equipment; and -
- Support cross-value chain interventions. For example, support to cotton producers will increase availability of high-value feed, and in return, support to livestock producers will increase the availability of manure for use in crop production.

Tigris River Crossing, from Syria to Iraq, at Peshkhabour, Syria - Mercycorps

[9] http://encyclopedia.thefreedictionary.com/Malta-fever

TOMATOES

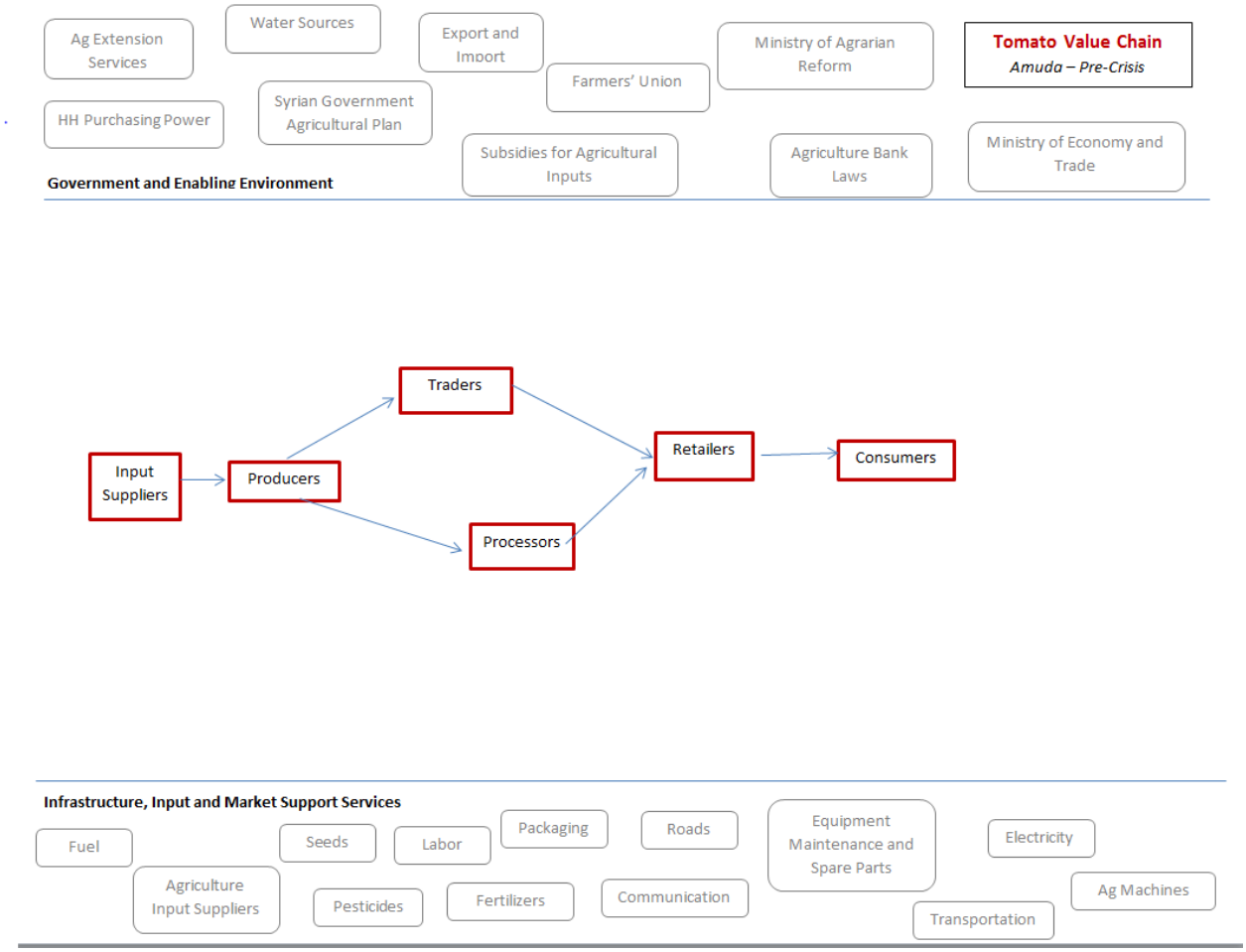
Tomato production in Al-Hasakeh is substantial and provides both fresh and processed consumer products. The results of the survey demonstrate that tomato production in the area is profitable to the producer, and meets local demand of local processors, traders, livestock producers (tomato peels used as fodder), and consumers. Tomato production is also used in crop rotation to help maintain soil fertility.

Activities		Monthly Crop Calendar for Tomatoes; Amuda, Syria											
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Land Preparation	Bef.												
	Aft.												
Initial Fertilization	Bef.												
	Aft.												
Sowing/Planting	Bef.												
	Aft.												
Fertilization	Bef.												
	Aft.												
Pesticides Application	Bef.												
	Aft.												
Herbicides Application	Bef.												
	Aft.												
Harvest	Bef.												
	Aft.												
Transportation	Bef.												
	Aft.												
Growers Receive Payment	Bef.												
	Aft.												
Labor	Bef.												
	Aft.												

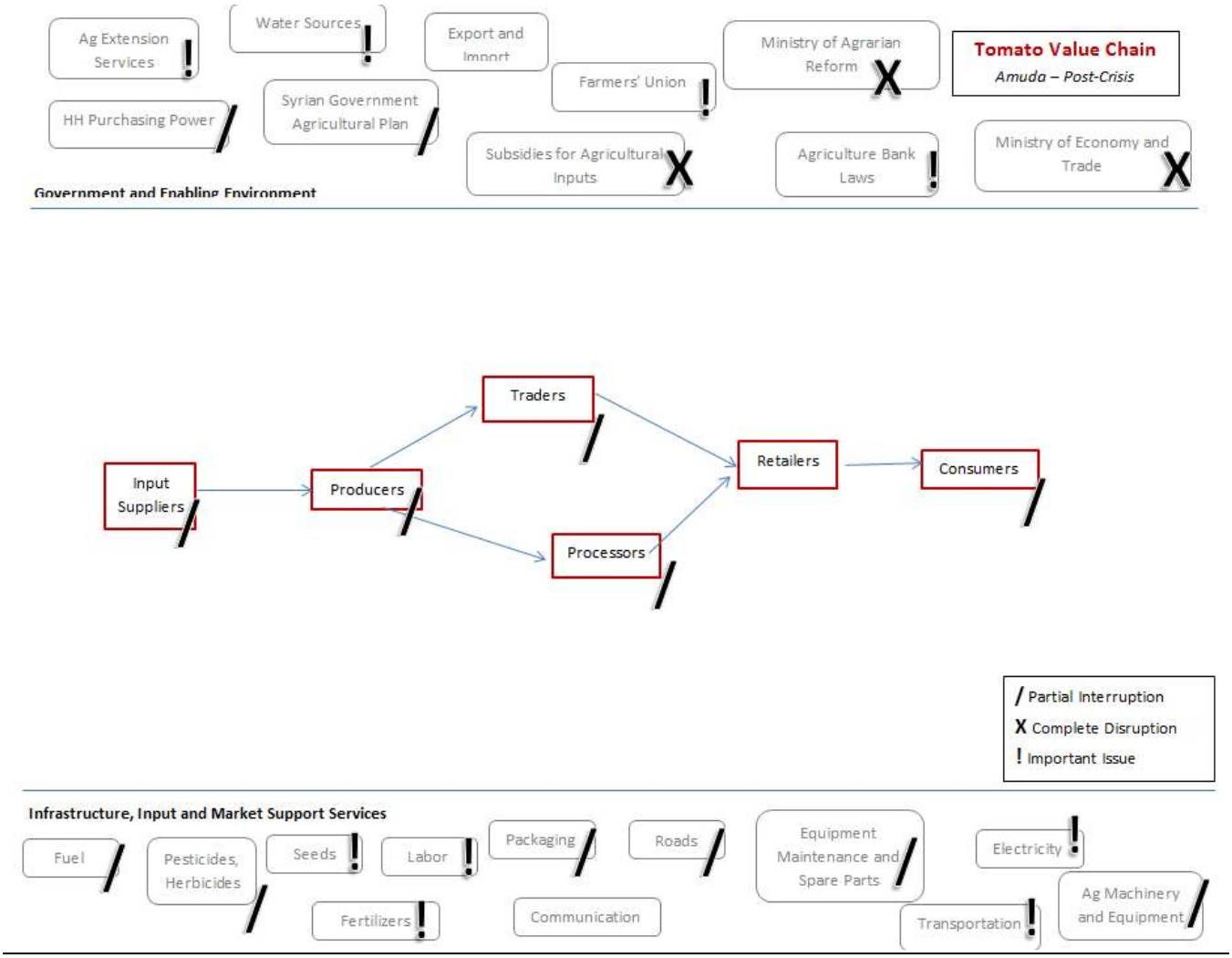
Occurs and/or available *Not available or strongly impacted*

The calendar above is typical for summer tomato production in areas of similar Northern Hemisphere latitude and altitude. Similar to the previous crop calendars, the key impacts post-crisis is the lack of high quality and quantity of inputs, the high cost of such inputs, and the lack of affordable labor.

Tomato Value Chain Map, Pre-Crisis



Tomato Value Chain Map, Post-Crisis



Further discussion of the Al-Hasakeh tomato value chain, pre and post-crisis

Most of the growers in the area (in particular, Amuda) are located within a relatively narrow band along the Turkish border, to about 30 km south, and estimated at about 300 hectares of production total. This is due to the availability of a high water table, and therefore, historically, water available for irrigation at a reasonable cost. Tomato production is said to be profitable, although it suffers from a lack of affordable inputs such as fertilizers, pesticides, fuel for irrigation, and seeds. One grower claimed that one gram of seed costs the equivalent of about US $24, which is very high. In terms of yields, one hectare of tomatoes produces and estimated 80-150 tons between June and November. Tomatoes are consumed mainly in Hasakeh city, and when the security situation is stable they are also shipped to other Syrian governorates such as Der Ezzor, Aleppo and Damascus.

The current crisis has strongly affected tomato marketing opportunities, including where products can be shipped and sold. Simultaneously, there are reportedly few processors in the area to purchase excess products in general, exacerbating marketing challenges. Therefore, large harvested quantities of products have at times accumulated, resulting in prices being pushed down further than they might otherwise have.

According to the survey, traders appear to be receiving the largest profits of those within the tomato value chain. Farmers in turn appear to be receiving the least profits in the chain. This is due, in part, to the lack of refrigerated storage space which leads to perishable tomatoes at times being sold en masse at low prices. Farmer profits are also impacted by relatively high production costs from increased labor, fuel, and other inputs prices.

Potential intervention opportunities along the value chain include:

- Support to tomato processors with more modern and efficient equipment;
- Facilitate farmers' and processor access to markets;
- Facilitate access to high-quality inputs at affordable prices, including seeds and pesticides;
- Support the provision of affordable fuel and electricity to run irrigation pumps;
- Increase the availability of refrigeration warehouses for product storage.

New construction, Deryk, Syria - Mercycorps

Wheat Processing Assessment (Milling); Rural Derik, Syria - Mercycorps

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Mercy Corps is a leading global humanitarian agency saving and improving lives in the world's toughest places. With a network of experienced professionals in more than 40 countries, we partner with local communities to put bold ideas into action to help people recover, overcome hardship and build better lives. Now, and for the future.

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