IN SEARCH OF ECONOMIC OPPORTUNITIES FOR AGRIBUSINESSES IN IRAQ

AGRICULTURAL VALUE CHAIN ANALYSIS FOR SALAH AL-DIN AND DIYALA

ABOUT IOM

The International Organization for Migration (IOM) is committed to the principle that humane and orderly migration benefits migrants and society. As an intergovernmental organization, IOM acts with its partners in the international community to: assist in meeting the operational challenges of migration; advance understanding of migration issues; encourage social and economic development through migration; and uphold the human dignity and well-being of migrants.

This publication was produced with the financial support of the European Union. Its contents are the sole responsibility of IOM and do not necessarily reflect the views of the European Union.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This report provides the main findings of a study entitled "Identification of Economic Opportunities for Agribusinesses based on Value Chain Analysis", focusing on Salah al-Din and Diyala in the northeast/centre of Iraq. It is part of a broader value chain analysis study carried out by IOM in seven governorates in Iraq.

An in-depth analysis was carried out of four agricultural value chains that were found to be among the most promising business opportunities in Salah al-Din and Diyala. The aim of this study was to understand economic opportunities and gaps in the local economy through value chain analysis. The four value chains analysed are:

- Cows (dairy)
- Eggplant
- Tomato
- Poultry (meat)

For the first two value chains (cows and eggplant), the focus of the research was on Diyala, while for the last two value chains (tomato and poultry), the focus was on Salah al-Din.

TRANSVERSAL MARKET ISSUES

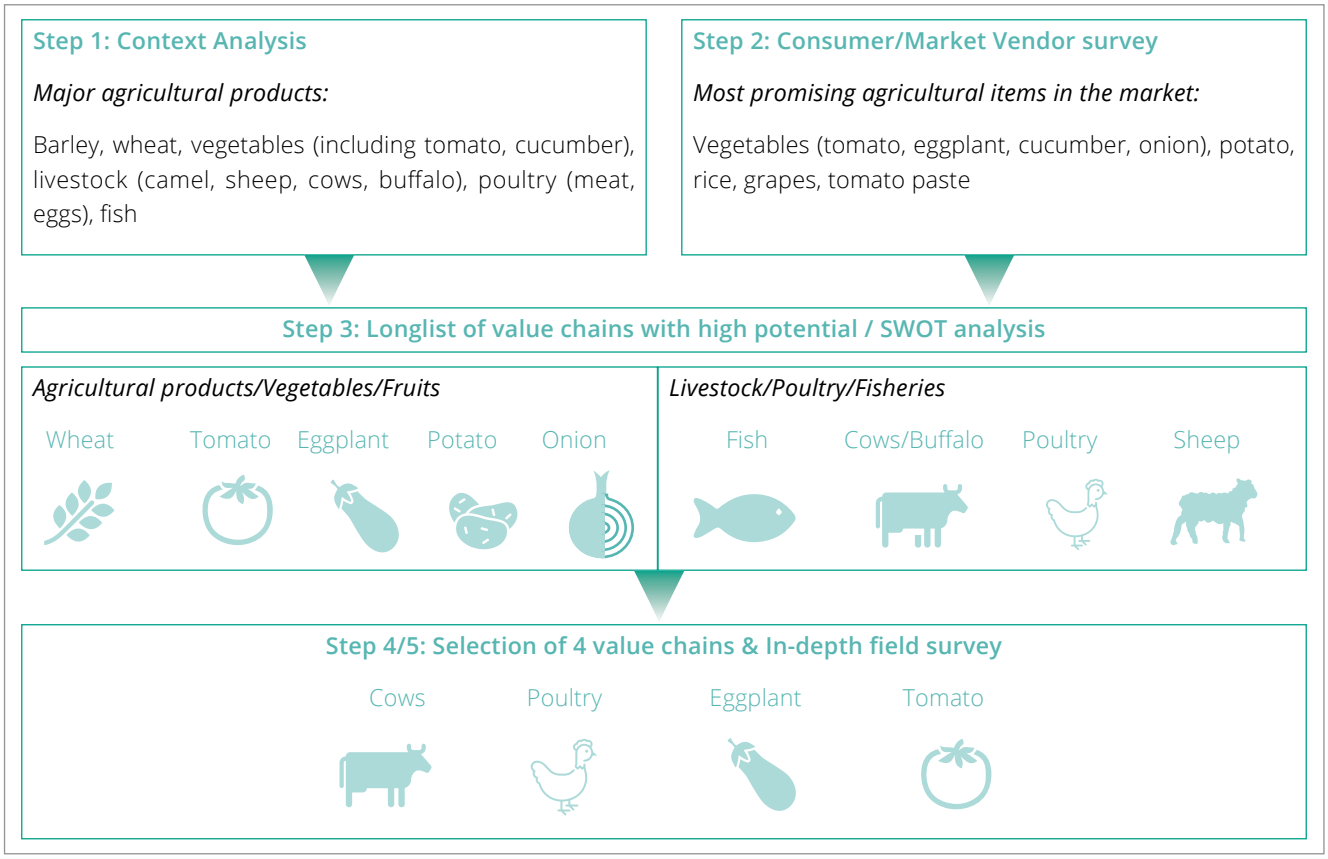
Agriculture is one of the main economic activities in both Diyala and Salah al-Din. In addition, fisheries, livestock and poultry farming are also common. Some of the major issues in relation to the functioning of the markets in the two governorates include competition from imported products, lack of government support to farmers, lack of access to finance for farmers, lack of hygiene and sanitation in the marketplace and a lack of street paving in the marketplaces, instability and lack of security because of the presence of armed militias, and logistical challenges as a result of the coronavirus disease 2019 (COVID-19), which has led to a restriction on the movement of products.

SUPPLY AND DEMAND FOR AGRICULTURAL GOODS

Based on a supply-demand analysis, it was found that in Salah al-Din, potatoes, tomatoes, onions, cucumbers, eggplants and grapes appear to be important agricultural items according to both consumers and vendors, including their ability to be produced locally at lower prices. In addition, tomatoes, eggplants and potatoes appear to be the most profitable for vendors with cucumbers and tomatoes requiring an improvement in quality too. In Diyala, rice, sugar, tomato paste, potatoes, tomatoes, eggplants, onions and cucumbers are the most demanded goods by consumers and also appear to be among the most popular items sold by vendors. At the same time, tomato paste, tomatoes, potatoes, onions and rice could be produced locally at a cheaper price. In addition, potatoes, tomatoes, eggplants, and onions are in the list of vendors' most profitable items.

MOST PROMISING VALUE CHAINS SELECTION

The selection of the most promising value chains was based on the findings of the consumer and market vendor survey, as well as on the context analysis and general insights of the value chain experts and IOM staff in Salah al-Din and Diyala. The flow chart in the following page shows which phase in the process led to the selection of each value chain.



COW VALUE CHAIN

Diyala has a large livestock sector, mainly due to the presence of abundant grazing lands, with cows as one of the major livestock sectors. Most dairy farmers produce for the local market only, because local demand is very high and often exceeds supply. The milk is partly sold fresh, and there is only limited processing of milk into yoghurt and butter. Processing capacity is hindered by the lack of packaging materials, which makes it difficult to conserve the products. As a result, the quality and quantity are not in line with consumers' expectations. Better packaging materials would increase the demand for locally produced yogurt and butter. With regards to relationships in the value chain, farmers indicated that they would be willing to invest in the chain if they had the capacity and resources available. They have a strong need for training in new techniques for dairy production, business management, marketing and communication. However, at present no organizations are providing vocational training or skills development in Diyala. There is also very limited government support to dairy farmers.

The following opportunities and challenges were found in the cows dairy value chain

OPPORTUNITIES	CHALLENGES
• High job creation potential in the dairy value chain, starting from gathering the milk, dairy production and marketing and distribution. • Opportunities for import substitution and processing, especially for high quality yoghurt and butter. • Good potential to create jobs for women, including in collection centres for milk.	• Use of old techniques by dairy farmers because of a lack of resources to invest in training or new technologies. • Lack of government support to cow raisers. • Need for a support programme to subsidize local feed in cooperation between feed producers and cow raisers. • Lack of proper packaging of dairy products.

• High demand for milk in urban areas, which gives room for increased production. • Plans to increase local production by the Iraqi government in all sectors makes it a good time for the local dairy sector to expand.	• Lack of proper standards or processes for indicating expiration dates on the final product. • Lack of marketing skills by dairy farmers. • Lack of organizations to provide training on business management, marketing and communication, and new techniques for dairy production.

EGGPLANT VALUE CHAIN

Vegetable production has traditionally been very important in Iraq, providing employment to many smallholder farmers. However, due to the large import of agricultural products into Iraq, it is very challenging for Iraqi farmers to compete. Eggplant is grown all over Iraq in open fields as well as in protected greenhouses and plastic tunnels. In 2018, eggplant was one of the five most important vegetables in Iraq (excluding the Kurdistan Region of Iraq -KRI). This vegetable is an important part of Iraqi cuisine and consumed almost daily by most people. Demand for eggplant often exceeds supply. However, despite its large demand, eggplant production in Iraq has decreased since 2013, due to imports from neighbouring countries, which has led to the unwillingness of Iraqi farmers to grow eggplant. Other factors were the lack of government support for the farmer and water scarcity.

Farmers are open to the idea of working with other farmers, as it would help them to share challenges and solutions to problems, and to discuss new planting techniques. The farmers have limited capacity, so they need to be trained on modern agricultural techniques and new varieties, prevention methods and drip irrigation. At present, no investments are made in the value chain because of the small size of the businesses and the lack of capacity of business owners.

The local government is training farmers on modern methods of cultivation and harvesting and on how to use the best fertilizers and seeds to optimize production. However, as appeared from the interviews with farmers, there is still strong competition from imported products. As well, although it is true that the Ministry of Agriculture provides farmers with fertilizers, this support is reportedly limited to registered farmers. There is a lack of support for the provision of seeds and pesticides.

The following opportunities and challenges were found in the eggplant value chain:

OPPORTUNITIES	CHALLENGES
• Eggplant production is very suitable for the Centre region in terms of climatic conditions. • High local demand for eggplant. • Potentially, eggplant can be very profitable. • During the harvesting season, eggplant becomes very cheap so everyone can buy it. • Eggplant can be produced in greenhouses to increase volume and quality. • Opportunity to add value by producing pickles from green eggplants (mekdos) as well as drying of eggplant. • Opportunity to rebuild processing capacity for eggplant-based products. • Ongoing cooperation programme for research on high quality seeds. • The governorate provides fertilizers to registered farmers	• Import of eggplant from outside Iraq is affecting local production. • Lack of resources of farmers to buy pesticides. • Lack of support from the Ministry of Agriculture to farmers for the provision of seeds and pesticides. For fertilizers, support is reportedly only provided to registered farmers. • Difficult to store eggplant for a long time. • At present, there are no factories for processing foods in Diyala.

TOMATO VALUE CHAIN

Tomato is the number one vegetable grown in Iraq. Many different varieties of tomatoes are grown across Iraq and are harvested at different times of the year in different parts of the country due to variations in soil and climatic conditions. Due to the large import of agricultural products into Iraq, it is very challenging for Iraqi farmers to compete.

Consumers demand a tomato of good quality, which is clean and sold at a low price. It is noted that many consumers prefer local tomatoes over imported ones. The most popular processed product made of tomatoes is tomato paste, which is used in a wide variety of dishes in Iraq. Ketchup and tomato-based sauces are also popular. However, there is very little processing capacity for tomato in Salah al-Din and Diyala. Many factories closed down as a result of the withdrawal of government support to farmers, which led to an increase in the price of local tomatoes, making it less profitable to produce tomato paste. Nevertheless, there is high potential for building local tomato processing capacity because of high demand.

Farmers interviewed are willing to invest in stronger relationships along the chain if there are guarantees and strong support. Wholesalers indicated that if support was available, they would be able to increase tomato production. Also, if refrigerators are available to store tomatoes, they would be able to compete with imported tomatoes.

The government supports farmers by providing fertilizers and seeds to farmers and agricultural extension programmes, as well as soft loans to buy agricultural sprinklers, to dig wells and set up greenhouses/tunnels (small green houses). However, the Department of Agriculture currently lacks financial resources, so the support provided is limited, even though the human resources are abundant.

The following opportunities and challenges were found in the tomato value chain:

OPPORTUNITIES	CHALLENGES
• Opportunity to provide training for farmers and traders on how to set up greenhouses, on agricultural sprayers and pumps, and on how to select tomatoes for harvesting at the right moment. • Opportunity to (re)build processing capacity for tomato paste and canning factories. • Opportunity to start local production of humic fertilizer, which would make the cost price of tomatoes much lower.	• Climatological factors: water scarcity and high temperatures. • The abundance of local production means competition is very high. • The government's policy to allow imported tomatoes into the market during the harvest time of Iraqi tomatoes, making tomato production less profitable. • The high prices of imported fertilizer. • Electricity from the grid is often disrupted, so diesel-based generators are needed. • Lack of government support to provide loans or support to dig artesian wells. • Lack of processing factories such as canning plants and tomato paste factories

POULTRY (MEAT) VALUE CHAIN

Poultry is an important sector in Iraq. In rural areas, poultry-keeping at the household level has a long history, mainly for subsistence purposes. The commercial industry consists of two separate sub-sectors: broilers (for meat) and layers (for eggs), with large-scale farms focusing on only one of these two. For Salah al-Din and Diyala, the focus was on chicken meat production, because this is considered to offer the greatest potential in terms of job creation.

Currently, most of the poultry farmers buy imported chicken feed. Chicken feed could be produced locally if the seeds were available for local production of feed. The locally produced feed could even be exported. Farmers are raising broilers (for meat production) instead of eggs, because the price for chicken meat is higher, it is faster in terms of production, and the demand for chicken meat is high in Salah al-Din.

The consumers of chicken from Salah al-Din are local people as well as people from Baghdad. Some consumers prefer coarse (large) chicken, and some of them ask for soft (smaller) chicken. In general, consumers prefer Iraqi chicken over imported ones.

The relationship between the different actors in the value chain is based on mutual trust and does not include contracts. So far, farmers have not made any investments in the value chain. There is currently no financial support from the government. Also, there are no organizations that provide training in the poultry sector.

The following opportunities and challenges were found in the poultry (meat) value chain:

OPPORTUNITIES	CHALLENGES
• Demand for chicken meat is high so there is an opportunity to expand local production and create jobs. • Poultry farming can be very profitable if the cost of production decreased and if the chicken was protected from disease. • Very good opportunity to develop the chicken feed value chain (corn, wheat, barley) in Salah al-Din, also providing job opportunities. • There are good job opportunities for small businesses for slaughtering and cleaning the chicken. • Jobs creation potential for both men and women, especially in poultry farms.	• The high price of chicken feed, part of which is imported (soy). • Need for special treatment and special medicines and veterinary support to prevent diseases of broilers, which is expensive. • Chicken imports are threatening local production. • Government claims to support the poultry farmers, but in reality, no support is provided. • Need for training of farmers in different components of the poultry value chain

POTENTIAL FOR INVESTMENT AND JOB CREATION

As an overall conclusion, it was found that all four value chains are promising sectors for local economic development and decent job creation. It is estimated that all four value chains can lead to a total of around 4,400 new jobs in both governorates. To stimulate local businesses, the eggplant and tomato value chains look the most promising in terms of job creation. With relatively small investments, both value chains offer opportunities to generate many jobs. For instance, the cost of constructing a greenhouse for the production of tomatoes and eggplants is estimated at 22,700 United States dollars (USD), providing employment for two people. Assuming that 1,000 new farms could be set up in Diyala, this would provide a total of 2,000 new jobs. Other opportunities include cold storage facilities for tomato and the restoration of a tomato paste factory.

For the cows and poultry value chains, good opportunities also exist, including the setting up of small dairy processing factories, improved poultry farms and promoting the production of local chicken feed. An improved poultry farm is estimated to cost around USD 25,600, providing employment for two people. Based on 25-50 new poultry farms in Salah al-Din, this would lead to a total of 50-100 new jobs created.

Finally, the estimated social return on investment was calculated. The investment needed per job created ranges between USD 9,000 and USD 20,000. It appears that the building of small processing factories for dairy offers the best social return on investment, followed by cold storage facilities for tomato traders, construction of greenhouses and improved poultry farms. The restoration of tomato paste factories is a relatively capital-intensive investment, creating only a limited number of jobs.

1. INTRODUCTION

1.1 BACKGROUND AND OBJECTIVES

IOM is a major actor in post-conflict recovery and reconstruction, and as such is heavily involved in livelihood development and job creation programmes. In Iraq, IOM's strengths lie in its field presence around the country and operational capacity to rebuild community infrastructure, conduct vocational and other trainings, provide grant funding at local levels to support business development, and a variety of other areas key to recovery. Lack of economic opportunity - even more than ideology -is cited as a major push factor leading to recruitment of youth by violent extremist groups. In 2020, IOM adapted its existing private sector development programming to support small and medium enterprises (SMEs) at various stages as well as different agricultural value chains.

This report provides the main findings of a study entitled "Identification of Economic Opportunities for Agribusinesses based on Value Chain Analysis", focusing on Salah al-Din and Diyala in the northeast/centre of Iraq. It is part of a broader value chain analysis study carried out by IOM in seven governorates in Iraq[1]

The aim of the study was to understand economic opportunities and gaps in the local economy through value chain analysis. More specifically, the purpose was to:

- Identify key promising sectors for the local economic development and decent job creation;
- Identify existing gaps to jump start the revitalisation of the sector development;
- Provide recommendations for IOM interventions to promote local economic development in conjunction with job creation for people who are in socioeconomically vulnerable situations.

At the end of the project, three final reports (one for each region) were produced, each analysing four different value chains.

The expected outcomes of the value chain assessment are:

1. Defining which areas of the value chains lack private/public investment, do not exist at all, or most urgently need cash injections to complete the chain and/or become competitive.
2. Defining which areas of the value chains have the best social return on investment in terms of the number of jobs created per dollar invested.

1.2 METHODOLOGY

The methodology adopted builds on the general concepts of value chain analysis. This means that the value chain is considered as a system, because its performance is a function of the interactions among its parts and needs to consider all activities along the chain of production. This involves collective decisions among chain members to work together to grow, process and deliver products that meet the expectations of specific consumers. In this way, the best outcome for all participants can be reached. Particular attention is therefore paid to the effective flow and use of information along the chain, which usually depends on the extent of trust and commitment between trading partners.

A systematic data collection process has been followed, consisting of the following steps:

1. Context analysis

In this step, a brief context analysis was produced for each governorate, based on a combination of literature review and in-depth knowledge of the local IOM teams. The analysis includes basic information about the governorate's geography, climatic conditions, population, poverty, employment/unemployment, displacement and return trends, and major economic sectors. An important goal of this context analysis is to obtain a first glimpse of the most important agricultural subsectors and products produced in each governorate.

2. Consumer/market survey

As an input for the selection of the most promising value chains, a selected number of interviews has been carried out with consumers and market vendors, to find out which goods and services are most in demand, and which opportunities exist for new goods and services to enter the market. Two semi-structured questionnaires were used, one for

1 This includes the following regions/governorates:

- Northeast/centre of Iraq with a focus on Diyala and Salah al-Din;
- South of Iraq with a focus on Basra, Missan, Thi-qar and Muthanna;
- Northwest of Iraq with a focus on Ninewa.

consumers (Tool 1) and one for market vendors (Tool 2).[2] The sample size was as follows:

- Consumer survey: 25 interviews per governorate
- Market vendor survey: 15 interviews per governorate

The tools have been adapted from a value chain analysis study carried out by IOM in 2020 in three governorates in the centre-south of Iraq, including Karbala, Najaf and Al Qadissiya.[3] These tools have been inspired by the manual developed by Transition International on socio-economic profiling and opportunity mapping.[4]

3. SWOT analysis/Value chain selection

The value chain selection was based on the previous steps in the research process, the context analysis and the consumer/market survey. First, several potential value chains that seem to have good potential were preselected, with a maximum of 10 value chains. Next, a SWOT analysis was carried out for each of these value chains. Based on a comparison of the SWOT analyses for each potential value chain, a final selection has been made of four value chains per region.

4. In-depth value chain data collection

As the next step in the research, more in-depth data collection was done through semi-structured interviews and Key Informant Interviews with four distinct groups of actors along the value chain: farmers (Tool 3), wholesalers and retailers (Tool 4), industry experts (Tool 5) and local authorities (Tool 6). For the farmers and wholesalers/retailers, semi-structured interviews were used, while for industry experts and local authorities, Key Informant Interviews were used.[5]

Respondents were selected using the purposive sampling technique (i.e. selecting those known to have the information needed). The interviews focused on the efficiency and effectiveness of product flows, communication and information flows, chain relationships and governance. The goal of this step in the data collection process was to investigate the efficiency and effectiveness of product flows, communication and information flows, and relationships (governance) through which value is created and diminished in the value-chain production and marketing processes. In this way, it was possible to examine the importance of the factors that lead to a chain's success.

By combining the data collected in all four steps (context analysis, consumer/market survey, SWOT analysis and in-depth value chain data collection), a value chain map was drawn to show the multiple ways a particular product gets to the consumer, from raw materials inputs (such as seed, fertilizer, chemicals) to the point of consumption.

5. Data analysis

As a next step, data analysis was carried out to draw meaning from the data. In a general sense this was done by asking the question, 'What enables and constrains the chain's efficiency and effectiveness?' During the analysis, the answers to the questions in the questionnaires and key informant interviews formed the building blocks for improving the chain's performance. As part of this process, for each region, a data analysis workshop was held to analyse the data collected and to draw a preliminary value chain map.

6. Reporting

As a final step, a final synthesis report for each region has been produced by the two lead researchers. The results will be presented during a workshop for each region.

1.3 CHALLENGES TO THE RESEARCH AND RESPONSES PROVIDED

The main challenge during the research was related to the COVID-19 pandemic, which affected data collection, in particular:

- Due to the international travel restrictions, it was not possible for the two value-chain researchers to provide the training for IOM staff in person. Nor was it possible to provide on-the-job guidance during the data collection phase. Instead, a three-day training was provided online for all IOM staff involved in the data collection. This worked out well and was almost as effective, although it was challenging to get the same level of commitment of staff compared to a live training.
- For the same reason, it was impossible to carry out any pilot interviews under the guidance of the two value chain researchers. This led to some misunderstandings and errors in the first round of interviews, which required additional data collection leading to some delays in the process.

2 See Part 1, Annex B for the questionnaires

3 Dorp M. van and A. Abass, Economic Opportunities for Youth Based on Value Chain Analysis in Centre-South Iraq, 2020. IOM Iraq.

4 Transition International, Socio-economic profiling and opportunity mapping manual, 2008. Available from: www.transitioninternational.com/ti/wp-content/uploads/2018/12/SOCIO-ECONOMIC-PROFILING-AND-OPPORTUNITY-MAPPING-MANUAL-2.pdf

5 The tools used during this phase can be found in Part 1, Annex B. The tools have been inspired by Collins R.C., Dent B. and Bonney L.B., Guide to value-chain analysis and development for Overseas Development Assistance projects, 2015.

- Throughout the process, several other meetings with the IOM teams were done through online video calls, which went relatively smoothly, although some staff had connection problems.

Finally, it is important to note that the study has been conducted in due consideration of the socioeconomic and political sensitivities in the target areas as determined in the IOM risk analysis/conflict analysis. Throughout data collection, no major incidents or violent conflict took place, so the IOM data collectors were able to carry out their work without major disruptions (apart from the general restrictions related to COVID-19, such as lockdowns and curfews).

2. CONTEXT ANALYSIS AND MAJOR ECONOMIC SECTORS

In this section, a context analysis is provided of the two governorates included in this report. This part consists of four sub-sections, including basic information about 1) geography and climatic conditions, 2) population, poverty and employment, 3) displacement and return trends, and 4) major economic sectors.

2.1 SALAH AL-DIN

2.1.1 Geography and climatic conditions

Salah al-Din Governorate lies to the north of Baghdad and is comprised of Tikrit, Al-Daur, Samarra, Balad, Shirqat, Baiji, Tooz Khormato and Faris Districts. It stretches over an area of 24,363 km^2 (Table 1 and Figure 1).

The governorate is intersected by the Tigris River, which allowed for the flourishing of agriculture, especially in the southern areas. Salah al-Din is also famous for its religious shrines and monuments, which mostly lie between Samarra and Shirqat, including the iconic minaret of Al-Malwiyya in Samarra or the Al-Said Mohammed Shrine in Balad City.

Salah al-Din has a desert climate characterized by low rainfall, with annual precipitations reaching 182 mm only, with temperatures heights in July reaching 36°C or more and January, which is the coldest month, dropping to 9°C. The average annual temperature is 27°C.

2.1.2 Population, poverty and employment data

Salah al-Din has a total population of 1.637,232 people, based on the most recent data available.[7] Slightly more people reside in rural areas, underscoring the importance of agriculture in Salah al-Din - which also employs most of the people residing in the governorate. The poverty rate in Salah al-Din was calculated at 16.6 per cent, which is slightly below the national average calculated at 18.9 per cent, with Samarra and Shirqat showing among the highest poverty rates recorded in the governorate.[8] Unemployment was recorded at above 20 per cent (37,957 men and 11,092 women in total).[9] As of 2014, unemployment was recorded at 13.5 per cent for women and 7.5 per cent for men, which points to a substantial increase in unemployment. [10]

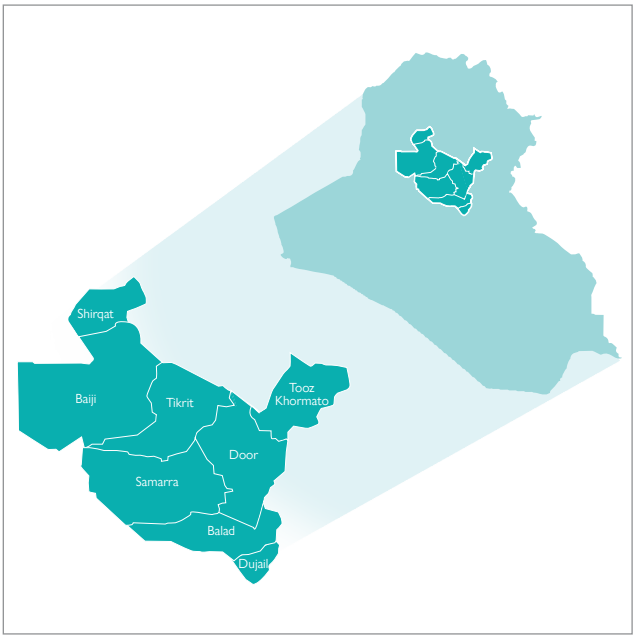


Figure 1: Map of Salah al-Din Governorate (Source: Wikipedia)

Table 1: Capital and areas of Salah al-Din [6]

TIKRIT	TOOZ KHORMATO	SAMARRA	BALAD	BAIJI	AL-DAUR	SHIRQAT	DUJAIL	TOTAL
2408 km^2	2316 km^2	4504 km^2	2469 km^2	6741 km^2	2836 km^2	1515 km^2	1286 km^2	24,363 km^2

6 Statistics Department of Salah al-Din, undated.

7 Ibid.

8 T. Vishwanath, D. Sharma, N. Krishnan, and B. Blankespoor, Where are Iraq's Poor: Mapping Poverty in Iraq, 2014. Available from: https://openknowledge.worldbank.org/bitstream/handle/10986/22351/Where0are0Iraq0ping0poverty0in0Iraq.pdf?sequence=1

9 Ministry of Labor and Social Affairs, undated.

10 UNDP, Iraq Human Development Report 2014.

Table 2: Population and unemployment data for Salah al-Din[11]

POPULATION	REGISTERED UNEMPLOYMENT		RURAL POPULATION		URBAN POPULATION	
	Female	Male	Female	Male	Female	Male
1,637,232	11,092	37,957	443,986	454,972	366,221	372,053

2.1.3 Displacement and return trends

Over 116,000 households (or almost 70,000 individuals) have returned as of August 2020[12] with the highest numbers recorded in Tikrit and Shirqat. Displacement remains high as well, with more than 11,000 households displaced (or over 66,000 individuals) with the highest concentrations recorded in Tooz Khormato, Tikrit and Samarra. According to UN OCHA, as of late 2019, gaps in service delivery and lack of quality standards for basic services, including water, health and education were severely affecting internally displaced persons (IDPs) in Salah al-Din.[13] Salah al-Din continues to accommodate the highest number of returnees living in conditions of high severity, the same report found.[14]

Table 3: Displacement and return per district, IOM, Dataset Round 117, July and August 2020

DISTRICTS	NUMBER OF IDP HOUSEHOLDS	NUMBER OF INDIVIDUALS	NUMBER OF RETURNEE HOUSEHOLDS	NUMBER OF RETURNEE INDIVIDUALS
Al-Daur	11	66	10.113	60.678
Faris	478	2.868	1.964	11.784
Shirqat	125	750	26.626	159.756
Baiji	86	516	19.069	114.414
Balad	766	4.596	11.153	66.918
Samarra	2.781	16.686	9.577	57.462
Tikrit	3.181	18.906	29.206	175.236
Tooz Khormato	3.726	22.356	8.601	51.606

2.1.4 Major economic sectors

A significant proportion of households from Salah al-Din were heavily impacted by the de-Baathification process, which purged those associated with the Baath party from their posts, including in government and security forces, limiting income sources for many and seen as a vengeful policy by those affected.[15] The governorate has since largely been neglected in terms of new investments and services, and with the latest crises only worsening the situation. Overall, the economy of Salah al-Din revolves around two main sectors: agriculture and oil. Located in Baiji and integral to Iraq's economy, the refinery is the largest in Iraq. At its peak, the Baiji complex employed more than 20 per cent of the district's workforce and supplied more than one third of Iraq's domestic energy needs (petrol, diesel, heating oil, motor oil), worth between USD 5.5 and USD 6.5 million per month.[16] In addition, other smaller sectors are found in Salah al-Din, including fisheries, livestock, trade and tourism.

AGRICULTURE

Salah al-Din Governorate is classified as a prevalently agricultural governorate. The area consists of about 11 million dunams (or 2.7 million hectares) of which over 7 million dunams (or 1.7 hectares) are suitable for agricultural activities (Table 4).

11 Statistics Department of Salah al-Din, undated.

12 IOM, Displacement Tracking Matrix (DTM) Dataset Round 117, July and August 2020.

13 UN OCHA, Iraq Humanitarian Needs Overview 2020, 2019. Available from: https://reliefweb.int/sites/reliefweb.int/files/resources/iraq_hno_2020.pdf

14 Ibid.

15 Social Inquiry, Social Dynamics in Tikrit and Al-Alam for Early Recovery Programming, 2017, DRC. Available from: https://static1.squarespace.com/static/5bbb4e4c29f2cc31b47ff50f/t/5c56a349971a1875f2c33fc8/1549181796420/Social+Inquiry+-+Report+Tikrit+Social+Cohesion+FINAL+FOR+DISSEMINATION.pdf

16 A. Derzsi-Horváth, M. Schulz, H. Nasser, Iraq After ISIL, 2017. Available from: www.gppi.net/2017/09/13/iraq-after-isil-baiji

Table 4: Agricultural land in Salah al-Din[17]

	ELIGIBLE FOR AGRICULTURE	NOT ELIGIBLE FOR AGRICULTURE	TOTAL AREA
Dunam	7,100,310	3,786,171	10,886,481
Hectares	1,775,078	946,543	2,721,620

The agricultural plan reported that 19,000 farmers are present in the governorate.[18] However, the number is likely much higher as the figure only accounts for those registered with the General Union of Peasants Association.

Wheat cultivation, present in all the districts, is substantial in Salah al-Din. According to the latest statistics, wheat production amounted to 704,000 tonnes, in addition to the 35,000 tonnes sold as seed for the next cultivation season.[19] Watermelon is the second crop most grown, especially in the southern parts (in Samarra, Ishaqi, and Dujail), followed by tomatoes, cucumbers and grapes, which are also cultivated in large quantities in the same areas.[20]

Overall, agriculture in Salah al-Din is favoured by the large swathes of land suitable for agriculture; high manpower; agricultural knowledge and expertise among farmers and those involved in agriculture in general; and multiple sources of irrigation water, including the Tigris River, artesian wells and rainwater.[21] Nonetheless, the Directorate of Agriculture also reported several challenges. Overproduction was noted, which tends to not lead to export or in loco processing, the latter attributable to the absence of industrial facilities. Storage space for wheat, barley and corn is limited too. For example, out of the 50,000 tonnes of corn produced during the past year, only 5,000 could be stored.[22]

Electricity supply is limited whereas gasoil for running generators (and irrigation pumps) is expensive. Payments disbursed by the government tend to be delayed. Transportation costs are high, which negatively affects both farmers and the governmental departments. Modern technology use is also limited, which greatly affects production.

LIVESTOCK

Salah al-Din is rich in livestock with about 11 million animals recorded, including sheep, cows, buffalos and camels, along with poultry, which is used for both meat and eggs.[23] According to the Livestock Department, poultry is used especially for meat in Salah al-Din. There are about 550 registered fields in the governorate, in addition to a large percentage of unregistered ones, fish farms (about 1000 dunams or 250 hectares), followed by sheep farms, poultry (used for eggs) and calves.[24] Due to a lack of registration with the directorate, providing reliable numbers is arguably difficult.

According to the same department, the main challenges of the livestock sector include diseases such as infectious bronchitis, Newcastle diseases, and influenza A virus subtype H5N1.[25] Nonetheless, these are treatable with vaccines that are available in the local market.

TOURISM

The province of Salah al-Din is famous for its variety of heritage sites, especially in Shirqat and Samarra. These include the Imam Dur Mausoleum, Jawsaq al-Khaqani or the Caliphal Palace, Qasr Al-Ashiq, the Abu Dulaf Mosque, the Shrine of Imam Al-Hadi and Imam al-Askari (or The Golden Dome), the Shrine of Sayyid Muhammad in Balad, the ancient city of Assyria, the walls of Tikrit, a convent, the Crusader Dome (located north of Samarra), and the Al-Mutawakkil Mosque (Great Mosque) with the distinctive spiral minaret of Al-Malwiyya, to list just a few. Due to the richness of historical and religious sites, many people visit the area. Samarra and Balad, in particular, receive a high number of visitors, which causes high demand on agricultural products among the

17 Directorate of Agriculture of Salah al-Din, undated.

18 Ibid.

19 Ibid.

20 Ibid.

21 Ibid

22 Ibid.

23 Ibid

24 Ibid.

25 Ibid

restaurants operating in the area.[26] However, local produce is not purchased by the businesses involved in the hospitality sector, including restaurants and hotels. Quantity and quality appear to be limited, because of inefficiencies in the supply chain. Imported goods are preferred due to their perceived higher quality and better/more attractive packaging.

2.2 DIYALA

2.2.1 Geography and climatic conditions

Diyala, a governorate stretching northeast of Baghdad and bordering Iran, is divided into six districts: Baquba, Khalis, Kifri, Khanaqin, Muqdadya, Baladruz, with the administrative centre located in the city of Baquba. The governorate covers an area of 17,685 km^2, which represents about 4 per cent of Iraq.[27] By the Hamrin Mountains, the Diyala River, a tributary of the Tigris, runs through a large swathe of the governorate. Due to the presence of the two major water sources and a number of other small rivers, agriculture constitutes one of Diyala's main economic sectors, with primarily dates grown in large groves along with orange production, which also landed Diyala the title of 'Orange Capital of the Middle East'.

Diyala has a typically dry desert climate. Average high temperatures peak at 15°C in January and up to 44°C in July with average low temperatures measured at 3°C in January and 25°C in July; rainfall is very limited with precipitations mostly recorded in winter and early spring.[28]

2.2.2 Population, poverty and employment data

The governorate's population was estimated at around 1.6 million.[29] Forty-nine per cent of the population resides in urban areas and 51 per cent in rural areas. Both poverty and food insecurity decreased substantially over the years in Diyala, at least between 2007 and 2011.[30] In 2012-2013, the poverty rate was calculated at about 20 per cent in Diyala, slightly above the national average of 18.9 per cent, with the lowest rates recorded in Khanaqin, followed by Baquba.[31]

In 2017, the unemployment rate was 13.1 per cent,[32] which was slightly higher than the national average calculated at 13 per cent.[33] Based on data from 2011, unemployment among women in Diyala was almost three-fold in comparison to men's (33 per cent and 11.9 per cent, respectively).[34]

Figure 2: Map of Diyala (Source: NCCI Diyala Profile, 2016)

Table 5: Demographics of Diyala (CSO, 2018)

INDICATOR	VALUE
Total Population	1,637,226
Urban population	49%
Rural population	51%
Percentage of population under 15	40%
Percentage of population over 60	5%
Sex ratio	102

26 Statistics Department of Salah al-Din, undated

27 NCCI, Diyala Governorate Profile, January 2016. Available from: www.ncciraq.org/images/infobygov/NCCI_Diyala_Governorate_Profile.pdf

28 Ibid.

29 Data obtained from the Central Statistical Organization (CSO), Ministry of Planning, 2018.

30 NCCI, Diyala Profile

31 T. Vishwanath, D. Sharma, N. Krishnan, and B. Blankespoor, 2014.

32 Data obtained from the Central Statistical Organization (CSO), Ministry of Planning, 2018

33 World Bank, Unemployment, total (% of total labour force) (modeled ILO estimate), Updated June 2020, https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS?locations=IQ

34 UNDP, Iraq Human Development Report, 2014

Table 6: Unemployment data for Diyala, CSO (2018)

INDICATOR	2016	2017
Unemployment rate (%)	7.5	13.1
Economic activity rate (%)	41.1	45.7

2.2.3 Displacement and return trends

Diyala's history as a hotbed for ethnic and sectarian conflict led to large displacement movements even before the war to drive out the Islamic State of Iraq and the Levant (ISIL), which forced even more people into displacement. Today, Diyala still hosts a large number of IDPs, with over 8,500 households (or over 50,000 individuals) recorded as of August

2020 by IOM.[35] A high number is concentrated in Baquba and Khanaqin. Over 38,000 households or over 231,000 individuals have returned to Diyala, with the highest numbers recorded in Khanaqin followed by Khalis and Muqdadiya. A high number of returns, even to areas that previously did not witness return, was attributed to the improved security situation as well as security clearances, along with returnees' emotional desire to go home. [36]

Table 7: Displacement and return per district, IOM, Dataset Round 117, July and August 2020

DISTRICT	NUMBER OF IDP HOUSEHOLDS	NUMBER OF IDP INDIVIDUALS	NUMBER OF RETURNEE HOUSEHOLDS	NUMBER OF RETURNEE INDIVIDUALS
Khalis	893	5.358	12.437	74.622
Muqdadiya	30	180	9.517	57.102
Baladrooz	88	528	/	/
Baquba	3.552	21.197	/	/
Khanaqin	2.820	15.953	16.406	98.436
Kifri	1.213	7.278	220	1.320

2.2.4 Major economic sectors

Agriculture represents one of the main economic activities of Diyala. The governorate is famous for its production of dates and citruses, with livestock and poultry farming also common.[37] The area of Khanaqin also hosts an oilfield and refinery. Private sector development was hampered by the governorate's poor infrastructure, which was mostly neglected by the Ba'ath regime. The Iran-Iraq War, the 1991 Gulf War, the following UN sanctions regime, the 2003 invasion and the following insurgency and sectarian fighting also took their toll on the governorate's infrastructure.[38] Cheap imports and lack of skilled labour and capital further stalled Diyala's economic development.[39] In the wake of conflict to push ISIL of out of the governorate, Diyala was left with high percentages of infrastructure and private property damage, with road damage particularly high in Khanaqin and Khalis, and accessible arable and grazing land left only partially accessible, in part due to landmines.[40]

AGRICULTURE

Diyala's farmers and agricultural businesses grow a variety of dates and citruses. In addition, wheat, barley and rice are major crops (Table 8).

The major challenges affecting the development of the agricultural sector in Diyala are: 1) water scarcity/insecurity; 2) the impact of climate change with rising summer temperatures; 3) lack of modern agricultural techniques and mechanization; 4) limited use of protected agriculture (greenhouses); 5) lack of support to farmers and 6) difficulties for farmers to obtain loans from agricultural banks due to lengthy and bureaucratic processes. At the same time, there is a growing demand for agricultural goods due to population growth.

35 IOM, Displacement Tracking Matrix (DTM) Dataset Round 117, July and August 2020

36 IOM, Displacement Tracking Matrix (DTM), Iraq Master List Report 117, July – August 2020, http://iraqdtm.iom.int/images/MasterList/20201081929951_DTM_117_Report_July_August_2020.pdf

37 NCCI, Diyala Profile

38 Ibid.

39 Ibid.

40 Social Inquiry, Conflict Fragility and Social Dynamics in Diyala Governorate

Table 8: Production of barley, wheat, paddy rice, and dates in Diyala, Directorate of Agriculture (2018)

CROP	TOTAL CULTIVATED AREA (IN DUNAM)	AVERAGE YIELD PER ACRE (KG/DUNAM)	PRODUCTION (TONNES)
Wheat	293,994	7631	28,723
Barley	18,585	151.1	656
Paddy	4,402	575.2	2,532
Dates	n/a	n/a	85,439

TOURISM

Diyala Governorate holds great potential for tourism development, which favoured its emergence as a retreat spot already during ancient times. The village of Al-Huwaider was already important among the Persian kings, the Abbasid Caliphs, and kings of Iraq. The area also represented a retreat for the Persian New Year celebrations due to its proximity to the capital, at least before 2003. Services for pilgrims (travelling on foot during the major religious observance of Arbaeen) and several holy shrines are also not far from Khanaqin, with Najaf 337 km away, Karbala 294 km away, and Balad 160 km away.

Since Diyala is surrounded by the Hamrin Mountain range, Hamrin Lake and the Great Dam, the governorate enjoys a temperate climate holding great potential for tourist development, also due the presence of greenery. Tourist complexes are planned for Kifri and Hamrin. The forest areas cover 49 km² of land, mostly in Jalawla and Kanaan, whereas orchards stretch over 300 km^2. Forests and orchards are appreciated by locals and the visitors of the holy shrines alike. The areas are rich in wild animals and fish, which represent tourist attractions on their own, especially for fishing and hunting. The governorate is rich in archaeological and religious sites, which require the development of local handicraft production as well as further investments. In addition, recovery and valorization as well as touristic infrastructure and services catering to tourists and support to educational activities are needed.

Table 9: Tourism in Diyala (CSO, 2016)

TRAVEL AND TOURISM COMPANY DATA FOR 2016	
Number of companies	43
Production value (revenue) in USD	2.075,809
Number of all travellers	23,566
Number of travellers from Diyala	3,836
Number of travellers from outside Diyala	19,730

LIVESTOCK AND POULTRY

Diyala has a lively livestock business sector mainly due to the presence of grazing lands and green grass during spring (Table 10)

Since Diyala has two major water sources, including the Diyala River and the Tigris, fish production was common and they still experience high demand. However, out of the 39 fish farms present in the province, only one is functional. In addition, there are also 11 fish river cages, operating with government authorization, according to the latest data from the Department of Agriculture.

The province also has a high number of poultry businesses (eggs, hatchery and meat production).[41] However, many of them are not operating (Table 11).

Table 10: Livestock statistics from the Directorate of Agriculture in Diyala, 2018

TYPE	QUANTITY
Calves	53,979
Meat production	7531,47 tonnes/year
Cows	137,721

41 Directorate of Agriculture in Diyala, 2018.

Milk production	4,549 tonnes/year
Sheep	650,980
Goats	182,884
Buffalos	21,809
Buffalo milk production	1205 tonnes/year
Camels	1,746

Table 11: Poultry sector statistics from the Directorate of Agriculture in Diyala, 2018

PRODUCTION TYPE	TOTA	FUNCTIONING	NON-FUNCTIONING
Chicken meat farms	578	175	403
Chicken egg farms	36	22	14
Chicken farms for hatching eggs production	4	3	1
Hatchery projects	9	6	3
Chicken butchery projects	5	1	4
Complete production projects (eggs, chicken and meat)	3	3	0

FOOD PROCESSING

Diyala had multiple food processing factories in the past, both government and privately owned, including tomato paste, date molasses, vinegar, dairy and soft drinks. These were all destroyed. The governorate now depends on goods imported from abroad with only some products, such as dairy, produced locally.

CONSTRUCTION

Construction represents an important economic sector in Diyala. In 2017, Diyala counted among the largest recipients of reconstruction and civil engineering work in general, based on the Government Reconstruction Strategy (see Table below). A total of 3.5 billion Iraqi Dinars (IQD), the equivalent of USD 2.5 million, was spent for public construction works in the governorate.[42] In addition, Diyala hosts several enterprises involved in the production of construction materials such as gravel and sand. The quarries, located in proximity of dams, represent a major source of construction materials for the region.

Table 12: Data on building and construction sector in Diyala, Ministry of Planning (2018)

TYPE	NUMBER	COST IN USD
Building projects in the public sector	28	7.491,543
Construction projects in the public sector	29	28.152,470
Buildings and constructions (addition and restoration) in the public sector	1	82,989
Total number of projects in the public sector for building and construction activity	58	35.727,003
Number of workers and their wages paid in the public sector for buildings and construction	2,003	2.954,510
Number of building and restoration permits granted to the private sector	2,338	134.122,973

42 Ministry of Planning, 2018.

3. CRITICAL MARKET SYSTEMS AND SUPPLY-DEMAND ANALYSIS

3.1 TRANSVERSAL MARKET ISSUES

During the research, the following major issues were found in relation to the functioning of the markets in the two governorates of Diyala and Salah al-Din.

1. **Competition from imported products:** The first issue affecting the functioning of the markets in Diyala and Salah al-Din governorates (as in the rest of Iraq) is the entry of goods from neighbouring countries without payment of customs duties. This leads to imported products being offered at very low prices in the market. For local producers, it is very hard to compete with these cheap, imported products.
2. **Lack of government support to farmers:** Another issue is the lack of support for local production by the Iraqi government. In the past, the government provided raw materials for agriculture such as seeds, fertilizers and pesticides at a subsidized price (or sometimes at no cost). Since this support is no longer provided, farmers have great difficulty to compete with imported products.
3. **Lack of access to finance for farmers:** It is very difficult for a farmer to obtain a loan from agricultural banks because of the banks' requests for documents and guarantees that are not available to all farmers. A high interest rate is also imposed on these loans with somewhat short repayment periods, which puts farmers in a difficult position and prevents them from obtaining a loan easily.
4. **Lack of hygiene and sanitation in the marketplace:** Another issue is poor attention to hygiene and sanitation as well as a lack of street paving in the marketplaces, which also makes movement of goods very difficult. In addition, there is also a lack of paved streets in marketplaces, which makes the movement of goods very difficult, especially in the winter season (due to rain). In addition, basic health conditions are not complied with in the markets of Salah al-Din or Diyala. This is especially relevant for meat and fish products that need a hygienic environment to ensure that germs do not multiply to prevent consumers' health being put at risk.
5. **Instability and lack of security:**The instability and lack of security in Salah al-Din and Diyala have negatively affected the farmers' productivity . The presence of armed militias in these two governorates discourages the production of agricultural crops, poultry and meat because these militias impose royalties on farmers and poultry farmers, especially in the outskirts of Salah al-Din Governorate.
6. **Logistical challenges:**There are many religious events during which the main roads are cut between governorates, making it difficult for goods to enter and exit, which seriously limits trade in agricultural goods. Visitors come on foot to perform the rites of visit, starting from Kirkuk, Diyala and Salah al-Din, heading to Baghdad and often continuing to Najaf or Karbala. From southern Iraq, visitors also come on foot to Najaf or Karbala. However, the entry of trucks loaded with foodstuffs, flour, vegetables, fruits, water, eggs, meat and other goods is very difficult as they are stopped for inspection several times and there are many delays. Therefore, many Iraqis stock up on basic foodstuffs days before the start of these religious events, also because prices increase significantly during these events (also because of the stockpiling). In addition, the COVID-19 has also posed a major challenge to farmers, as the Iraqi government has imposed curfews inside and outside the governorates, which has led to a restriction on the movement of products.

3.2 SUPPLY-DEMAND ANALYSIS OF MAJOR AGRICULTURAL GOODS AND SERVICES

As an input for the selection of the most promising value chains, a supply-demand analysis was carried out to find out which goods and services are most in demand, and which opportunities exist for new goods and services to enter the market. In each governorate, 25 interviews were held with consumers, and 15 interviews with market vendors. The main results for Salah al-Din and Diyala are provided in the following sections.

3.2.1 Salah al-Din

As can be seen in (table 13) consumers reported regularly buying tomatoes, cucumbers, potatoes, and eggplants followed by onions, yoghurt, grapes, eggs. Consumers also reported buying occasionally the following agricultural items: rice, potatoes, grapes, onions, cooking oil, tomatoes followed by fruits, legumes, apples and meat. The vast majority of consumers (92%) also reported mostly finding the agricultural items they need in the market, with a small percentage reporting challenges in finding potatoes, eggplants and fruits such as grapes and lemon along with dates.

Sixteen per cent of all consumers interviewed (4 respondents) reported being dissatisfied with one item in the market, which included mainly tomatoes and cucumbers. The majority reported the poor quality of the item (mentioned by 3 respondents), the high price (mentioned by 2 respondents), and distrust in the vendor (mentioned by 2 respondents).

Some agricultural items could be grown locally at a cheaper price, consumers believe, in particular tomatoes and potatoes, followed by cucumbers, onions, eggplants, oranges, apples and fruits in general. Some agricultural products are available to consumers but not affordable, including bananas and oranges followed by apples, lemons and peaches.

Table 13: Findings on demand and supply of most important agricultural goods, Salah al-Din

CONSUMERS				VENDORS	
Goods obtained regularly (n=25)	Goods obtained once in a while (n=25)	Imported goods but cheaper if produced locally (n=20)	Available but not affordable (n=14)	Most popular goods sold (n=15)	Most profitable goods sold (n=15)
Tomatoes (23)	Rice (11)	Tomatoes (11)	Bananas (5)	Potatoes (15)	Tomatoes (15)
Cucumbers (19)	Potatoes (10)	Potatoes (7)	Oranges (4)	Tomatoes (15)	Eggplants (1)
Potatoes (17)	Grapes (8)	Cucumbers (4)	Apples (2)	Onions (14)	Potatoes (1)
Eggplants (16)	Onions (8)	Onions (4)	Lemons (2)	Cucumbers (11)	
Onions (10)	Cooking oil (7)	Eggplants (4)	Peaches (2)		
Yogurt (9)	Tomatoes (7)	Oranges (4)	Potatoes (1)		
Grapes (8)	Fruit (6)	Apples (3)	Pomegranates (1)	Eggplants (7)	
Eggs (6)	Legumes (5)	Fruits (3)		Grapes (5)	
Milk (4)	Apples (4)	Lemons (2)		Pepper (3)	
Watermelon (3)	Meat (4)	Bananas (1)		Bananas (1)	
		Grapes (1)		Dates (1)	
		Meat (1)			

Vendors reported that among the agricultural items most in demand, potatoes, tomatoes and onions are the most mentioned followed by cucumbers, eggplants and grapes. The most profitable agricultural item is tomatoes, mentioned by 13 vendors. One vendor mentioned eggplants and another one mentioned potatoes as being among the most profitable items they sell (see table above).

Sixty per cent of all vendors interviewed (9 respondents) feel they are able to satisfy the demand of their customers, while 40 per cent (6 respondents) feel that they are not able to do so. The reasons for the inability to fulfil the demands of their customers, which were provided by 10 vendors, include: low level of stocks (33%), high taxation (25%), lack of finances to purchase stocks (21%), high costs of supplies (13%) with a small percentage also mentioning lack of transportation to bring the product from its source.

Fifteen vendors also reported some marketing constraints with price fluctuations followed by poor market facilities among the most mentioned challenges, with some vendors identifying commodity procurement challenges and delayed supply as major constraints.

Vendors were also asked about the most promising business opportunities in agriculture in Salah al-Din. The most mentioned opportunity includes the establishment of tomato paste factories, with a small number also mentioning jam factories. Some have commented that many tomatoes are simply thrown away since the market is not able to absorb all produce. Other promising opportunities included a dairy factory, opening of additional shops and generally expanding the market. Less mentioned opportunities include a pickle factory, renting shops at reduced prices and the establishment of manufacturing businesses unrelated to the agricultural sector (Table 14).

Consumers also advanced some ideas on how to improve the functioning of the market in Salah al-Din. They suggested supporting local farmers to ensure Iraqi products are available in the market at lower prices (68%), followed by supporting and improving the market in general (12%), establish one market for selling vegetables in specific (8%), preventing the import of fruits (8%) and reducing the taxes paid by farmers when selling to market vendors.

Table 14: Most promising business opportunities in Salah al-Din as reported by Vendors

MOST PROMISING BUSINESS OPPORTUNITIES	NUMBER OF MENTIONS BY VENDORS
Canning plant especially for tomato paste (and less mentioned jam)	7
Dairy factory establishment	2
Opening grocery stores/expanding the market	2
Sandwich panel workshop	1
Pickle factory establishment	1
Nylon bags factory	1
Renting shops at low prices	1

In conclusion, potatoes, tomatoes, onions, cucumbers, eggplants and grapes appear to be important agricultural items according to both consumers and vendors, including their ability to be produced locally at lower prices. In addition, tomatoes followed by eggplants and potatoes appear to be among the most profitable for vendors with cucumbers and tomatoes requiring quality improvement (Figure 3).

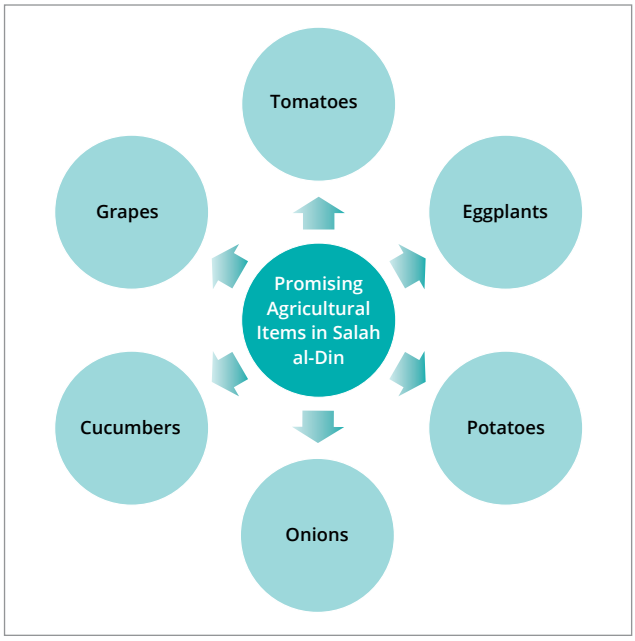


Figure 3: Most important agricultural items in Salah al-Din

3.2.2 Diyala

Consumers in Diyala reported tomatoes, cucumbers, potatoes, eggplants and onions as the most demanded agricultural goods, which are obtained on a regular basis (Table 15). The main agricultural goods obtained less regularly include rice and sugar followed by cooking oil and tomato paste, flour and meat. The vast majority of respondents always find the agricultural goods they are searching for in the market with only a small percentage (4%) reporting difficulties in obtaining fruits, including pears, cherries and grapefruit.

Consumers also listed some agricultural goods that are currently available in the market but are imported and could be produced locally at a cheaper price. Tomato paste, tomatoes and potatoes were the most mentioned, followed by cucumbers, dates, onions and rice. Nonetheless, all agricultural goods and services available in the market appear to be reasonably priced and affordable, based on the responses provided by consumers.

Almost one third of consumer respondents reported being dissatisfied with one item in the market with the remaining reporting an overall satisfaction. The main reason for dissatisfaction, reported by seven respondents in total, includes poor quality of the item with a small number mentioning the item being expensive and one consumer mentioning distrust in the vendor.

The most popular agricultural products sold by market vendors include rice, sugar, tomato paste, tomatoes, potatoes, eggplants, cooking oil, eggs, onions and cucumbers. The most profitable products sold by market vendors include potatoes and tomatoes, immediately followed by eggplants, eggs, and onions (Table 15).

Vendors overall feel they are able to satisfy the demand of their customers, which was reported by the majority of respondents (87%). Only a small number reported not being able to do so.

Table 15: Findings on demand and supply of most important agricultural goods, Salah al-Din

CONSUMERS			VENDORS	
Goods obtained regularly (n=25)	Goods obtained once in a while (n=25)	Imported but cheaper if produced locally (n=23)	Most popular items (n=15)	Most profitable (n=15)
Tomatoes (25)	Rice (21)	Tomato paste (12)	Rice (7)	Potatoes (4)
Cucumbers (23)	Sugar (21)	Tomatoes (10)	Sugar (7)	Tomatoes (4)
Potatoes (23)	Cooking oil (13)	Potatoes (9)	Tomato paste (7)	Eggplants (3)
Eggplants (21)	Tomato paste (12)	Cucumbers (5)	Potatoes (6)	Eggs (3)
Onions (15)	Flour (10)	Dates (5)	Tomatoes (6)	Onions (3)
Vegetables (11)	Meat (9)	Onions (5)	Eggplants (6)	
Fruits (9)	Yoghurt (6)	Rice (5)	Cooking oil (6)	
Cheese (8)	Oranges (5)	Pomegranate (4)	Eggs (6)	
Eggs (7)	Tea (5)	Cooking oil (3)	Onions (5)	
Lemons (7)	Legumes (5)	Flour (3)	Cucumbers (5)	

Vendors were also asked about the reasons why they are unable to fulfil customers' demands (Figure 4). The major reason appeared to be the lack of financial means to stock up on the goods in demand (reported by 6 vendors). A small number also mentioned the high purchase cost by suppliers (3 vendors), followed by insufficient stocks of the item in question (2 vendors). One vendor mentioned access issues due to a lack of transportation to bring the product from its source to the respective communities. The major marketing constraint reported by vendors is related to price fluctuations and controls, which were reported by the majority of respondents. A smaller number complained about the poor market facilities. A minority did not report any constraints (Figure 5).

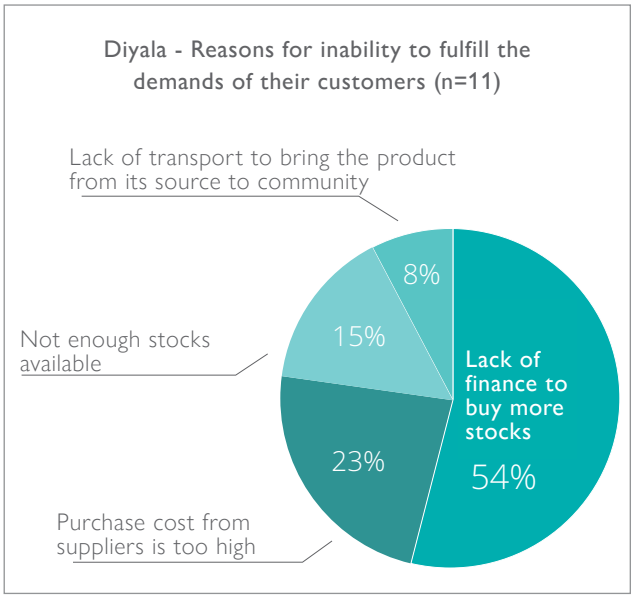


Figure 4: Reasons for market vendors' inability to fulfil demands of customers, Diyala

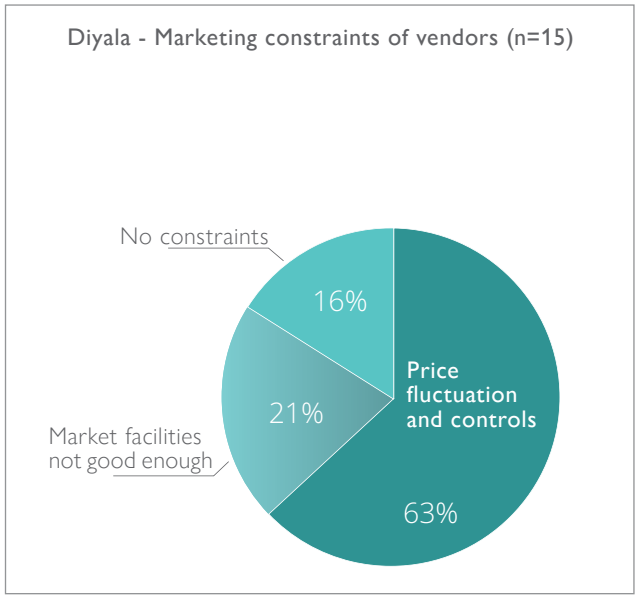


Figure 5: Marketing constraints as reported by vendors, Diyala

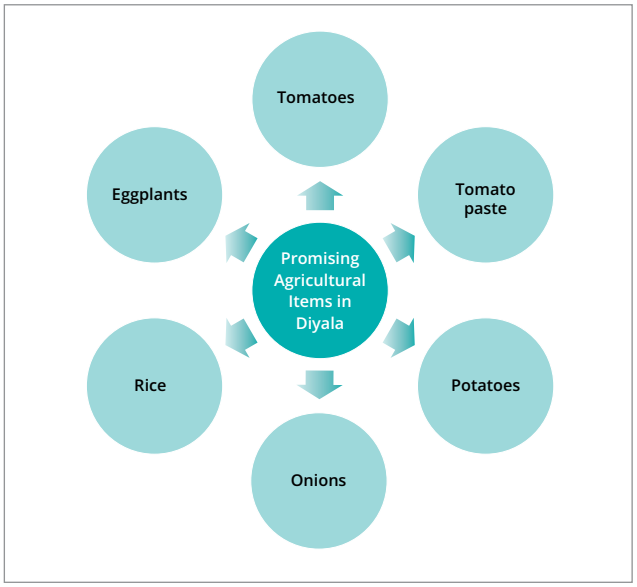


Figure 6: Most important agricultural items in Diyala

Respondents were also asked on the ways to improve the functioning of the market in Diyala. Overall, consumers mentioned the need for improving the functioning of the market in general (14 respondents), cleaning and organizing the local market (2 respondents), developing agribusiness, support farmers with basic needs, preventing fruit imports, restarting food processing factories, and improving water availability and access for farmers.

Based on the findings from Diyala, it could be reasonably concluded that rice, sugar, tomato paste, potatoes, tomatoes, eggplants, onions and cucumbers are the most demanded goods by consumers and also appear to be among the most popular items sold by vendors (Figure 6). At the same time, it appears that tomato paste, tomatoes, potatoes, onions, and rice could also be produced locally at a cheaper price, according to respondents. In addition, potatoes, tomatoes, eggplants and onions also populate the list of vendors' most profitable items.

4. AGRICULTURAL VALUE CHAIN ANALYSIS

4.1 SWOT ANALYSIS AND SELECTION OF PROMISING VALUE CHAINS

Following the context analysis and the consumer and market vendor surveys, the next step in the process was to identify and select the value chains for this study. Selecting an appropriate value chain requires a SWOT analysis (Strengths, Weaknesses, Opportunities, Threats). The following key elements have been used in the process of evaluating each value chain with high potential:

1. **Availability of local capacities and skills** for value chain development of the specific product.
2. **Market demand** for the specific products in the chain by local, regional and international customers and consumers.
3. **Potential market size**, depending on the size of the geographic area, population size and population density.
4. **Market trends** that will affect the consumers' buying habits.
5. **Presence of industry forces** that may affect the value chain positively or negatively, including international as well as internal issues such as government policy, and structural or technological changes.
6. **Competitor analysis** of direct competition (i.e. between producers/vendors of the same products) and indirect competition (i.e. between producers/vendors of similar or substitutable products or those competing for the same market). Special attention will be given to the competitiveness of local producers with imported products.
7. **Profitability** of the value chain.

During a workshop with the IOM teams in the southern region, a total of eight value chains with high potential for Basra, Missan, Thi-Qar and Muthanna were identified. For each of these chains, a SWOT analysis was carried out, which can be found in Annex A.

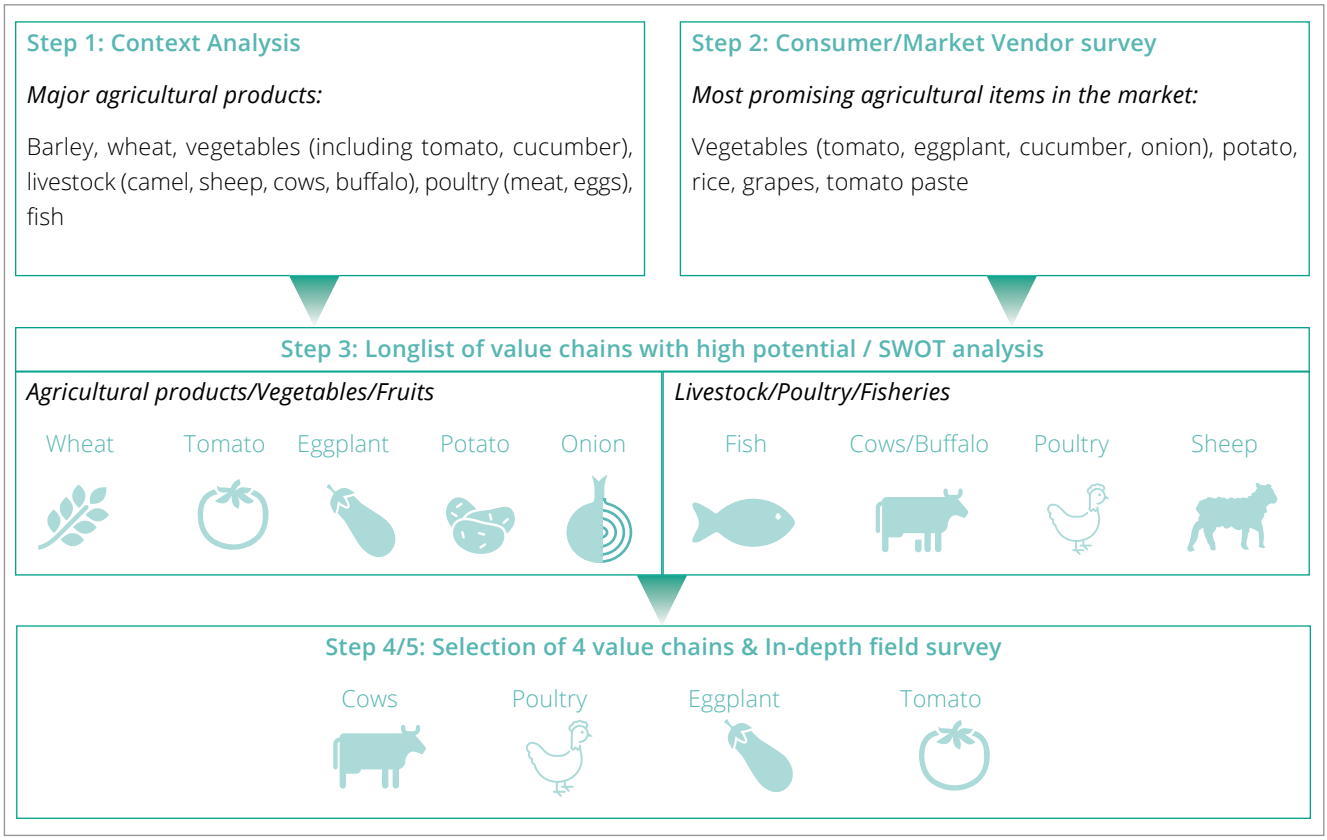


Figure 7: Value Chain Analysis Process

The selection of the most promising value chains was based on the findings of the consumer and market vendor survey, as well as on the context analysis and general insights of the value chain experts and IOM staff in the four governorates in the south. Figure 6 shows which phase in the process led to the selection of each value chain.The value chains with high potential are outlined in Table 16.

Table 16: Value chains with high potential in Salah al-Din and Diyala

VALUE CHAINS WITH HIGH POTENTIAL	GOVERNORATE WHERE THIS VALUE CHAIN IS MOST PROMINENT
Agricultural products/Vegetables/Fruits	
Wheat	Salah al-Din/Diyala
Tomatoes	Salah al-Din/Diyala
Eggplants	Salah al-Din/Diyala
Potatoes	Salah al-Din
Onions	Salah al-Din/Diyala
Livestock/Fisheries	
Cows	Salah al-Din/Diyala
Buffalos	Salah al-Din/Diyala
Sheep	Salah al-Din/Diyala
Poultry	Salah al-Din/Diyala
Fish	Salah al-Din

Next, based on a comparison of the SWOT analyses for each potential value chain, a final selection of the four most promising value chains was made for the northeast/centre region (Salah al-Din and Diyala). The main arguments for the selection of the four value chains are listed in Table 17. During the workshop, a score was assigned to each potential value chain on a scale of 1-10, to compare and rank them (see Annex A for the full ranking of value chains).

Table 17: Arguments for selection of value chains in Salah al-Din and Diyala

SELECTED VALUE CHAIN	MAIN ARGUMENTS FOR SELECTION	SCORE BETWEEN 1–10
Cows	• Good job opportunities for both meat and milk production • Job opportunities for women in dairy chain, including in collection centres for milk • Demand for milk in villages is met by local production, while high demand for milk in urban areas gives room for increased production • Cold chains are short and manageable • Offers opportunities for import substitution and processing • Recommended to focus on dairy value chain (and not on meat)	8.5

Poultry	• Demand is exceeding local supply by >50 per cent • Very profitable • Diyala already has many poultry farms • Processing chain is also there (including feed factory) • Challenges include volatile prices for eggs, and high price of chicken feed • Opportunity to develop chicken feed value chain (corn, wheat, crushed corn) – 70 per cent of inputs consist of feed • Recommended to focus on chicken meat value chain (and not on eggs)	8.5
Tomato	• High demand for tomatoes • Salah al-Din is one of the best places to grow tomatoes • Multiple value-added projects are possible • Wastage of tomatoes because of imports/short shelf life	8
Eggplant	• High demand for eggplant • Opportunity to rebuild processing capacity for eggplant • Job opportunities in drying eggplant • Suitable for the centre region	8

4.2 VALUE CHAIN ANALYSIS PER SUBSECTOR

For each of the four selected value chains, a detailed value chain analysis, including a value chain map for the north-east/central region has been carried out. This analysis was informed by interviews with a selected number of key informants:

1. Agricultural producers (this category includes farmers, livestock or fish producers, depending on the value chain);
2. Wholesalers and retailers (middlemen, large traders, shop owners, restaurant owners);
3. Industry experts (equipment suppliers , chemicals, feed, seeds and other inputs, processors such as graders and packers, slaughterhouses, food production factories);
4. Local authorities (Chamber of Industry or Commerce, Provincial Council / Committee on Industry, Trade and Agriculture, agricultural advisors/extension officers).

The goal of these interviews was to obtain deep insights into the functioning and the shortcomings of the value chain, as well as to create a value chain map showing the multiple ways in which products in the four selected subsectors reach the consumer, from raw materials inputs to the point of consumption. The maps are based on a combination of qualitative and quantitative data and information. During a workshop with IOM staff and the value chain consultants, a first draft version of the value chain map was developed, becoming the basis for the maps included in this report.

For each value chain, the focus of the data collection was on one governorate, depending on where this subsector has the highest potential or is already best developed with room for further expansion:

- Cows (dairy): Diyala
- Eggplant: Diyala
- Tomato: Salah al-Din
- Poultry (meat): Salah al-Din

In the next sections, for each value chain, the following themes will be explored:

- Context
- Value chain map
- Value chain actors
- Cost structure and prices
- Communication and information flows
- Relationships (governance) in the value chain
- Government support to development of the value chain

- Opportunities and challenges for value chain development
- Potential for investment and job creation in the value chain

The last section provides an idea on the potential for investment and job creation in the value chain, to understand in which areas of the value chain cash grants are needed.

4.2.1 COWS (DAIRY)

Focus area: Diyala[43]

Context

In Iraq, livestock production has always been an important pillar of the agriculture sector. It represents one third of the total value of agricultural production. Cattle, goats and sheep are the main livestock in Iraq, supplying meat, wool, milk and skins. In the recent past, animal husbandry was an important source of income and food for many female-headed households. However, as a result of the conflict, in large parts of Iraq, including in Salah al-Din and Diyala, a large number of livestock were lost, dead or injured due to the conflict. On average, 75 per cent of cattle, sheep, goats and buffaloes were lost, although in some areas this figure was as high as 85 to 95 percent.[44]

The reduction of herd sizes is usually attributed to security-related problems such as livestock being stolen or killed. Other reasons included the lack of animal feed, the high prices of animal feed, the inability to access pasture due to occupation or explosive contamination and government suspension of veterinary programmes (e.g. medicines, vaccines, etc.). As a coping mechanism, farmers often resorted to selling their livestock to obtain cash. For rebuilding their herds, farmers mentioned requiring improved security, temporary shelters, replanting of pastures and clearance of unexploded ordnance. In addition, feed, fodder and government emergency veterinary services are needed, as well as government support to improve the sector's economic viability.[45]

With regards to the dairy industry, much of the Iraqi dairy processing sector has been destroyed during years of conflict. As a result, Iraq is currently a major importer of dairy products. Trade data is not very reliable, because of smuggling and the limited government capacity to collect statistical data. With this limitation in mind, it is nevertheless useful to take a look at the available trade data. In 2016, officially, Iraq imported around 433,000 tonnes of dairy products worth 707 million Euro (EUR). How much was imported unofficially, without being captured in trade data or misclassified is difficult to estimate, though it is likely significant. The main import categories were cheese (EURO 294 million), yoghurt and fermented products (EUR 177 million), milk (EUR 115 million), powder and condensed milk (EUR 63 million) and fat filled milk powders (FFMP) (EUR 44 million). Exports were relatively insignificant.[46]

For dairy imports, Iran was the leading supplier in most product categories including cheese, yoghurt and other fermented products and milk in 2016. Other important supplier countries included Turkey and Saudi Arabia for milk, yoghurt and cheese, and Europe (mainly the Netherlands, France, Belgium and Denmark) for butter.[47]

Diyala has a large livestock sector, mainly due to the presence of abundant grazing lands, with cows as one of the major livestock sectors. In 2018, the total number of cows amounted to 137,721 in Diyala. Total meat production was 7,531 tonnes/year, while total milk production was 4,549 tonnes/year.

Value chain map

The value chain map for cows (dairy) in Diyala is presented in the following page.

43 Even though the focus of the cow's value chain is on Diyala, it should be noted that Salah al-Din is also rich in livestock and produces substantial amounts of cow meat and dairy products as well.

44 FAO, 2017. Iraq Agriculture damage and loss needs assessment. Available from: www.fao.org/3/i7810e/i7810e.pdf

45 Ibid.

46 Irish Food Board, 2018, Iraq Dairy Market. Available from: www.bordbia.ie/industry/news/food-alerts/iraq-dairy-market/

47 Ibid.

Value Chain map for Cows - Dairy (Diyala)

Inputs:

- Animal feed
- Medicine/ vaccines

Production:

- Raising of cows to produce milk, yoghurt, butter, fat and cream
- Both small and large producers

Distribution:

- Wholesalers

Retail:

Small shopkeepers and grocery stores

Consumers:

All dairy produced is consumed locally

Value chain actors

Input suppliers

Feed is provided by local farmers and consists of wheat and wheat hay. In addition, cows consume grass on the farmland. Usually farmers buy cow feed from several suppliers, depending on the available supply, price and quality.

The Agriculture Department in Diyala indicated that there is cooperation with a company producing animal feed, enabling them to provide the feed to farmers at subsidized prices.

Production

The two female farmers interviewed in Diyala are smallholder farmers, raising cows to produce milk and yoghurt. One farmer has only one cow, the second owns several cows. One of the farmers explained: "My business is small because I lost most of my cows during the 2014 invasion [by ISIL] and the following displacement".

Milk is collected daily , once in the morning and once in the evening. The milk is partly sold fresh, and partly used for the production of yoghurt, based on the requests received from consumers. The milk is packaged in bottles, and the yoghurt in containers of 500 ml. On average, milk production amounts to 10 litres per cow per day.

In terms of product quality, according to farmers, the most important are the products' cleanliness and freshness, as they have a short expiration date. There is normally no waste in the production stage, because the farmers are able to sell their full production every day, due to the high demand in the area. This is also the reason farmers do not have to store the products. They only use a refrigerator to keep the milk and yoghurt fresh during the day. Since demand always exceeds supply, marketing is not needed.

Distribution [48]

Farmers sell their products directly to residents of their village or neighbourhood, or to people living in nearby villages, as well as to relatives and friends. As stated above, the local demand exceeds supply so 100 percent of production is sold to local consumers. The farmers interviewed indicated that they have a stable customer base who are very satisfied with the products sold. The only problem is that sometimes demand exceeds supply, which leaves some customers empty-handed. If farmers were able to increase their production, they would still be able to sell their full production easily.

According to a wholesaler who sells both dairy and meat, there is no need for a certificate or quality standard, because his customers buy his product based on their quality. The wholesaler buys from different suppliers, mainly based on the prices of the products. There are no formal contracts involved. Transport is sometimes done by cooled trucks, but sometimes by regular trucks, when the distance is close and there is no risk that the products perish. There are no hygiene issues in the dairy value chain because the consumers are close to the producers.

One of the wholesalers controls about 10 per cent of the market, while there are quite a few competing traders. The wholesaler sells to grocery stores daily. The main reasons for consumers to buy dairy products are the cleanliness of the products, the method of preservation, the quality of the product as well as competitive prices. The relationships

48 It should be noted that three wholesalers were interviewed in Diyala, one dairy trader and two meat traders. Since this chapter focuses on the dairy value chain, only the response by the dairy trader was used.

between wholesalers and suppliers as well as buyers are very good and stable. It is important for traders to understand the consumer's preferences.

The main cause of waste is the short expiration date, which makes it challenging to buy a sufficient quantity of the products. This sometimes leads to losses for both the supplier and the wholesaler due to expiration of the dairy products.

At present, there is no export of dairy products from Diyala to other governorates or to export markets.

Processing

Processing of milk into yoghurt and butter is limited. Processing capacity is hindered by the lack of packaging materials. If this would be solved, the expiry date could be extended, leading to less waste and more sale opportunities for dairy farmers. As the Iraqi government is currently planning to increase local production in all sectors, this is a good opportunity for the local dairy sector to expand.

Consumption

According to industry experts, in Diyala, the demand for dairy products exceeds supply, especially of fresh yoghurt and butter. These products are currently produced locally but both the quality and quantity are not in line with consumers' expectations. The yoghurt currently sold is still acceptable to consumers, but if the quality and packaging could be improved, consumers would be more satisfied.

Cost structure and prices

The turnover per day for an average dairy farmer is 10 litres of milk per cow. At a price of IQD 750 per litre, this leads to total revenues of IQD 7,500 per day per cow for milk producers. The turnover per day for yoghurt is also 10 litres, sold at a price of IQD 2,000 per litre. This leads to total revenues of IQD 20,000 per day per cow for yoghurt producers.

The main cost drivers for farmers are the cost of feed, medicines and vaccines. The cost of feed is IQD 5,000 per cow per day. The main cost drivers for wholesalers in the value chain are rent, labour, electricity and utilities.

The sales price of the wholesaler is determined on the basis of the available stock of dairy products in the refrigerators, as well as on the purchase price. The prices change continuously according to the season and the exchange rate of the dollar in the market. The profit margin for the wholesaler interviewed is IQD 6-7 million per year (= USD 4,000-5,000). A small amount is added as profit.

The average prices of dairy along the value chain, produced in Diyala, are as follows:

ACTOR IN THE CHAIN	SALES PRICE
Farmer	Milk: 1500 IQD per 2 litres (= 750 IQD per litre) Yoghurt: 1000 IQD per 0,5 litre (= 2000 IQD per litre)
Wholesaler	Milk: 1000 IQD/L Yoghurt: 2250 IQD/L
Retailer	Milk: 1250 IQD/L Yoghurt: 2500 IQD/L

Communication and information flows

Farmers receive information from their input suppliers on the prices and the quality of the feed, as well as about the veterinary treatment. The choice for a supplier is based on the quality and the price of the materials. Farmers indicate that they would like to receive more information about new technologies for the production of feed.

Downstream of the chain, farmers also receive information from their buyers on how to increase the quality and taste and how to optimize the product's freshness. Such information helps farmers to increase sales.

Relationships (governance) in the value chain

The farmers interviewed have never invested in their business because they are too small and do not have resources. They would be willing to invest if they had the capacity and resources available. If supported, farmers would be interested in expanding their business. They would also require training in new techniques, as they are still using traditional methods in dairy production. There is a need for training in business management, marketing and communication, and new techniques for dairy production. However, currently no organizations provide vocational training or skills development in Diyala. There is also no tradition of apprenticeship in the dairy sector.

The farmers indicated that they are open to cooperating with other farmers. The dairy sector offers good opportunities for women too. One female farmer stated that: "There are some other women in the village who have the same business, we share information, challenges and solutions with each other". According to an industry expert, "The dairy business is important for women who have cows, especially in the rural areas.

"

Most wholesalers interviewed have never received any support by Business Support Providers (BSP), donors or state-owned agencies on product development, product mix, process planning or management. All of them feel motivated by the future prospects of their business as part of the value chain and believe that there is growth potential in both the dairy and meat value chain. All wholesalers interviewed are open to the idea of working with other upstream or downstream chain members to further support the development of the dairy and meat market.

Government support to development of the value chain

According to the Agricultural Department in Diyala, there is no policy on the promotion of breeding cows, and no projects focused on improving the dairy value chain. There is also no cooperation with other ministries, nor with international agencies. Previously, the state provided soft loans to the farmers. In addition, a government centre supported the dairy sector, but it no longer exists.

Opportunities and challenges for value chain development

Opportunities:

- There are many job opportunities in the dairy value chain, from gathering the milk to dairy production and marketing and distribution. This means that there is potential for employment generation at each step of the value chain.
- The dairy sector offers opportunities for import substitution and processing. Especially for high-quality yoghurt and butter, demand exceeds supply in Diyala, which means there is potential for existing dairy farmers to expand their business or for new producers to enter the sector.
- The dairy business is often run by women, especially in the rural areas, so there is potential to create many jobs for women, including in milk collection centres.
- The demand for milk in villages is met by local production, while the high demand for milk in urban areas gives room for increased production.
- As the Iraqi government is currently planning to increase local production in all sectors, this is a good time for the local dairy sector to expand.

Challenges:

- Farmers are still using old techniques, because they have no resources to invest in training or new technologies.
- There is a lack of government support to cow raisers; the only support provided consists of awareness raising sessions.
- A support programme to subsidize local feed in cooperation between feed producers and cow raisers is needed.
- Good packaging of dairy products is needed.
- There are no adequate standards or processes for indicating expiration dates on the final product.
- There is a lack of marketing skills by most dairy farmers, who often only depend on local consumers.
- There is a need for training in business management, marketing and communication, and new techniques for dairy production. However, currently no organizations provide vocational training or skills development in Diyala.

Potential for investment and job creation in the value chain

In conclusion, the highest potential for investment and job creation in the cow value chain in Diyala is the setting up of small dairy processing factories. Many small farmers sell their milk without any form of processing, leading to waste in the value chain. If small processing factories were established throughout the governorate, farmers would benefit because they would have a more secured offtake and more stable prices, and consumers would benefit because they would have access to locally produced dairy products of good quality and taste, instead of imported dairy products, which are less preferred. The products most in demand are cheese, milk fat, cream, butter and yoghurt.

Small dairy processing factory – estimated investment cost and job creation
Initial investment cost:

– Pasteurization unit (1 tonne capacity)	USD 7,500
– Agitation unit to separate fat from milk	USD 3,500
– Cold store (5x4 m2, capacity 3-4 tonnes)	USD 6,500
– Packaging Machine	USD 2,500
Initial investment needed:	USD 27,500

Operating cost:

– Gasoline for the generator: 20 lt gasoline/hour for 8 hours = 160 lt per day;

this would cost 160lt x US$0.40/lt x 30 days = USD 1,920 per month

– Salaries of workers: USD 350 x 10 workers = USD 3,500 per month

Operating cost per year: USD 5,420 per month x 12 = USD 65,000

Total investment cost for the first year:
(Initial investment + operating cost) = USD 27,500 + USD 65,000 = USD 92,500

Employment creation:
It is estimated that 10 people could be employed in each dairy processing factory: two to collect milk from farmers, six to operate the machines, two for storing and arranging the final products and managing the marketing and sales.

In Diyala, it is estimated that a minimum of seven small dairy factories can be established (one in each district). This means that at least 70 people could be employed.

Total potential job creation: 70 jobs

As an additional investment, the factory could provide other support services to farmers, especially with high-quality feed (to increase the quantity and quality of milk per cow) and technical support (vet services/vaccines). The cost of such a service has not been included in the above calculations.

4.2.2 EGGPLANT[49]

Focus area: Diyala

Context

Vegetable production has traditionally been very important in Iraq, providing employment to many smallholder farmers. In general, vegetable production has increased in Iraq in recent years, particularly near urban centres where relatively modern farming techniques are applied. However, a major challenge for producers and processors has been achieving and maintaining quality standards in this value chain. Currently, about 60-70 per cent of vegetable consumption is supplied by imports from neighbouring countries.[50]

Eggplant is grown all over Iraq in open fields as well as in protected greenhouses and plastic tunnels. In 2018, eggplant was one of the five most important vegetables in Iraq (excluding KRI), together with tomatoes, watermelons, cucumbers and melons.[51] Central to Iraqi cuisine, eggplant is consumed on an almost daily basis by most people. Demand for eggplant often exceeds supply. In the market vendor survey carried out for this study in Salah al-Din, eggplant was mentioned as one of the four items most difficult to obtain in the market.

Eggplant production increased between 2009 and 2013 because of the launch of the agricultural initiative by the government that offered easy loans and subsidized prices of inputs such as fertilizers and seeds.[52] However, since 2014 eggplant production has decreased (Table 18). In 2017, local eggplant production amounted to only 94,000 tonnes per year, compared to 511,000 tonnes in 2013. This sharp decrease was due to the dumping of imports in the Iraqi market and the surplus in the local market. This has led to the unwillingness of Iraqi farmers to grow eggplant. Other factors causing the drop in eggplant cultivation included lack of government support and water scarcity.

Meanwhile, imports of eggplant have fluctuated considerably in the last decade. In 2017, imports amounted to 15,000 tonnes, meaning that the import dependency ratio was 13.5 per cent, which is relatively low compared to other crops.

Table 18: Total imports and local production and the proportion of Iraq's dependence of eggplant (2009-2017) (Source: L. H. Ghadhban and O. K. Jbara, 2019)

YEAR	QUANTITY IMPORTED 1000 TONS	VALUE OF IMPORTS IN MILLION DINARS	LOCAL PRODUCTION 1000 TONS	AVAILABLE FOR CONSUMPTION*	DEPENDENCY RATIO**
2009	35.03	2577	396	431.03	8.12
2010	6.98	4078	387	393.98	1.77
2011	7.7	2751	452	459.7	1.67
2012	11.72	2186	422	433.72	2.7

49 In Iraq, eggplant is also known as aubergine; in local Arabic, it is called aswad while the formal name in Arabic is bathingan. For consistency purposes we use eggplant throughout this report.

50 World Bank, 2019, Iraq Economic Monitor, Turning the corner: sustaining growth and creating opportunities for Iraq's youth.

51 Data obtained from CSO, 2020.

52 L. H. Ghadhban and O. K. Jbara, 2019, Impact of Product Dumping on the Agricultural Sector in Iraq (2009-2017); Iraqi Journal of Agricultural Sciences, 2019:50(5):1228-1236. Available from: www.researchgate.net/publication/337001415_IMPACT_OF_PRODUCT_DUMPING_ON_THE_AGRICULTURAL_SECTOR_IN_IRAQ_2009-2017/link/603f55ca4585154e8c729a73/download

2013	120	22	511	511.12	0.02
2014	11.54	1233	343	354.54	3.25
2015	67.84	14357	343	410.84	16.51
2016	8.02	1528	102.45	110.47	7.25
2017	14.8	4611	94.48	109.28	13.54

Value chain map

The value chain map for eggplant in Diyala is presented here below.

Value Chain map for Eggplant (Diyala)

Inputs:

- Seeds (imported from the Netherlands)
- Fertilizer (imported from Turkey/Jordan)
- Pesticide (imported from different countries)

Production:

Small farmers (both male and female)

Eggplant is one of the main crops for all farmers in Diyala

Distribution:

Farmers transport the eggplants by pickup car to the wholesaler

Packaging in plastic bags of 10-15 kg

Retail:

Wholesalers sell to local market vendors and grocery stores

Consumers:

High demand from consumers, as eggplant is consumed on an almost daily basis

Processing:

No processing of eggplant, because fresh eggplant is available throughout the year

Sales to other governorates or export:

There are no sales to other governorates or exports

Value chain actors

Input suppliers

The following inputs are used by farmers for the production of eggplant:

- Seeds imported from the Netherlands; most farmers use a special kind of seed used for the sweet eggplant variety.
- Fertilizer imported from Turkey or Jordan.
- Pesticides imported from different countries.

Farmers store the seeds and fertilizers in a special room in their house.

Farmers do not deal with one specific supplier due to the volatility of prices and variation in the quality of seeds. They look for the supplier who can offer the best quality at the lowest price. It would be better for the farmers if they had a more stable supplier base.

Production

Production is done by smallholder farmers (both female and male). Eggplant is a main crop for all farmers, together with tomato and onion. During data collection, interviews were held with two female farmers, who both selected the best quality seeds to get the highest quality eggplant, which should be medium-sized and fresh. Planting starts in January, with the harvest taking place three months later (usually in March). Under normal circumstances, 1 donum can give a yield of 2-3 tonnes of eggplant per season. After the eggplant has been harvested, other crops are planted to keep the land fertile (usually peas). Some farmers plant in open fields, while some use tunnels to cover the fields and protect them from outside influences, such as insects or storms.

Some waste occurs during the production phase, caused by plant diseases, insects and weeds that grow next to the plants. To prevent waste, farmers use insecticides and fertilizers. After the harvest, farmers store the crop in a special room located close to their house, after which they immediately do the packaging, so there is no wastage at this stage. Only during the hot season, some waste may occur because of the high temperatures.

Distribution

Eggplant is packaged in plastic bags of 10-15 kg. The farmer takes the harvest in mini pickup cars to the city, where the product is sold to different wholesalers, who then sell it to market vendors and grocery stores in smaller quantities. Sometimes, farmers also sell directly to grocery shops in the village.

One grocery shop owner stated that she prefers to buy directly from the nearby farmers, because it is less costly, and because the quality is guaranteed. Vendors make verbal arrangements with the farmers about the supply of eggplant, usually at the beginning of the harvest time. Eggplant does not require a refrigerator for storage.

Grocery stores sell to city residents and to people from nearby villages. The main reason to buy from a certain store is the quality of the products. As one vendor stated: "Consumers always look for clean and fresh products as well as affordable prices." In most locations, there are different grocery stores, and competition is quite high. One vendor estimated that he has a market share of about 15 per cent.

During the cold season, there is no waste of eggplant, because produce can be easily kept fresh in the warehouse or shop, but during the hot season, a percentage of the products gets wasted because of the heat. This could be reduced by cooling the produce, but is currently not a common practice.

There is no export to other governorates or abroad.

Processing

Eggplant is not processed in Diyala, because fresh eggplant is available throughout the year, so there is no need to preserve it.

Consumption

As mentioned above, eggplant is consumed almost daily by most Iraqis. As a result, demand for eggplant often exceeds supply. In Diyala, the consumers of eggplant are all based in the area of production and nearby villages and cities.

Cost structure and prices

The main cost drivers for the vendors are the eggplant itself (about 400-500 IQD/kg) and transportation cost (about IQD 5,000-10,000 per delivery of 100 kg). The total weight of each delivery of eggplant is around 100 kg, which means that the transportation cost for 1 kg of eggplant will cost IQD 50-100.

The sales price of eggplant is unstable and can vary from day to day. At the time of research (January 2021), the sales price was between 500-750 IQD/kg. The price depends on the market supply and the quality of the products.

The profit margin of vendors varies from one person to another. One vendor reported a profit margin between 100-250 IQD/kg, another vendor earned between 250-300 IQD/kg. This means that the profit margin varies a lot (from 100 to 300 IQD/kg). Based on an average sales price of 450 IQD/kg, the profit margin varies between 22 per cent and 67 per cent. This means that eggplant trade is in theory a very profitable business, but it is often difficult to compete with imported eggplant.

The average prices of eggplant along the value chain, produced in Diyala, are as follows:

ACTOR IN THE CHAIN	SALES PRICE
Farmer	350 IQD/kg (to wholesaler or grocery shop) 500 IQD/kg (direct sales to consumer)
Wholesaler	400-500 IQD/kg
Retailer	500-750 IQD/kg

Communication and information flows

With regards to information flows, farmers usually receive information from the suppliers about the quality of the seeds, the fertilizers, and how to control the insects. They also ask to provide them with information on new planting technologies and new techniques to control the insects.

Farmers also receive information from the wholesalers and grocery shops about the quality that consumers demand and about the preferred types of eggplant, so they can adapt their production. In addition, they also receive information about the best way to package the products. Farmers would also like to have information on new planting technologies. They also indicated that it would be good if the Agriculture Directorate could prevent importing crops from outside the country.

Vendors would like to have more information about their consumers. One vendor expressed that he is keen to learn about new ways of marketing, and to know what kind of products consumers prefer.

Relationships (governance) in the value chain

Farmers are open to the idea of working with other farmers, as it would help them to share challenges and solutions , and to discuss new planting techniques. One farmer stated that: "We usually meet and share the challenges and information among us but not as a pool or organized meetings." The farmers also have limited capacity, so they need to be trained on new techniques and new ways of planting.

The farmers interviewed have no major problems in dealing with their input suppliers or buyers, except for the general problem of market instability, which leads to large differences in prices. Also, fertilizer is sometimes lacking, so it becomes very expensive. Farmers indicated that they have no skills and ability for investments to meet the requirements of their buyers. It would be a good idea to invest in the value chain, but farmers would need the right tools and resources to be able to do so. One farmer indicated that: "it would be great to invest in partnerships with other actors in the value chain, but I need to improve my skills and experience as I have not been in a partnership like that before." At present, no investments are made in the eggplant value chain because of the small size of the businesses and the lack of capacity of the business owners.

Vendors have a problem related to the market instability due to the absence of governmental support and the lack of control of the market prices. Vendors have never received any support from BSP, donors or state-owned agencies on improving their businesses. They are open to work with other upstream or downstream chain members because it will help them with getting better information about the market.

Government support to development of the value chain

According to the Agricultural Department in Diyala, the most important policies to strengthen the vegetables value chain is to prevent the import of products into Iraq and to provide registered farmers with fertilizers. The government is training farmers on modern methods of cultivation and harvesting and on how to use the best fertilizers and seeds to optimize production.

There is an ongoing cooperation programme between the Agricultural Department and the Centre for Science and Technology at Diyala University on high-quality seeds research.

The government also cooperates with companies in terms of exchange of technical expertise. At present, there are no international cooperation projects. Before 2014, the government was providing financial resources and loans to farmers, but this support has stopped because of lack of financial resources of the government.

In terms of capacity needs, farmers need training courses on protected agriculture, modern techniques of cultivation, introductory courses on modern varieties, prevention methods and drip irrigation. At present, vocational training is not provided, whereas in the past, it was provided by the Department of Plant Production and the Agricultural Extension Centre in the Agricultural Department.

Opportunities and challenges for value chain development

Opportunities:

- Eggplant production is very suitable for the central region due to its climatic conditions.
- There is high daily demand for eggplant, not only by consumers but also by restaurants.

- By preventing imports from outside of Iraq, eggplant cultivation could become very profitable.
- During the harvesting season, the price of eggplant goes down, which is beneficial for consumers.
- Eggplant can be produced in greenhouses to increase volumes and quality, but so far, this is not done on a large scale due to a lack of investments in greenhouses.
- There is an opportunity to produce pickles from green eggplants (mekdos), for which there is high demand by consumers. Dried eggplant also provides an opportunity to add value to the product and provide additional income for farmers.
- There is an opportunity to rebuild processing capacity for eggplant-based products (e.g. canned eggplant).
- There is an ongoing cooperation programme between the governorate and the University of Diyala to do research on high-quality seeds.
- The governorate provides fertilizer to registered farmers (but not to unregistered farmers)

Challenges:

- Import of eggplant from outside Iraq is affecting local production.
- Farmers have to use pesticides against insects, but due to a lack of resources, they are often unable to buy them.
- The government does not provide seeds and pesticides; fertilizers are only provided to registered farmers (see above).
- It is difficult to store eggplant for a long time, so it needs to be sold directly after the harvest, especially during the hot season.
- At present, there are no factories for processing food in Diyala.

Potential for investment and job creation in the value chain

In conclusion, setting up greenhouses for growing vegetables holds the highest potential for investment and job creation in the eggplant value chain in Diyala. Currently, vegetable production occurs in summer only. By building greenhouses, vegetables could be grown also during winter, which would increase farmers' income and provide consumers with fresh locally produced vegetables throughout the year. In addition to eggplants, farmers would be able to plant tomatoes, cucumbers, green peppers and other vegetables, which all have a high demand locally.

Construction of greenhouse - estimated investment cost and job creation

Initial investment cost:

– Steel structure (9x54m)	USD 3,000
– UV nylon	USD 1,500
– Ventilation system	USD 300
– Solar system/pump/well	USD 3,000
– Drip irrigation system	USD 500
– Fertilizer system[53]	USD 500
– Water tank (1000 lt)	USD 200
– Heating system[54]	USD 500
Initial investment needed[55]	USD 9,500

Operating cost:

- Kerosene/gasoline for the heating system
  USD 400 per month
- Salaries of workers (USD 350 x 2 workers)
  USD 700 per month

Operating cost per year: USD 1,100 per month x 12 = USD 13,200

Operating cost per year:
USD 2,500 per month x 12 = USD 30,000

Total investment cost for the first year:
(Initial investment + operating cost) = USD 9,500 + USD 13,200 = USD 22,700

If a farmer built more than one greenhouse, the initial investment cost per greenhouse would be lower because of economies of scale. It is roughly estimated that for the construction of four greenhouses, the initial investment cost would be USD 20,000 (or USD 5,000 per greenhouse), instead of USD 9,500.

53 The liquid fertilizer will be distributed through the irrigation system.

54 This is the cost for a modern system fueled by kerosene/gasoline; it is also possible to use a traditional system fueled by wood, but this is not preferable because of the negative health and environmental impacts.

55 It should be noted that it is possible to build a greenhouse with lower quality materials for USD 5,000.

Employment creation:

It is estimated that two people could be employed in each greenhouse. In Diyala, it is estimated that a minimum of 1,000 new greenhouses could be established. This means that at least 2,000 people could be employed.

Total potential job creation: 2,000 jobs

4.2.3 TOMATO

Focus area: Salah al-Din

Context

Although tomato is originally native to South America, it has been cultivated in the Middle East since the end of the 18th Century, where it is now a major food crop. Many different varieties of tomatoes are grown across Iraq and are harvested at different times of the year in different parts of the country due to variations in soil and climatic conditions.[56] Tomato is one of the main vegetables grown in Iraq, with a total production of around 450,000 tonnes in 2018. Tomato is the most grown vegetable in Iraq (excluding KRI), followed by watermelon, cucumber, melon and eggplant[57] (Figure 8).

In recent years, vegetable production has increased in Iraq, particularly near urban centres where relatively modern farming techniques are applied. However, a major challenge for producers and processors has been achieving and maintaining quality standards along the value chain. Currently, about 60-70 per cent of vegetable consumption is supplied by imports from neighbouring countries.[58] In Salah al-Din, watermelon is the most grown vegetable/fruit, especially in the southern parts (in Samarra, Ishaqi, and Dujail), followed by tomatoes, cucumbers and grapes, which are also cultivated in large quantities in the same areas.[59]

Tomato-processing capacity is very limited in Salah al-Din. Diyala had multiple food processing factories in the past, both state- and privately owned, including for processing tomato paste, date molasses, vinegar, dairy and soft drinks. Such factories included the Baquba Food Canning & Dates Processing Company, which was one of the major tomato paste and date processing factory in Iraq, located in the

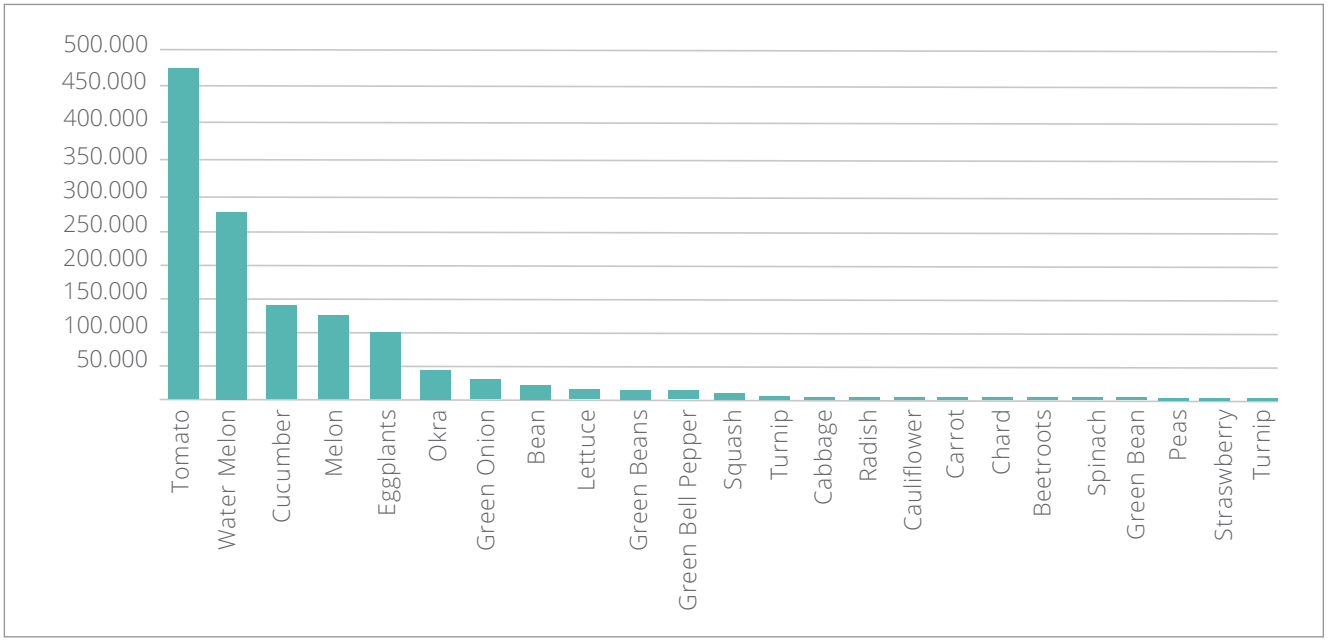


Figure 8: Vegetable production in Iraq (excluding KR-I) 2018/Ton; Source: CSO

centre of Baquba. This factory alone employed 500 people, while during the date season the number of employees rose to about 1000. All factories closed down. The governorate now depends on goods imported from abroad with only some products, such as dairy, produced locally.

The consumer survey in Salah al-Din and Diyala found that

56 DRC, 2020, Analysis of key value chains in the agriculture and food-processing sector in Muqtadiyah, Diyala governorate

57 Data obtained from CSO, 2020

58 World Bank, 2019, Iraq Economic Monitor, Turning the corner: sustaining growth and creating opportunities for Iraq's youth

59 Directorate of Agriculture of Salah al-Din, date n. g.

tomato was the product with highest consumer demand. In Salah al-Din, tomato was mentioned as one of the two items present in the market, which consumers do not find satisfactory. The main reasons for dissatisfaction with tomatoes are the poor quality, lack of trust in the vendor and high prices. Tomato is also the most mentioned product that is currently imported but could be produced locally at a cheaper price. Interestingly, in Diyala, tomato paste was most often mentioned as a product that could be produced locally at a cheaper price, followed by tomato, while tomato and potato were mentioned as the most profitable products. In Salah al-Din, tomatoes are mentioned by market vendors as the most profitable product sold.

Value chain map

The value chain map for tomatoes in Salah al-Din is presented here in the following page.

Value chain actors

Input suppliers

The inputs needed to produce tomato are:

- Seeds: Seeds are imported from Jordan or Lebanon. Seeds are first grown into tomato seedlings before being planted on the farm. The price of a box of 1,000 tomato seeds is IQD 60,000.
- Fertilizer: Most commonly, the urea fertilizer is used (also called humic), which costs USD 500 per tonne.
- Water: Water is supplied either through the artesian wells (owned by the farmer) or by purchasing water from water wells. Establishing an artesian well requires a high investment cost so only wealthy farmers use it.

Production

In Salah al-Din, fresh tomato production is centred in Samarra, Al Jazeera, Mukeshifa, and Zelaya. Two male farmers were interviewed that are producing tomatoes, one in Tikrit and one in Samarra. In the central region, tomatoes are normally produced during a period of six months. Production mainly takes place during summer in open fields, but during winter tomatoes are sometimes planted in greenhouses. Farmers intercrop different crops with tomatoes.

First, farmers prepare the soil with machines and eliminate bushes and weeds. Afterwards, the soil is sprinkled with organic fertilizer called humic, which consists of animal excrement. After leaving the soil resting, the tomato seedlings are planted, followed by the addition of fertilizers and pesticides to protect them from rodents. Tomatoes are harvested by hand and are packed in plastic boxes.

Farmers base their planting decisions on the demand for tomatoes among people and the productivity of the farm. In addition, farmers look at the possibility of exporting it to other governorates (e.g. Ninewa or Baghdad). The types of tomato that are most demanded are Olka and Badiaa. The main factors that determine the yield include the quality of tomato seedlings, the type of fertilizer used during cultivation, the type of agricultural chemicals used, the type of stimulants and the degree of soil preparation.

The main challenges experienced by tomato farmers in Iraq include water scarcity and high temperatures. Tomato plants require ample fresh water, usually from irrigation systems, and do not tolerate high salinity or temperatures above 36°C for long periods of time.

Waste occurs at different steps along the value chain:

- During the production of seedlings, about a quarter of the seedlings are damaged and can no longer be used.
- During cultivation, a significant loss of tomatoes occurs due to diseases such as the whitefly. This is caused by the lack of pesticides for rodents and worms. Also, if there are power outages, the crop irrigation is affected, leading to a loss of tomatoes.
- Finally, a significant waste occurs during the harvesting and marketing of tomatoes, when about a third of the total production perishes during transportation and storage. In part, this happens during transportation because of broken boxes and cartons, but also because tomatoes have passed their expiry date. The cost of transporting the unusable tomatoes falls on the wholesalers.

Farmers cannot store tomatoes for more than three or four days, after which the tomatoes will no longer be fit for consumption. In addition, there are no cold storage facilities to store tomatoes for a long period of time. Some farmers in Salah al-Din have tried sending the tomatoes to a cold storage facility in Erbil, but the transportation and storage costs were too high to make this option economically viable. Iraqi farmers and traders also do not have knowledge on the optimal harvesting time; at present, farmers harvest mature tomatoes, while they should harvest them when they are still green and can mature on the way to the consumer. As a result, already during the harvest, some of the production is lost. A tomato processing factory would help with reducing waste and would create more opportunities for tomato farmers to increase their production.

Distribution

After harvesting the tomatoes, the farmers place them in plastic boxes, and then sell them to grocery wholesalers. These wholesalers collect the tomatoes (and other

Value Chain map for Tomato (Salah al-Din)

Inputs:

The following inputs are needed:

- Seeds/ tomato seedlings
- Fertilizer
- Water

Production:

Main production areas of tomato in Salah al-Din:

- Samara centre
- Al Jazeera
- Mukeshifa
- Zelaya

Production mainly takes place during summer in open fields, during winter tomato is sometimes planted in greenhouses

Distribution:

Farmers sell their produce to wholesalers, shopkeepers or directly to consumers.

Wholesalers sell to retailers/shopkeepers

Retail:

Retailers sell tomatoes to consumers

When there is not enough supply, retailers sometimes also buy from Sulaymaniyah or Erbil

Consumers:

High demand from consumers

Consumers prefer Iraqi tomatoes, as they tend to be softer and of higher quality

Export:

At present, tomatoes or processed tomato products are not exported from Salah al-Din.

Sales to other governorates:

Some wholesalers sell tomatoes to Hilla, Mosul, Baghdad or Erbil

Consumers:

Same as above

vegetables) on the farm. Traders sell different vegetables, but for most, tomato is their main product (together with eggplant and cucumber). The traders buy tomatoes from farmers in Samarra, Zalaya, Dujail and Tikrit Island because of their high quality. Sometimes, tomatoes are bought from farmers in Karbala. An important requirement is the careful handling by farmers and cleanliness of their products. According to one trader, "It is important to know the source of all the products I buy, because some buyers do not want products imported from certain countries such as Iran."

During summer, sales are higher than during the cold season. There is no cooling during transportation and during storage in the marketplace, because fridges are too expensive. The wholesalers sell tomatoes to market vendors in the vegetable markets in Tikrit or Samarra, or transport it to Hilla, Mosul, Baghdad or Erbil to sell it to market vendors there. One wholesaler, who sells tomatoes in Erbil, stores the tomatoes in a cold storage facility there.

Wholesalers have limited competition in the markets where they operate, with market shares between 20-30 per cent. This dominance by a few traders hinders newcomers in the tomato trade. According to wholesalers, certificates and standards of quality are not very important, but they often have a merchant certificate and a health certificate.

Hygiene is very important for wholesalers, as the consumers ask for a clean and safe product. Tomatoes sold by farmers are often dirty, which leads to decreasing buying prices.

One trader offers inputs to farmers under the condition that they sell at below-market prices. This deal is helpful for farmers, who are unable to finance inputs themselves; on the other hand, it creates dependency on the trader who then also has more power to set the price.

Tomatoes are not exported at the moment because the product does not meet the export market needs and therefore export is not profitable.

Processing

The most popular processed product made of tomatoes is tomato paste, which is used in a wide variety of dishes in Iraq. Ketchup and tomato-based sauces are also popular. However, in Salah al-Din, a factory to process tomatoes has been closed and currently no processing capacity exists (Box 1).

Industry experts noted that if more locally produced tomato paste and ketchup were available at reasonable prices, there would be high local demand, because local people have a strong preference for locally produced tomato products. There is high potential for building local tomato processing capacity. This would require the introduction of new canning methods for factories, and the introduction of machines for a ketchup plant. It is estimated by industry experts that it would be possible to employ at least 25 workers in each tomato paste factory, and that it should be feasible to open two factories in each Governorate (so four in total), which means that at least 100 jobs would be created. Local tomato processing would also generate many job opportunities for women, and thus would increase women's income.

BOX 1: THE DOWNFALL OF A TOMATO PASTE FACTORY IN SALAH AL-DIN

Ten years ago, the tomato paste factory in Salah al-Din closed and was transformed into a juice factory. Before the closure of the factory, the government used to support tomato farmers to sell good quality tomatoes at a low price. However, after the government stopped its support to the farmers, the price of local tomatoes increased. This led to a higher cost price compared to the cost of imported tomato paste. This meant that it became impossible to compete with the imported tomato paste, leading to the closure of the factory.

To build processing capacity, providing training on the use of tomato paste making machines and canning machines is needed. Most training takes place on-the-job in the factory, especially for electricians. At present, there is a vocational training institution in Tikrit that provides training in electrical work; this institution could be involved in setting up a training for electricians in a tomato paste factory.

Consumption

According to farmers, most tomatoes are sold to consumers in Tikrit, Samarra and Mosul. In general, consumers demand good-quality tomatoes that are clean and cheap. Many consumers prefer local tomatoes over imported ones. As one wholesaler expressed: "The consumers are looking for the Iraqi tomato because it has a wonderful taste, and they are also looking for a clean tomato." During harvest time, prices are lower, and the taste is generally better. Some consumers require a coarse tomato to make appetizers, others want a soft tomato for making broth.

An increase in demand is expected for locally produced tomato and tomato-based products if prices decrease, because of the high preference by Iraqi consumers for local products.

Cost structure and prices

The main cost drivers for traders are the price of tomatoes, the transportation cost, the rental of a market stall and the cost of workers. Depending on the size of their business, wholesalers usually hire people to work for them. A small amount is added as a profit.

There is no single selling price for tomatoes. Prices are determined by dealers in the market, which is the basis for the price that wholesalers pay to farmers. Sales price depends on the quality, type and size of the tomato box. The weight of a box varies between 15 and 25 kg, and the sales price ranges from IQD 10,000 to IQD 30,000 per box (or 650 to 1200 IQD/kg). There are frequent price fluctuations, especially due to the rise in the price of the dollar in relation to the Iraqi dinar, which is harmful to the local farmers and traders.

In the summer season, a wholesaler can earn between IQD 800,000-1 million per day, but in winter revenues range between IQD 300-400,000 per day. The profit margin of wholesalers is 50 per cent of the buying price of tomatoes.

The average prices of tomatoes along the value chain, produced in the South of Iraq, are as follows:

ACTOR IN THE CHAIN	SALES PRICE
Farmer	150-1200 IQD/kg
Wholesaler	350-1350 IQD/kg
Retailer	500-1500 IQD/kg

The price of tomatoes varies a lot, depending on the volume of imported tomatoes available. When more tomatoes are imported, the price tends to be lower, but when the borders are closed, the prices increase. The government sometimes enforces minimum prices when prices become too high.

Currently, the sales price of imported tomato paste is USD 10 for a box and the price of ketchup is USD 15 for a box.

Communication and information flows

Farmers receive information from their suppliers about seed and fertilizer quality. The information is very reliable, and the relationships are usually very strong and established. Farmers also receive information from the agricultural offices about the cultivation methods and about the recommended distance between the tomato seedlings and other crops. The farmers indicated that they need agricultural extension programmes and training courses on best agricultural practices and on how to use pesticides. They would also like to hire experienced agronomists to monitor the crop during growth. As one farmer put it: "In this region, all the elements of agriculture are available, including agricultural land, experience and human resources. We only need support in terms of seeds, fertilizers and pesticides, and providing channels for purchasing their products." However, farmers indicated that at the moment, the communication between the Department of Agriculture and the farmers is very weak and support is not provided.

The farmers indicated that they usually receive useful information about market conditions and price changes in the markets, as well as about good selling places.

Wholesalers obtain information about the preferred type of tomato through information from the grocery stores. Consumers in Mosul have a preference for a strong tomato, while a soft tomato is preferred in Tikrit. For farmers, it is very important to be aware of the demands of the consumers. However, one farmer stated that: "In the current situation, the prices are too high, and the product quality is too low and needs improvement." Wholesalers interviewed indicated that they would like to know more about the consumer's demand to be able to meet all their requirements.

Relationships (governance) in the value chain

Some input suppliers have helped tomato farmers by suggesting new seed varieties for testing in exchange for advice from them. According to one farmer interviewed: "The relationship with our input suppliers extends for more than ten years of good dealings and we have mutual trust as I take raw materials from them and pay them when money becomes available. Our relationship could be improved further if the prices of inputs were lowered." It is also reported that sometimes, input suppliers cheat the farmers by selling inferior materials. Another problem is that when purchasing raw materials at the beginning of the season, some input suppliers raise the prices of inputs and the farmer needs to buy on credit.

Farmers do not have any contracts with their buyers, but they work on mutual trust – this is confirmed by the wholesalers who sometimes have relationships with the same supplier for more than 15 years. As one farmer puts it: "We do not have any sale or purchase contracts between us, but it is based on mutual trust that resulted from the long period of dealings between us." Sometimes, farmers have problems with buyers because they want to pay lower – and often unreasonable - prices due to the presence of imported tomatoes, which are generally cheaper. Vice versa, wholesalers have problems with suppliers about the cleanliness of tomatoes, the presence of insects, and the fluctuation of prices.

Farmers indicated that they have never made any investments in time or money to meet the requirements of a buyer

or another downstream chain member. They both indicated that they are willing to invest if there are guarantees and strong support. For instance, it is recommended to have a contract to ensure the sale of the harvest. Both farmers are open to the idea of working with other farmers. One of them stated that: "We welcome such an idea, and we have experience in such relationships as the Iraqi seed company used to provide us with seeds and fertilizers and take the product from us during the production period and provide us with agronomic support."

Wholesalers have never received any support by Business Support Providers (BSP), donors or state-owned agencies. They indicated that if support were available, they would be able to increase tomato production. Also, if refrigerators were available to store tomatoes, they would be able to compete with imported tomatoes. One wholesaler expressed that: "If the value chain could be improved, this would help me in supplying the tomato paste and canning factories; I would also benefit from the purchase of refrigerators." They are also open to the idea of working with other upstream or downstream chain members, for instance by cooperating more closely with farmers to improve production and have a more secure supply.

Government support to development of the value chain

According to the Department of Agriculture, one of the most important policies pursued by the government to support local development is to support farmers by providing: 1) home-made urea fertilizer, 2) imported dab and urea (if available) and 3) agricultural extension programmes through holding seminars and workshops to develop agriculture. The Ministry of Agriculture also provides loans to farmers to buy agricultural sprinklers, and dig wells and greenhouses/tunnels (small green houses). The Department of Agriculture cooperates with the Mesopotamia Seed Company to provide seeds to farmers.

The same department also cooperates with other governmental entities, including the Ministry of Finance, which provides loans to farmers, and the Ministry of Industry, which provides agricultural machinery and cars at subsidized prices. However, these activities stopped a year ago due to lack of sufficient financial resources.

The Chamber of Commerce is working on issuing a trade identity card for tomato merchants to facilitate their work, including to obtain loans, use social security funds and facilitate travel in general.

In terms of international cooperation, at present, the Department of Agriculture cooperates with FAO to discuss the situation of the COVID-19 pandemic and its impact on farmers and the market. Before the pandemic, there were other organizations that supported agriculture in the region. For instance, the Near East Foundation distributed greenhouses to farmers and provided support on improved water supply through the Department of Agriculture. The Chamber of Commerce is currently not implementing any programmes or projects with international agencies.

The Department of Agriculture lacks financial resources. However, human resources are available and include agricultural engineers, agricultural trainers and experts, as well as vast agricultural lands for tomato cultivation. If full support were provided by investors or companies, the sector would be able to grow in the future. The same applies to the Chamber of Commerce, who indicated that they have many human resources with expertise on tomato cultivation. They also have agricultural engineers who can be used to develop tomato cultivation.

According to local authorities, the following trainings are needed:

- Setting up greenhouses and regulating the temperature inside the greenhouses.
- Using and managing agricultural sprayers and pumps.

Currently, the only institute that provides training is the Vocational Training Department in Tikrit. Some international organizations also provide training in agriculture, such as Mercy Corps.

Opportunities and challenges for value chain development

Opportunities:

- If the government would restrict the import of tomatoes from neighbouring countries (especially during the tomato harvesting season in Iraq), this would enable local farmers to become competitive again.
- There is a strong need for training farmers and traders on how to set up greenhouses and regulating the temperature inside the greenhouses, on the use and management of agricultural sprayers and pumps, and on harvesting tomatoes at the right time.
- There is an opportunity to (re)build processing capacity for tomato paste and canning factories. For this to be successful, farmers would need to lower their cost of production, for instance through increased government support for subsidized inputs, or by supporting them to dig artesian wells.

- The humic fertilizer used by the farmer is currently imported. There is an opportunity to start local production of humic, which would substantially lower the cost price of tomatoes.

Challenges:

- Climatological factors, especially water scarcity and high temperatures, are major challenges for farmers.
- One of the main problems for farmers is the abundance of local production leading to very high competition.
- Imports during the harvest time of Iraqi tomatoes put pressure on prices and make tomato production less profitable.
- Farmers use a fertilizer called humic which prevents tomato diseases. However, the fertilizer is imported and expensive.
- Electricity from the grid is often disrupted, so diesel-based generators are needed.

- The government used to provide loans or support in digging artesian wells, but this support has stopped.
- Processing factories such as canning plants and tomato paste factories are inexistent.

Potential for investment and job creation in the value chain

In conclusion, the highest potential for investment and job creation in the tomato value chain in Salah al-Din involves the three steps of the value chain:

– Farmers: Investment in drying of tomatoes;

– Wholesalers: Investment in cold storage for tomato traders;

– Processing: Restoration of the dysfunctional tomato paste factories.

Despite the high demand, the supply of locally produced dried tomatoes is currently limited. With a very small investment, many jobs could be created. For the wholesalers, investing in cold storage would diminish the amount of waste of tomatoes and lead to lower prices paid by consumers. And finally, the restoration of the tomato paste factories would give a boost to local employment and would respond to consumer's preference for locally produced tomato paste.

1. Investment in drying of tomatoes - estimated investment cost and job creation

To dry tomatoes, 1 kg of tomato is required to produce 200 gr of dried tomatoes. Next, olive oil and salt need to be added, and dried tomatoes put into a jar. Below, the cost per jar is calculated. This cost is based on the assumption that farmers or one of their household members are involved in the production, and no labour is hired. A more detailed cost-benefit analysis is needed to estimate the total profits per farmer. The price of tomatoes varies significantly, so the profitability will be different for each price level.

Initial investment cost: no investment needed
Cost of production:

– Buying price of 1 kg of tomatoes	IQD 750
– Buying price of empty jar	IQD 150
– Additional cost (salt/olive oil)	IQD 250
Cost of production of 1 jar of dried tomatoes of 200gr	IQD 1,150
Sales price per jar	IQD 2,000
Profit per jar	IQD 850

Profit margin: (2000–850) / 2000 x 100% = 42.5%
Employment creation:

Drying of tomatoes can be done by hundreds if not thousands of farmers and their families. Thus, this activity would not create additional employment, but would increase farmers' incomes.

2. Investment in cold storage for tomato traders - estimated investment cost and job creation

Building cold storage facilities for tomato traders addresses the problem of tomato waste, which is high, especially during summer when tomato production is at its peak. Doing so would increase traders' incomes, reduce the waste levels in the value chain and improve the quality of tomatoes for the consumers. For each cold storage facility, three workers are needed for offloading and storing the tomatoes, and one worker to run the generator at night and guard the facility. It should be noted that this investment would only be profitable if the import of tomatoes were restricted, allowing the price of local tomatoes to increase and make the investment worthwhile.

Initial investment cost:

- 2 generators (medium size 30-35 KV) at USD 7,500 USD 15,000
- Construction of cold storage room USD 2,000
- Buying of refrigerator system USD 3,000

Initial investment needed: US$20,000

Operating cost:

- Gasoline for the generator USD 400 per month
- Salaries of workers (USD 350 x 4 workers) USD 1,400 per month

Operating cost per year: USD 1,800 per month x 12 = USD 21,600

Total investment cost for the first year:
(Initial investment + operating cost) = USD 20,000 + USD 21,600 = USD 41,600
Employment creation:

If we assume that at least 50 cold storage facilities could be set up in Salah al-Din, this means 200 jobs would be created.

Total potential job creation: 200 jobs

3. Restoration of the dysfunctional tomato paste factories

There are two dysfunctional tomato paste factories located in Salah al-Din. For the restoration of these factories, a relatively small investment is needed because the generators are still functional, which is normally the main investment cost (USD 100,000 for a large generator of 500 kVA). The main operational cost consists of the gasoline to operate the generator. The production capacity of each factory is 10 tonnes of tomato paste per day. For a tomato paste factory consisting of one line of production, at least 25 workers would be needed per factory. For this production capacity, the volume of tomatoes needed is 35 tonnes per day.[60] To calculate the profitability of the factory, a more detailed cost benefit analysis is needed.

Initial investment cost:

- Repairs to the generator/factory hall USD 25,000

Initial investment needed: USD 25,000

Operating cost:

- Gasoline for the generator (300 lt gasoline/hour for a total of 8 hours/day; 300lt x USD 0.40/lt x 8 hours x 30 days) USD 28,800 per month
- Maintenance cost (10% of total investment cost of USD 100,000 = USD 10,000/12 months= USD 833) USD 833 per month
- Salaries of workers (USD 350 x 25 workers) USD 8,750 per month

Operating cost per year: USD 38,383 per month x 12 = USD 460,600

Total investment cost for the first year:

(Initial investment + operating cost) = USD 25,000 + USD 460,600 = USD 485,600

Employment creation:

It is estimated that it would be feasible to restore two factories in Salah al-Din, which means the total employment created would be 50 jobs.

Total potential job creation: 50 jobs

4.2.4 POULTRY (MEAT)

Focus area: Salah al-Din

Context

Poultry is an important sector in Iraq. In rural areas, poultry-keeping at the household level has a long history, mostly for subsistence purposes. There has also been commercial poultry production, which started in Iraq in the 1960s, expanding into the 21st century. The commercial industry consists of two separate subsectors: broilers (for meat) and layers (for eggs), with large-scale farms focusing on only one of the two.[61]

At national level, chicken production for meat collapsed in 2014 and 2015, along with egg production, because of the avian flu outbreak and a ban on poultry imports from several countries.[62] Poultry production has since increased again (Figure 9 and 10)

60 3.5 kg of tomato are needed to produce 1 kg of tomato paste.

61 Goal and Big Heart Foundation, 2016, Agricultural Market Assessment, Egg and sheep value chains.

62 UNESCO, 2019. Assessment of the Labour Market & Skills Analysis, Iraq and Kurdistan Region-Iraq, Agriculture

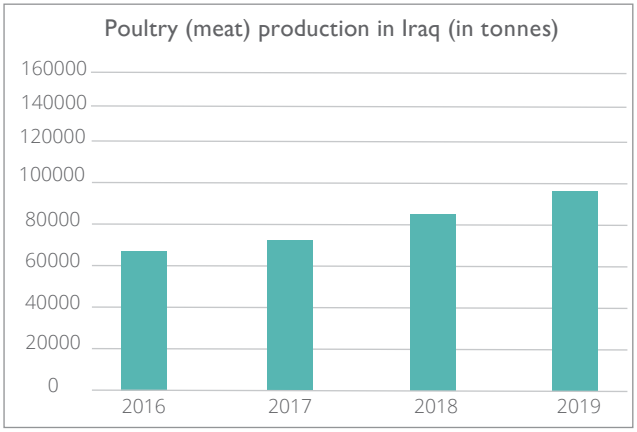


Figure 9: Poultry (meat) production from 2016-2019 (in tonnes); Source: CSO

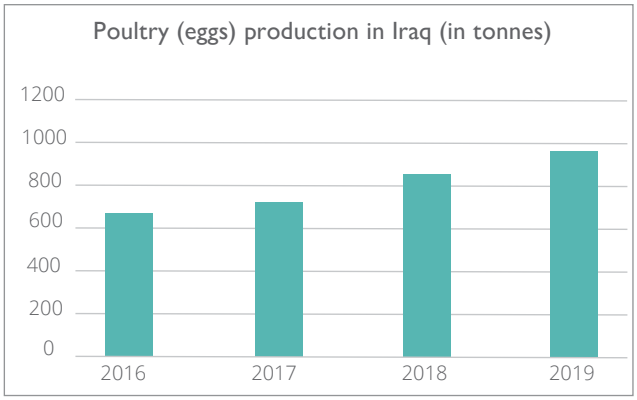


Figure 10: Poultry (eggs) production from 2016-2019 (in tonnes); Source: CSO

The livestock sector is very important in Salah al-Din, including sheep, cows, buffalos, and camels, along with poultry, which is used for both meat and eggs.[63] According to the Livestock Department, poultry is used especially for meat in Salah al-Din. There are about 550 registered poultry fields for meat production in the governorate, in addition to a large number of unregistered fields. There are also poultry farms focusing on egg production. [64] Due to a lack of registration with the local authorities, it is difficult to provide reliable estimates.

Diyala is also famous for poultry farming. According to data from the Directorate of Agriculture, the Governorate has a significant number of poultry businesses. However, a high percentage of the registered businesses are not functioning. For instance, out of 578 registered chicken meat farms, only 175 are operational (or 30%). For egg farms, this is also the case, although less extreme: out of 36 registered egg farms, only 22 are operational (or 61%). [65]

63 Directorate of Agriculture of Salah al-Din, date not given.

64 Ibid.

65 Directorate of Agriculture in Diyala, 2018.

Value chain map

On the next page, the value chain map for poultry (meat) in Salah al-Din is presented. The value chain research conducted in Salah al-Din focussed on chicken meat production, because it was considered to offer the greatest potential in terms of job creation.

Value chain actors

Input suppliers

The following inputs are needed when raising chicken for meat:

- Locally produced chicks
- Chicken feed (soy, corn, wheat, barley, protein)
- Sawdust (to prepare the floor)
- Fuel
- Vaccines
- Medicine (in case of sickness)

The chicks are produced from a "mother chicken", that is usually imported from the Netherlands or Turkey. The chicks are produced in the Mutasim hatchery in Samarra. The current buying price for broilers (chicks for meat production) is USD 1 and the price for laying hens (chicks for eggs production) is USD 1.30. The current prices are very high, because the chicks are imported and customs and import fees are added to the price of the chick. Only a few farmers have their own poultry hatching incubator to grow chicks from eggs, but most poultry field owners buy chicks for the production of meat or eggs.

In the past, Iraq produced all chicks needed for the domestic poultry sector through the Ibaa Research Centre (Ministry of Agriculture). This was a centre specialized in developing poultry, cows and fish production, and even creating new generations that were resistant to the Iraqi climate.There are three types of feed:

- Coarse feed (soy, corn, wheat, protein, barley);
- Medium feed (same components as coarse feed, but in different proportions);
- Soft feed (same components as coarse feed, but in different proportions).

The average cost of feed is IQD 800,000 per tonne (compared to IQD 500-600,000 in pre-pandemic times).[66] The input suppliers advise chicken farmers on the best type of feed to be used. Some types of chicken feed are not available locally but imported by big traders who monopolize it and raise the price. This is especially the case with raw permanix and soy. The major trader of soy is based in Najaf, importing from Latin America. However, according to industry experts, chicken feed could be produced locally if the seeds were available for local production. The locally produced feed could be even exported. A large increase is expected in the demand for locally produced feed, because the demand for locally produced chicken is also increasing. Creating local feed plants will generate many job opportunities, as one feed plant can generate employment for about 40 people, from engineers to electricians, workers and others.

According to industry experts, the same goes for the production of local eggs for raising broilers (for meat). One expert stated that: "Within two years, if the import of eggs from outside Iraq would be prohibited, we could produce eggs that are used for meat poultry, and even export these eggs after meeting the local demand."

Medical consultations are provided by a specialist veterinarian in Salah al-Din.

Value Chain map for Poultry (meat) (Salah al-Din)

Inputs:

The following inputs are needed:

- Locally produced chicks
- Feed: soy, corn, wheat, barley, protein
- Sawdust
- Fuel, Vaccine & Medicine

Production:

Main production areas in Salah al Din:

- Tikrit
- Al-Alam

Raising of chicks by poultry farmers, which takes 35-40 days

Waste of chicken wings is used as fertilizer

Distribution:

Farmers sell their chicken to wholesalers

Wholesalers sell to retailers/shopkeepers.

There is only one trader for Tikrit, one for outside Salah al-Din

Retail:

Retailers (chicken shops and butchers) sell chicken to consumers

Main trade centres in Salah al Din:

- Tikrit, Baiji & Al-Alam

Consumers:

High demand from consumers

Export:

At present, there is no export of chicken meat

Sales to other governorates:

Wholesalers also sell to other governorates.

Main destination is Baghdad

Consumers:

Same as above

66 The change in price was mainly caused by the devaluation of the Iraqi Dinar to the US dollar, from 1,250 IQD/USD to 1450 IQD/USD now. Most of raw materials for chicken feed are imported, such as soy.

Production

In Salah al-Din, the products for which demand exceeds supply are chicken feed and table eggs, as the price of a carton of eggs reaches IQD 70,000. Each carton contains 12 plates of eggs, meaning that each plate costs about IQD 5,800. However, raising egg hens is very expensive so this is more difficult as a start-up business compared to raising chicken for meat production. There is also a high demand for eggs for meat poultry. The supply of local eggs is low because the imported eggs are cheaper than locally produced eggs, and the cost of raising laying hens is higher than importing them because of the price of feed and medicine. An additional problem is the lack of government support. By preventing the import of cheap poultry products, the local poultry sector could become very competitive and even start exporting.

Two chicken farmers were interviewed in Salah al-Din, one based in Tikrit, one in Baiji. The preparatory steps needed for production are as follows:

1. Washing and sterilizing the hall;
2. Preparing the floor of the hall with sawdust;
3. Putting the chicks in the hall at the right temperature.

The walls must be made of bricks or stone, and the ceiling must be made of sandwich panels to provide suitable weather conditions for breeding.

The farmers interviewed decided to raise broilers (for meat production) instead of eggs, because 1) the price for chicken meat is higher, 2) production is faster, and 3) the demand for chicken meat is high in Salah al-Din (and other governorates). The main advantage is that broilers require only 35-40 days to raise the chicken and make it ready for selling, while egg-laying hens need six months to produce eggs, and it requires providing fodder and special care throughout this period. Another advantage of raising broilers is that most of the materials, such as feed and fuel, can be purchased on credit, which will be repaid after the chickens are sold.

The best time for selling is when the chicken weighs 2 to 2.5 kg, which is usually after 35 days, which can be achieved by providing it with good care and good fodder. Production can be negatively affected by viruses and a general poor care of the chicken.

There is significant waste during production. Approximately 100 out of 1,000 chickens die during the production process. The disposal of this waste is through burning, while the chicken manure is sold as fertilizer for about USD 100/tonne. The chicken manure is sold through local merchants, who buy from the farmers and then sell to other farmers. Losses also occur during transportation, because there are too many chickens in a small space and because boxes break. The level of waste can be reduced if more modern means of transportation were introduced, such as chicken transportation lorries. Another waste component is the sawdust that is used for the poultry flooring. This is also burned after it is no longer usable.

The storage of chicken before they are sold is called manoeuvre and takes between one and eight days. The longer the storage time, the higher the costs; therefore, farmers try to limit it as much as possible.

Industry experts suggested introducing modern heating devices and lighting, which would increase productivity.

Distribution

The distribution and marketing of chickens is carried out by merchants in Baghdad. The merchant is selected by the farmer on the basis of mutual trust and long-term dealings. The merchants collect the chickens at the farms in their own cars. While the majority of chickens are sold to Baghdad, there are also merchants in Salah al-Din. Two of them were interviewed, both based in Tikrit. The following is based on the data provided by these two merchants.

The merchants buy live chickens from the main poultry fields in Tikrit and Al-Alam. The volumes vary considerably depending on the size of the merchant's business: one merchant interviewed goes out to buy chicken three times a month, while the other buys about 50 chicken cages per day. The criteria to buy from certain poultry farmers include the price, the high quality of chicken, and the long-lasting trade relationship with the farmers. The merchants are aware of the source of the chicks, which is an important factor in their decision to buy from a poultry farm. The local chicks are produced in the Mutasim hatchery in Samarra.

After buying the chickens, in some cases, the chickens are stored in the merchant's house. One of the merchants stores the chickens in a special room in his house that can contain 400 chickens. The storage period cannot exceed three days, because afterwards it becomes too expensive to store them. The other merchant sells the chickens immediately after collecting them at the farms.

Next, the merchants distribute them to the owners of chicken shops or to chicken pluckers/butchers in Tikrit, Baiji and Al-Alam. The merchants have long-standing relationships with their buyers, sometimes dealing with them for more than 10 years. One merchant is able to sell 100 chickens per day, the other 300 per day.

There are very few competitors in the chicken market because setting up a poultry trade business is expensive,

and it is difficult to enter it without strong capital. The market share of one merchant interviewed is approximately 35 percent in Salah al- Din.

Hygiene is a very important factor: the cleaner the chicken, the higher the demand. If problems occur due to hygiene, the merchants reduce the buying price of the chicken, or they return the chickens to the seller. One of the merchants had a professional practice certificate and a health license, whereas the other did not have any certificates.

With regards to gender, at present, the poultry sector is mostly controlled by men. According to industry experts, in north Iraq, there are many women's groups in the poultry sector, but this is not yet the case in the central region. He stated that: "It is mostly a family business, with women breeding poultry under the supervision of a man, and this is due to the lack of community awareness in these areas about the inclusion of women."

Processing

The slaughter of chicken is usually done by chicken pluckers/butchers, who also act as retailers, selling the chicken meat in their store. There is no further processing, for instance packaging for sales in supermarkets. Sometimes the slaughter is done by the consumer, after buying the live chicken in the market.

Consumption

The consumers of chicken from Salah al-Din include local people as well as people from Baghdad. Some consumers prefer coarse (large) chicken, and some ask for soft (smaller) chicken. Consumers are always looking for chicken of good weight (minimum 2 kg) and good quality, in addition to good prices. In general, consumers prefer Iraqi chickens over imported ones.

Cost structure and prices

The main cost drivers are the cost of chicks, chicken feed, construction of the poultry field, medicine and vaccines, transport, gasoline for generators and storage cost. In addition, the salaries of workers are also included, because a poultry farmer needs to hire specialized workers. It should be noted that before the devaluation of the Iraqi dinar against the dollar, the price of chicken for production was much lower. The current buying price for broilers (chicks for meat production) is USD 1 and the price for laying hens (chicks for eggs production) is USD 1.30.

The buying price that the wholesaler pays to the farmer is determined by a committee of merchants. The price is based on the weight of the chicken and its quality, including the guarantee that the chicken is disease free. The selling price is determined by the purchase price from the poultry field, adding the transportation cost and the labour cost of workers. A small amount is added as a profit. Price variations occur because of exchange rate fluctuations as well as the opening or closing of border crossings and the import of cheap chicken meat. The profit margin of wholesalers is around 30 per cent.

The average prices of chicken (for meat) along the value chain, produced in Salah al-Din, are as follows:

ACTOR IN THE CHAIN	SALES PRICE
Farmer	3,100 IQD/chicken
Wholesaler	3,500 IQD/chicken
Retailer	4,000 IQD/kg

The price of chicken manure, which is sold as fertilizer, is about US$100/tonne.

Communication and information flows

Generally, buyers provide the farmers with information about the type of chickens that are most in demand, and on the type of vaccines and feed available in the market. Chicken farmers are interested in extension programmes on the best ways to raise poultry. They also need government support to provide them with cheaper chicken feed.

Poultry farmers and merchants are generally well aware of preferences among consumers and align their production to this. Better information on consumer preferences would help them to be even more responsive to market demand.

Relationships (governance) in the value chain

The relationship between input suppliers and farmers is based on mutual trust and does not include contracts. Farmers generally deal with the same suppliers for several years. For farmers, the most important selection criteria are good quality and low prices. As one farmer puts it: "The only thing that improves the relationship is when the supplier reduces the price while providing me with good quality materials such as feed and eggs."

The most frequent problems that farmers experience in the chain are:

1. Excessive debts with the supplier
2. High feed prices
3. The instability of selling and buying prices
4. The lack of government support
5. Problems with police checkpoints, sometimes leading to the loss of chickens because of the long delays.

Farmers indicated that sometimes it is hard to negotiate a good price for their chickens, because buyers do not want to pay what they are asking for. The price is sometimes reduced if, according to the buyer, the product is not of high quality. This is problematic because the losses are borne by the farmer. In general, the relations between farmers and buyers are very good and based on mutual trust, sometimes dating back 15 years.

So far, farmers have not made any investments in time or money to meet the requirements of a buyer or another downstream chain member. Farmers indicated that they are open to the idea of working with other farmers or invest in the value chain, but only under certain conditions, such as a guarantee from the buyer and support to improve production methods. According to one of them: "The sales price of chickens should go up and there should be higher production, otherwise it is considered a dangerous risk and without guarantees." This means that farmers tend to be risk-averse and are only prepared to make investments if the economic prospects of the sector are very bright and certain. As one farmer stated: "The poultry businesses here are successful, but we need other ways to sell poultry. We also need support from the government in providing chicken feed and hatcheries in order to generate more profits." According to an industry expert: "There is no support from the state for poultry farmers, so they are forced to buy raw materials on debt, and this prevents them from developing themselves further."

Merchants indicated that there are sometimes problems with suppliers about price fluctuations and product hygiene. As one merchant stated: "Sometimes the owners of the fields are reluctant to sell to me because someone else is paying them more despite my agreement with them, renting cars and going to the fields."

The merchants interviewed have never received any support by Business Support Providers (BSP), donors or state-owned agencies. They are enthusiastic about the future prospects of their business as part of the value chain. One of them stated that: "I expect that production will increase, and prices decrease, which will be good for both sellers and buyers." They are also open to the idea of working with other upstream or downstream chain members, especially in relation to improved contracts and guarantees.

Training is needed in the following skills:

- Training on how to raise chicken, including how to build the halls for raising poultry;
- Training on how to use feed press machines;
- Training on business management.

At present, no organizations provide training in the poultry sector. Some seminars are provided by the agricultural extension service on diseases and their treatments, as well as the correct way to raise poultry, but these seminars only provide theoretical knowledge. The College of Agriculture at Tikrit University only offers theoretical training without the practical component. According to the Chamber of Commerce, it would be good to set up these trainings in cooperation with the Vocational Training Institute or those organizations that accommodate vocational training programmes, such as IOM, Oxfam, the Danish Refugee Council (DRC) and FUAD Organization for Relief and Development. This should also include on the job training.

Some people offer apprenticeships, for instance as assistants in the chicken breeding farms to teach them about the optimum conditions for temperature and humidity in the poultry halls.

Government support to development of the value chain

The government policies to develop the poultry value chain include the banning of imports, as well as supporting the provision of chicken feed (yellow corn). The owner of a registered poultry field can submit a request for support, followed by a verification process, which determines whether the farmer will receive support or not. The government also supports field owners with vaccines provided by the veterinary services, as well as with subsidizing fields with fuel

at a reduced price from the government. The Chamber of Commerce's policy is to grant merchants an affiliation ID through which they can obtain loans and grants through the state.

In the past, loans were given to poultry farmers as part of the agricultural initiative, but this practice stopped in 2014. Previously, a company called the National Company supported the owners of the poultry fields from the beginning of the process until the stage of production and assumed the potential loss with the owners of the fields. At present, when a new poultry field is opened, the field owner can submit a request for a loan at the bank. There is currently no financial support from the government, nor is there cooperation with international agencies, other private sector actors or CSOs in the poultry value chain.

Cooperation with other government institutions include:

- the Ministry of Finance regarding loans;
- the Ma Bain Al Nahreen Company to provide field owners with fodder (yellow corn for poultry, as well as barley for livestock feed);
- the Agricultural Supplies Company, which provides farmers with agricultural machinery and grains.

Opportunities and challenges for value chain development

Opportunities:

- Demand for chicken meat exceeds local supply so there is an opportunity to expand local production and create jobs.
- Poultry farming could become very profitable if the costs of production decreased and if chickens were protected from diseases.
- There is a great opportunity to develop the chicken feed value chain (corn, wheat, barley) in Salah al-Din, which would also provide job opportunities.
- There are good job opportunities for small businesses for slaughtering and cleaning the chicken.
- Jobs would be created for both men and women, especially in the poultry farms.

Challenges:

- The high price of chicken feed, part of which is imported (soy).
- Several diseases affect broilers (including the Newcastle virus); they need special treatment and special medicines/ veterinary support, which is expensive.
- The import of chicken threatens local production; consumers prefer local chicken, but the price is higher compared to imported chicken.
- Government is claiming to support the poultry farmers, but in reality, no support is provided.
- Experience is necessary for raising poultry for meat, so training in different components of the poultry value chain is needed.

Potential for investment and job creation in the value chain

In conclusion, the highest potential for investment and job creation in the poultry value chain in Salah al-Din is investing in the local production of chicken feed, as well as in improved poultry farms. Seventy per cent of the cost of chicken production consists of chicken feed. In the past, the supply of chicks and chicken feed was provided by the government. At present, the government does not support the poultry sector, which is why it has become very difficult to start a poultry field. This means that investing in local chicken feed production is the best way to lower the cost of production for poultry farmers. Also, investing in improved poultry farms can lead to higher local production for chicken meat, which is in high demand locally.

Local production of chicken feed - estimated investment cost and job creation

At present, most poultry farmers buy prepared feed mix because they do not know how to prepare it themselves. The chicken feed mix is also imported. Farmers can produce their own feed mix by buying and mixing soybeans, yellow corn, wheat, brimex and salt. They will need support from a veterinarian to decide on the right mixture. The amount of feed needed is 1000 kg per 10 days (this is calculated as follows: 100 gram/chicken/day x 1000 chicks x10 days = 1000 kg of feed per 10 days). The cost of buying a prepared chicken feed mix is USD 700-800 for 1,000 chicks every 10 days. If farmers prepare their own feed mix, the cost would be around USD 500 for the same production. This means that a cost reduction of around 33.33 per cent is possible.

It is also possible to set up a factory for producing chicken feed mix on a more industrial scale. It is roughly estimated that the total investment cost for one year would be USD 100,000 for a production of 10 tonnes of feed mix per day. Investments are needed in machinery for drying, smashing and mixing, a machine for adding additives and a pellet machine. A more detailed cost-benefit analysis is needed to estimate the total investment cost for the first year and the profits to be made. The number of jobs that could be created by setting up this factory should be estimated.

Investment in modern poultry farm - estimated investment cost and job creation
Initial investment cost:

– Building poultry field on own land for 3,000 chickens	USD 8,000
– Cooling system	USD 1,000
– Automatic feeder	USD 1,200
– Generator (medium size generator of 10 kVA)	USD 1,000
Initial investment needed:	USD 11,200

Operating cost:

- Kerosene/gasoline for the cooling system: USD 500 per month
- Salaries of workers (USD 350 x 2 workers) USD 700 per month

Operating cost per year: USD 1,200 per month x 12 = USD 14,400

Total investment cost for the first year:
(Initial investment + operating cost) = USD 11,200 + USD 14,400 = USD 25,600

Employment creation:
It is estimated that two workers could be employed in each poultry farm. In Salah al-Din, the potential for new poultry fields is very high, so it is estimated that at least 25-50 new poultry fields could be established. This means that 50-100 direct jobs would be created. Indirect job creation needs to be added as additional jobs in the value chain.

Total potential job creation: 50-100 jobs

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 INVESTMENT AND JOB CREATION POTENTIAL

This report provided an in-depth analysis of four agricultural value chains that were found to be among the most promising business opportunities in Salah al-Din and Diyala. The aim of this study was to understand economic opportunities and gaps in the local economy through value chain analysis. The four value chains analysed are:

- Cows (dairy)
- Eggplant
- Tomato
- Poultry (meat)

For the first two value chains (cows and eggplant), the focus of the research was on Diyala, while for the last two value chains (tomato and poultry), the focus was on Salah al-Din. As an overall conclusion, it was found that all four value chains are promising sectors for local economic development and decent job creation. To stimulate local businesses, the eggplant and tomato value chains look the most promising in terms of job creation. With relatively small investments, both value chains offer opportunities to generate many jobs. For the cows and poultry value chains, some opportunities were also identified. Table 19 shows the opportunities for cash investment and job creation of the four value chains.

Table 19: Estimated investment and job creation per value chain in Diyala and Salah al-Din

VALUE CHAIN/BUSINESS OPPORTUNITY	ESTIMATED INVESTMENT COST FOR THE FIRST YEAR PER BUSINESS	ESTIMATED JOB CREATION PER BUSINESS	ESTIMATED TOTAL JOB CREATION
Diyala			
Cows (dairy) - small dairy processing factories	USD 92,500	10 jobs	7 new businesses x 10 = 70 jobs
Eggplant/vegetables - construction of greenhouses	USD 22,700	2 jobs	1,000 new businesses x 2 = 2,000 jobs
Salah al-Din			
Tomato/vegetables - construction of greenhouses	USD 22,700	2 jobs	1,000 new businesses x 2 = 2,000 jobs
Tomato - drying of tomatoes	No initial investment needed	At least one job created per farm	Depends on demand for dried tomatoes
Tomato - cold storage for tomato traders	USD 41,600	4 jobs	50 new businesses x 4 = 200 jobs
Tomato - restoration of tomato paste factory	USD 485,600	25 jobs	2 factories x 25 = 50 jobs
Poultry (meat) - local production of chicken feed	No initial investment needed	No extra jobs created; cost reduction of 50% in cost of chicken feed	No extra jobs created
Poultry (meat) - improved poultry farms	USD 25,600	2 jobs	25-50 new businesses x 2 = 50-100 jobs

From these data, it is possible to calculate the estimated social return on investment in terms of the investment in dollars per job created for each value chain (see table in the following page). The investment needed per job created ranges between USD 9,000 and USD 20,000. It appears that the building of small processing factories for dairy offers the best social return on investment, followed by cold storage facilities for tomato traders, construction of greenhouses and improved poultry farms. The restoration of tomato paste factories is a relatively capital-intensive investment, creating only a limited number of jobs.

Table 20: Estimated social return on investment in terms of the investment in dollars per job created for each value chain in Diyala and Salah al-Din

VALUE CHAIN/BUSINESS OPPORTUNITY	ESTIMATED INVESTMENT IN DOLLARS PER JOB CREATED
Diyala	
Cows (dairy) - small dairy processing factories	USD 9,250
Eggplant/vegetables - construction of greenhouses	USD 11,350
Salah al-Din	
Tomato - cold storage for tomato traders	USD 10,400
Tomato/vegetables - construction of greenhouses	USD 11,350
Poultry (meat) - improved poultry farms	USD 12,800
Tomato - restoration of tomato paste factory	USD 19,424
Tomato - drying of tomatoes	n/a
Poultry (meat) - local production of chicken feed	n/a

5.2 RECOMMENDATIONS FOR IOM

Based on the value chain study, the following recommendations can be made for IOM interventions to promote local economic development in conjunction with job creation for people who are in socioeconomically vulnerable situations. To promote employment of target groups, IOM could consider several actions addressing the final beneficiaries as well as institutional recipients, to boost the sustainability of the intervention.

As immediate actions in support of unemployed people, IOM could:

- Support agricultural value chains of cows (with a focus on dairy), vegetables farming (with a focus on eggplant/tomato) and poultry (with a focus on meat). The selection of which value chains to develop and which businesses to support needs to be made based on proximity to markets, agricultural areas and the accessibility for traders, as well as the existing skills of the target beneficiaries;
- Develop skills of unemployed people in production, processing and trade of the identified value chains;
- Develop specific feasibility studies for the identified value chains with high market potential in each governorate;
- Provide financial support and technical training for start-up and management of micro-enterprises in the identified value chains;
- Consider partnering with public and private microfinance institutions (including the Agricultural Cooperative Bank) to increase the credit threshold and credit access/collaterals and guarantees;
- For the identified value chains, identify all existing and potential suppliers of vocational training including local businesses, craftsmen and small entrepreneurs, and involve them in the provision of skills development and as a pool of business counsellors and mentors to follow up on the target groups' new businesses. This includes coaching of new entrepreneurs, making them part of their chains of production and value chains;
- Support the establishment of women and youth sustainable enterprises/cooperative societies involved in production, manufacturing and trading in the identified value chains;
- Support the establishment of self-help groups or cooperatives for promoting saving and credit schemes for setting up small businesses, including for farms, shops, storage facilities and means of transport.

As immediate actions in partnership with national and local institutions and international stakeholders, IOM could:

- Cooperate with local authorities (including Directorate of Agriculture and Directorate of Trade) in assigning agricultural land and providing extension services to the target beneficiaries;
- Address two of the major problems in agricultural value chains in Diyala and Salah al-Din - water shortages and insecurity – with international partners and with the relevant government authorities.

- Initiate a study into the impact of local militias on business and trade, especially on women entrepreneurs. As was found during the research, the production of agricultural crops, poultry and meat is discouraged by the presence of armed militias in the two governorates, due to the imposition of royalties on farmers. Increased insight into the dynamics of this situation would provide the basis for a strategy to prevent or mitigate its impacts.
- Strengthen Business Development Services in collaboration with the Chambers of Commerce and Trade in both governorates;
- Support the Directorate of Labour in both governorates to extend coverage of active labour market measures for unemployed youth, including training needs assessment, initial Labour Market Information, and skills development/ vocational training;
- Advocate for the improvement of local market structures and road infrastructure by the Government and development partners as a necessary condition for the promotion of commercialization of locally produced goods as well as for export of goods;
- Advocate for improved government policies around market prices, taxes and customs regulations, focused on a more business-friendly approach, including the facilitation of obtaining export licenses for small businesses.
- Advocate for the ending of the delays in payments to farmers by the government.
- Advocate for the renovation and reopening of the two tomato paste factories in Salah-al-Din to increase supply of locally produced tomato paste and other processed products that are in high demand locally.
- Support small entrepreneurs in developing online shopping services.

To ensure gender-responsive programming, the following is recommended to IOM:

- Promote gender-responsive individual and group endeavours for young women, including assistance to women to start up and develop their business along the recommended value chains;
- Promote equal access for men and women to technical training and entrepreneurial skills development for decent employment.

ANNEX A: SWOT ANALYSIS FOR THE VALUE CHAINS WITH HIGH POTENTIAL

In this Annex, the SWOT analyses are presented for the eight value chains with high potential. The analysis was done during a workshop with the IOM team from Salah al-Din (SAD) and Diyala, guided by the value chain consultants. The information is based on the data collected during the earlier phases of the research, including the context analysis, the consumer and market vendor survey, as well as on the in-depth knowledge and experience of the IOM team in the region.

1. Wheat

Strengths	Weaknesses
– Very high demand (both for food and animal feed) – Very high production – Fixed, stable price paid to farmers by government – Big factory for milling (SAD) – No need for complex technology – Technique for separating wheat for feed from other whe	– Government payments to farmers are often delayed – Large area needed for planting (at least 10 acres/40 donum) – Government only accepts wheat grade no. 1 – Need for electricity for irrigation system; farmer needs long cable to connect to the grid / gasoil too expensive – farmers need to pay for connection to the grid – Already many value chain studies on wheat
Opportunities	**Threats**
– Providing many job opportunities for farmers and workers – Huge land available for producing wheat – Demand in other governorates – Demand abroad - export of wheat (first batch of 70,000 tonnes sold to Kuwait in 2020)	– Many fires took place in wheat farms, farmers have to protect their farms 24/7 – In planting season, large quantities were imported from Iran but sold as Iraqi wheat in local market – Planting wheat depends on rainfall as well as irrigation/ rivers; shortage of rainfall is a big threat

2. Tomatoes

Strengths	Weaknesses
– High demand for tomatoes – Local quality is very high – Very cheap product, therefore available to everyone – Planting can be done in greenhouses all year long (4 harvesting seasons) – Tomatoes have high profit margin for vendors	– No tomato paste factory in SAD and Diyala – Local quantities produced are very low – Tomato cannot be stored for a long time

Opportunities	Threats
– Providing many job opportunities for farmers and workers – Creation of tomato paste factory will provide job opportunities – If the government would prevent import of tomatoes from Iran, this would create opportunities for farmers and workers	– Import of tomatoes is threatening local production – recently, the government has restricted imports, but vegetables are still being imported unofficially from Iran – Ministry of Agriculture is not providing farmers with pesticides to protect the crops – Lack of irrigation water due to dams established by Turkey – Due to the lack of processing capacity (e.g. tomato paste factory), the farmers cannot sell their product and some of them give away tomatoes for free – lack of marketing strategy

3. Eggplants

Strengths	Weaknesses
– Very high daily demand, especially for restaurants – Special use of green eggplants to produce pickles (mekdos), high demand by consumers – During cultivation season, eggplant becomes very cheap, so everyone can buy it – High profitability (if import from outside Iraq is prevented)	– Lack of government support for seeds, fertilizers, pesticides to farmers – No factories for processing foods (canned eggplant) – Very difficult to store eggplant for a long time
Opportunities	**Threats**
– Good opportunity for using greenhouses	– Import of eggplant from outside Iraq affecting local production

4. Potatoes

Strengths	Weaknesses
– There is a large cold warehouse for potatoes in Babylon Governorate – Security is improving in SAD and Diyala	– Potato machinery for harvesting and cleaning is not advanced, so Iraqi potatoes appear less clean on the market than imported ones – Packaging is not advanced – The types of potatoes grown are not as well preserved as well as imported ones (often with more roots/eyes)

Opportunities	Threats
– Potatoes can be grown concurrently with other crops – USAID has a programme to teach farmers how to co-cultivate potatoes and tomatoes – The only processing of potatoes is chips production; potential for French fries/hash browns, etc.	– Sixty per cent of potatoes sold are imported from Iran, while only 40 per cent are from Khanaqiin and Muqtadiya, Diyala – There is low demand for potatoes when Iranian imported products flood the market – Even when the borders closed, people suffered from the high prices of national products and the demand for local products did not increase, people just waited and then resumed consumption of Iranian products when the borders reopened

5. Onions

Strengths	Weaknesses
– Simple to grow, the same types are available locally as imported onions – Onions don't require a large amount of land to get started – There is a cold warehouse available to store potatoes, garlic and onion in Babylon Governorate	– There is no facility to store and dry onions – There is a lack of government support for growing onions
Opportunities	**Threats**
– There is a high demand, which is consistent even during periods of crisis such as COVID-19 – Opportunity to develop processing facilities for drying onions – Other products developed could have onions added to it (e.g. sauces and dips).	– There are many imported varieties of onions that are cheaper

6. Cows

Strengths	Weaknesses
– Demand for milk in villages is met by local production, while high demand for milk in urban areas gives room for increased production – Cold chains are short and manageable – Good job opportunities for both meat and milk production	– Lack of marketing: sometimes a producer has no way to market the product, and depends only on local consumers – There is no good packaging of the dairy product – There are no adequate standards or processes for putting expiration dates – There used to be a central government centre for milk but not anymore

Opportunities	Threats
– In urban areas, demand is not met by local production, but through imports – Some companies use imported frozen meat instead of local meat	– Imported milk is often sold instead of locally produced milk – Imported beef is cheaper than locally produced beef

7. Buffalos

Strengths	Weaknesses
– Natural environment is suitable, there are areas where water is available that are used to raise buffalos	– Lack of government support for buffalo raising – Poor packaging and consequently short expiration times
Opportunities	**Threats**
– Buffalo milk can be used to make cream – Packaging and marketing could be improved	– There is an imported cream which is in a nice package and the expiration date is longer/the price is lower – In the past, local buffalo products were doctored by the addition of oils, so the population may not trust local products

8. Sheep

Strengths	Weaknesses
– Multiple products can be produced: milk, meat, wool – Possible to sell the whole sheep	– No veterinarian support to farmers – Very high price of feed (USD 500 per tonne)
Opportunities	**Threats**
– Good job opportunities for farmers to produce animal feed for sheep (green feed) – Good job opportunities for establishing slaughterhouse	– Iraqi sheep meat is very tasty, so it is smuggled outside of Iraq frequently – Militias threatening the sheep herders outside the city – Migration from sheep herders from rural areas to the city

9. Poultry

Strengths	Weaknesses
– Multiple products: meat, eggs, feathers – Factory for producing poultry feed (SAD) – Meat and eggs are both very profitable on the condition the chicken is protected from disease	– Poultry needs special treatment and special medicines/ veterinary support – Very high price of feed (USD 550 per tonne)

Opportunities	Threats
– Job opportunities for small businesses for slaughtering and cleaning the chicken – Job opportunities for farmers to produce animal feed for chicken (corn and wheat)	– Diseases affecting the chicken (Newcastle virus and others) – Import of chicken threatening local production

10. Fish

Strengths	Weaknesses
– Very profitable – Fish tanks and other equipment are very cheap – Export is possible to outside SAD (e.g. Bagdad) – Tigris River and Al Tharthar Lake provide a very good resource for raising fish	– Fish feed is very expensive – No existing factory for canning of fish or drying fish
Opportunities	**Threats**
– Baby fish are very cheap – Opportunity to sell fresh fish from door to door in fish tank – Good job opportunities for fish farmers and workers	– Fish cages get stolen – People poison the fish in the fish cages to destroy local production – Lack of support from MoA leads to many diseases in fish cages

Based on a comparison of the SWOT analyses for each potential value chain, a final selection of the four most promising value chains was made. The main arguments for selection or deselection are listed in the table below. During the workshop, a score was assigned to each potential value chain on a scale of 1-10, to compare and rank them.

POTENTIAL VALUE CHAIN	MAIN ARGUMENTS FOR SELECTION/DESELECTION	SCORE BETWEEN 1 AND10
Cows	• Good job opportunities for both meat and milk production • Job opportunities for women in dairy chain, including in collection centres for milk • Demand for milk in villages is met by local production, while high demand for milk in urban areas gives room for increased production • Cold chains are short and manageable • Offers opportunities for import substitution and processing • Recommended to focus on dairy value chain (and not on meat)	8.5

Poultry	• Demand exceeds local supply by >50 per cent • Very profitable • Diyala already has many poultry farms • Processing chain exists (including feed factory) • Challenges include volatile prices for eggs, and high price of chicken feed • Opportunity to develop chicken feed value chain (corn, wheat, crushed corn) – 70 per cent of inputs consist of feed • Recommended to focus on chicken meat value chain (and not on eggs)	8.5
Tomatoes	• High demand for tomatoes • SAD is one of the best places to grow tomatoes • Multiple value-added projects are possible • Wastage of tomatoes because of imports/short shelf life	8
Eggplants	• High demand for eggplants • Opportunity to rebuild processing capacity for eggplants • Job opportunities for drying eggplants • Suitable for the centre region	8
Buffalos	• Buffalo milk and cream are sold at high prices, but buffalos are also very expensive to keep • Currently no packaging capacity, could be developed as an opportunity • More famous in south/Babylon compared to SAD and Diyala	7
Fish	• Fish production is more important in SAD than Diyala • At present, no processing capacity but there is an opportunity for frozen fish processing • Opportunity to develop the production of fish feed • Ninewa and SAD have dams which gives many opportunities • Aquaculture/pisciculture is new to Iraq, offers good opportunities • Fish disease is a major problem, which can be solved • Need for government permissions, which takes a long time so many fish farmers operate without permission; this provides an opportunity to formalize the sector and increase processing of fish	7
Potatoes	• Potato is already planted in SAD • Not yet very well developed in centre region • Possibility for value added projects (chips production etc.) • Minister of Agriculture requested developing potato value chain • It might be better to start in Ninewa, then move to SAD and Diwaniyah	6,5

Sheep	• Security issues are a major problem • Local wool is not very popular because of low quality	6
Wheat	• Input for poultry feed • Many studies already done • More prominent in the northwest	5
Onions	• Do not require much investment • Grown all over the country • Little possibilities for value added	4

IOM IRAQ

June 2021

iraq.iom.int

iomiraq@iom.int

UNAMI Compound (Diwan 2),
International Zone,
Baghdad / Iraq

@IOMIraq

Funded by the
European Union