# Assessment of the Labour Market & Skills Analysis
Iraq and Kurdistan Region-Iraq

Agriculture

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UNESCO and Sustainable Development Goals

UNESCO actively helped to frame the Education 2030 agenda which is encapsulated in UNESCO's work and Sustainable Development Goal 4. The Incheon Declaration, adopted at the World Education Forum in Korea in May 2015, entrusted UNESCO to lead and coordinate the Education 2030 agenda through guidance and technical support to governments and partners on how to turn commitments into action.

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Executive Summary

TVET Reform Programme for Iraq and KR-I

This is one of a series of reports on selected key economic sectors in Iraq and Kurdistan Region-Iraq (KR-I), prepared by UNESCO under the auspices of the European Union funded TVET Reform Programme, in partnership with the government of Iraq and KR-I. The purpose of the reports is to inform decision makers and education and training providers about issues of supply and demand in priority sectors. Research and data collection activities were implemented in 2017 and the reports were completed in 2018.

Desk-based research on the sector was based on publicly available documents and statistics; and on documents and submissions provided by the relevant ministries, agencies and organisations. Research on the supply of skills to the sector relied on data submissions from the Ministry of Education (MoE), Ministry of Labour and Social Affairs (MoLSA), Ministry of Higher Education and Scientific Research (MoHESR) and Ministry of Agriculture (MoA). Every effort was made to mitigate issues of the completeness, quality and currency of the data available.

Qualitative data for this report were collected during interviews with ministry officials and professional body representatives; and during two days of discussions with eight of pilot sector councils constituted to provide public and private sector perspectives on the challenges and opportunities of the sector. A survey of firms in each sector (excluding the informal sector) was implemented in eight governorates through the Central Statistical Organization (CSO) and the Kurdistan Regional Statistics Office (KRSO).
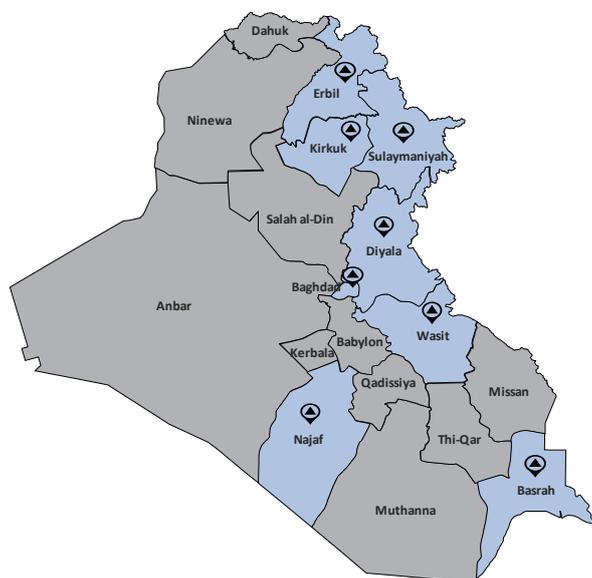
Agriculture sector

There are good conditions for agriculture in Iraq, especially in the rain-fed north; and using irrigation from the Tigris and Euphrates rivers in the centre and south. Agriculture is a traditional way of life in Iraq and it is the one of the biggest employment sectors, with relatively high numbers of women and youth employed. Food security depends on agriculture.

The agriculture sector was growing rapidly, nearly doubling in value between 2009 and 2013, before falling by 30% after 2014. The agricultural sector in Iraq has faltered due to conflict, poor access to water, deteriorating soil quality, challenging legislative environment; and low public and private investment in new technologies for equipment, irrigation, farming, and fishing.

Swathes of agricultural land are not currently used for agriculture. Poor marketing and difficult logistics including insufficient transport infrastructure, cold storage, and storage facilities can cause a loss of crops before they reach the market.

Local demand for agricultural products is not being met; and the ready availability of cheaper imported food products from neighbouring countries is putting farmers out of business. Government support for inputs and services is diminished. Farmers and agricultural enterprises are uncertain of the future, and some have given up.

Most of the farms in Iraq are small mixed family farms, and most of the jobs are for semi-skilled and skilled workers. The top occupations in the 2017 sample survey were predominantly for livestock workers.

Top ten most frequent agriculture-related occupations in employment by region

Rank	1	2	3	4	5	6	7	8	9	10
Iraq	Animal breeders and dairy producers	Agricultural, forestry and fishery department managers	Livestock and poultry labourers	Forestry workers	Poultry breeders	Animal care workers	Food processing machine operators and their associated	Hand-packers in manu-facturing	Vegetable farmers	Tied: Drivers and operators of agricultural machinery & Field crop farmers
KR-I	Poultry breeders	Veterinarians	Animal care work-ers	Agricultural, forestry and fishery department managers	Zootechny, poultry farming, apiculture and aqua life technicians	Agri-cultural machinery mechanics	Animal breeders and dairy producers	Livestock and poultry labourers	Vegetable farmers	Tied: Gardeners and nursery farmers & Butchers, fish-mongers and related food preparers

In contrast most of the agriculture training available is higher education (for technical and professional levels), and the majority is specialised in crop growing, and more theoretical than practical.

Traditionally the skills development of small mix family farmers is the domain of MoA, outside of the education and training system. In recent years there has not been enough funding available for extension services and training for farmers. However, MoA has a very large number of under-utilised training facilities.

MoE trains small numbers of young learners for basic, semi-skilled and skilled agricultural work in vocational preparatory school. MoHESR trains technical and professional levels, mainly for public sector jobs. MoLSA only offers training for registered unemployed people, to skilled level, and does not offer agriculture.

No ministry provides formal certifiable training for adult learners who are not able to join institutes or colleges, often because they have farms to run in rural locations, but also because they lack the entry requirements for higher education. No provider offers supervisory level training (post-secondary, non-tertiary), because this 'craftsman' level falls between the traditional domains of general education and higher education.

The UNESCO Office for Iraq, under the TVET Reform Programme, has developed a suite of new competency-based agriculture training programmes suitable for small-scale mixed farmers and agricultural entrepreneurs, and for adults as well as young learners. A demand-led training strategy for agriculture training, encompassing the pilot delivery and further development of these model programmes, needs to be developed in consultation with the relevant ministries and private sector, as part of the implementation of the Government of Iraq's strategic plan for agriculture. The Agriculture Strategy[1] aims to improve the capacity of public institutions, enable market-based agriculture with policy reforms, and invest in local markets, irrigation, farm inputs, extension and animal health services.

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[1] Ministry of Agriculture. "Agricultural Reality, Challenges and Ambitions," 2017

Chapter 1: Introduction to the Sector Skills Analysis Project

This report on the agriculture sector is one of a series of eight reports on the seven economic sectors and informal sector in Iraq and Kurdistan Region-Iraq (KR-I). The series consists of:

- Report on the **Agriculture, Forestry and Fishing** sector in Iraq and KR-I
- Report on the **Manufacturing** sector in Iraq and KR-I
- Report on the **Construction** sector in Iraq and KR-I
- Report on the **Wholesale and Retail and Repair of Motor Vehicles** sector in Iraq and KR-I
- Report on the **Transport and Storage** sector in Iraq and KR-I
- Report on the **Accommodation and Food Services (Hospitality)** sector in Iraq and KR-I
- Report on the **Information and Communication** sector in Iraq and KR-I
- Report on the **Informal** sector in Iraq and KR-I

These reports are the culmination of a series of primary and secondary research activities implemented in 2017.

The Sector Skills Analysis (SSA) Project[2] is a component of the Technical and vocational education and training (TVET) Reform Programme, funded by the European Union and in partnership with the government of Iraq and KR-I. The twin aims of the SSA project are (I) to inform education policy and priorities at secondary and tertiary levels, especially curriculum development for TVET and the development of training and opportunities for unskilled and/or unemployed people (with emphasis on women and youth) to enter the labour market and participate in formal and informal economic activity and (ii) to build the capacity of stakeholders to survey businesses and analyse employer demand in order to determine the best use of funding and target relevant TVET provision to better meet the demand of the labour market.

1.1 Global expectations of TVET

TVET is widely understood to be key to achieving a range of sustainable development goals including alleviation of poverty by empowering people to work and create jobs for others; increasing productivity and economic growth; promoting social equity, stability and peace; and increasing awareness of environmental issues and promoting green practices. TVET is regarded as pivotal to the achievement of inclusive, equitable and sustainable economic growth of industry and business, youth employability and enhanced social well-being. A TVET system has potential to influence work practices in the long term by emphasising occupational and professional standards, through developing skills and knowledge for sustainable work practices, and by introducing new technologies.

A TVET system capable of achieving these aspirations should be demand-driven by the current and projected needs of the labour market and by identified social and economic development opportunities for the future, so that it is relevant to the needs of employers and the opportunities of the formal and informal sectors.

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[2] The full title of the project is "Labour Market Assessment and Sector Skills Analysis. In this document, the short name "Sector Skills Analysis" is used to refer to all parts of the project, including assessment of the labour market

It needs to be accessible to all social groups (including urban and rural and marginalised segments of the population) and include a range of components to ensure that graduates (especially youth) are equipped with work-ready skills.

1.2 Context of the project

These concepts have shaped the UNESCO Global TVET Strategy and underpin the TVET Reform Programme for Iraq and KR-I (see Figure 1).

Figure 1: TVET Reform Programme for Iraq and KR-I is aligned with global thinking about TVET
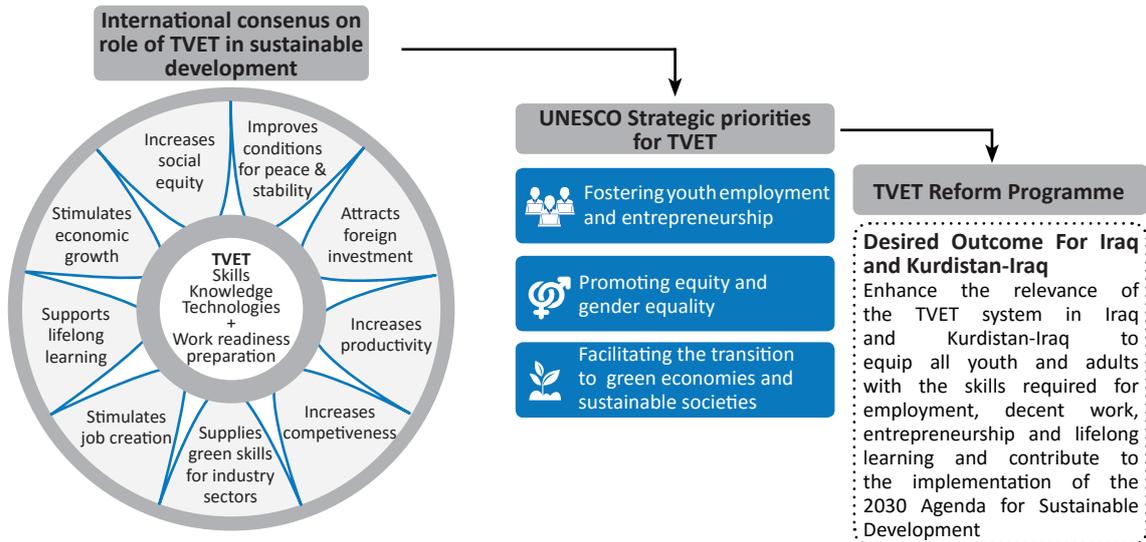
This SSA Project is an essential element in the realisation of the desired outcome for the TVET system in Iraq. It constitutes a specific component in the overall design of the larger TVET Reform Programme (as shown in Figure 2), and it contributes to the other components. The larger Programme needs labour market information and analysis of skills supply to inform the development of new training programmes leading to the award of TVET Qualification Framework (TVQF) qualifications and youth employment and entrepreneurship initiatives. The Project provides skills demand and supply analysis for these purposes and it lays the groundwork for a system for employer participation in TVET, through the establishment of pilot Sector Councils.

Figure 2: Relationship between the Sector Skills Analysis (SSA) Project and other elements of the TVET Reform Programme

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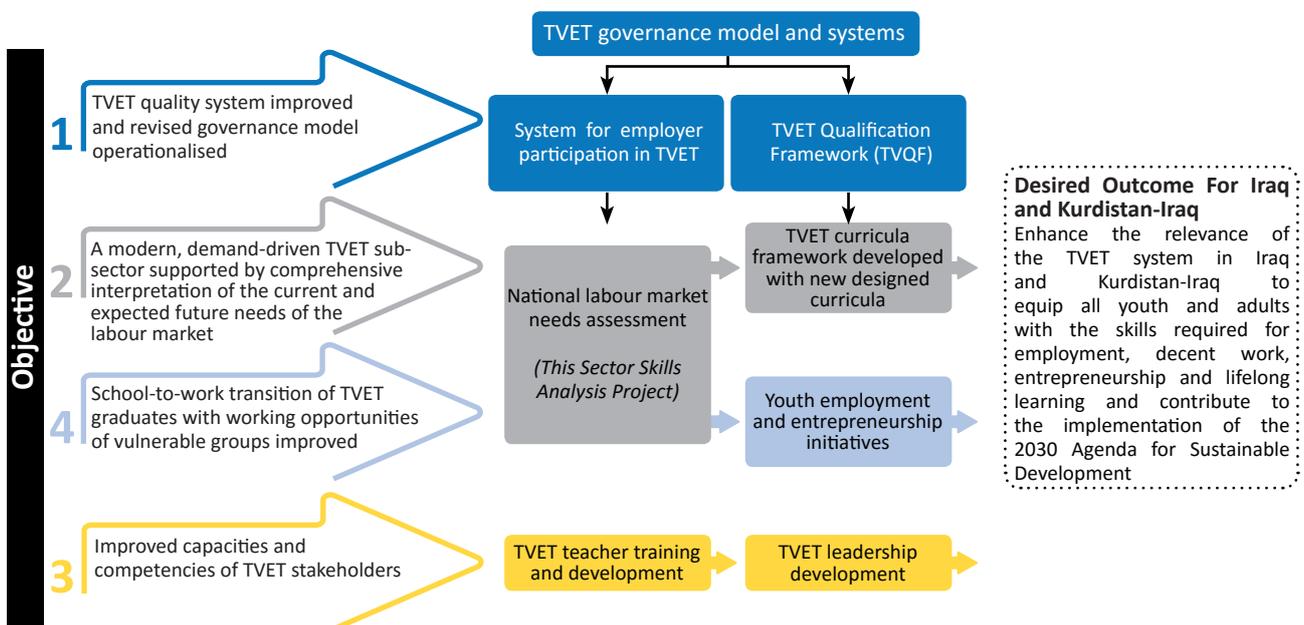
1.3 Scope of the project

There are no established systems in Iraq and KR-I for monitoring changes in the demand for labour and ascertaining employers' changing requirements for human capital, and there are no systematic arrangements for responding to emerging skills needs by adapting curricula, developing qualifications or designing learning provision to meet those needs. Information on labour market trends and skills needs is scarce, and any existing information is the result of ad-hoc initiatives of national and international institutions. As a result, the mix of occupational training offered, and the number of students enrolled in each occupation have little relationship with the needs of the labour market.

Assessing the needs of the labour market requires synthesis and analysis of information about the dynamic relationship between the labour market, the economy and the education and training system. The Project synthesises information about these three systems by collating data from the past (existing data and identified trends), from the present (actual current situation and needs of employers) and about the potential future (planned and untapped potential development). It includes desk review of existing data and past trends, qualitative and quantitative data from the present situation (Enterprise Survey, interviews and structured pilot Sector Council meetings) and projected and planned future development (national and sectoral strategic plans, Enterprise Survey and pilot Sector Council meetings).

1.3.1 Focus on selected economic sectors

The Project focuses on seven ISIC[3] economic sectors and the informal sector. The seven economic sectors selected for the focus of the Project are shown in Table 1.

The selection criteria for the economic sectors, which were determined in consultation with the Programme Steering Committee, the Inter-Ministerial Working Group (IMWG), the Central Statistical Organization (CSO) and the Kurdistan Regional Statistics Office (KRSO), were as follows:

- Minimum of 6 sectors relevant to both Iraq and KR-I

- Sectors considered to be drivers for inclusive, equitable and sustainable economic growth in Iraq and KR-I

- Sectors conducive to fostering youth employment, decent jobs and entrepreneurship

- Sectors that can support the reconstruction of the country and transition to green economies and environmental sustainability

- Sectors with potential for leveraging employment opportunities and business development in other sectors

- Include primary, secondary and tertiary sectors of the economy

- Take into consideration growth potential in terms of GDP, employment and exports, and changing technology

- Capable of using and applying the results and insights from a sectoral skills analysis (i.e. the sector is relatively well organised).

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[3] International Standard Industrial Classification of All Economic Activities

Table 1: Selected economic sectors and subsectors

Section	Sector	Selected subsectors of interest based on consultation and desk-review
A	**Agriculture, Forestry and Fishing**	01 - Crop and animal production, hunting and related service activities 03 - Fishing and aquaculture
C	**Manufacturing**	10 - Manufacture of food products 11 - Manufacture of beverages 19 - Manufacture of coke and refined petroleum products 20 - Manufacture of chemicals and chemical products 21 - Manufacture of basic pharmaceutical products and pharmaceutical preparations 22 - Manufacture of rubber and plastics products 23 - Manufacture of other non-metallic mineral products 24 - Manufacture of basic metals 25 - Manufacture of fabricated metal products, except machinery and equipment 26 - Manufacture of computer, electronic and optical products 27 - Manufacture of electrical equipment 28 - Manufacture of machinery and equipment 32 - Other manufacturing
F	**Construction**	41 - Construction of buildings 42 - Civil engineering 43 - Specialised construction activities
G	**Wholesale and Retail Trade, Repair of Motor Vehicles and Motorcycles**	45 - Wholesale and retail trade and repair of motor vehicles and motorcycles
H	**Transport and Storage**	49 - Land transport and transport via pipelines 52 - Warehousing and support activities for transportation 53 - Postal and courier activities
I	**Accommodation and Food Services**	55 - Accommodation 56 - Food and beverage service activities
J	**Information and Communication**	61 - Telecommunications 62 - Computer programming, consultancy and related activities 63 - Information service activities

1.3.2 Focus on a sample of governorates

The scope of the Enterprise Survey included a sample of firms from each of the 7 economic sectors from 8 governorates, as shown in Figure 3 (survey was not conducted for the informal sector).

The selection criteria of the governorates for the Survey were as follows:

- Have at least 5 governorates in Central and Southern Iraq (CSI) and 2 governorates in KR-I to represent the whole country

- Urban and rural economic areas

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- Based on population, employment trends and growth predictions
- Consistency with the selection of economic sectors (i.e. the selected sectors are active in the selected governorates).

Figure 3: Map of governorates of Iraq and KR-I showing those selected for the Enterprise Survey
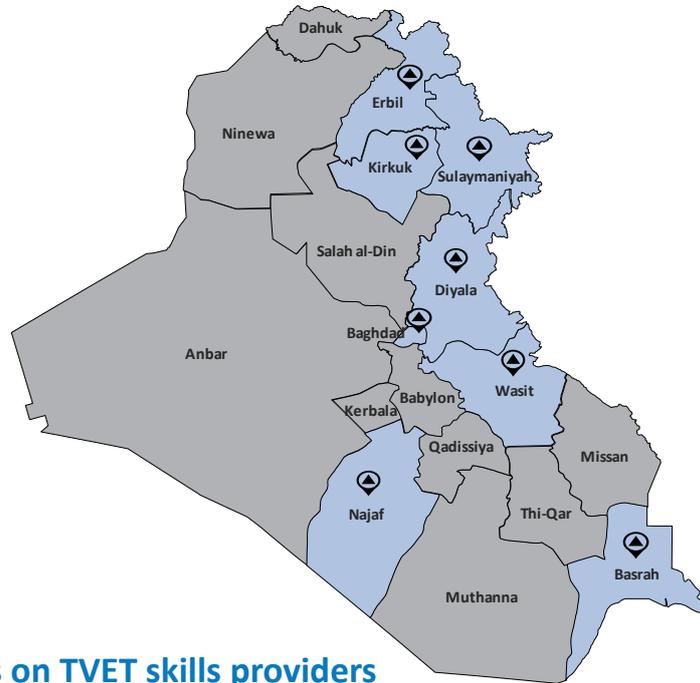
1.3.3 Focus on TVET skills providers

Figure 4 below provides the overview of provision of TVET by the Ministry of Education (MoE), Ministry of Labour and Social Affairs (MoLSA), Ministry of Higher Education and Scientific Research (MoHESR) and other ministries.

Figure 4: Structure of TVET provision
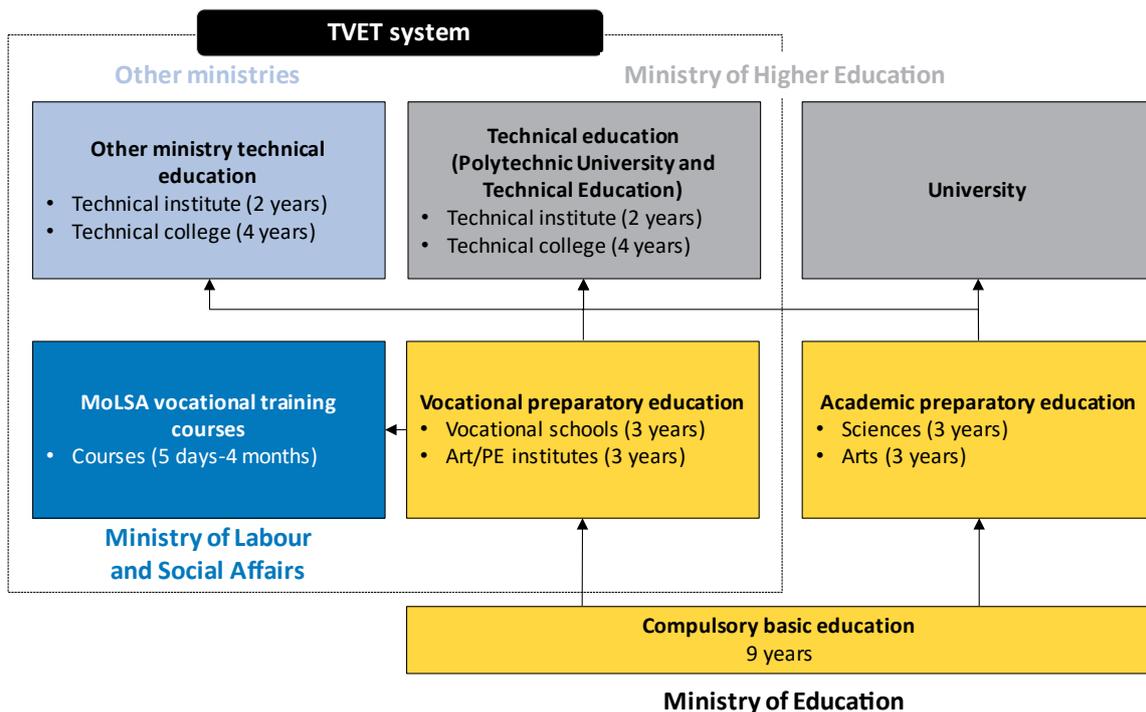
Vocational preparatory education is offered by the MoE in Iraq and KR-I. Vocational education is offered in 3-year programmes (equivalent to years 10, 11 and 12) in vocational schools and institutes. Due to capped numbers, a very small percentage of vocational education graduates are eligible for entry to tertiary technical education in the polytechnic universities and technical universities. In Iraq, there were 315 vocational education institutions. The total number of all vocational students enrolled in specialist vocational programmes was just over 50,000 in 2016-2017. In KR-I, there were 33 vocational schools and 28 institutes (for a total of 61 institutions). The total number of students enrolled in all three years of the programme in 2015-2016 was nearly 8,000.

In Iraq, there are 38 MoLSA training centres with an average annual MoLSA cohort size of 16,659. In KR-I , there are 7 MoLSA training centres with annual enrolment of approximately 1,500 learners.

In Iraq, there are four technical universities with 29 institutes and 16 colleges (for a total of 45 institutions) with an annual admission of approximately 30,000 students. In KR-I, there are three polytechnic universities with a total of 36 institutes and colleges, and a total estimated annual enrolment of approximately 12,000 students.

The Boards of Tourism in both Iraq (Ministry of Culture) and KR-I (Ministry of Municipality and Tourism) offer training for tourism and hospitality. The nine tourism and hospitality institutes in Iraq provide pre-service training in four 3-year programmes with a total enrolment of 756 students in 2015-2016. The operationalisation of the KR-I Tourism Training Centre has been subject to significant delays. A specialist facility with capacity for approximately 120 students is only partially equipped for training of hospitality staff; and licensed by MoHESR.

The Ministry of Communications in Iraq offers training through its Higher Institute for Communications and Post, but insufficient information was provided for inclusion in the skills analysis. Likewise, the Ministry of Agriculture has many training centres (78 not including KR-I) all over the country offering professional development to farmers and ministry staff, but no detailed information about these was accessible within the research period. The Ministry of Transport in Iraq also has three training centres, which are reportedly partially operational, but no detailed information was available for these.

Therefore, the analysis of skills supply included programmes relevant to the selected economic sectors delivered by the following provider types:

- All public vocational preparatory schools in Iraq and KR-I
- MoLSA training centres in Iraq and KR-I
- All public technical institutes in Iraq and KR-I
- All public technical colleges in Iraq and KR-I
- Travel and tourism institutes and training centres in Iraq and KR-I (Ministry of Culture, and Ministry of Municipality and Tourism).

1.4 Methodologies of the project

1.4.1 Methodology overview

Four streams of information inform the final Sector Skills Analysis (SSA):

- Desk-based research on the seven ISIC economic sectors and the informal sector

- Synthesis and augmentation of the desk-based research by the eight pilot Sector Councils
- Analysis of skills supply
- Results of the Enterprise Survey (not conducted for the informal sector).

The sources of primary data for the analysis include (i) the Enterprise Survey, (ii) 32 interviews with ministries and leading private sector organisations, and (iii) eight pilot Sector Council meetings. The secondary data sources for the background research included existing documents (strategies, plans, reviews, policies, laws), and international and national websites and data sets.

The purpose of the SSA is to inform education policy and priorities, especially curriculum development for TVET and the development of training and opportunities for unskilled and/or unemployed people; and to build the capacity of stakeholders to analyse and respond to labour market demand. Figure 5 shows the multiple potential uses of the information.

Figure 5: Overview of the Sector Skills Analysis (SSA) Project
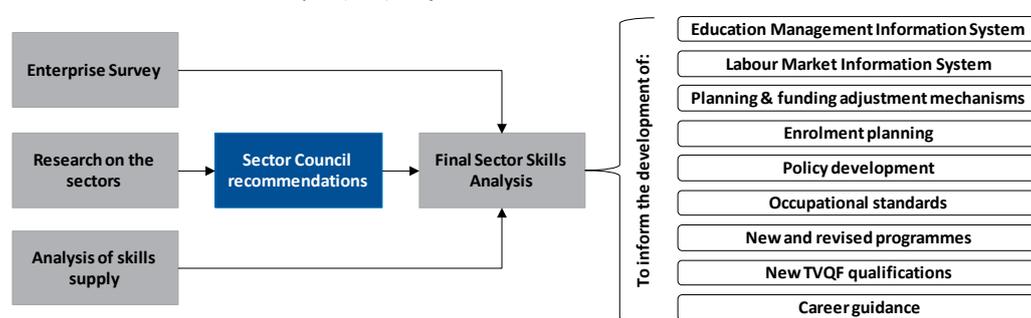
1.4.2 Desk-based research methodology

Preliminary analysis of the economic sectors of Iraq and KR-I commenced during the inception period, for the immediate purposes of selecting the sample of economic sectors and governorates for the Enterprise Survey.

After final agreement on the selected sectors, each of the selected economic sectors was researched and analysed, using the PESTLE framework (Political, Economic, Social, Technological, Legal and Environmental) as a tool for analysing, holistically, each sector from different perspectives.

1.4.3 Mapping the supply and demand systems

Background research included mapping the institutional landscape within which economic development and education and training are planned, financed, regulated and delivered.

Mapping the supply and demand systems includes analysing the mandates of, and the relationships between, organisations providing related and complementary services in the broad fields of the labour market and the TVET system.

These stakeholder organisations are the main beneficiaries of this Project, since the Project aims to influence policy and planning in these two fields, and any developments resulting from the TVET Reform Programme will be implemented by these organisations.

Therefore, it was important to have a detailed understanding of the component parts of the systems: how they work; how information flows between them; the location and processes of decision making, implementation and monitoring and evaluation; the main outputs and outcomes; and any identified constraints or issues of concern. Sources of information for mapping included both desk-based research and interviews.

1.4.4 Interview methodology

The ministries relevant to all the selected economic sectors in Iraq and KR-I were involved in the research through participation in interviews, submission of documents, and participation in the pilot Sector Council workshops. The other main public sector participants included MoLSA, MoHESR, and MoE.

32 interviews were conducted in Baghdad and Erbil between January and February 2017 and some additional interviews were conducted in Erbil in April 2017. In some cases, formal data requests were sent to the interview participants in advance, and in some cases written requests followed the interviews. The format of the interviews varied according to the availability of participants and prior access to relevant information. In most cases interviews took between 1 and 2 hours.

1.4.5 Sector Council methodology

Both the Enterprise Survey and the pilot Sector Council meetings are mechanisms for collecting information about employer demand and increasing employer participation in TVET. The qualitative data collected from the pilot Sector Councils complements the quantitative data collected in the Enterprise Survey.

Eight pilot Sector Councils were established to represent the public and private leadership of each of the selected seven economic sectors and the informal sector. Private sector representatives included the Chamber of Commerce and Industry and relevant professional federations, unions and associations.

The rationale for including an Informal Sector Council includes these considerations:

- The Enterprise Survey of employers includes mainly formal sector businesses
- Skills development should acknowledge the skills needed for informal economic development opportunities and transition to the formal sector
- The informal sector includes traditional forms of informal skills training such as informal apprenticeships which can be further developed
- Women and vulnerable groups like unemployed youth, displaced people and refugees work in the informal sector
- Entrepreneurship initiatives often start on a small scale in the informal sector
- Green skills and sustainable development practices need to penetrate all of society and all workplaces
- The informal sector employs a substantial proportion of the population.

Sector representative bodies are a necessary element of a demand-led TVET system. The system can only be 'demand-led' if the sectors have organised leadership that is well informed and able to advise on the skills needed by the sector.

Formal establishment of permanent Sector Councils will take time as the concept needs to be widely discussed and agreed upon, and policy and legislative implications need to be considered. Thus, for the purposes of this project, 'pilot' Sector Councils were constituted to act as 'think tanks' for the sector; to provide a forum for strategic discussion about sector growth and development; to identify challenges and opportunities; and to develop goals to address challenges and exploit the opportunities and achieve its goals.

The eight pilot Sector Councils met between April and July 2017, and played an important role in validating, augmenting and interpreting the findings of the desk-based research; and providing explanations and illustrative stories behind the statistical information presented.

Each two-day workshop (with slight variation for the Informal Sector) consisted of a structured series of progressive small group activities to explore the issues of the sector and identify the prioritised skills needs. Five worksheets were designed to guide the deliberations of the small groups and capture brief written responses from the small group activities. The structured activities were as follows:

- **Activity 1:** Define 3-4 main challenges that impact the growth and development of the sector (a problem statement)

- **Activity 2:** Identify new opportunities and untapped potential to be explored

- **Activity 3:** Formulate goal statements to address the challenges and/or seize the identified opportunities for the sector

- **Activity 4:** Identify occupations needed for the sector to address challenges, seize opportunities and achieve goals

- **Activity 5:** What should the training for the identified occupation look like?

Analysis of the written and verbal outputs of each meeting triangulated what the participants wrote down, what they presented and responded in small groups, and any other response or critique of the participants.

1.4.6 Skills supply methodology

The data supplied by MoE, MoHESR and MoLSA, and data accessed from CSO, have significant weaknesses in terms of sufficiency and adequacy for estimating the supply of skills to each economic sector in this study.

The minimum information required for a results-oriented evaluation of a TVET system generally includes enrolment by level and programme, retention, progression, completion, success, graduation and employment rates of graduates. Ideally, this information would be routinely collected by all providers and uploaded to a central TVET Management Information System (MIS). However, in Iraq, routine, standardised, continuously updated and centrally managed TVET data collection does not routinely occur, nor is there any systematic use of skills supply data to inform enrolment planning.

Weakness in the data available for estimating the skills supply included:

- The data obtained from various sources was a mix of enrolment numbers and graduate numbers. It included these variations for each specialisation and programme:
  o Enrolment in each year of a three-year programme.
  o New enrolment in the first stage of a programme each year for a 3-4-year period.
  o New enrolment for two years (2014 and 2016) over a 3-year period.
  o Graduates over a period of three years.

- In some cases, two spreadsheets provided at the same time, by the same organisation, were contradictory in some respects (e.g. different totals), which raised more questions than answers

- Spreadsheets provided by ministries included adding and formula errors (e.g. vertical summation contradicted horizontal summation). Tables provided in Word format were especially prone to this kind of error

- In some cases, much data processing effort has been devoted to inputs (e.g. number of workshops held, number of teaching and training staff, and other matters which are of exclusive interest to supply management) or issues of low significance, with little or no attention given to investigating outcomes and issues relevant to the labour market

- There appears to be no indicators or benchmarks to guide (i) what units of analysis and data are required to evaluate the quality and effectiveness of skills supply and (ii) how to recognise data which are causes for concern or require further analysis, and which data are within an agreed normal range, and do not require further analysis.

Because of the limitations of the data, it was decided that both average student cohort size and average graduate cohort size by specialisation will be used as proxies for skills supply. This means that the estimation of skills supply can only be regarded as a rough guide.

Generally, student cohort size is larger than graduate cohort size, because some students do not graduate (i.e., they fail and/or drop out). There is not enough information available to estimate a drop out-rate to apply to student cohorts at all levels. The only reported drop-out rate (5% reported by CSO in 2015) is for vocational (school) education. Longer programmes at non-compulsory levels generally have much higher drop-out rates than short or compulsory school programmes. With no scientific basis for estimating drop out and failure rates, no adjustments could be made to the average cohort size to allow for failure and drop out.

It is possible that an overestimated proxy for supply (average cohort size) is somewhat balanced out by (i) the absence of any data in this study for NGO training (mainly for refugees and IDPs) or private providers (very few), and (ii) the exclusion of informal apprenticeship training, which is unrecorded but may be substantial, especially in fields like construction. This is, of course, an assumption without any evidence.

Calculating average cohort size is valid when enrolment seems steady (when the difference from one year to another is negligible), but not when there is a significant difference. A dramatic difference suggests either (i) a new or discontinued programme or (ii) some kind of external shock, such as temporary closure of a specialist institution due to the ISIL/Da'esh incursion. In the few cases where averaging does not seem to give a correct reflection of the skills supply, this is noted in the Chapter 4 tables by an asterisk (*).

In some parts of Iraq, colleges and institutes have closed. This appears to have inflated enrolment in other colleges and institutions (with big differences between 2014-2015 and 2015-2016 cohorts). Information provided by the MoHESR was incomplete for 2015-2016. In many cases, only one enrolment figure is available. Therefore, for all Technical Foundation University programmes, the 'cohort size' is the last known enrolment (see Chapter 4 tables, noted by an asterisk*).

As can be seen from the discussion above, at best the figures provided in this report for skills supply are indicative. However, since there has been no previous study on this scale to quantify the supply of skills to the specific sectors of the economy, this assessment can provide a benchmark estimation based on the best evidence available. For the first time in this study the unit of analysis is not the institution or the governorate which *supplies* the skills, but the economic sector which *demands* the skills.

1.4.7 Enterprise Survey methodology

The survey was carried out so that it can inform reforms to the TVET system i.e. to make it more demand driven. In view of this, firms were surveyed (excluding for the informal sector) regarding the number and kind of employees at present, with consideration of labour requirements for the future. The goal of the survey was to enable a view into the future skill needs of Iraq's economy so that relevant capacity could be built to fulfil such needs, in terms of offering the relevant TVET training programmes at TVET institutions.

Sample design

The sample was chosen from the *CSO (Central Statistical Organization) Business Register*. Established in 2009, the Register contains all firms in Iraq found during a census survey, numbering 490,080 across the 18 governorates of Iraq and KR-I. It is developed at the establishment level, meaning that all units of a firm (the headquarters as well as all subsidiaries) are identified within the Register ('population frame'). This is presented in Appendix 1.

The sample taken aimed to assess the needs of firms, with 10 or more employees, within the 8 selected governorates. From the Register ('population frame') there are 5,091 such firms ('sample frame') in total, which can be seen below in Figure 6. A complete breakdown of the sample frame can be found in Appendix 2.

Figure 6: Sample frame for the Enterprise Survey
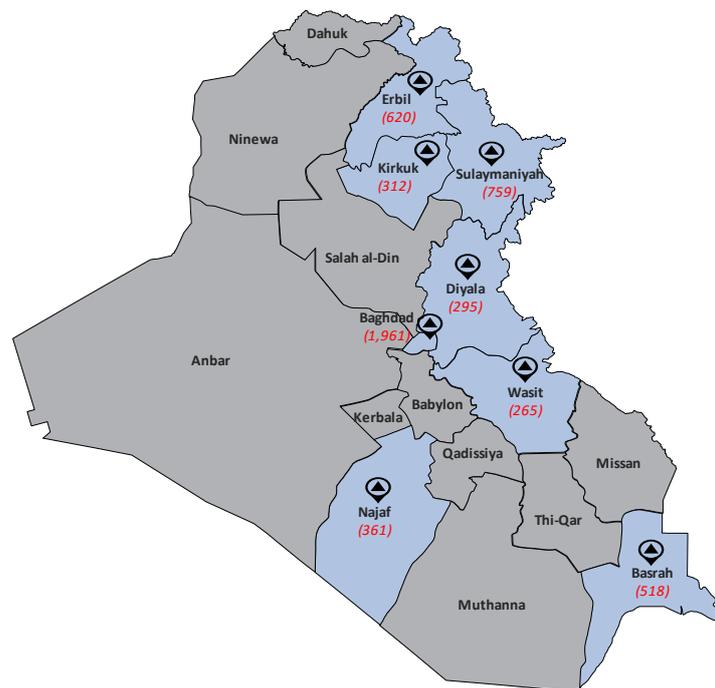
The Register was stratified by both 27 subsectors (across the seven ISIC selected economic sectors) and the 8 selected governorates. A simple random sampling method (each firm equally likely to be selected) was used for each of the 216 strata (27x8) with the goal of minimizing the margin of errors within each stratum. The result was a target sample size of 4,432 firms of which 2,010 were surveyed ('actual sample size'). More details on the sample sizes are provided in Figure 7 and in the following sections.

Figure 7: Enterprise Survey population and sample frames & target and sample sizes

- 2,010 — Actual sample size
- 4,432 — Target sample size
- 5,091 — Sample frame
- 490,080 — Population frame
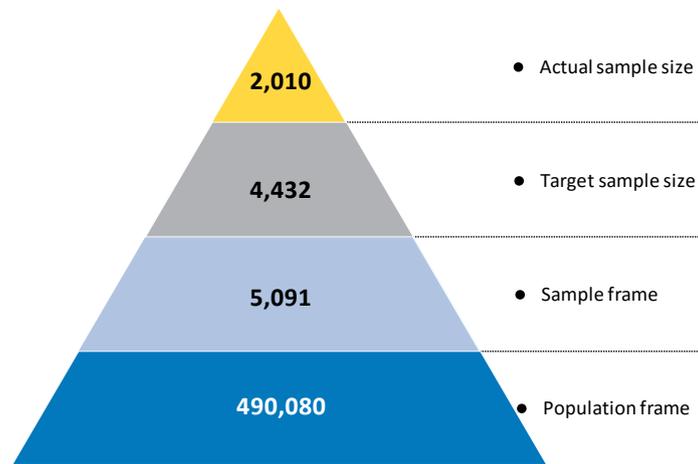
Sample size

The determination of the sample size depended on the:

- Types of questions being asked (i.e. population parameter of interest)
- Degree of desired confidence and precision of final estimates
- Anticipated response rate.

In this survey, the questions of interest had 3 possible responses (multinomial response). For example, asking a company how important (not important/somewhat/very) is having relevant technical skills is in the occupation. In this case, the parameters of interest are the proportion of firms that place importance on technical skills (not/somewhat/very). Therefore, the target sample size should be calculated to ensure that these proportions are accurately estimated by the sample.

As is typical, a 5% margin of error, and 95% confidence level were selected. This means that the sample size was calculated so that the estimated proportions are within 5% of the true proportions 95% of the time. That is, we want the 95% confidence interval for the proportions of each response to have a width at most of 0.05 (5%). These confidence intervals are calculated as the proportion plus or minus the margin of error:

$$p \pm e,$$

where the margin of error is dependent on the sample size.

For example, if 'very important' was answered to the above question 80% of the time, then we would like a large enough sample size, so that we would be 95% sure that the true proportion of firms who value technical skills as 'very important' is between 75% and 85%.

The response rate was estimated to be 95%, indicating that 95% of firms sampled were expected to answer the survey questionnaire.

As mentioned in the preceding section, the sample was selected to allow for analyses within each stratum. Therefore, required sample sizes were calculated for each stratum, with the total target sample size being the sum of the stratum sample sizes. The benefits of sampling this way are two-fold. Firstly, this approach ensures that each stratum is represented sufficiently to allow accurate analyses at that stratum level. Secondly, by minimizing the margin of errors within each stratum, the overall margin of error of the survey is greatly reduced.

Based on the above assumptions, the sample size within each strata was calculated as:

$$n_h = \left(\frac{z^2 p(1-p)}{e^2 + \frac{z^2 p(1-p)}{N_h}} \right) x \frac{1}{1 - NR}$$

Where:

n_h : the required sample size in stratum h

p : the proportion of firms that select a particular response within a given question

z : the value (z-score) associated with a 95% confidence level (z = 1.96)

e : the margin of error

N_h: the number of firms in the CSO Business Register in stratum h

NR: the anticipated non-response rate

For example, for the telecommunication firms in Baghdad, there are N_h= 120 firms in the Register of size 10 or more employees. To find the sample size required for a margin of error of 5% (e = 0.05) with a 95% confidence level (z=1.96) and 5% non-response rate (NR =0.05) we need only to determine a value of p to use in the above formula. Often, previous surveys or pilot data are used to determine an approximate value for p. Since no pilot data exists for a survey of this kind, we want to use a value of p that will result in a conservative value of n_h. In this case, n_h in the formula above is largest when p =0.5. Therefore, we use p =0.5 to ensure that the value of n_h will be sufficiently large to estimate any true value of p. Inserting all these values into the above formula gives a stratum sample size of n_h=97. A similar calculation was done for all 216 strata. The result was a total target sample size of 4,432 to ensure the 5% margin of error for each stratum. The complete breakdown of the target sample size can be found in Appendix 3.

In the above formula, the calculated target sample size applies to estimating the proportion of a single response to a question, i.e., the possible responses are treated as binary for the purpose of calculation (the single response/not). For example, if we are interested in the needed sample size to estimate the proportion of firms who answered 'very important' to the 'technical skills' question, then for the purpose of the calculation, the possible responses are treated as 'very important' and 'any other response'. As mentioned above, the case that requires the largest sample size is when the proportion of firms answering 'very important' is 50% (p = 0.5). Therefore, p = 0.5 is used in the above formula to determine the sample size needed to accurately estimate the proportion of firms answering 'very important'. To determine the sample size needed to estimate the 'somewhat important' and 'not important' categories an analogous approach is taken. Since we use p = 0.5 in all 3 cases, we get the same result from the above formula. This means that the same value for n_h is sufficient to estimate each of the 3 proportions accurately.

Since in the above we set each of the 3 proportions to be 50% (p= 0.5) for the purpose of the calculations, we are ignoring the fact that the 3 proportions must sum to 100%. That is, we are treating the 3 proportions as independent when in reality they depend on each other. Ignoring this dependency is not of concern as the calculation leads to having a sufficient sample to ensure each question is answered to within the specified margin of error independently of one another.

Alternative methods that properly account for this dependence, such as those in Thompson (1987)[4], can be used to estimate the sample size. For reference, using this approach the total sample size for the stratum margin of errors to be 5% is 4,457. For this survey, the calculated total size of 4,432 (as outlined above) was used for the sample size as it is sufficient to ensure each question is answered to within the 5% margin of error within each stratum.

As discussed below, these sample sizes proved to be challenging to obtain, and in some strata replacement methods were required which still allowed for the analyses undertaken to find significant results. In total, 2,010 firms with 10 or more employees were surveyed (see Appendix 4 for breakdown). The fact that the Register has not been updated since 2009 makes it possible that these 2,010 firms represent a greater proportion of the population.

Design of the questionnaire

The survey explored information about the employers' current workforce and workforce management practices. In particular, it collected information about current and future employment opportunities; about occupations in employment; about the skills of current and prospective employees, and the hiring and service training practices of the firms (as illustrated in Figure 8).

Figure 8: Enterprise Survey lines of enquiry

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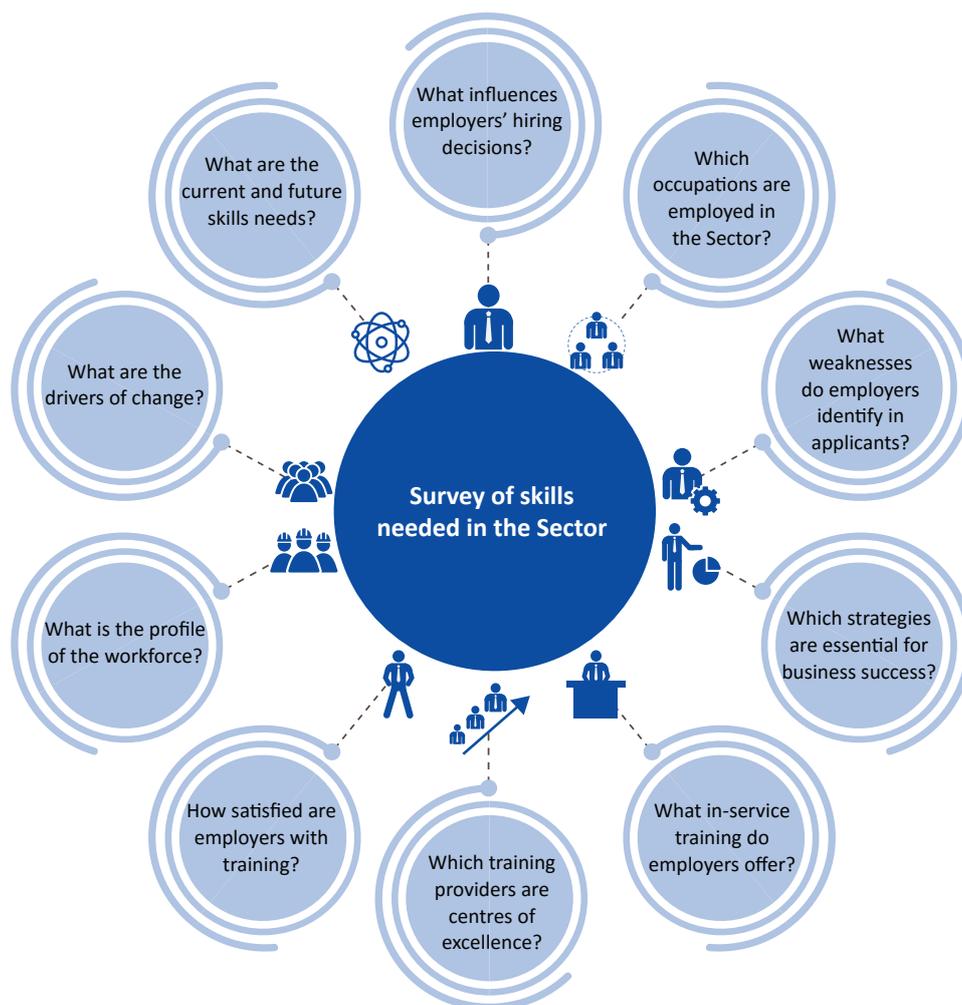
[4] Thompson, S. "Sample Size for Estimating Multinomial Proportions," February 1987

Implementation of the survey

The Register is typically updated annually for medium (11-29 employees) and large (30+ employees) firms. However, given recent turmoil in Iraq with the dual crisis of decreased oil prices and the ISIL/Da'esh conflict, the Register has only been updated for large firms in the manufacturing sector since 2009. As a result, all other sectors in the Register were out of date, and many of the firms listed had ceased operations. Therefore, many of the initial firms randomly selected to be surveyed were no longer operational and replacement firms were identified by CSO regional offices. These replacements were selected from the same stratum in such a way as to ensure similar characteristics to the no longer operational firms.

In some strata, the CSO regional office could not identify a sufficient number of firms with 10 or more employees. In these cases, the threshold was lowered, first to 7 or more, and in some cases to 5 or more employees. This replacement was done in an attempt to maintain as closely as possible the original sample size, and stratum allocation.

Despite this replacement strategy, the final actual sample taken contains 2,010 firms with 10 or more employees, and an additional 643 firms with 5-9 employees (totalling 2,653). Since the original sample was chosen from the firms of 10 or more employees, the primary analyses focus on this group only. This allows for the most accurate representation of the target population, and most accurate calculation of the sample weights.

Although not included in the primary analysis, the 643 firms of size 5-9 have been analysed as an independent subset as to make best use of the data. These analyses are presented in Chapter 5.

Survey quality assessment

A subsample of the firms were interviewed and audit analysis was done to ensure that interviews had been completed. Information was also collected from interviewed firms selected for the monitoring exercise to evaluate the quality of the interviews and the understanding of the objectives of the survey and its usefulness. The proportion of firms to be interviewed was targeted at 10%.

As noted in Table 2 below, calls were made to a total of 583 of the total records reaching 448 which corresponds to a sample size of 18% of the total. Of the 448 contacted, 400 of the firms surveyed (89% of the sample) verified that interaction between a CSO/KRSO surveyor and a company representative took place.

Table 2: Enterprise Survey lines of enquiry

	Iraq	KR-I	Total
Total firms surveyed	1,787	866	**2,653**
Total calls made	412	171	**583**
Contact made	295	153	**448**
% Contacted	16.5%	17.7%	**16.9%**
Verified	260	140	**400**
% Verified	88%	92%	**89%**
Inconclusive survey respondents	34	14	**48**

- *Contact made: All respondents that were reached by phone. This group does not include wrong numbers where an individual was reached, or calls where a person was reached but language precluded identification.*

- *Verified: All respondents that were reached by phone and with whom an interview by a CSO or KRSO surveyor was determined to have been made.*

- *Inconclusive: All respondents that were reached by phone but whose participation in the survey could not be verified.*

As one would expect, the time spent on the survey varied between interviewers. Using time spent on individual survey interviews as a primary indicator of whether a valid survey was performed, the results show that more than 70% of respondents indicated that the interviewer spent at least 30 minutes doing the interview. This 30-minute benchmark was applied as the minimum time required based on the training conducted for both CSO and KRSO.

As a part of the planned monitoring process, field personnel were instructed to submit reports. However, some of the field personnel did not respect the reporting schedule. In some cases, information was not transmitted until the end of the survey collection period, eliminating the possibility of corrections and feedback to weaker interviewers.

While the results support the conclusion that the survey activity was completed successfully, based on the information provided by respondents, there are indications that the quality of survey results varied from interviewer to interviewer. Some surveys did not meet the benchmark minimum time needed, and interviewers may not have effectively communicated with the company representatives. This is further supported by the responses from several respondents indicating that they did not understand the reason for the survey.

Analysis of the data

From the initially planned sample of 4,432 firms, 2,010 (45.4%) completed the entire survey questionnaire. Although this response rate is lower than hoped, the fact that the Register has not been updated since 2009 makes the true population size difficult to estimate. Therefore, it is possible that these 2,010 firms represent a greater proportion of the population.

Margin of error. The non-response rate and degree of replacement varied by governorate and subsector. Therefore, the margin of errors within the strata can be expected to vary. For example, in the manufacture of food products subsector in Baghdad, the calculated sample size (based on 5% non-response rate) for a margin of error of 5% was to try sample 144 of the 211 total firms in this stratum. In the actual sample, only 81 were obtained (56.2%). Therefore the true non-response rate for this stratum was 44%. We use the following formula to compute the margin of error in each of these situations:

$$e = \left(\frac{z\sqrt{p(1-p)}}{\sqrt{n}} \right) \sqrt{\left(1 - \frac{n}{N} \right)}$$

where e is the margin of error, z = 1.96 (for a 95% confidence level), n =0.5 is the assumed proportion of a specific answer (as in the 'Sample size' section above), p is the sample size, and N is the population sample size.

In the above example, if we sample the full 144, the margin of error is 4.6%. If the non-response rate was 5% (as originally assumed) then the sample size is 137 and the margin of error is 5%. Finally, if the sample size is 81 (actual), then the non-response rate is 43.8% and the margin of error is 8.5%.

The differences in the above margin of errors result in differences in the width of the confidence intervals for the survey estimates. Specifically, holding everything else fixed, the confidence intervals will be (in this case) 8.5%/5% = 1.7 times wider. For example, if 20% (p=0.2) of firms answered 'very important' to technical skills question then in the above example with a sample size of 137 the 95% confidence interval would be [16%, 24%]. With the increased non-response rate (and therefore a higher margin of error) the confidence interval would be [13%, 27%].

Most results are available at the subsector and governorate level, however, given the small number of firms in some strata, it is important to verify the response rate for these strata before presenting the results. In all governorates, there was no responses to the survey in two subsectors (32 – Other manufacturing and 62 – Computer programming, consultancy and related activities). The target sample size was small in each of these two subsectors, which helps explain the no response rate. These subsectors are not included in the results.

In the firms that did respond, missing data was not a problem, and therefore imputation methods were not required.

Weighting. In a given sample, it is preferred that it represents the true population with respect to all variables under consideration in the survey. For example, if the sample contained 60% males in telecommunication firms and the true population contains 70% for a given stratum, population inferences can therefore only be made by appropriate weighting.

Sample weights for each stratum were calculated based on the Register. The strata weights were based on the inverse probability of selection for a given company in that stratum. That is, the weights were calculated as:

$$W_{h*} = N_h/n_h$$

where N_h is the number of firms in the Register of size greater than 10 for stratum h and n_h is the size of the sample of firms of size greater than 10 drawn from stratum h.

As non-response may cause some groups to be over- or under-represented, these weights were further adjusted to obtain final strata weights of:

$$W_h = W_{h*} \times \frac{n_h}{n_{hr}}$$

where n_{hr} is the number of respondents in stratum h.

For example, according to the Register, in Baghdad, there are 120 telecommunication firms of at least 10 employees of which 97 were selected to be sampled. Of these 97, 23 responded and were interviewed for the survey. Therefore, the weight for this stratum was calculated as:

$$\left(\frac{120}{97}\right) \times \left(\frac{97}{23}\right) = 5.22$$

Across all strata the average sample weight was 2.96.

The above weights are based on the Register from 2009 and are therefore subject to bias if the true population has changed significantly since then. Given this potential problem, the survey data is analysed both with and without weighting and the primary report includes only the unweighted data, as this is deemed less likely to introduce significant bias. As a result, inferencing is limited because of cases where, for example, there could be a high range of variation in responses and reliable conclusions cannot be drawn. Some cases include:

- Cross strata (e.g. technical workers are paid more in Governorate A than Governorate B)

- Aggregation across strata (e.g. how important are technical skills in the construction sector? That is, aggregation across all the construction subsectors).

For the firms of size 5-9, sample weights should be used with extreme care as the population strata sizes in the Register are quite large, and the sample sizes are quite small. Using sampling weights as outlined above could lead to situations in which 1-2 sampled firms are weighted to represent 100 or more firms in that stratum. Given these concerns, weights are not computed for the size 5-9 firms and only unweighted data is displayed.

Limitations and potential bias. There are several limitations in the interpretation of the survey results, many of which are a result of the lack of up to date population of firms to draw the sample from.

As previously mentioned, the Register was last updated in 2009 for small- and medium-sized and non-manufacturing large firms. Given the change in economic and societal conditions in Iraq during this time, it is unlikely that the Register provides an accurate representation of the population of firms in the 8 selected governorates. This potential weakness was identified prior to the survey, but given that the Register was the only national reference of firms available, it was determined that it was the best possible reference population.

This discrepancy between the Register and the true population of firms on the ground led to many cases where those firms selected for the sample were no longer operating. Therefore, CSO used the replacement strategy, outlined previously in Chapter 1, to attempt to maintain the needed stratum sizes. Since the firms selected as replacements were not from a national register and were the result of field knowledge from local CSO offices, there is the potential that these replacement firms do not constitute a random sample of the population. Therefore, depending on the true populations of the stratum, this replacement strategy may introduce bias towards those firms known to CSO and possibly larger firms.

Furthermore, in cases where there were insufficient number of firms of size 10 or more the inclusion criteria were reduced to include firms of 7 or more employees, and in some stratum 5 or more employees. There is a total of 643 such firms. Given that the sample was created based on those firms in the Register with 10 or more employees, these firms of smaller size are not representative of the population sampled from. Therefore, these 643 firms of size less than 10 have not be used in the primary analyses referring to firms of larger size.

In principle, these 643 smaller firms could be used to attempt to make inference about the population of firms sized 5-9, although this has several limitations. Most importantly, this sample size is too small to accurately represent the 12,952 firms of size 5-9 in the Register at the subsector level in each governorate.

Moreover, the selection of these 643 firms was non-randomly drawn from the 12,952 firms in the Register and their selection was highly dependent on stratum (as this replacement strategy was only used in strata where not enough larger firms were available). Nonetheless, these 643 firms may be used to provide a snapshot of possible needs of smaller firms, and the data resulting from them are presented in Chapter 5. No strong conclusions should be drawn from them, but the data may help inform future areas of research.

Despite these replacement strategies, the overall sample size (2,010 firms of 10 or employees, 643 of size 5-9) is still potentially low for making inference at the strata level. Therefore, the margin of errors within the strata may be higher than the pre-specified 5%. These margin of errors within the strata depend on both the number of firms sampled within strata, and the variability in the answers given and therefore are difficult to predict prior to analysis. In general, those strata where the sample sizes are lower will likely yield higher margin of errors.

Finally, as mentioned previously, the discrepancy between the Register and the true number of firms in operation makes the calculation of sampling weights problematic. As outlined in Chapter 1, the strata weights are based primarily on the probability of a firm being sampled from the Register. Therefore, since the Register is out of date and some firms were sampled (via replacement) that were not part of the 2009 Register, it is likely that the sampling weights are not calibrated to the true population. Nonetheless, they constitute the best available given the available information, but any analysis involving them should be interpreted with care.

Chapter 2: Introduction to the context for skills development

2.1 Overview of the economic sectors in Iraq and KR-I

Within the Middle East region, Iraq is a medium-sized economy, with a GDP of 574 billion USD in 2015, which is less than a third of the GDP of Turkey or Saudi Arabia and around half of Iran's or Egypt's, but much larger than the GDP of Jordan or Lebanon. The Iraqi population of around 38 million represents less than half of the population of Egypt, Iran or Turkey, similar to that of Saudi Arabia but much larger than Jordan or Lebanon. Standards of living are lower than the MENA average, with an income per capita of 15,780 USD in 2015, much lower than that of Gulf States, behind that of Turkey or Iran, but higher than Lebanon, Egypt or Jordan.

Business conditions are very low compared to the region, with Iraq ranking 165th, much lower than Gulf States or Turkey (69th), Jordan (118th), Iran (120th), Egypt (122nd) or Lebanon (126th). Iraq receives significant FDI, mainly in the oil sector, comparable in the past five years to that of Iran or Egypt, lower than that of Turkey or Gulf States but higher than Jordan or Lebanon. Life expectancy, at around 70 years, and literacy at around 80%, are far below those of neighbouring countries.

Like many large oil-exporters, the Iraqi economy is not very diversified and the government plays a key role in the economy. Indeed, oil activities represented between 45 and 55% of Iraqi GDP between 2010 and 2014, while oil accounts for over 90% of government revenues. In 2014, the largest non-oil economic sectors are transport, storage, information and communication (14% of non-oil GDP), the public sector (13%), construction (13%), wholesale and retail (13%) and real estate (12%).

The public sector accounts for over 60% of Iraq's production, both because of the size of public administration and of its control of large activities: oil, mines, electricity and water. In addition, two-thirds of the banking sector and one-third of the manufacturing sector are run by the state, and it finances most of the construction projects.

Figure 9: Contribution to Iraqi GDP (non-oil economic sectors), 2014

The government also has a monopoly on the purchase, sale and import of several agricultural and industrial goods, and it subsidizes consumption and investment of many goods.

KR-I represents around 11% of Iraqi non-oil GDP. The public sector is as important as in the rest of the country, representing 28% of the region's non-oil GDP, and construction accounts for nearly 20%. In parallel, the private sector plays a larger role in other business sectors.

Iraq relies very much on imports, importing over 15% of its GDP in most recent years. Iraq's main imports are machinery and mechanics, as well as electrical and electronic equipment, both accounting for 10-12% of total imports. China, Turkey and the UAE are its main suppliers. On the other hand, KR-I was responsible for 40% of Iraqi imports in 2014, purchasing mainly from Turkish, Iranian, Chinese and American suppliers.

2014 marked a turning point. The ISIL/Da'esh insurgency in mid-2014 caused significant economic damage. Trade routes were closed, economic activities in the northern regions were held hostage, most notably the agricultural production of the largest Iraqi crops, wheat and barley, which severely declined. Military expenditure also increased substantially. Simultaneously, in 2014, oil prices were halved on international markets, drying up the government's main source of revenues and foreign currency. As a result, the government fiscal deficit more than doubled, from 5.6% of Iraqi GDP in 2014 to 13.7% in 2015.

Figure 10: Oil GDP, non-oil GDP and oil prices, 2009-2015

Meanwhile, the economic and political turmoil drove away tourism and foreign investment, which fell by around 30%.

Iraq's real GDP fell modestly in 2014. In 2015, it grew by 2.4% because of a significant increase in oil production but the sharp fall in the value of that production caused Iraqi nominal GDP to fall by around 30% in 2015, triggering a severe economic recession across economic activities. Sectors in ISIL-held areas were more severely hit, as were sectors that relied extensively on public financing such as construction. Indeed, the sector lost half of its value in 2015, while other more resilient sectors, such as wholesale and retail, fared better. In 2016, growth resumed, with an estimated 11% increase in real GDP.

Figure 11: Selected sectorial GDP, 2009-2015

Upon normalization of the political situation, the country still faces a number of important challenges including economic diversification away from oil-related activities, fighting corruption, training and integrating youth and women in the labour force, building institutional capacity and reducing the size of the informal sector.
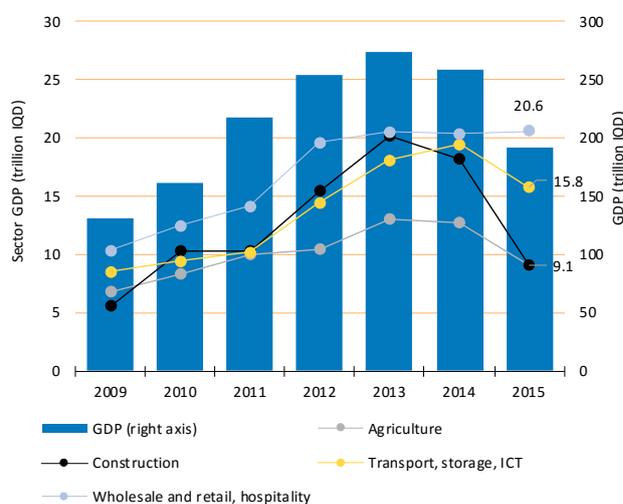
2.2 Overview of the demographics and the labour market in Iraq and KR-I

Table 3: Key demographic and labour market statistics

Population	• Estimated at approximately 38 million in 2016[5] • Growth rate estimated at 3.3%[6]
Age of the population	• Estimated 40.2% are under 15 years • Only 3.2% are over 65[7]
Gender of the population	Approximately 49% are female
Education level of the population	• In 2011 38% had no education[8] • Approximately 50% had primary and intermediate schooling. 11% had a diploma or above
Location of the population	Approximately 70% urban and 30% rural[9]
Working age population	21.5 million[10]
Economically active and inactive	• 42% of working age population was economically active in 2011[11] • National labour force: Estimated at 8 million (2011) to 10.5 million (2017)[12] • In 2014 76.2% of the economically inactive were female, 23.8% were male youth (15-25) represented 42.2% of the economically inactive[13] • In 2014 the formally employed labour force consists of 86.1% males, 13.9% females (12% in KR-I in 2012[14]). Youth (15-25) represented 24.5% of the formally employed[15]
Unemployment	• In 2014 67% of unemployed were males and 33% were females. 51.7% of unemployed were youth[16] • **National:** 34.1% of 15-19 year olds available for and actively seeking work are unemployed[17] • **KR-I:** in 2012 the unemployment rate for female youth was exceptionally high, at 48.3%, compared to 13.4% for young men[18]
Public Sector employment	• **National**: the government provides 40% of all jobs[19] and employs 60% of female workers • **KR-I:** in 2014 the public sector employed 80% of all employed women and 45% of all employed men[20]
Private sector employment	60-70% of jobs in formal and informal private sector employment
Oil employment	Oil accounts for 32% of GDP[21] and over 90% of government revenue, but only 1% of employment[22]

The population of Iraq is approximately 38 million, of which 70% live in urban areas. Around 40% of the population are children under 15 years, and the population is growing at a rate of 3.3% on average. Less than half of the working age population is economically active (i.e. working or looking for work).

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[5] CSO
[6] UN Statistics Division
[7] CSO
[8] CSO; UN
[9] CSO
[10] CSO
[11] UN
[12] ILO
[13] CSO
[14] Save the Children *Assessment of Youth Labour Market and Entrepreneurship Opportunities in the KRG* (2014)
[15] CSO
[16] CSO
[17] CSO
[18] Save the Children *Assessment of Youth Labour Market and Entrepreneurship Opportunities in the KRG* (2014)
[19] UNDP
[20] Save the Children *Assessment of Youth Labour Market and Entrepreneurship Opportunities in the KRG* (2014)
[21] CSO
[22] UNDP

Figure 12 shows employment of male, female and youth workers by economic sector. The education and agriculture sectors have the biggest proportion of women in their workforce, followed by health & social work. Traditional male domains (such as construction) and public facing sectors such as accommodation & services, and wholesale & retail employ a very small proportion of women. Building & construction, and accommodation & services employ the largest proportion of youth (15-25), followed by agriculture, wholesale & retail, and other service services.

Figure 12: Formal employment in Iraq by economic sector and worker profile, 2014
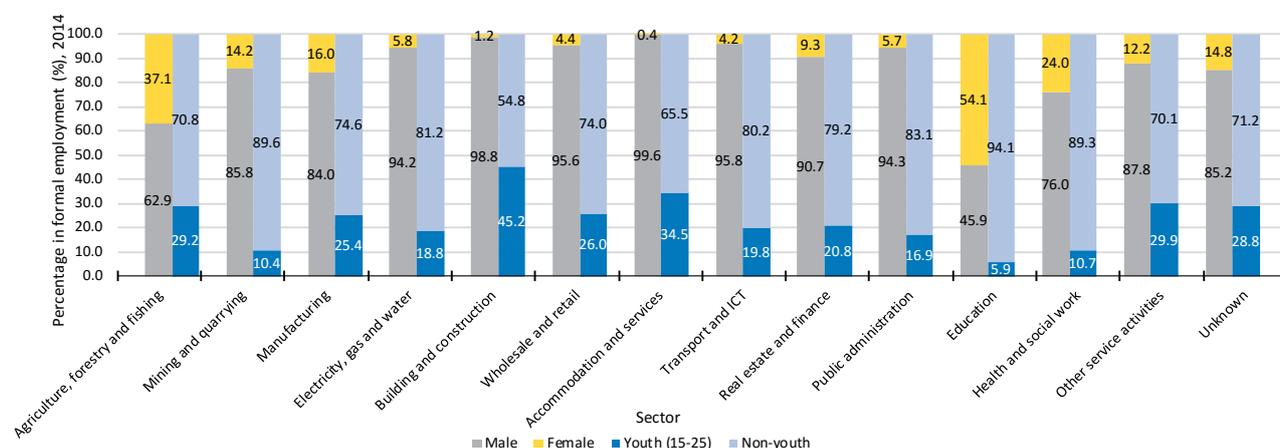
Source: CSO

2.2.1 Public sector employment

For most MENA countries, including Iraq, the public sector is the largest formal employer. Typically, in these countries, the civil service has grown disproportionately large as a result of a social contract in the 1970s and 80s which effectively offered employment to all university and TVET graduates. Even though the public sector is no longer able to absorb growing numbers of these graduates, the public sector is by far the most preferred employer and almost all formal employment is still in the public sector. In some MENA countries (e.g. Jordan), there is a waiting list for public sector positions, and the informal sector is seen as a transition zone where young people wait for public sector administration jobs to be offered. In both Iraq and KR-I there are now measures in place to reduce the size of the public sector.

According to a Save the Children Assessment[23], the public sector in KR-I employs a larger percentage of the workforce, and a much larger proportion of working women than the national average shown in Table 3. Reportedly more than half of all employed people in KR-I work for the government. This number includes people who work directly for the government, a small number who work for state-owned enterprises, and a small number who work in mixed public-private enterprises. According to KRSO, approximately 80% of all employed women and 45% of all employed men work for the government.

The planned downsizing of the public sector in Iraq and KR-I has implications for the informal sector, since the private sector remains underdeveloped, and primarily informal in its operation. The private sector in Iraq consists largely of informal trade. The formal private sector is not ready to absorb the excess of the public sector as well as an estimated million new entrants to the labour market every year.

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[23] Save the Children *Assessment of Youth Labour Market and Entrepreneurship Opportunities in the KRG* (2014)

2.2.2 Women in employment

87% of women in Iraq are economically inactive (not working or looking for work) and 78% are housewives.[24] In KR-I, only 12% of women are economically active. Of those who are economically active (working or looking for work) in Iraq, 13% are unemployed. In 2014 only 13.9% of all citizens who were formally employed were women.

Traditional societal norms cast women as mothers.[25] The working hours of other types of work, that might keep them out of the house after dark, or roles that require them to work with males not in their families, are barriers that contribute to females in Iraq and KR-I not working. However, the UN reported a change in attitudes, noting that 66% of youth, compared to 42% of older people, support women's right to work outside the home.[26] Nationally 60% of all female workers are employed by the government. In KR-I this number is reportedly closer to 80%. In 2011 only 2% of all private sector workers were women.[27] Female unemployment is reportedly lower in rural areas due to high female employment in agriculture.

2.2.3 Foreign workers in employment

Although, according to the Labour Law (under revision) there is no specific requirement for at least 50% of employees of companies to be Iraqi, this condition is part of the Investment Law. In both Iraq and KR-I, the Investment Law states that the investor may employ local and foreign manpower but should give priority to local manpower with an equal skill set.[28] In recent years, however, the government has stopped the granting of work permits for Arab and non-Arab expatriates workers in several instances.[29]

It is difficult for MoLSA to control the number of foreign workers since reportedly *Recommendation 46 (2012)* allows for employers to employ 50% foreign labour, and *Law 80 (2013)* allows foreign companies with government contracts to bring in their own labour without approval for one month. Some of these unregistered workers do not register, or return to their home country, and become illegal immigrants.

MoLSA in Iraq and KR-I issue work permits for 'domestic' and 'project' foreign workers. The cost to the applicant of obtaining a permit is insubstantial, and no disincentive. MoLSA does not have records of technical or professional level foreign workers. There is no complete record of the technical skills or qualifications of foreign workers. Classification and quantification of the skills of foreign workers would be a strong indicator of skills needed in Iraq and KR-I. Information from MoLSA KR-I shows that just over 10,000 foreign workers got permits for project and domestic work in 2015. Foreign workers originate mainly from many countries. In 2015 the largest numbers came from Nepal, Indonesia, India, Ghana, Georgia and Pakistan. Others have come from Iran, Syria, Turkey, the Philippines, Somalia, Ethiopia and Bangladesh. Positions as maids and nannies are often given to women from Bangladesh and Ethiopia.

Foreign labour can be found in all sectors of the economy, in both skilled and unskilled roles. In some sectors, foreign workers are preferred, for example in the hotel and construction industries. The HR

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[24] CSO

[25] Save the Children *Assessment of Youth Labour Market and Entrepreneurship Opportunities in the KRG (2014)*

[26] UN Women in Iraq. Factsheet – CSO/KRSO/UNFPA/Pan Arab Project for Family Health, Iraqi Women Integrated Social and Health Survey (I-WISH 2011), 2012

[27] UN Women in Iraq. Factsheet (CSO/KRSO/UN) Iraq Knowledge Network, 2011

[28] Law No. 4/2006. Investment Law in the Iraqi Kurdistan Region

[29] http://www.tamimi.com/en/magazine/law-update/section-6/march-5/employment-of-expatriate-workers-in-iraq.html

manager of a five-star hotel in Erbil reported in 2014 that of a staff of 303, only 55 were Iraqi Kurds, because Iraqi Kurds do not have the market-relevant skills needed and they lack the necessary command of English and Arabic.[30] Employers and policy makers who were interviewed for this report generally agreed that graduates of the TVET system in Iraq do not have enough practical experience to be useful on the job.

There is a perception amongst employers that foreign workers will work harder and for longer hours, for less money[31] , and make fewer demands on their employers. The typical transaction type described by a foreign labour recruitment agency is 'no questions asked' in exchange for low rates of pay. In 2014, it was reported that foreign labour will work for two-thirds the wage expected by Iraqi youth. Refugees will apparently accept even less than foreign labour. Because exchange rates have changed.

2.2.4 Youth unemployment in Iraq

According to the ILO, the Middle East region has the highest youth unemployment rate in the world at a level of 30% in 2017 (Figure 13). The youth unemployment rate for the Middle East has been more than twice the global and OECD youth unemployment rate since 2014. The OECD youth unemployment rate is reported at 12%, but some individual OECD countries (e.g. Spain, Italy and Greece) have higher youth unemployment rates than the regional rate for the Middle East.[32]

Figure 13: Youth unemployment rates for the Middle East, OECD and world, 2007-2017
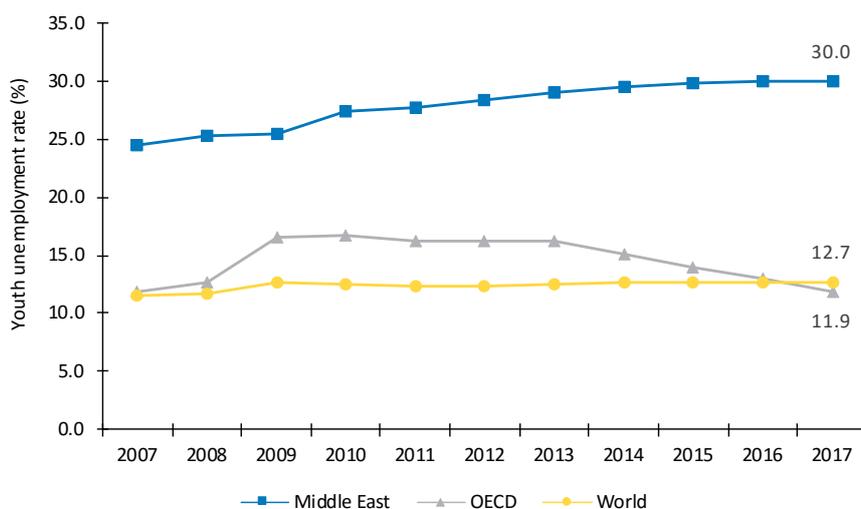
Sustainable development indicators for decent work and economic development include substantially reducing the proportion of youth not in employment, education or training (NEET). Very high unemployment of youth is associated with poverty and social unrest.

The Save the Children Assessment of the Labour Market (2014) states that at the start of 2010, Iraq had the highest rates of unemployment in the Middle East: more than half of the country's young urban males were unemployed as well as the large majority of young women. The official national unemployment rate in Iraq is 11%[33] , youth unemployment stands at 18%, while female youth unemployment reaches 27%, against 17% for males.[34] Youth unemployment rates for KR-I are reported as 48.3% for young women and 13.4% for young men.

[30] Save the Children *Assessment of Youth Labour Market and Entrepreneurship Opportunities in the KRG (2014)*
[31] Ibid
[32] OECD
[33] UNDP
[34] CSO. Labour Force Factsheet (2011)

The youthfulness of the Iraqi population (40.2% are under 15 years) has implications as millions of new workers will enter the labour force in the next 20 years. In KR-I alone it is estimated that over the next 20 years between 850,000 and 1.1 million new workers will enter the labour market.[35] No comparable data was available for the whole of Iraq.

2.3 Overview of the skills supply in Iraq and KR-I

2.3.1 Planning for TVET

The National Development Plan (NDP) for Iraq 2013-2017 has been replaced with the new NDP 2018-2022. The NDPs include some objectives relevant to TVET reform. Other planning for TVET (vocational schools) is included in the National Strategy for Education and Higher Education in Iraq for 2012-2022. There is also a TVET Strategy (2014-2023) for Iraq and KR-I, which is a ten-year strategic plan developed by an inter-ministerial group with funding from the EU and support from the British Council. The TVET Strategy provides analysis of the challenges and opportunities and sets out objectives for eight axes which include these focus areas:

1. Legal and governance framework

2. Infrastructure and equipment

3. Enrolment and private sector participation

4. Quality of staff and recognition of graduates' skills (including NQF)

5. Labour market observatory and occupational standards

6. Research and innovation

7. Quality and accreditation

8. Funding.

In both Iraq and KR-I, the Ministries of Planning are at the centre of planning activities. The identified needs of districts and governorates filter upwards, through municipalities and governorates and other ministries to the Ministry of Planning. The Ministries of Planning work with development partners; commissioning and receiving studies; and co-ordinating and developing overarching planning agenda, in collaboration with the Ministry of Finance. Therefore, planning is an iterative process, which synthesises information from many sources, including 'bottom up' information from all parts of the country, and 'top down' information which is responsive to international developments and country and sector-wide analysis.

Some ministries have quantitative human resource development information which can feed straight into skills training and Human Resource Development planning (HRD). For example, the Ministry of Health in KR-I has produced detailed analysis of over- and undersupply (based on established norms of number of inhabitants per health professional) of all types of health personnel.

The development of a labour market information system has long been suggested and planned, and even attempted, but so far without significant advancement until the implementation of this UNESCO programme. Lack of labour market information has been a major inhibitor to any kind of structured HRD planning.

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[35] Save the Children *Assessment of Youth Labour Market and Entrepreneurship Opportunities in the KRG (2014)*

CSO and KRSO (attached to the two Ministries of Planning) conduct surveys periodically. The last Household Survey was in 2011-12 with an update in 2014. The last Employment and Unemployment Survey was in 2008. Other surveys reviewed for this Sector Skills Analysis project include, for example:

- CSO Hotel and Tourist Accommodation Survey 2012

- CSO Survey of Household Industries 2012

- CSO Repair of Machinery, Equipment and Appliances Services Survey for 2012

- CSO Report on University Education 2013-2014

- CSO Report on Vocational Education 2014-15

- CSO/KRSO Survey of Street Vendors 2015.

Both CSO and KRSO periodically collect and publish data on the productive sectors of the economy, such as crops in agriculture, building and construction, manufacturing and trade. Typically, CSO and KRSO reporting on survey data is descriptive but not analytical. The reader must derive the meaning from the data provided in the tables. The data does not seem to be collected to satisfy specific lines of enquiry, relevant to planning and decision making.

From the interviews conducted for this Sector Skills Analysis Project it does not appear that CSO and KRSO work plans are based on the commissioning of specific surveys and reports by the Ministry of Planning or by other ministries specifically to inform planning. CSO and KRSO operations are based on commitment to updating existing information; so that planners can help themselves to statistical data which exist, as it seems relevant to their purposes.

2.3.2 Financing TVET

Interviews held in Iraq and KR-I suggested that specific budget allocations for education and training are subsumed within the overall budget for ministries' running costs.

Each ministry negotiates its annual budget based on its own perceived short term operating and capital development needs, within parameters which are based on previous budget usage. The MoHESR, for example, will negotiate for a budget slightly larger than the previous budget, irrespective of the development plans of other ministries, which may have implications for HRD.

Ministries (such as MoE, MoHESR and MoLSA) have a budget for the delivery of their core business services, irrespective of the number of students trained. Interviews in Iraq and KR-I suggested that the allocation of funding from the ministries to their education and training institutions is based on historical operating costs, with no mechanisms which enables budgetary consideration to be given to changes in the number of students, or running cost implications of delivering new or amended programmes. There is no per full-time-equivalent student cost formula which provides a baseline for different types and specialisations and levels of education and training.

There is no TVET levy fund in Iraq or KR-I. In many countries education and training is partially funded by a levy on private sector business. Different countries have developed different approaches, and the levy can be based on a percentage of taxable income, payroll or work permits. Contributors to the levy fund also have access to education and training for their local staff.

Education and training at all levels is fully subsidised by the state for those students who meet the required academic entry criteria. Students receive living allowances and other subsidies.

Many countries have found full state-funding of all tertiary education unsustainable in the context of the "massification" of tertiary education, and have introduced various cost sharing schemes. Full government subsidy of all students does not discriminate between those that need financial assistance and those who could afford to contribute to their own education and training. In some countries where all the living expenses of students are fully funded by the government, students prefer to remain enrolled for as long as possible, since study with benefits is preferable to unemployment.

MoHESR is able (by decision of the Council of Ministers) to supplement the state budget allocation through the 'parallel system' of fee-paying students who did not quite meet the criteria for state sponsorship. This provides another source of income for polytechnic and technical universities. Separate streams of government funded students (who got good grades at school) and privately funded students (who did not get good enough grades to meet the entry requirement) are common in some post-Soviet countries. This practice is associated with some risks such as compromising the quality of the qualification by lowering the entry requirement, and institutions may be tempted to raise the official entry requirement for the purpose of generating more income. There may be other ways for institutions to generate income (such as education with production) which are less discriminatory and less compromising.

The mandate of MoLSA is to provide training to people who are registered umemployed. Nevertheless, there is some evidence of private sector companies requesting professional development training for their employees on a per-student fee basis from MoLSA training centres, such as the Swedish Academy in Erbil. Engagement of the private sector in requesting and paying for training seems to be uncommon. In general, social demand, rather than labour market demand, is the driver of enrolment. Numbers of students enrolled are only constrained by space in the classrooms.

2.3.3 Demand for TVET

Social demand for education and training is largely dictated by society values and beliefs. Within such values and belief systems, in many developing countries including Iraq, there may be a strong belief in a hierarchy of occupational status, in which young people with the "best" results should become doctors, and those with the next best grades should, for example, become lawyers or engineers. This is reinforced by the post-secondary admission system that limits entry into programmes which lead to such occupations. In this way, many young people train for the highest status occupation for which they can meet the entry requirement, rather than the occupation which suits them in terms of their aptitude or the occupation for which there is labour market demand.

Another factor which determines enrolment behaviour in Iraq, and in many other developing countries, is the historical legacy of public service employment, which was permanent and pensionable with many benefits. Even though the governments of Iraq and KR-I no longer absorb all graduates, and plan for mandatory downsizing of the public service, the idea of being qualified to work in the public service is still a very compelling option for young people and their families.

Certain occupations are very low down in the occupation hierarchy, such as hospitality services, and 'dirty jobs' such as blue-collar jobs in construction. Working in the private sector is unattractive, since it is believed that the work in the private sector offers lower pay, less job security and little or no social security. The private sector is very small as well as underdeveloped (mostly informal), and therefore offers less opportunities than the public sector.
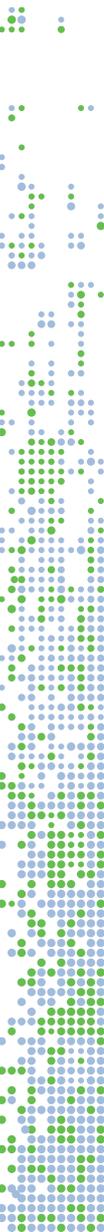
2.3.4 Employment of graduates

As a result of these dynamics of preference, there may be a surplus of graduates for high status occupations such as engineers, and "white-collar, high security" jobs such as administrators, bankers and statisticians, and these graduates may be more likely to face unemployment than their peers. However, since there is no practice, in any of the education and training providers, of systematically following up TVET graduates (tracer studies) to find out how well their training prepares them to enter the workforce or pursue further study, there is only anecdotal evidence about employment and unemployment of graduates in each field of work.

Interviews with the Vice President and the Career Development Advisor of a Polytechnic University in KR-I, and with MoHESR and MoLSA in Iraq and KR-I, confirmed that there is no surveying of graduates (tracer studies), and despite the strong direction in the TVET strategy, there is still very little meaningful interaction between employers and training institutions.

Many countries which have experienced extreme regime changes (like post-Soviet countries), seem in some respects, to have "thrown out the baby with the bathwater" in their drive to distance themselves from the past. In Iraq, there is sense that some of the systems of the past had merit and should not have been discontinued without anything to replace them.

One example of a discontinued good practice from the past is the practice of surveying graduates. Even though the intention to survey graduates is still current and even recently renewed, it was not possible, over the course of several interviews, to locate a single example of a past or current graduate survey instrument.

2.3.5 Relationships between TVET providers and employers

Good practices of the past which were impacted negatively, and even completely disrupted, by political and social upheaval include the practices of close relationship between training providers and (often adjacent) production sites including factories, farms and service providers. These relationships offered easy access to work-based practice experiences, continuous employer feedback on student and graduate skills, and employment opportunities for graduates.

Another loss is the practice of "training-with-production," which includes actual production of goods and services for sale (revenue steam for the institution and the 'workers') and actual work experience for trainees, within the concept of training. More recently there is a small resurrection of this concept in the form of 14 "experimental" agriculture "training-with-production" programmes (MoE Iraq) with financial benefits for all parties, including trainees.

Many of the interviewees and pilot Sector Council participants, in both Iraq and KR-I, made the point that the training in technical fields which is currently offered in the institutes and colleges of MoHESR is very theoretical in nature, and is designed to prepare people for desk jobs in ministries. This is reportedly true of most fields of training, including those which would be expected to lead to practical work, such as agriculture and highway engineering. The Contractors Union reported that despite the availability of graduates in construction trades, the standard practice of building contractors is to hire unqualified labour or unskilled labour, and train them on the job.

The concept of 'summer training' which is intended to provide work experience for TVET students during 'vacation' periods is an example of a potential enhancement of the training to increase the practical skills and employability of graduates. The fact that educators are not paid to supervise

summer training is certainly a contributing factor to the failure of the concept to provide meaningful work experiences for learners. Supervision of work-place-based work experiences should be part of the assigned workload of educators and trainers. Work experiences need to be designed with close alignment to the competencies (learning outcomes) to be achieved, and closely supervised and monitored to ensure that learners have sufficient range of opportunities to practice and demonstrate their competence. Work experience should be a meaningful and worthwhile experience which is valued by learners, as well as a 'credit-bearing' component of the training programme.

An example of good practice for 'summer training' was provided by the Ministry of Transport (MoT) which offers 'summer training' to over 750 students each year. Experience with public universities is not positive (students don't show up), but MoT has good experience with some private universities (e.g. Al Mansour). Their students are supervised by University staff and can be sent to the field (i.e. they have useful skills) and the University requests a report on each student. This successful experience can provide a model of good practice.

2.3.6 Provision of vocational preparatory education by MoE

Vocational preparatory education consists of 3-year programmes (equivalent to Years 10, 11 and 12) in vocational schools and institutes. Over 400 schools and institutes offer these programmes in Iraq and KR-I with a total enrolment of just under 60,000 students (over 50,000 in Iraq and around 8,000 in KR-I). More specialisations are offered in the governorates of Iraq than in KR-I (as shown in Figures 14 and 15). In Iraq, electricity and computer maintenance are the most popular vocational specialisations. In KR-I, student enrolment in trade and commerce programmes (accounting, administration, and commercial and tourism management) account for approximately half of all MoE vocational education enrolment.

Figure 14: Vocational education average cohort size by specialisation in Iraq, 2015-2017
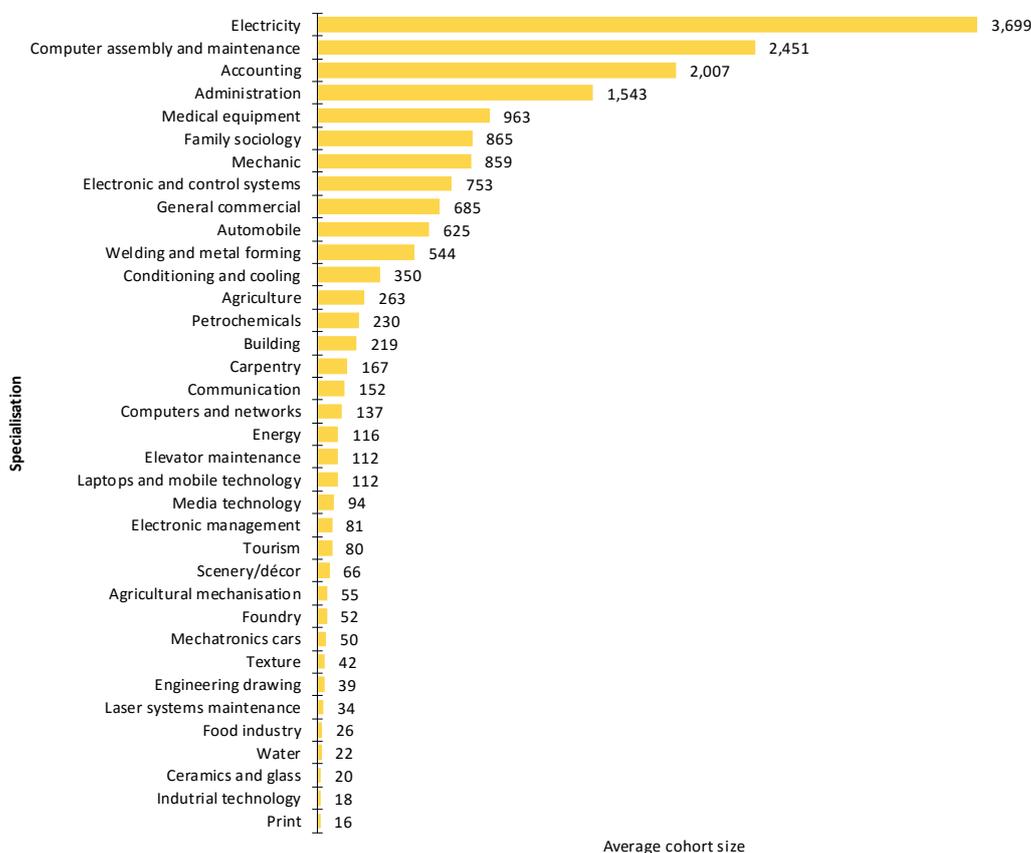
Source: Author compiled from tables provided by MoE Directorate of Vocational Education, February 2017

Figure 15: Vocational education average cohort size by specialisation in KR-I, 2015-2016
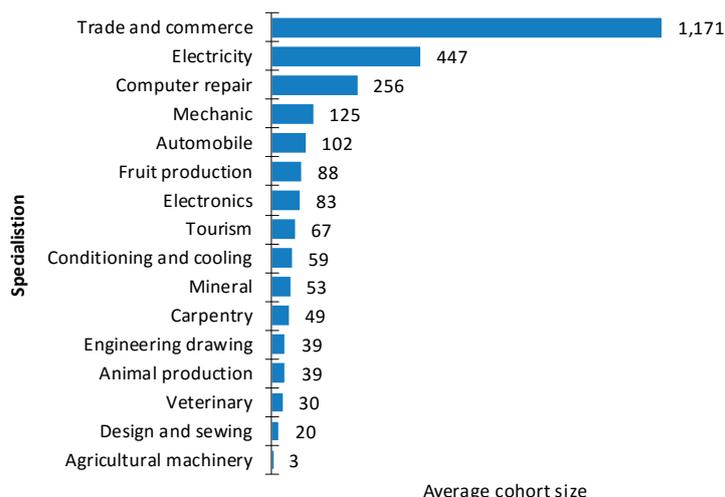
Source: Author compiled from tables provided by MoE Directorate of Vocational Education, January 2017

2.3.7 Provision of technical education by MoHESR

TVET programmes are offered in institutes and colleges. Institute programmes are 2-year programmes leading to diploma qualifications and college programmes are four years long, leading to bachelor degree qualifications.

In Iraq, there are 4 technical universities with 29 institutes and 16 colleges (total 45 institutions). Data received from MoHESR for this report are insufficient to estimate an average cohort size, and numbers are affected by closure of some institutes and colleges in areas which were under ISIL/Da'esh control.

Table 4: Total enrolment in Iraq technical universities, 2014-2015

Technical university	Total enrolment 2014-2015	New intake 2014-2015
Northern Technology University	8,708	2,870
Central Technology University	40,169	12,200
Middle Euphrates Technology University	27,323	9,227
South Technical University	21,360	5,606
Total	97,560	29,903

In KR-I, there are 3 polytechnic universities with a total of 36 institutes and colleges, and total estimated enrolment of 12,341 students each year.

Table 5: Total enrolment in KR-I polytechnic universities, 2013-2016

Polytechnic university	Total enrolment over the period 2013-2016	Average cohort size per year
Duhok Polytechnic University	9,648	3,216
Erbil Polytechnic University*	14,295*	4,765
Sulaymaniyah Polytechnic University	13,082	4,360
Total	37,025	12,341

*One of EPU's submission had an incorrect total of 13,981

2.3.8 Provision of vocational training by MoLSA

In Iraq, there are 38 MoLSA training centres with an average annual MoLSA cohort size of 16,659. Students are 66% female. The largest enrolment in this group is in business innovation (which may be linked to small loans) and is followed by the next four largest specialisations of sewing, computing, hairdressing, and English language. These top 5 specialisations make up over 70% of total enrolment (Figure 16).

Figure 16: MoLSA Iraq vocational training average cohort size by specialisation, 2013-2015
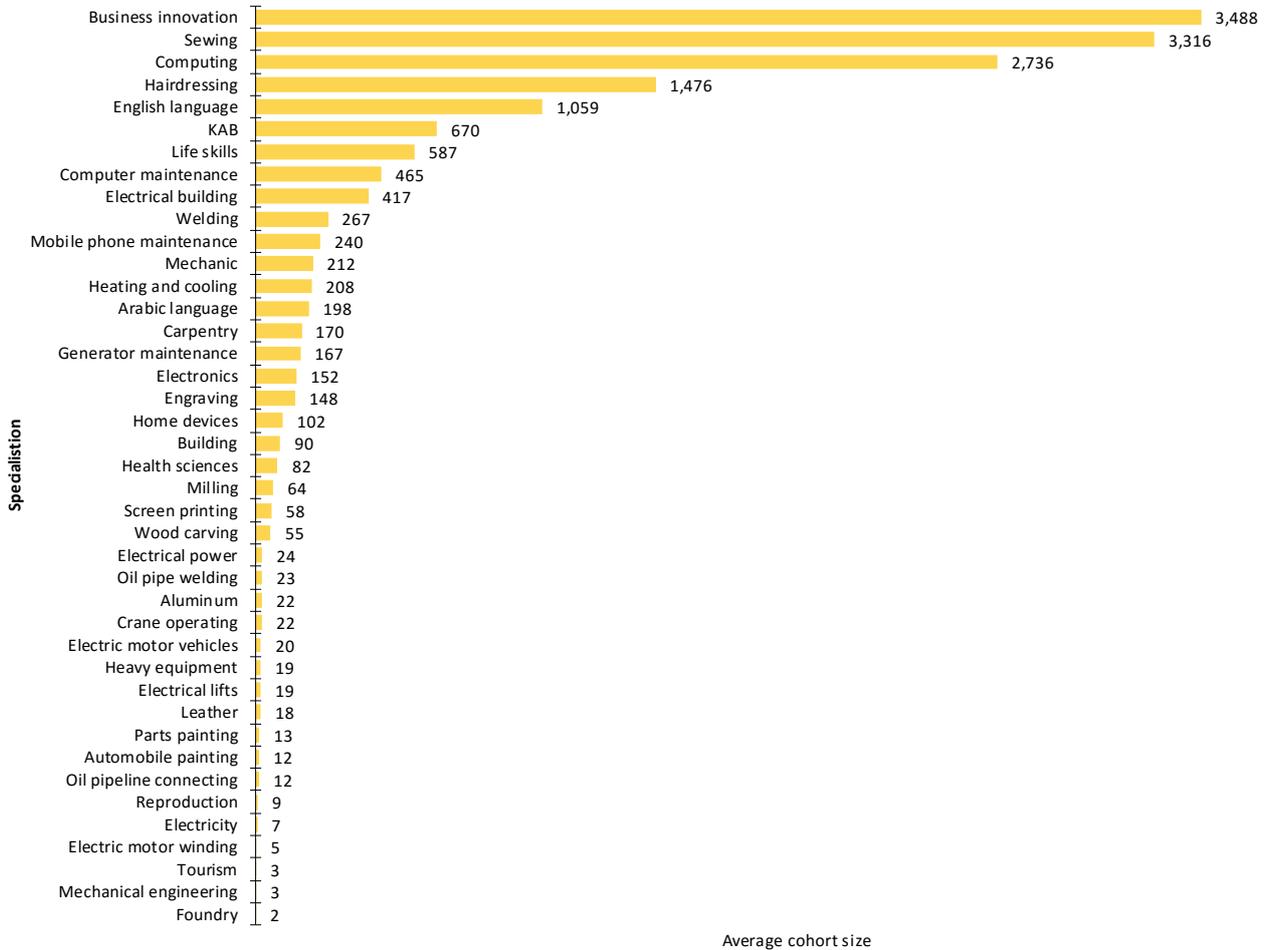
Source MoLSA Iraq

In KR-I there are 7 MoLSA training centres. Total enrolment was 1,504 in 2014 and 1,414 in 2016. The data from MoLSA KR-I shown in Figure 17 below is an amalgamation of three data sets with data cleaning modifications. Computer, sewing and English language courses have the biggest share of enrolment (over 50%). MoLSA KR-I students are 55% male and 45% female. Dahuk has by far the largest share of MoLSA enrolment in KR-I (34% of enrolment) and Erbil has the second highest share (18%).

Figure 17: MoLSA KR-I vocational training average cohort size by specialisation, 2014-2016
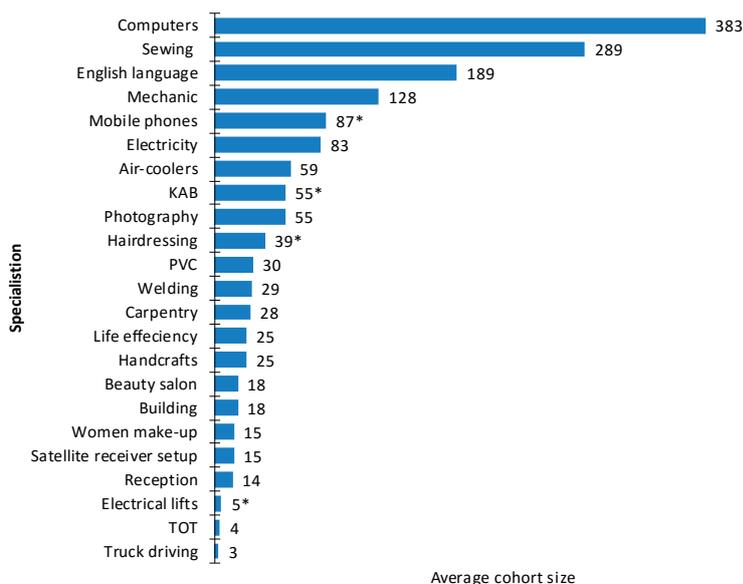
Source: MoLSA KR-I, and Swedish Academy enrolment for 2015

*Note: * represents adjusted figures*

2.3.9 Provision of technical and vocational training by other ministries

Tourism and Hospitality

The nine tourism and hospitality institutes in Iraq provide pre-service training in four programmes each of three years duration with a total enrolment of 756 students in 2015-2016. The institutes are as follows:

- Baghdad Center for Tourism & Hospitality, Rasafah (3 branches)

- Najaf Center for Tourism & Hospitality

- Karbala Center for Tourism & Hospitality

- Ninive Center for Tourism & Hospitality

- Dkar Center for Tourism & Hospitality

- Basra Center for Tourism & Hospitality

- Muthana Center for Tourism & Hospitality.

Data from the Board of Tourism Iraq includes both enrolment and graduation rates but it is not possible to extrapolate a sensible graduation rate from these data (graduate cohorts appear to be more than 100% of the relevant enrolment cohort which may indicate a high repetition rate). What is clear from both enrolment and graduation data is that numbers of enrolment have more than doubled since 2012 and the number of graduates is nearly four times the number in 2012.

Four specialities (cooking, hotel management, accommodation, and reception) are offered in 3-year programmes. The three years of training are organized as follows: two years of theoretical and practical training and a year of internship in a reputable touristic establishment (public or private).

Information on new enrolments in 2015-2016[36] (189 for accommodation and 202 for reception) suggests that in the future there will be more graduates in these two areas, whereas enrolment for

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[36] Board of Tourism Iraq

cooking (182) and hotel management (183) suggest little expected growth in skills supply in those two areas.

The KR-I Tourism Training Centre has a training and production kitchen, restaurant, canteen and hotel rooms. However, currently the facility is substantially used by the Ministry of Municipality and Tourism for office space, since the delivery of programmes is not expected to start until a future date.

Agriculture

The Ministry of Agriculture Iraq has 78 training centres all over the country for professional development of farmers and Ministry staff. Specialised training includes focus on rural women and rural youth.

Communication

The Ministry of Communications (MoC) Iraq offers training through its Higher Institute for Communications and Post.

Transport

The Ministry of Transport's Department of Training and Development coordinates three existing training centres for civil aviation (two campuses), sea port and railways, which are partially operational.
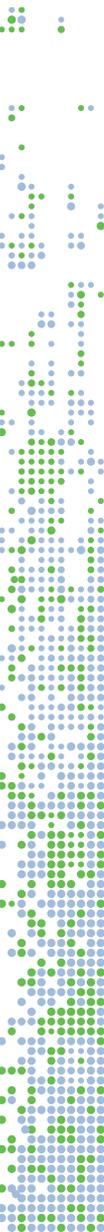
3.1 Key statistics and overview of the sector

Table 6: Key statistics of the agriculture sector

Size of sector	9.1 billion IQD in 2015
Importance of sector	• 7% of non-oil GDP in 2015 • 5th largest non-oil sector in 2015
Employment	• Around 23% of employment in 2012 • Employment is 63% male and 29% youth (15-25 years old)
Share of the private sector	99.5%
Largest subsectors	• Growing of wheat • Growing of barley • Growing of tomatoes, melons, eggplants, cucumbers • Breeding of sheep and goats
Main governorates active	• Wheat and barley: Ninewa • Rice: Najaf, Qadissiya • Ruminants: Sulaymaniyah, Ninewa • Chicken: Babylon
Current conjuncture	• Fast growth between 2009 and 2013 (average of 18% per annum) • Sharp decrease between 2013 and 2015 (average of -16% per annum)
Main challenges	• Access to water • Support to farmers for crops and equipment • Technological and medical upgrading

Agriculture is a crucial sector in Iraq and KR-I as it vital to food security, with vast opportunities for economic growth, and it employs a large share of the population. As a result, it is an absolute government priority.

In 2014, agriculture was the 6th largest economic sector in Iraq, representing 8.4% of non-oil GDP. In 2015 it was the 5th largest sector, contributing 9.1 trillion IQD to GDP Figure 18.

Figure 18: Components of non-oil GDP in Iraq including KR-I, 2015 (current prices)
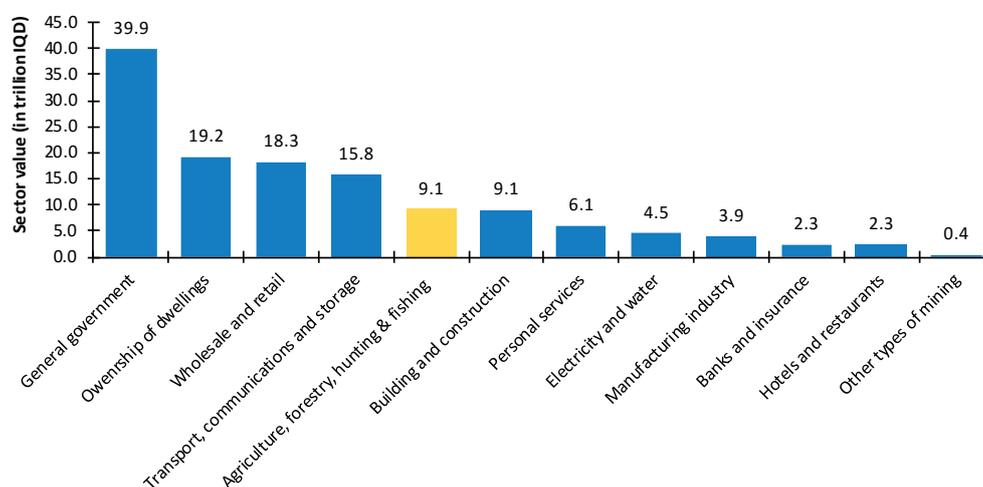
Source: CSO

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[37] In this report, the short name 'Agriculture' is used to refer to this sector

KR-I has better conditions for agriculture and higher agricultural productivity, yet in 2012 agriculture was KR-I's 10th largest economic sector, representing only 3.1% of KR-I non-oil GDP, amounting to 0.8 trillion IQD.

Figure 19: Components of non-oil GDP in KR-I, 2012 (current prices)
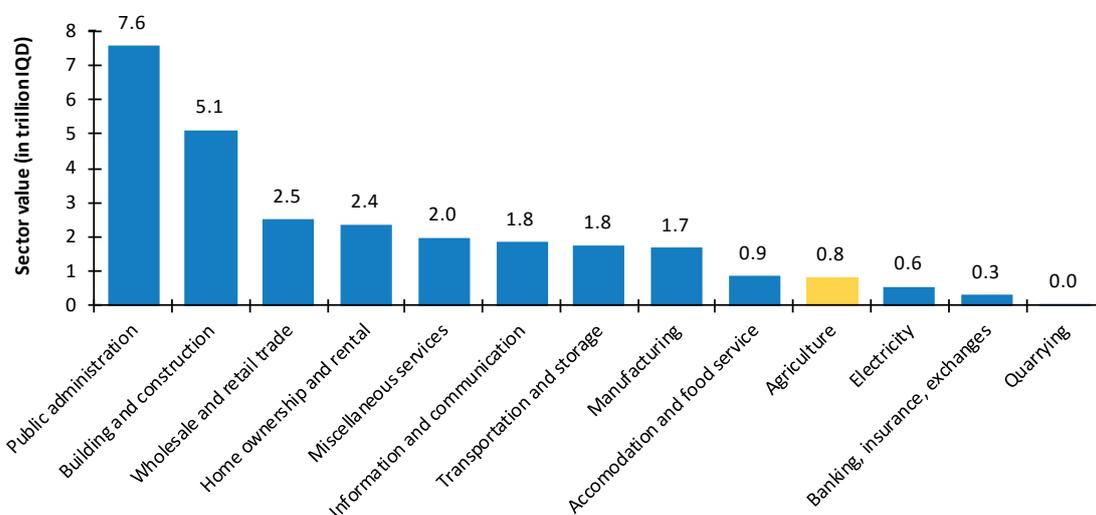
Source: Abramzon et al.

Nonetheless it is a sector of prime importance. Firstly, because it is key to food security in a country where food security is currently a concern: in 2017 it was estimated that 2.4 million people in Iraq were in need of food aid, especially Internally Displaced Persons (IDPs), refugees, and returnees.[38]

Secondly, agriculture is important because the sector as a whole presents opportunity for economic growth and diversification. Currently, only a portion of available land suitable for cultivation is being used. Productivity is not maximized and can be increased with improved methods and inputs, and local demand for most agricultural products is not met by domestic production. Iraq imports most of its food needs. Much of the land remains unused or under utilized because of conflict, lack of skilled human resources, and poor quality water for irrigation.[39]

Lastly, it is important because production of crops and animals, and agro-industries are labour-intensive and employ approximately 23%[40] of the labour force in Iraq, including some of the most vulnerable groups. Agriculture can provide livelihoods for unskilled, illiterate, rural or poor people. Iraq's rural population is 35% of the total population[41] but 40% of the total poor. This sector is especially important for reaching unemployed female youth, since there is easier access to employment for women in rural agriculture.[42]

As a result, agriculture is of primary importance to the governments of Iraq and KR-I, second only to the oil sector, according to the Government of Iraq.[43] The three pillars for the Government of Iraq's strategic plan for agriculture (in collaboration with the Food and Agriculture Organization of the United Nations (FAO)) are to improve the capacity of public institutions, enable market-based agriculture with policy reforms, and invest in local markets, irrigation, farm inputs, extension and animal health services.[44]

[38] FAO. "Global Information and Early Warning System: Country Profiles- Iraq," 2017
[39] Save the Children. "Youth Labour Market and Entrepreneurship: Opportunities in the KRG Assessment," 2014
[40] UN Data. "Iraq"
[41] Ministry of Agriculture. "Agricultural Reality Challenges and Ambitions," 2017
[42] Save the Children. "Youth Labour Market and Entrepreneurship: Opportunities in the KRG Assessment," 2014
[43] Ministry of Agriculture. "Agricultural Reality, Challenges and Ambitions," 2017
[44] Save the Children. "Youth Labour Market and Entrepreneurship: Opportunities in the KRG Assessment," 2014

Geographical characteristics determine to a large extent the agricultural potential of the governorates, and in particular, access to water. There are two main types of agricultural practice in Iraq: cultivation of rain fed arable land and cultivation of irrigated land. Northern governorates benefit from substantial rainfalls, with Sulaymaniyah and Dahuk receiving over 500 mm of rain yearly, followed by Erbil, Ninewa, Kirkuk and Diyala.

Figure 20: Average yearly rainfall by millimetre (mm) and governorate
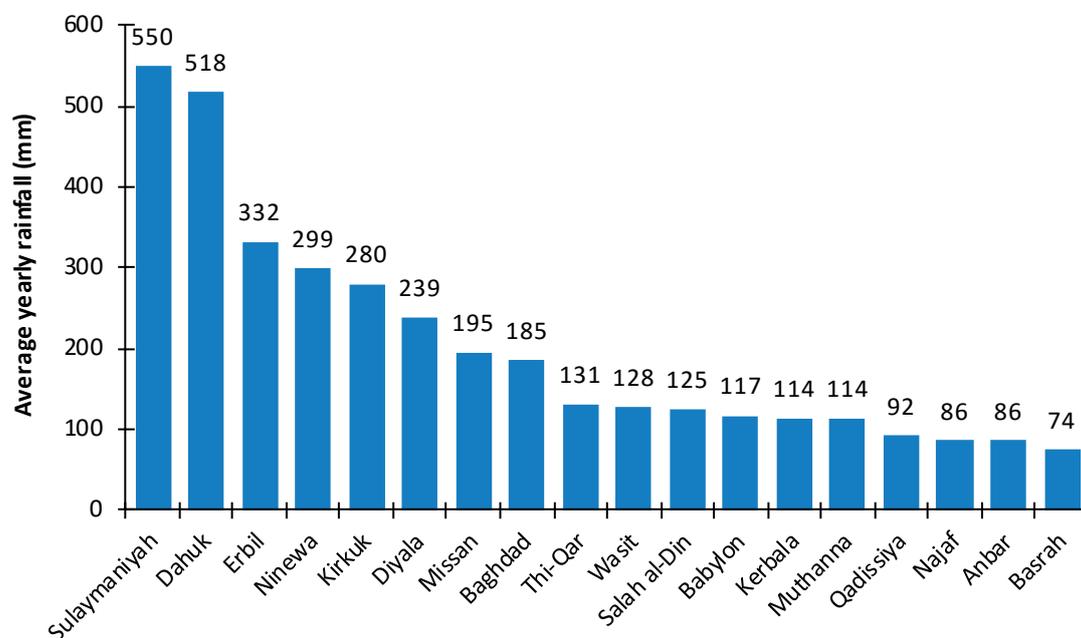
Source: CSO

Central and southern governorates mostly depend on rivers for irrigating their land, namely the Tigris, the Euphrates and their tributaries, although their capacity has fallen to a third of normal capacity in the past 30 years. Groundwater sources are frequently used, although the availability and dynamics of groundwater sources are poorly understood.[45] Natural lakes make up 39% of the 600,000 to 700,000 hectares of water cover in Iraq. The total area equipped for irrigation is around 3.5 million hectares and the agricultural sector accounts for 90% of total water consumption[46]; while two million Iraqis face severe drinking water shortages according to the Ministry of Water.[47]

As a result, a large share of crop and livestock production is situated in the northern governorates and along the Tigris and Euphrates. The map in Figure 21 shows the broad repartition of agricultural activities along the Iraqi territory.

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[45] UNESCO. "Advanced Hydrogeological Survey for Sustainable Groundwater Development"
[46] FAO. "Iraq Agricultural Sector Note," 2012
[47] UNESCO. "Advanced Hydrogeological Survey for Sustainable Groundwater Development"

Figure 21: Map distribution of land use and important crops in Iraq

Legend:
- Woodland forest
- Meadows and pastures (sheep and cattle)
- Arable land
- Irrigated farming
- Rough graxing nomadic herding
- Wasteland

- Barley
- Cotton
- Dates
- Rice
- Vegetables
- Wheat
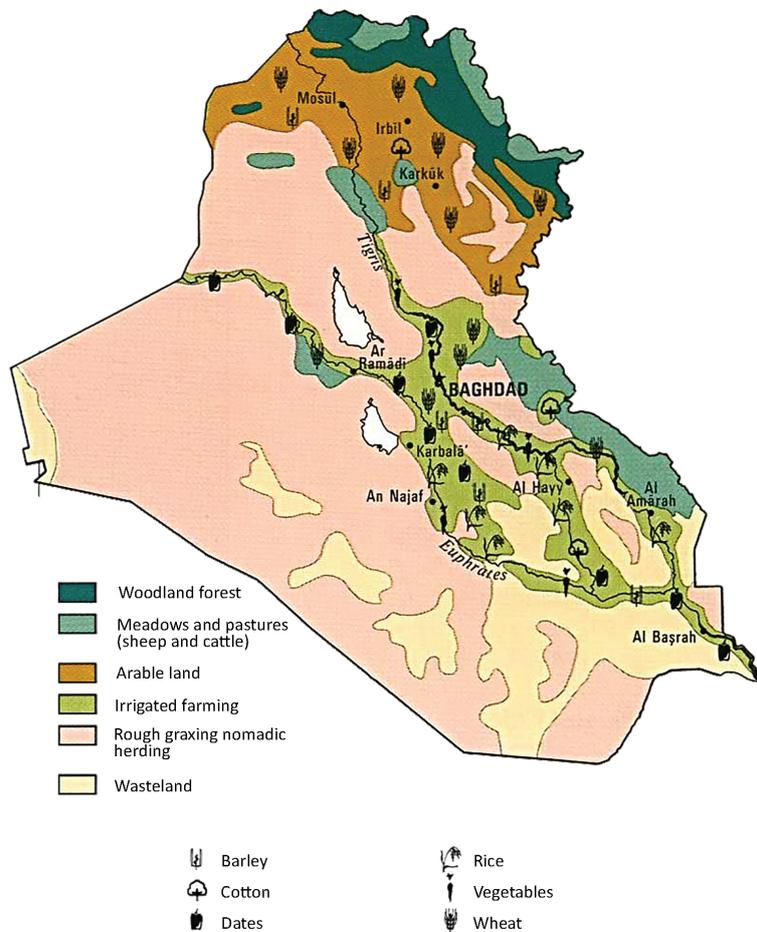
Source: The University of Texas at Austin. "Perry-Castañeda Library Map Collection," 2003

As with the rest of the economy, the agricultural sector is in recession since 2013. After steady growth, and having grown nearly 18% per annum between 2009 and 2013, the sector remained stable in 2014 and fell by approximately 28% in 2015 (Figure 22).

Figure 22: Agriculture sector value (in trillion IQD), 2009-2015
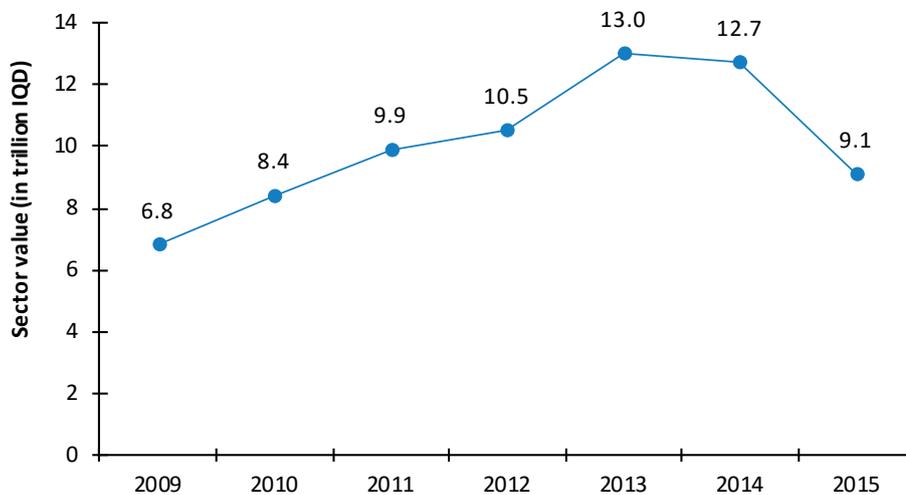
Source: CSO

The agricultural sector in Iraq has faltered due to conflict, poor access to water, land erosion, the spread of sand dunes, a challenging legislative environment and low public and private investment in new technologies for equipment, irrigation, farming, and fishing. Poor marketing and difficult logistics including insufficient transport infrastructure, lack of cold storage, and storage facilities which can cause a loss of crops before they reach the market.

3.2 Structure of the sector and types of enterprise

Some of the most important stakeholders in Iraq in the agricultural sector are government ministries.

The Ministry of Agriculture oversees the sector and controls several state-owned companies (SOCs) that provide agricultural production inputs such as fertilizers and agricultural chemicals. It also has a General Board for fish resource development and a state company for veterinary services.

The Ministry of Industry and Minerals (MIM) also controls several agro-industry companies that process agricultural products such as dairies, cattle feedlots, sugar refineries, vegetable oilseed extraction and processing facilities; and produce agricultural inputs, including fertilizer plants and an equipment assembly plant.

The Ministry of Trade runs the state company for foodstuff trading, the state company for grains industry and the state company for grains trading. It is home of the Grain Board of Iraq that sources grain internationally and from Iraqi farmers. The Ministry also oversees the public distribution system (PDS) that provides Iraqis with basic food supplies.

The Ministry of Water Resources oversees the allocation and distribution of water, the Ministry of Planning has a role in strategic planning, and the Ministry of Finance for allocating the state budget.

The Agriculture Cooperative Bank of Iraq finances the purchase of agricultural inputs and agricultural investment. The State Board for Seed Testing and Certification is responsible for quality control of seeds.

In the private sector, the main actors include the Federation of Iraqi Chambers of Commerce, whose role is to represent the interests of the private sector in Iraq and abroad, monitor national trade conditions, help develop private economic activity and coordinate the governorate Chambers of Commerce. The Iraqi Businessmen Association represents Iraqi businessmen in Iraq and abroad, seeks to defend their interests in policy-making as well as to promote existing economic opportunities available to them.[48] There are also several sector-specific professional and farmer's associations, unions, federations, for example (not limited to):

- Confederation of Farmers & Agriculturists in Iraq
- General Union for Peasant Associations
- Green Mada'in Association for Agricultural Development
- The Iraqi Poultry Producers Association (IPPA)
- Union of Honey Bee Producers and the Iraqi Beekeepers Association.

There are also NGOs and research centres dedicated to agriculture in Iraq, such as (not limited to):

- The State Board for Agricultural Research (SBAR)
- Plant Protection Research Centre (Baghdad)

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[48] Iraq Trade Information Centre. "Federations and Vocational Organizations," 06 September 2011

- Center for Water and Soil Research (CWSR)

- The General Board for Fish Resource Development

- Two NGOs in Basrah for marine fishes.

In KR-I, the Ministry of Agriculture and Water Resources oversees the sector, while the Ministry of Trade and Industry and the Ministry of Planning also contribute to the development of the sector.

The Kurdistan Region Chamber of Commerce and Industry, the Businessmen's Union, the Farmers Association and their branches in each governorate, are the major private stakeholders. There are also several industry-specific associations, such as (not limited to):

- Kurdistan Bee Keepers organization

- Olive Oil Cooperatives Association

- Agricultural Supplies Trading Association

- Green House Development Association

- Poultry Industry Higher Committee

- Goran Association for Potato Producers and Developers - Kurdistan Region.

Farming activity is mostly small, family operated production.[49] It is estimated that 80% of farms are less than 10 hectares.[50] Most farms are either small holdings or "restricted sufficiency" and there are only a few small and large scale commercial farms.[51] Farming activities are either organised as standalone farms, cooperatives of several farmers, or larger companies.

There is limited use of modern or semi-intensive farming techniques or integrated crop and livestock production. Integrated farming is more effective and sustainable, meant to reduce the negative effects of poor farming practices. Integrated farming combines the production of livestock, crops, and fish, for example using manure for fish culture, or cyclic farming, allowing animals to graze fields that are being left fallow. There is frequently "mixed farming" i.e. nomadic flocks and sedentary farmers who combine livestock and farming, but it is not usually integrated. The "traditional system" of grazing animals dominates in Iraq. Families may have a few goats, sheep, or even cows for milk, but this is mostly subsistence farming. There are also animal fattening operations for meat production.

In Iraq, the Ministry of Planning estimates that agricultural holdings are owned by farmers 64% of the time, or rented/leased by the farmers in 32% of cases (Figure 23). In KR-I, agricultural land is owned 58% of the time, while it is rented on an agricultural contract 34% of the time; with some variation by subsector.[52] For instance, over 70% of chicken farms are privately owned, and only 18% are rented. Many existing farms are not operational; for example, in KR-I there are 1,179 poultry farms, but only 75% are working.[53]

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[49] Save the Children. "Youth Labour Market and Entrepreneurship: Opportunities in the KRG Assessment," 2014
[50] FAO. "Iraq Agricultural Sector Note," 2012
[51] Ministry of Agriculture. "Country Report: Animal Genetic Resources," 2003
[52] KRSO. "Poultry Farm Report in Kurdistan Region 2013," 2015
[53] Ibid

Figure 23: Agricultural holdings in Iraq (excluding KR-I), by ownership structure
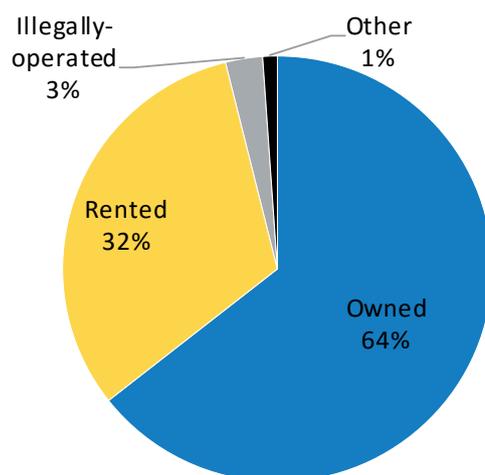
Source: Ministry of Planning. "National Development Plan 2013-2017," 2013

Industrial food and beverage processing in Iraq, which produced products worth 2 trillion IQD in 2014, is done mostly by large firms (over 60% of the production). Food and beverage processing industries represented 20% of total manufacturing activities. In KR-I, food processing is mostly (80%) done by small firms and the value of their production nearly reached 1 trillion IQD in 2013. In Iraq and KR-I, over 80% of food processing is done by private firms.

3.3 Types and distribution of products and activities

3.3.1 Categories of agriculture activity

The International Standard for Industry Classification (ISIC), divides the agricultural sector in three broad categories:

- Crop, animal and hunting
- Forestry and logging
- Fishing and aquaculture.

Table 7 below shows the agricultural activities selected for this report, according to the International Standard Industrial Classification of All Economic Activities, Revision 4 (ISIC-4).

Table 7: ISIC-4 Classification of activities in agriculture

Section: A (Agriculture, Forestry and Fishing)		
01	**Crop and animal production, hunting and related service activities**	
	11	Growing of non-perennial crops
	12	Growing of perennial crops
	13	Plant propagation
	14	Animal production
	15	Mixed farming
	16	Support activities to agriculture and post-harvest crop activities
	17	Hunting, trapping and related service activities
03	**Fishing and aquaculture**	
	31	Fishing
	32	Aquaculture

Crop and animal production, however, comprise most of the sector as there is very little forest activity in Iraq, and fishing and aquaculture represents only around 2% of the agricultural sector. Indeed, when constructing its agricultural index, CSO uses a weight of 84% on plant production (crops, trees, vegetables etc.), 14% on livestock and 2% on fish production, to represent Iraqi agricultural activities (Figure 24). According to the Food and Agricultural Organization (FAO), crop production provides 75% of income for farmers in Iraq.[54]

Figure 24: Breakdown of agriculture subsectors in Iraq, 2014

Plant production   Fish production   Livestock
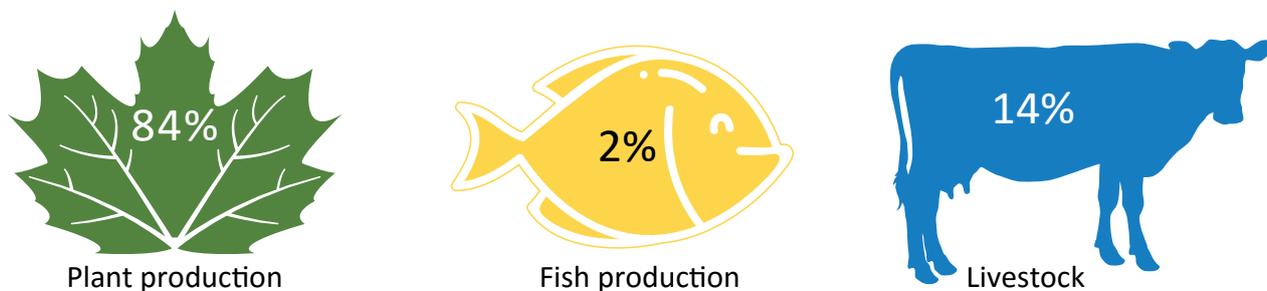
3.3.2 Crop production

Although crop production and animal production are analysed separately, in reality farmers often engage in mixed farming: they rely on a mix of crop and some livestock such as backyard poultry.

Most of the cultivated land is used for growing wheat and barley which require large fields for production. The remainder is mostly used for orchards, dates, oil seeds rice and tomatoes.

Figure 25: Repartition of the cultivated areas in Iraq
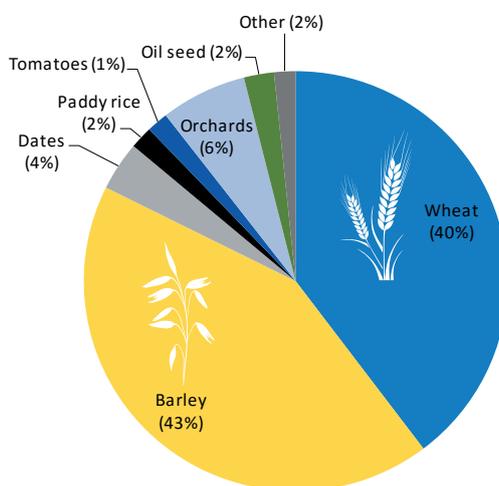
The most important crops are barley and wheat, followed by dates, corn, and rice. Almost all the cultivated arable land is used for barley and wheat production in winter, mostly in the north and central rainfed areas. Table 8 belows shows the crops cultivated in KR-I, according to the season.

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[54] FAO. "Iraq Agricultural Sector Note," 2012

Table 8: Crops cultivated in KR-I by season

Winter crops		Summer crops	
Wheat	Radish	Rice	Squash
Barley	Lettuce	Sunflower	Okra
Red onion	Table beet	Green gram	String beans
Green broad beans	Garlic	Cotton	Green beans
Swiss chard	Carrot	Tobacco	Green onion
Cauliflower	Sunflower	Corn	Watermelon
Cabbage	Corn	Peanut	Melon
Turnips	Coriander	Sesame	Cucumber
		Tomato	Green pepper
		Cucumber	Gourd
		Eggplant	Potatoes

Source: KRSO. "Agricultural Areas in the Governorates of the Kurdistan Region," 2012

In Iraq (excluding KR-I), cereals are the most produced agricultural product. In 2014, before the sharp fall in production, over 70% of the production was wheat, 18% of barley, followed by rice (6%) and corn (4%).

Figure 26: Main crop production in Iraq (excluding KR-I), 2012-2016
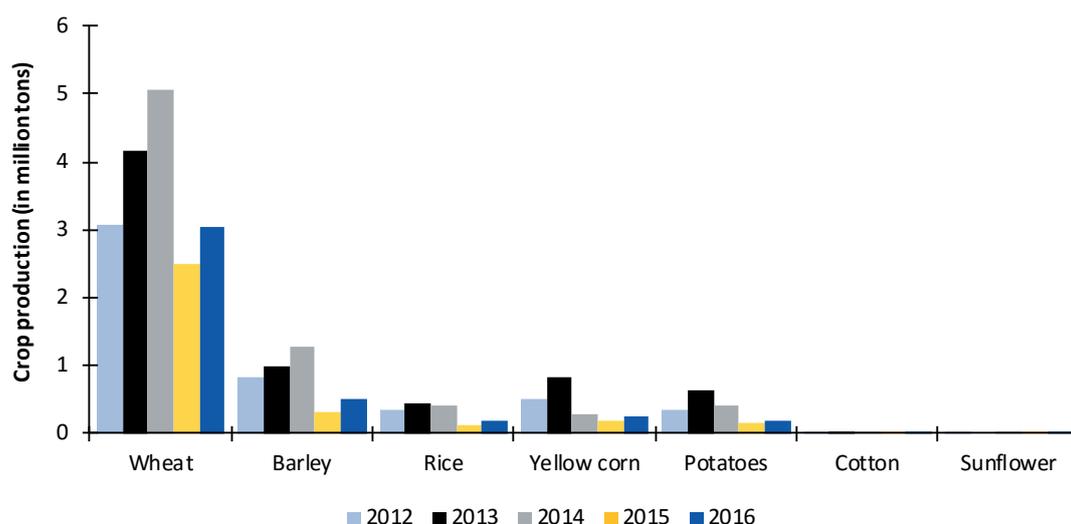
Source: CSO

Irrigated wheat production, as opposed to rain-fed production, yields most Iraqi (excluding KR-I) wheat production (as shown in Figure 27): around 70% of the cultivated land is irrigated and over 75% of the production is from irrigated land.

Figure 27: Wheat production in Iraq (excluding KR-I) by method, 2004-2015
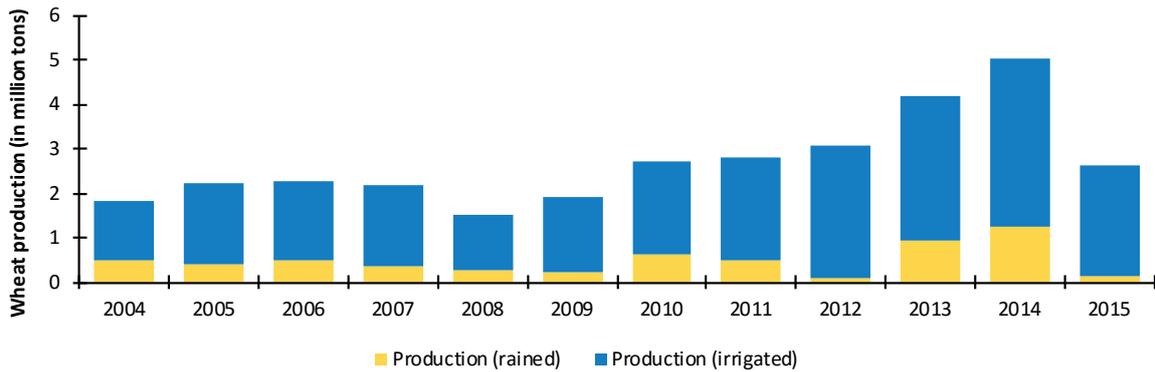
Source: CSO

Wheat production is centered around the northern governorates of Ninewa, Wasit, Kirkuk, Diyala and Salah al-Din (Figure 28). In 2014, Ninewa accounted for 22% of total Iraqi wheat production (1.3 million tons).

Figure 28: Wheat production by governorate, 2014
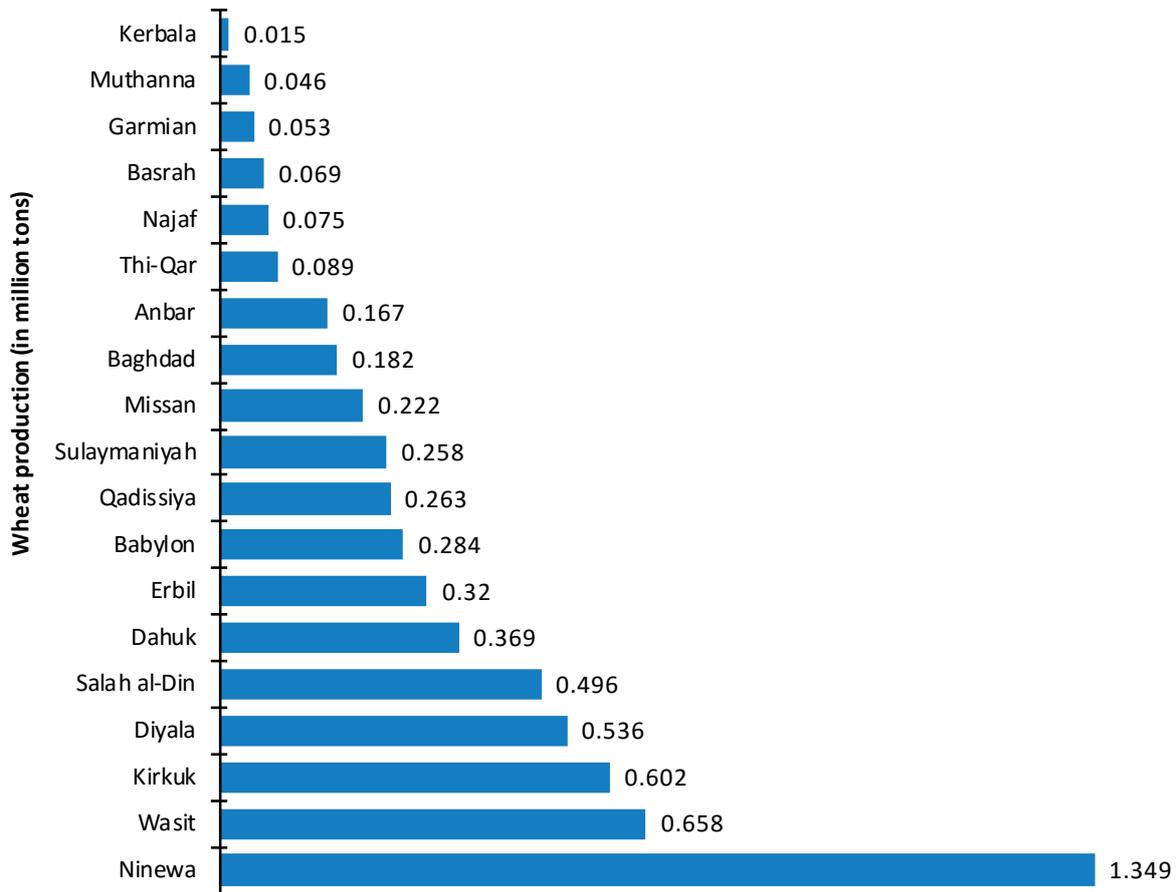
Source: CSO; KRSO

In KR-I, around a million tons of wheat was produced in winter 2012-2013, with the three governorates contributing comparable amounts to total production. KR-I accounted for around 20% of total Iraqi production of wheat in 2013.

The second largest Iraqi crop production is barley, with 1.28 million tons produced in 2014 in Iraq (excluding KR-I). Figure 29 shows that production has been variable over the years with significant decline in 2015 – a decrease of nearly 75% in total production from 2014.

Figure 29: Barley production in Iraq (excluding KR-I) by type, 2004-2015
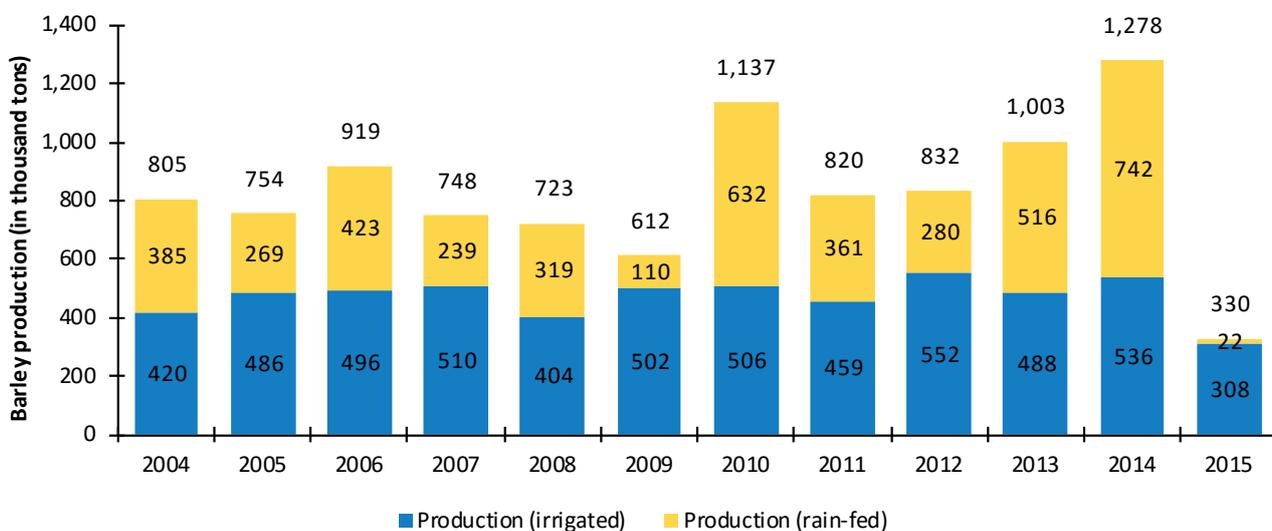
Source: CSO

Ninewa was by far the largest producer of barley producing 51% of the Iraqi production in 2014 followed by Kerbala at 11% (Figure 30).

Figure 30: Barley production by governorate, 2014
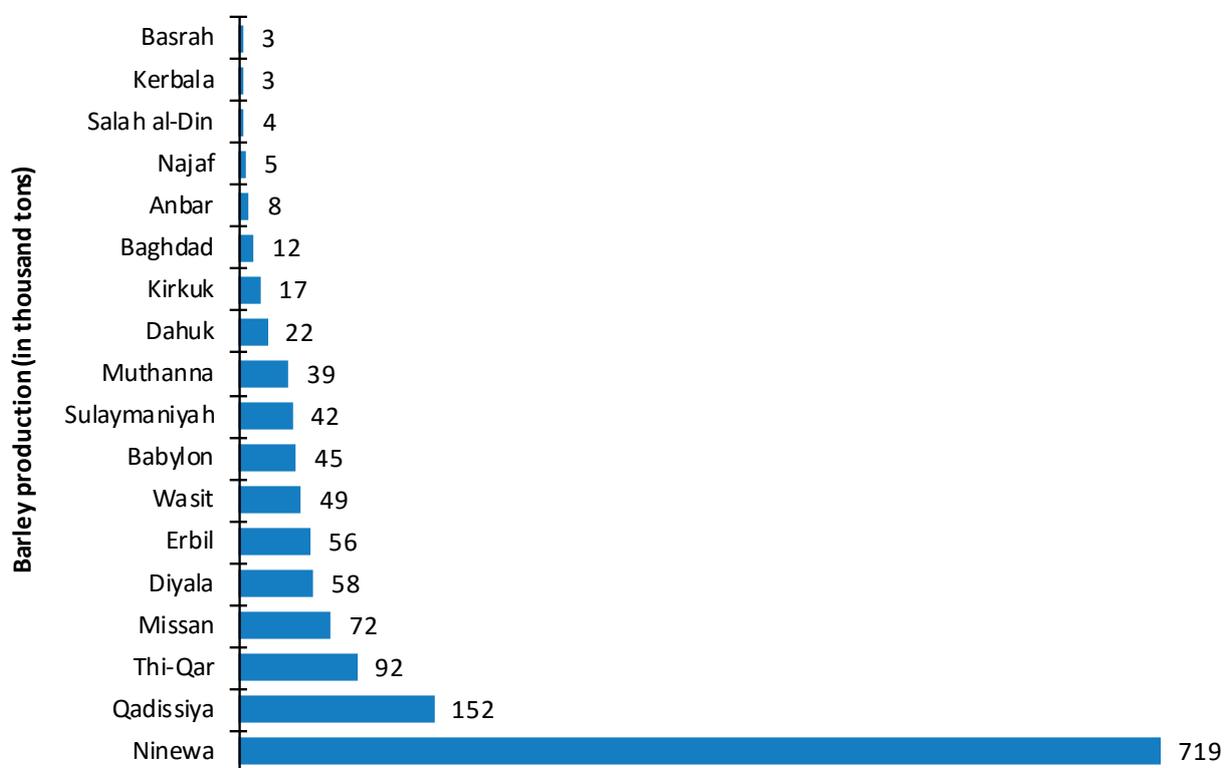
Source: CSO; KRSO

The third largest cereal cultivated in Iraq is rice, with approximately 200,000 tons produced in 2016 according to the United States Department of Agriculture. Considering this only supplies around 20% of domestic consumption, there is considerable opportunity to increase production and productivity to meet the market demand. Najaf and Qaddisiya governorates account for most rice production.[55] In KR-I, Dahuk accounts for over 70% of rice production.[56]

Vegetable production in Iraq (excluding KR-I) is relatively diversified. Tomatoes, eggplants, watermelons, cucumbers and onions are the most widespread (Figure 31).

Figure 31: Vegetable production in Iraq (excluding KR-I) by type, 2014
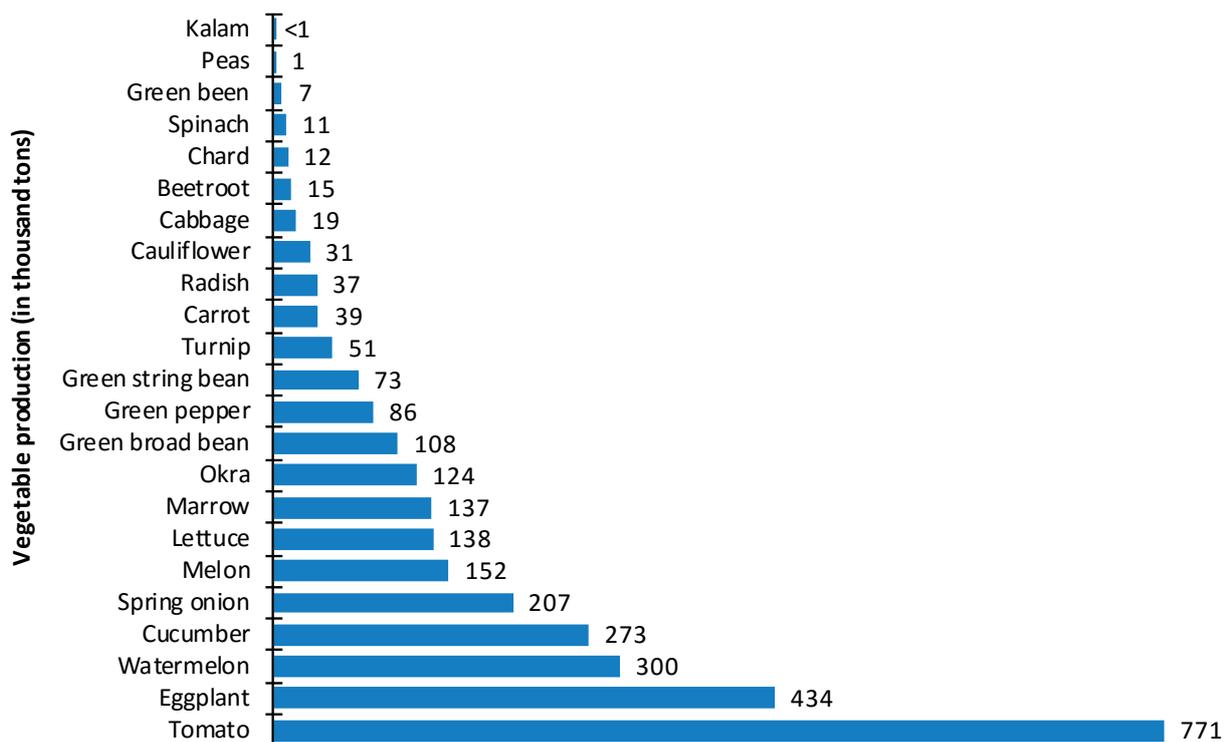
Source: CSO

Other crop production includes tuber and bulbs, mostly potatoes, onions and garlic; legumes such as dry broad beans; and crops for making oil, mostly out of sesame and sunflower; or for industrial use, such as cane sugar and cotton.

An important part of the production is also used as forage crops, crops grown specifically to be grazed by livestock or conserved as hay or silage. The most common is alfafa (or lucerne) followed by mixed forage and sorghum.

In KR-I, production is also diversified. In the summer, melon, tomato, watermelon, potato, corn, armenian cucumbers and onions were the most produced in 2013.[57] Other winter crops in KR-I are chickpeas which are mostly grown in Dahuk, and lentils grown in Dahuk and Erbil.[58] More than 40% of summer crops are cultivated in Sulaymaniyah, around 30% in Dahuk, around 25% in Erbil and below 5% in Garmian.[59]

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[55] USDA. "Commodity intelligence Report: Iraq Rice Production Up from Last Year but Still Below Average," 27 December 2016
[56] KRSO. "Agricultural Areas in The Governorates of Kurdistan Region," 2015
[57] KRSO. "Summer Crops Agriculture Report - Planting year 2013," 2015
[58] KRSO. "Winter Crops Planted Survey in Kurdistan Region Area," 2015
[59] KRSO. "Summer Crops Agriculture Report - Planting year 2013," 2015

There are a number of important tree crops in Iraq. Most trees are used for herbs, citrus (orange, lemon, clementine) and date production. Dates are a flagship Iraqi product, and the country's only significant agricultural export (see section 3.4). The governorates which produce the most dates are Baghdad, Babylon, Kerbala and Diyala, as shown in Figure 32.[60]

Figure 32: Date production in Iraq (excluding KR-I), 2014
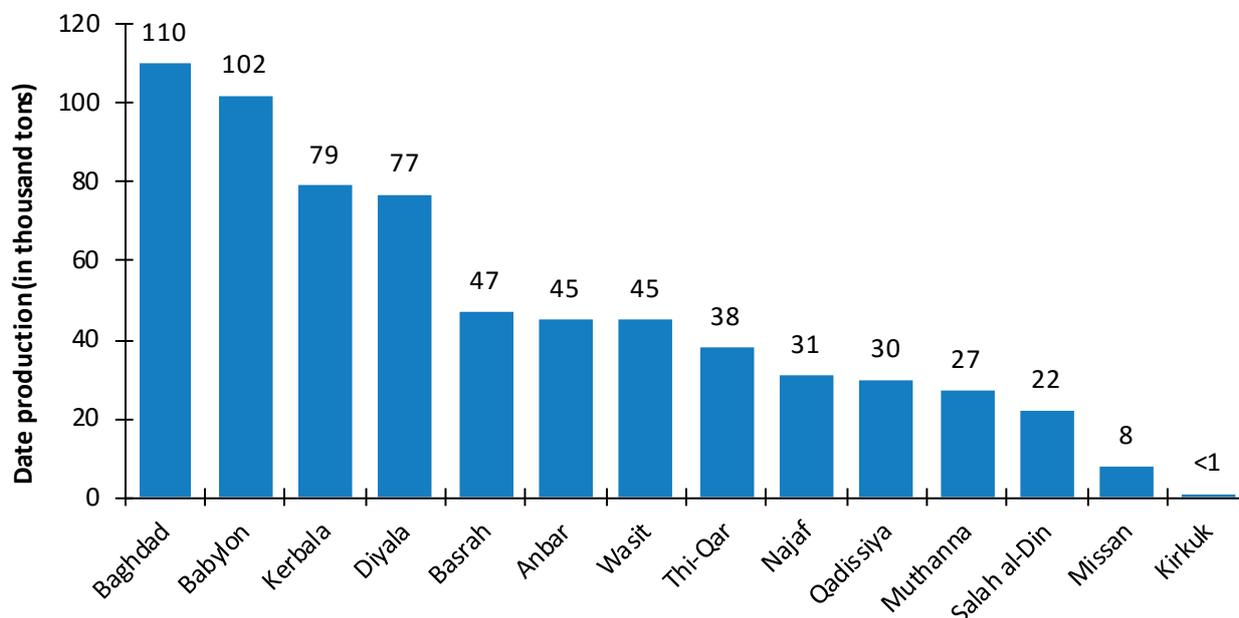
Source: CSO

3.3.3 Livestock production

Iraqi meat production is roughly half red meat and half chicken and fish (Figure 33). The production of red meat has remained steady since 2005.

Figure 33: Meat production in Iraq, 2005-2015
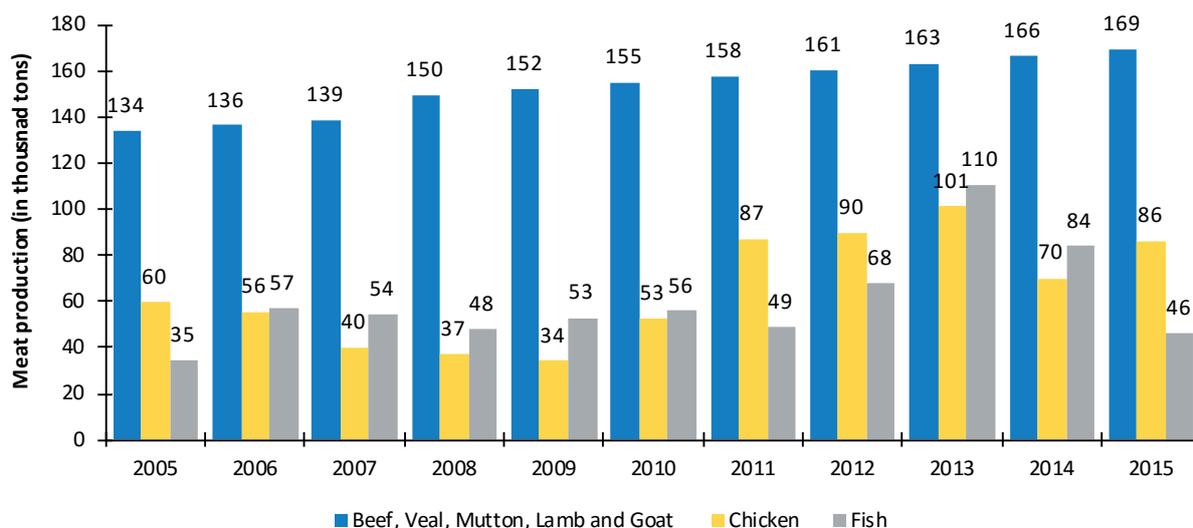
Source: CSO

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[60] CSO

Amongst farmed ruminants, the most important are sheep, cows and goats There are also buffalo, donkeys and camels, and in the KR-I there is ostrich farming. Animal production relies on meadows, pastures, and rangeland, and animals are mostly fed by grazing.

Ruminants also provide milk, wool, leather and hair that are transformed in agro-industries. Like red meat production, the quantity of milk produced has remained relatively stable over time. In Iraq, over 80% of milk comes from cows, while most of of the remainder comes from sheep and buffalo.[61] Similarly, the amount of wool and leather produced has not evolved much since 2005.

There is significant poultry activity in Iraq. FAO estimates that there were 27,500 chickens in Iraq in 2009. After growing substantially 2010-2012 and reaching a peak in 2013, chicken production collapsed in 2014 and 2015, along with egg production. An avian flu outbreak and a ban on poultry imports from a number of countries are responsible for most of this decline in poultry activity. According to KRSO, in 2013 KR-I production of chicken meat was almost as much as the rest of Iraq.

There is also beekeeping and honey production in Iraq, The sector has good growth potential and can be done on small family farms. KR-I is responsible for an important share of national production. In 2014, KR-I produced 800 tons of honey, which satisfied 62% of local demand. The KR-I government's objective is to increase production to 1,094.50 tons annually.[62]

Fishing is not traditionally a prominent feature of the Iraqi economy[63], although fishing activities developed in 2004 and have been growing in recent years, becoming a main protein source for many Iraqis. Because Iraq only has a 50km coastline, nearly all fish production is in fresh water (rivers, lakes, dams and marshes).

Inland capture fisheries[64] represent more than half of total fish production, inland aquaculture around more than a third, while sea capture represents only 10-15% of fish production and there is no marine aquaculture.[65] The total area under aquaculture production in Iraq is estimated to be 7,500 hectares. Fisheries are fish farms relying on pond culture in the middle and southern part of Iraq.[66] The majority of fish are carp (common, grass, and silver). Fish farms are usually small private firms. There are a few relatively large fish farms.

Fishing is mostly concentrated in the south east of Iraq, and in the Iraqi marshlands. Nearly half of all fisheries (fishermen, vessels, and farms) are found in Basrah and Thi-Qar governorates. Basrah has the most fish farms, while Baghdad and Babylon process the most fish. The biggest fish markets are in Baghdad and Basrah, and there is no fish export.[67]

KR-I has a limited production which meets only 22% of the estimated demand.[68] The most common form of fish production uses ground ponds, which are the cheapest to construct and can be dug out using ground water.

[61] Ministry of Planning. "Atlas of Agricultural Statistics," 2008
[62] KRG. "Agriculture and Water Resources in KR-I," 2015
[63] FAO. "Fisheries and Aquaculture Statistics Yearbook," 2012
[64] The harvesting of naturally occurring fish
[65] FAO. "Expert Meeting on the Review of Fisheries and Aquaculture Activities in the Euphrates-Tigris Basin," 2012
[66] FAO. "National Aquaculture Sector Overview: Iraq," 2012
[67] FAO. "Expert Meeting on the Review of Fisheries and Aquaculture Activities in the Euphrates-Tigris Basin," 2012
[68] KRG. "Agriculture and Water Resources in KR-I,"2015

3.4 International trade and investment[69]

Historically Iraq and the KR-I have been exporters of agricultural products. This is no longer the case, however, as the country exports under 100 million USD in agricultural products and their derivatives, while it imports over 5 billion USD of these products.

Iraq's overall exports are composed at 98% of oil, while its chief agricultural export is dates, which amounted to only 0.13% of Iraqi total exports in 2016. Iraq also exported hides and skins of bovines, sheep and lambs.

Iraq's imports of agricultural and agro-industry products are substantial, because local production of nearly all agricultural products is well below the level of local demand. Table 9 below displays the main agricultural and agro-industry product imports of Iraq by category which gives an indication of the areas where increased local production is most needed.

Table 9: Iraqi imports by category, 2016

Product code	Product description	(In million USD)
1006	Rice	517
1101	Wheat or meslin flour	495
207	Poultry meat	405
48	Articles of paper pulp, of paper or of paperboard	362
1701	Cane or beet sugar and chemically pure sucrose, in solid	315
24	Tobacco and manufactured tobacco substitutes	298
407	Birds' eggs, in shell, fresh, preserved or coked	281
44	Wood and articles of wood; wood charcoal	257
21	Miscellaneous edible preparations	196
406	Cheese and curd	164
1517	Margarine, other preparations of animal or vegetable fats or oils	133
202	Meat of bovine animals, frozen	132
401	Milk and cream, not concentrated nor with added sugar	110
902	Tea, whether or not flavoured	109
1901	Food preparations of flour, groats, meal, starch or malt extract	109
713	Dried leguminous vegetables, shelled, wether or not skinned or split	100
402	Milk and cream, concentrated or with added sugar	92
2002	Tomatoes, prepared or preserved otherwise than by vinegar or acetic acid	91
102	Live bovine animals	77
2005	Other vegetables prepared or preserved otherwise than by vinegar or acetic acid	73
1206	Sunflower seeds; wether or not broken	67
1704	Sugar confectionery not containing cocoa, incl. white chocolate	64
1005	Maize or corn	50
2008	Fruits, nuts and other edible parts of plants	49
2009	Fruit juices, incl. grape must, and vegetable juice	46
1902	Pasta	45
1904	Prepared foods obtained by the swelling of roasting of cereal products	44
1103	Cereal groats, meal and pellets	43
1001	Wheat and meslin	41
1512	Sunflower-seed, safflower or cotton-seed oil and fractions thereof	39
810	Fresh strawberries, raspberries, blackberries and other berries	37
803	Bananas, icl. plantains, fresh or dried	36
702	Tomatoes, fresh or chilled	36
1905	Bread, pastry, cakes, biscuits and other bakers' wares	36
802	Other nuts, fresh or dried, wether or not shelled or peeled	33

Source: International Trade Center. "Trade Map."

Rice is Iraq's largest agricultural import in 2016, with imports worth over 500 million USD. Half of it is imported from India and China, while another 20% comes from Argentina and Uruguay. As can be seen in Figure 34, local production has not satisfied more than 20% of domestic consumption in the past 15 years. In 2016 Iraq was one of the top 10 rice importers in the world.[70]

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[69] International Trade Center. "Trade Map."
[70] USDA. "Commodity intelligence Report: Iraq Rice Production Up from Last Year but Still Below Average," 27 December 2016

Figure 34: Iraqi rice production and domestic production, 1990-2016
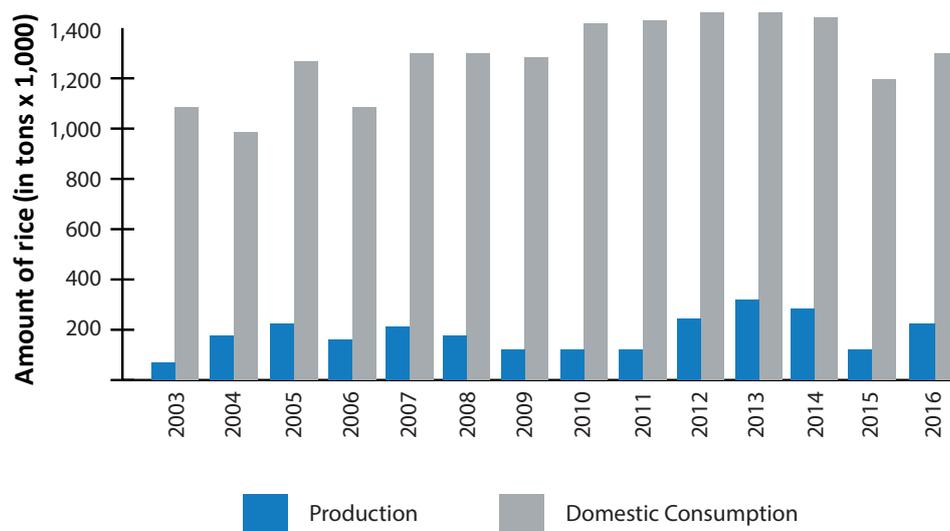
Source: US Department of Agriculture

Flour imports are the second largest agricultural import in Iraq. While data on suppliers isn't available, the existing evidence suggests it comes mostly from the Middle East region as well as Canada and Australia. Poultry meat, Iraq's third agricultural import, comes mostly from Brazil, the USA, Iran and the Middle East region.

KR-I also runs a large trade deficit in agricultural and agro-industry goods. While it exports just over 1 billion USD, it imports nearly 3.5 billion USD. KR-I's largest agricultural imports are vegetables and live animals. Turkey supplies more than half of KR-I's agricultural and agro-industry imports, while Iran supplies a quarter of them. The region imports most of the vegetables it also produces, such as tomatoes, potatoes, cucumbers, or fruit such as oranges and apples. While imported chicken meat was needed to meet 40% of KR-I's domestic demand; in 2013, the region also supplied chicken meat to the rest of Iraq.[71]

3.5 Employment in the sector

Estimates of employment in the agricultural sector vary. According to CSO data from 2011, between 15 and 20% of all employed people were in the agricultural sector, which would make agriculture the fourth largest employer after services, public administration and construction.[72] Likewise, the UN estimated agricultural employment as representing 23% of total employment[73] and employment in the agricultural "system" (including agro-industries) around 25% of total employment.

The agriculture sector is the largest employer of women, along with the public sector. The agricultural sector workforce is approximately 63% men and 37% women. Moreover, around 29% are youth between the age of 15 and 25 years old.[74]

Agriculture is almost entirely a non-wage activity, and it represents the largest proportion of non-wage jobs in Iraq.

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[71] KRSO. "Poultry farms report, Kurdistan region 2013," 2015
[72] Iraq Knowledge Network. "Labour Force Factsheet," 2011
[73] UN Data. "Iraq."
[74] CSO

In KR-I in 2012, around 6% of the labour force was employed in agriculture, with little variation across the three governorates.[75] Reportedly, agricultural employment in the KR-I has increased to 20% since the financial crisis and with the rise of ISIL/Da'esh in the region.[76]

Employment in agriculture is seasonal. According to KRSO, there are an estimated 71,000 farm workers for winter crops and 23,000 for summer crops in the KR-I; half in Sulaymaniyah (49%), 26% in Dahuk, 22% in Erbil and 3% in Garmian.

The majority of child labour in Iraq work in agriculture. In 2006, more than half of workers (54%) under the age of 15 were found in the agricultural sector, including 89% of working girls and 44% of working boys. The sector is also the largest employer of teenagers aged 15 to 19 years old (28%) and of workers over the age of 60 (27%).[77]

Although little data is available on the matter, private sector representatives report that there is a high level of foreign workers in the agricultural sector. For instance, KRSO reports that 65% of labourers who work in Kurdish poultry farms are local and 35% are foreigners. It is likely that this is an underestimation and that the share of foreign workers in agriculture is even higher.

According to the 2012 Kurdistan Labour Market Survey (KLFS), for 93% of jobs in agricultural occupations secondary vocational education is sufficient.[78] However, actual educational levels of workers may be lower than this. For instance, in Kurdish poultry farms 6% of workers are reportedly illiterate, 51% have no educational certificate and only 2% have tertiary education.[79]

3.6 Classifications of occupations in the sector

In this Sector Skills Analysis report several classification systems for occupations and education are relevant. Table 10 provides a schematic illustration of how the levels of these different systems are related to each other. It also provides the context in which the classifications of ISCO (International Standard Classification of Occupations) and ASCO (Arab Standard Classification of Occupations) specific to agriculture (Table 11) can be understood.

Table 10: Relationships between different classification and levelling systems

ISCO	ISIC		ISCED	ASCO	EQF	Example qualifications
3-4	01	Managers	5 and 6		8	PhD
4	02	Professionals	5a and 6	1 Professional	7	Masters
					6	Bachelor
3	03	Technicians	5b	2 Technician	5	Diploma
2	04	Clerical workers	4	3 Craftsman	4	Certificates
	05	Service and sales workers				
	06	Agriculture and Fisheries workers	3	4 Skilled worker	3	Preparatory School Cert.
	07	Craft and related trade workers				
	08	Plant and machine operators	2	5 Semi skilled	2	Certificates
1	09	Elementary occupations	1	Foundation skills	1	Basic Education

[75] KRSO. "Labour Force Report for Kurdistan Report 2012," 2014
[76] KRG. "Agriculture and Water Resources in KR-I," 2015
[77] CSO. "IHSES 2007," 2008
[78] Constant et al. "Improving TVET in KR-I," 2014
[79] KRSO. "Poultry farm report in Kurdistan Region 2013," 2015

Table 11 shows the potential range of specialised occupations in the subsector, as classified in the ISCO, with cross referencing to ASCO.

Table 11: Occupations and ISCO/ASCO classifications

Level	ISCO classification and name	ASCO classification	ASCO description
1 Managers	1311 Agricultural and forestry production managers	1310/1511	مديرو الإنتاج في الزراعة والغابات والثروة السمكية الناظرون(المشرفون) في الزراعة والصيد والغابات والثروة السمكية
	1312 Aquaculture and fisheries production managers	1310/1511	مديرو الإنتاج في الزراعة والغابات والثروة السمكية الناظرون (المشرفون) في الزراعة والصيد والغابات والثروة السمكية
2 Professionals	2132 Farming, forestry and fisheries advisers	2132	الاختصاصيون في الزراعة والحراجة والثروة السمكية
	2143 Environmental engineers	2143	مهندسو البيئة
	2250 Veterinarians	2250	الأطباء البيطريون
3 Technicians and Associate Professionals	3142 Agricultural technicians	3122	فنيو الإرشاد الزراعي
	3143 Forestry technicians	3123	فنيو الزراعة والغابات
6 Agriculture, Forestry, and Fisheries workers	6111 Field crop and vegetable growers	6111	العاملون في زراعة المحاصيل الحقلية للأغراض التجارية
	6112 Tree and shrub crop growers	6112	العاملون في زراعة الأشجار والبستنة للأغراض التجارية
	6113 Gardeners, horticultural and nursery growers	6113	العاملون في المشاتل والحدائق للأغراض التجارية
	6114 Mixed crop growers	6114, 6115	العاملون في زراعة الخضروات والفطر للأغراض التجارية العاملون في الزراعة المحمية للأغراض التجارية
	6121 Livestock and dairy producers	6121, 6124	العاملون في تربية الحيوانات للأغراض التجارية العاملون في إنتاج منتجات الألبان للأغراض التجارية
	6122 Poultry producers	6122	العاملون في تربية الدواجن والطيور للأغراض التجارية
	6123 Apiarists and sericulturists	6123	النحالون ومربو دودة القز
	6130 Mixed crop and animal producers	6210	العاملون في الزراعة لحسابهم الخاص (المزارع الصغرى)
	6210 Forestry and related workers	6231, 6132	مزارعو الغابات والمراعي الحطابون والفحامون
	6151 - Aquaculture workers	6141	مربو الأسماك والأحياء المائية
	6152 Inland and coastal waters fishery workers	6142	صيادو الأسماك والأحياء المائية
	6210 Subsistence fishers, hunters, trappers and gatherers	6210	العاملون في الزراعة لحسابهم الخاص (المزارع الصغيرة)
7 Craft and related trade workers	7233 Agricultural and industrial machinery mechanics and repairers	7236	ميكانيكيو المعدات والآليات الزراعية
8 Plant and machinery operators and assemblers	8341 Mobile farm and forestry plant operators	8331,8332	سائقو الآلات الزراعية مشغلو المعدات الزراعية
	8342 Earthmoving and related plant operators	8341	سائقو الآليات الثقيلة
9 Elementary occupations	9211 Crop farm labourers 9213 Mixed crop and livestock farm labourers 9214 Garden and horticultural labourers	9211	عمال المزارع
	9212 Livestock farm labourers	9214	عمال تربية الحيوانات والدواجن
	9215 Forestry labourers	9212	عمال الغابات
	9216 Fishery and aquaculture labourers	9213	عمال تربية السمك والصيد

3.7 Factors impacting on the growth and development of the sector
3.7.1 Political factors

Domestic politics, institutional dynamics and political uncertainty can have a large impact on the agricultural sector. State-owned companies (SOCs) are partly responsible for the supply of many agricultural products (grain, livestock, fertilizers, etc.) to farmers, and the public sector is the sole importer of some products, so SOCs are in a monopsony (sole buyer) position for several agricultural goods.

The state subsidises farm input prices, and controls the distribution and output prices of strategic crops. The state subsidises farm input prices, and controls the distribution and output prices of strategic crops. The Ministry of Trade has a near monopoly in the importation of wheat, rice, oil and pulses. These imports are distributed by the

POLICY CONFLICT

A PDS (Public Distribution System) has lowering effects on market prices. Distribution of subsidised food discourages the private sector and creates disincentives for wheat producers. Depressed domestic producer prices negatively affect private agricultural traders, who cannot afford to sell at low domestic market prices, while purchasing at international prices.[80] According to private sector representatives, the government does not support the farmers enough, resulting in a decrease in production and increased reliance on imports. The private sector would like local products to be supported in the same way as neighbouring countries, who reportedly subsidise inputs and fix prices; and they would like to be better protected from foreign competition.

Military hostilities and the fight against ISIL/Da'esh deters all economic activities in affected areas. The agricultural sector has been severely hit, as the areas with the highest cereal production were recently under ISIL/Da'esh control. It is estimated that the ISIL/Da'esh invasion has reduced Iraqi agricultural production capacity by 40%, as areas that were liberated from ISIL/Da'esh in 2015 and 2016 contributed around half of the Iraqi production of cereals.[81] Besides controlling production, ISIL/Da'esh confiscated 1 million tons of grain to send to Syria, denying payment to 400,000 farmers. It also looted farm equipment, used irrigation pipes to make improvised explosive devices (IEDs), and used water cuts as a weapon and tactic for punishment. In liberated areas challenges for rehabilitating agriculture remain because of landmines.[82] In Salah al-Din and Ninewa, it is estimated that 50% of farmer income was lost.

In more than half of Iraq, water for agriculture mostly comes from the Tigris, Euphrates and their tributaries, and the source of these rivers comes from outside of Iraq. Currently there are no international treaties on the division of water between Iraq, Iran, Turkey and Syria.[83] Water flow has been reduced by up to 80% by dams built[84] by Turkey along the Tigris and Euphrates. The Southern Anatolian Dam project (GAP) in Turkey affects the water flow and water quality of the Tigris and Euphrates into Iraq.[85]

Government policy and regulation in the sector affects the level of activity by creating additional costs and favouring some firms over others:

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[80] FAO. "Iraq Agricultural Sector Note," 2012
[81] Regional Food Security Analyis Network. "The Impact of ISIS on Iraq's Agricultural Sector," 2016
[82] United Nations Iraq. "Demining and repair initiatives restores key irrigation canals, farmland near Mosul," 26 December 2016
[83] Ministry of Planning. "National Development Plan 2013-2017," 2013
[84] Bradley , Matt. "Islamic State Squeezes Iraq's Food Supply," Wall Street Journal, 12 July 2015
[85] Water-technology.net. "Dam Locations within Southeastern Anatolia Project (GAP)," 2017

- Trade policy, especially the imposition of tariffs or non-tariff barriers, can have a strong impact on the sector's development. Iraq is not a member of the World Trade Organization, but is part of the League of Arab States and the Great Arab Free Trade Agreement (GAFTA). It also ratified a Trade and Investment Framework Agreement (TIFA) and Partnership and Cooperation Agreement with the European Union in 2012

- The imposition of taxes has a direct impact on the agriculture sector. Currently, the Iraqi government taxes corporate income, but there is no general sales tax (GST) or value-added tax (VAT). A corporate tax audit, however, is deemed "highly unlikely" by the World Bank's Doing Business report[86]

- The quality control of goods allows the importing of certain goods and not others. In Iraq, the Central Organization for Standardization and Quality Control is responsible for quality control. According to private sector representatives, laws which restrict importation and set out quarantine requirements are inefficient. In some instances, the strictness of quality control encourages illegal importation and the delays which cause the spoiling of some products going to the markets

- Corruption is a strong hindrance to the sector's development, discouraging economic activity, as well as increasing the final price paid by the customer. Private sector representatives[87] report instances of corruption at several levels: for importing goods, assessing the quality of goods, transporting goods, as well as for opening and keeping shops open. In 2015, for example, Iraq's acting Trade Minister reportedly sacked the head of the Grain Board of Iraq and six other officials over allegations of corruption and claims of illicit gains made from the purchase of Uruguayan rice.[88]

3.7.2 Economic factors

The cost of inputs into the sector will affect its financial viability. In the agricultural sector, the main costs are the purchase of the grain and the equipment, the fertilizers, the labour and construction materials required as well as transportation and storage.

The agricultural sector is dependent on the dynamics in the transportation sector, as well as the real estate sector. As a result, the factors affecting these sectors are also to be taken into account, such as energy prices, the reopening of trade routes and borders, and real estate prices.

Changes in exchange rates directly affect the price of agricultural imports and exports. These price changes, ultimately, affect the competitiveness of Iraqi producers.

Customer purchasing power, generally speaking, is important to the sector's development. However, the relative control of prices and distribution of food products under the PDS provides for a constant demand for agricultural products.

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[86] World Bank Group. "Doing Business: Economy Profile – Iraq," 2017
[87] Workshops with pilot Sector Councils in Erbil, May 2017
[88] Iraq Business News. "Grain Board Boss Sacked in Corruption Probe," 7 November 2015

3.7.3 Social factors

Migration has a great impact on agricultural activities. The arrival of Syrian refugees, mainly into the KR-I, and of internally displaced people (IDPs) increased labour supply for semi-skilled and unskilled employment and has substantially lowered wages in some sectors. The partial return of IDPs and Syrian refugees will have the opposite effect. Moreover, private sector representatives suggest that many workers from Bangladesh are employed in the fields.

The agricultural sector is one of the sectors that employs the most women. Generally speaking, there is a cultural disinclination for females to work, and they represent only 13% of the labour force. In agriculture, however, 37% of workers are women.

The age structure of Iraq will favour the development of the sector. Half of the population is under the age of 20 years old, 40% under the age of 15. This segment of the population will increase the demand for consumer goods and increase the pool of labour available.

Child labour is widely used in the agriculture. In 2011 national child labour was 6.4%, and 2.2% for the KR-I.[89] Approximately 89% of girls aged 7 to 14 who are economically active work in non-wage agriculture.[90]

There is a cultural bias against working in the private sector, and in low-skilled occupations such as agriculture. This is a problem for the agricultural sector, which is mostly private and low-skilled.

3.7.4 Technological factors

There is a technology gap between urban and rural farmers and rural women in particular do not access modern technologies.[91] According to industry representatives, there is also a need to provide literacy and numeracy training to farmers. Agriculture college and institute graduates are often unemployed, while at the same time there is a critical shortage of skills for agriculture.

There is insufficient research and research dissemination. There have been budget cuts in agricultural service institutions for research, plant quarantine and disease control, extension, animal health and artificial insemination centres. There is insufficient support for extension services and training strategies that effectively facilitate decentralisation, privatisation, modern IT, client participation, pluralism and gender-sensitivity. Extension services promote exchange between farmers, ministries, banks, investors and researchers in order to improve technology transfer to farmers, and ensure that beneficiaries are involved in setting research and extension agenda.[92] FAO recommends rehabilitation of extension capacities, strengthening research, research centres for technology transfer by training agents and farmers.[93]

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[89] CSO and KRSO. "Iraq Multiple Indicator Cluster Survey 2011, Final Report," 2012
[90] World Bank. "World Development Indicators Database."
[91] Ministry of Agriculture. "The Status of the Agriculture Sector, Challenges and Ambition," 2012
[92] FAO. "Iraq Agricultural Sector Note," 2012
[93] Ibid

The MoA recommends improved access to veterinary hospitals, clinics, artificial insemination, genetic improvement programs (specifically in buffalo stallions), drugs and vaccines, as well as embryo transfer technology.[94] Modern technologies can have a large effect: in Erbil, conventional system poultry farms have a death rate of 25%, while modern ones have an 8% death rate.

The health infrastructure for animals sharply diminished between 2002 and 2004. According to the General Company for Veterinary Services, in 2001, 544 million doses of vaccines were produced, but the number never surpassed 50 million after 2003. Similarly, 969,000 animal patients were counted in 2001, but that number never exceeded 150,000 after 2003. According to the MoA there are currently 15 veterinary hospitals, 17 mobile clinics, 225 veterinary dispensaries, and 1,622 veterinarians.[95] Indeed, private sector representative complain that livestock is not well protected from diseases, which is made worse by the fact that no compensation exists for farmers affected by disasters, such as the recent bird flu.

Poor infrastructure limits activity and can cause wastage. This is true for transport, storage and conservation capacity. According to private sector representatives, lack of adequate and affordable storage capacity result in waste (ex: milk, cooking oil, iron corrosion, etc.) and there is a need for investment in storage capacity and cold houses. Health risks also arise because of delays in selling good. Fisheries, for instance, lack cold storage and refrigerated vehicles for transportation.

According to the Ministry of Planning, 39% of Iraqi land is good agricultural land, 43% is medium quality land and 18% is limited productivity land. According to the Arab Organization for Agricultural Development, Iraq has a lower agricultural productivity than the Arab World average, and lower than neighbouring Syria.

Modern technologies in crops could include implementing the use of drought resistant and higher yield crops (rice) and crop varieties (durum wheat), promoting zero-tillage agriculture in rain-fed areas (Ninewa, Kirkuk, Salah al-Din, Anbar), implementing movable, fixed, spray, drip irrigation techniques[96], reducing production costs by incorporating fertilizers and pesticide, improving fruits and vegetable yields by establishing laboratories, greenhouses, nurseries, and improving seed quality through the State Board of Seed Testing and Certification.[97] The MoA does not support the use of genetically-modified organisms (GMO). The MoA has imported 7 helicopters for plant spraying.[98]

Hay production for feeding animals is neglected and scarce, which has a negative impact on livestock activities. According to private sector representatives, there is a need for specialised companies to produce hay using seeds with better yield and better technology.

Availability of fertilizers: in KR-I 73% of wheat land and 40% of barley land was fertilized in 2012-2013 - mostly with urea and compound. Fertilizers represent between 20 and 40% of the cost of producing wheat in KR-I, and between 15 and 30% for barley.[99]

New technologies need to be used to keep Iraqi varieties of dates from going extinct. New date orchards need to be planted with modern agricultural and irrigation techniques, using chemical compound micronutrient fertilizers. There is a need for the allocation of loans and licenses for nurseries, and laboratories.[100]

[94] Ministry of Agriculture. "The Status of the Agriculture Sector, Challenges and Ambition," August 2012
[95] Ministry of Agriculture. "Agricultural Reality Challenges and Ambitions,"2017
[96] Ministry of Agriculture. "The Status of the Agriculture Sector, Challenges and Ambition," August 2012
[97] Jaradat, A. "Agriculture in Iraq: Resources, Potentials, Constraints, and Research Needs and Priorities," 2002
[98] Ministry of Agriculture. "The Status of the Agriculture Sector, Challenges and Ambition," August 2012
[99] KRSO. "Winter Crops Planted Survey in Kurdistan Region 2012," 2015
[100] Ministry of Agriculture. "The Status of the Agriculture Sector, Challenges and Ambition," August 2012

Modern technologies in fish farming beyond water conservation technologies include increased cage-farming activities. Support could be to provide oil or electric power subsidies for intensive fish breeding[101], emphasise integrated aquaculture, integrate fish farming with rearing other livestock, improved research, production of genetically modified fingerlings, additional training for modern fish farming and management techniques, promoting private sector participation with marketing and assembly facilities for fisheries.[102]

The availability of services and facilities: sewage and water treatment systems, connection to the electricity network and connection to transport networks are enabling factors for many activities. The Iraqi Federation of Industries has been reporting problems to gain access, in the context of electricity shortages. According to the World Bank Doing Business report, Iraq ranks 133rd of 180 countries for the ease of getting electricity. Electricity shortage are particularly damaging for conservation of agricultural products.

3.7.5 Environmental factors

Climate change events like floods, spread of diseases, rising temperatures and wildfires[103] can have large and damaging effects on forests and agricultural lands. Rangelands are disappearing because of unplanned grazing and drought.[104] Forests are also under threat because of economic growth and increased investment in new roads and other service projects. The government of KR-I intends to increase and develop natural and manmade forests and rangelands. Development mechanisms identified by the government of KR-I include: regulating grazing, controlling soil erosion, maintaining and developing natural forests, increasing forests, parks and green spaces around cities and towns, establishing natural protectorates, surveying man made forests using RS and GIS systems, as well as legal and policy reforms.[105]
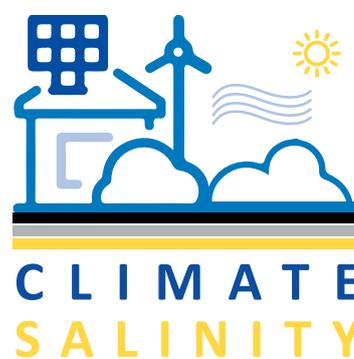
Salinity is a major issue (Figure 35) which contributes to low productivity of agricultural land as well as desertification, sand storms, and sands dunes. There are human and natural factors for the accumulation of salt in the soil, including the misuse of resources, the presence of marine sediment, groundwater and climate. It is estimated that 10 million donnum is currently overly salty. Controlling water salinity is a solution, but there are few alternatives to salty water considering water scarcity. Reclamation would be the optimal solution and the Ministry of Water has been able to reclaim 30,000-50,000 donnum annually, but at this rate it would take 200 years to reclaim all the land. In 2010-2011 the government was able to reclaim 10% of the targeted land for that period.

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[101] Ministry of Agriculture. "The Status of the Agriculture Sector," 2012
[102] FAO. "Iraq Agricultural Sector Note," 2012
[103] KRG. "Agriculture and Water Resources in KR-I," 2015
[104] Ibid
[105] Ibid

Figure 35: Salinity map of Iraq

Legend:
- Non saline
- Very slightly saline
- Slightly saline
- Moderately saline
- Strongly saline
- Exteremly saline
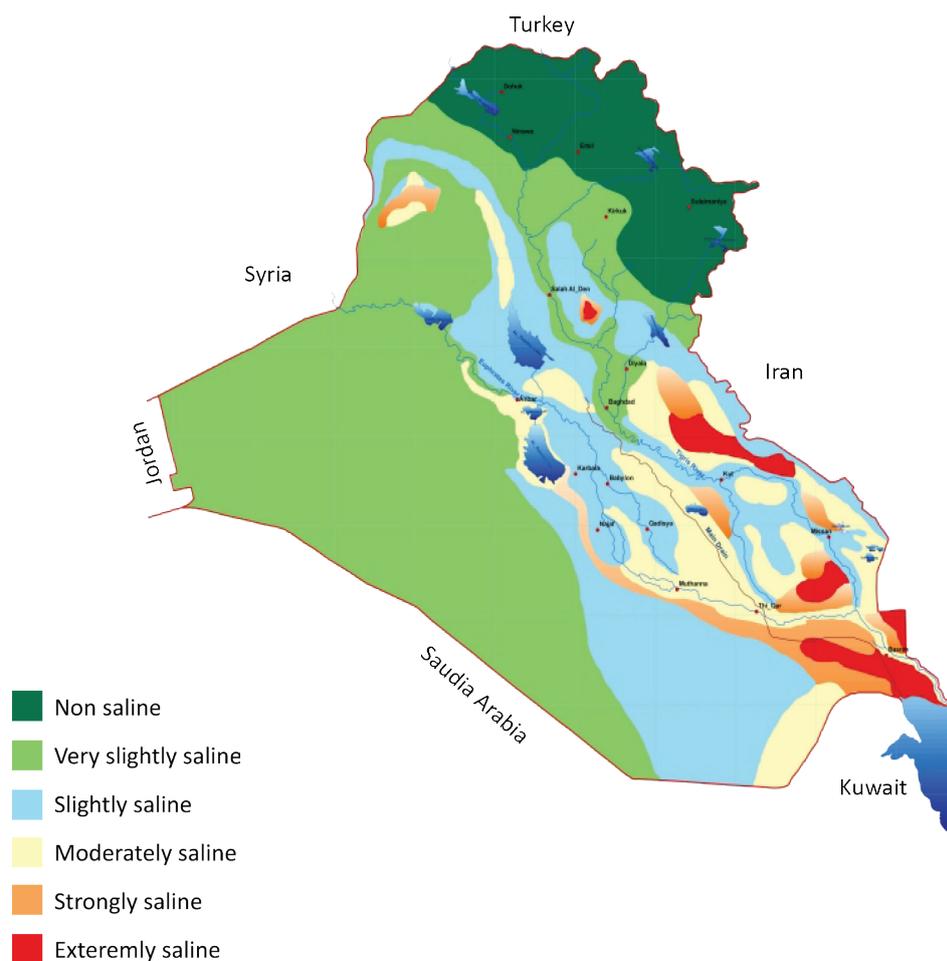
Source: Ministry of Water Resources, 2011

The use of modern irrigation techniques can alleviate the negative impacts of climate change, salinity and drought on agricultural productivity.[106] Technologies needed for water management include capacity building programmes, modern irrigation methods (drip, spray, and closed channels), conservation, desalination technologies and agricultural crop water management techniques.[107] New technologies are needed to reduce water waste such as water pumps or greenhouses. Alternatively, the introduction of different variants of crops that consume less water or are drought resistant should be favoured, as well as conservation agriculture.[108]

Dam maintenance and management is critical. Some dams central to securing water needs and water storage are not operational, such as the Dukan and Darbandikhan dams.[109] The Mosul dam is on the verge of collapsing which would be a major catastrophe for all the territories along the Tigris.[110]

3.7.6 Legal factors

Access to financing is quasi-impossible, Iraq ranks 180th in the World Bank Doing Business report, down from 174th in 2012. Entrepreneur investors face burdensome reporting and compliance requirements and difficulties in providing acceptable guarantees.

[106] Ministry of Agriculture. "The Status of the Agriculture Sector," 2012
[107] FAO. "Iraq Agricultural Sector Note," 2012
[108] Salman, Iman Sahib. "Status, priorities and needs for sustainable soil management in Iraq," 24 June 2014
[109] Ministry of Planning. "National Development Plan 2013-2017," 2013
[110] Bibbo, B. "Mosul Dam collapse 'will be worse than a nuclear bomb," Al Jazeera English, 11 November 2016

The agricultural bank does provide some financing, although private sector representatives mention it is insufficient. Figure 36 below shows the loans made by the agricultural bank, which are low and have decreased since 2012. These loans also used to be much longer term. Before 2003 the ratio of long-term loans to short-term loans was over 10, after 2003 this ratio never exceeded 5.

Figure 36: Loans by the agricultural bank, 2008-2014
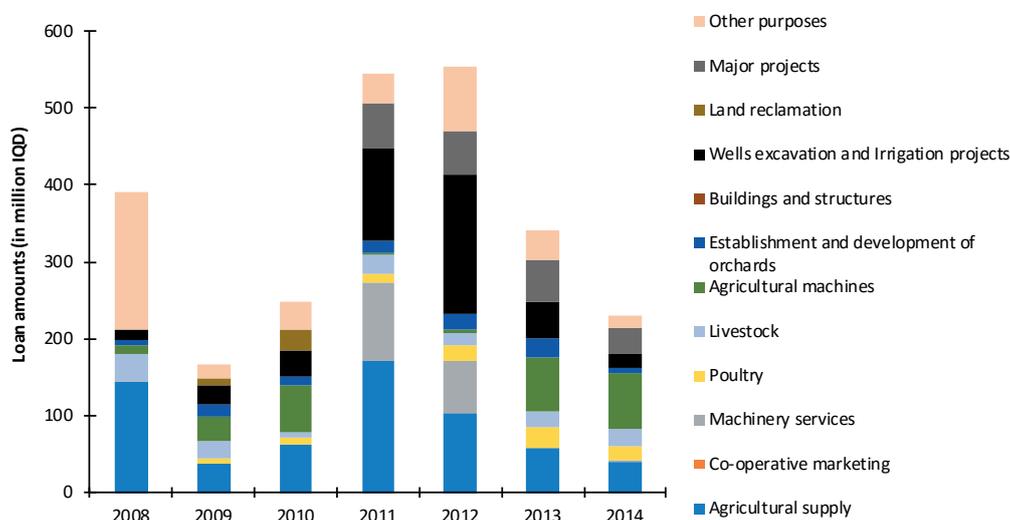
Source: CSO

The legal framework for water management is lacking. There is trespassing and welling without permission, and wells and ground water are misused. There is a lack of existing legislation regarding conversion to modern irrigation and just distribution of water domestically.

There is also a need for legal reforms to create an enabling legislative environment for more effective growth in the agricultural sector. There is a lack of existing legislation regarding conversion to modern irrigation and just distribution of water domestically.

The new Labour Law number 37/2015 replaced the old Labour Law number 71/1987 in February 2016. The Law protects the rights of workers, specifying a minimum wage of 250 000 IQD, with a proposal to raise this to 350,000 IQD (MoLSA interview). It also limits the share of foreign labour that can be employed. Further changes and the extent of its application can affect the sector's ability to recruit.

The Law on Investment number 4/2006 offers provides strong incentives for foreign direct investment, but in practice the processes to implement the law (e.g. allocation of land) crosses organisational ministerial boundaries and are difficult to control. There is a proposal that the Board of Investment should become a 'one-stop-shop' with additional powers to allocate land.

Land tenure is problematic, as the current ownership regime contributes to land degradation and low productivity.[111] Reforms need to address the problem of land fragmentation, land ownership, types of holdings (freeholding by individuals or groups, and state-owned land), joint ownership and inheritance laws.[112] Repeated division of holdings for inheritance has reduced productivity and led to fragmentation of holdings into very small, uneconomic plots.[113]

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[111] FAO. "Iraq Agricultural Sector Note," 2012
[112] Ministry of Planning. "National Development Plan 2013-2017," 2013
[113] Ibid

Chapter 4: Skills supply to the agriculture sector

4.1 Skills supply to the agriculture sector

In this analysis of skills supply to the agriculture labour market, the estimated cohort size is a proxy for the number of new entrants to the labour market with the skills relevant to work in the economic sector.

This is only a rough indicator since informal skills supply for agriculture offered through the professional development short training courses of the training centres (76 excluding KR-I) of the Ministries of Agriculture (MoA) is not easily quantifiable, and not included. The amount and accessibility of this MoA training is significant, with training centres all over the country, but it is not integrated into mainstream education and training systems and does not lead to any recognised award.

In the following tables skills supply is organised by skill area, irrespective of the level or duration of education and training. MoLSA does not offer any agriculture related courses.

- MoE Vocational Preparatory School is basic-skilled, semi-skilled and skilled levels
- Diplomas awarded after successful completion of a two-year programme by institutes (referred to as 'technical' in the tables)
- Bachelors are awarded after successful completion of a 4/5-year programme by colleges.

Agriculture skills are organised as:

- Crop and plant skills
- Livestock skills
- Water technology skills
- Agricultural mechanization skills
- Other agriculture and forestry related skills.

Table 12: Agriculture skills in Iraq

Institution	Name of specialisation	Estimated cohort size (or last known intake*)
Crop and plant skills		
MoE Vocational Schools	Agriculture	263
College of Agricultural Technology / Rashidiya / Ninewa	Plant production techniques	0*
Technical / Mosul	Plant production	0*
Technical / Hawija	Plant production	9*
College of Technology / Musayyib[114]	Plant production	38*
College of Technology / Musayyib	Plant production	26*
Technical / Kufa	Plant production	11*
Technical / Musayyib	Plant production	35*
STU Technical / part of	Production plant	12*
Technical College / Thi-Qar	Plant production techniques	0*

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[114] This programme appears twice in official lists and may be an error or two streams of the same programme

Institution	Name of specialisation	Estimated cohort size (or last known intake*)
Livestock skills		
College of Agricultural Technology / Rashidiya / Ninewa	Animal production techniques	0*
Technical / Mosul	Animal production	0*
College of Technology / Musayyib	Animal production	34*
Technical / Kufa	Animal production	10*
Technical / Musayyib	Animal production	34*
STU Technical / part of	Animal production	23*
Water technology		
Technical / Mosul	Water resources technologies	0*
Technical / Hawija	Water resources technologies	11*
Technical / Hawija	Water resources technologies	9*
Technical / Kut	Water resources technologies	40*
STU Technical / part of	Water resources techniques	51*
Technology Baghdad	Water resources technologies	76*
Technical / Musayyib	Water resources technologies	42*
Agricultural mechanisation skills		
MoE Vocational Schools	Agricultural mechanisation	55*
Technical / Mosul	Agricultural mechanisation	0*
Technical / Musayyib	Agricultural mechanisation	14*
STU Technical / part of	Agricultural mechanisation	10*
College of Technology / Musayyib	Engineering of agricultural machinery techniques	27*
Other agriculture and forestry related skills		
Technical / Essaouira	Agricultural	3*
College of Technology / Musayyib	Soil and water technologies	30*
Technical / Musayyib	Soil and land reclamation	9*
College of Technology / Musayyib	Engineering of pump techniques	29*
Technical / Kirkuk	Forestry	25*

Technical University figures are based on one intake only due to incompleteness of the data submitted

Table 13: Agriculture skills in KR-I

Institution	Name of the Specialisation	Estimated cohort size (or last known intake*)
Crop and plant skills		
MoE Vocational Schools	Fruit production	88
Kalar Technical Institute	Horticulture	110
Technical College of Applied Science	Horticulture	258
Akre Technical College	Horticulture	29
Akre Technical Institute	Horticulture	12
Bakrajo Technical Institute	Industrial crops	198
Kalar Technical Institute	Field crops	116
Technical College of Applied Science	Field crops	206
Bakrajo Technical Institute	Plant protection	199
Khabat Technical Institute	Plant product technology	37
Bakrajo Technical Institute	Ornamental plants	178
Khabat Technical Institute	Plantation technology	37
Livestock skills		
MoE Vocational Schools	Animal production	39
MoE Vocational Schools	Veterinary	30
Kalar Technical Institute	Animal health	184
Amedi Technical Institute	Animal resources	14
Shaqlawa Technical Institute	Animal health technology	32
Shaqlawa Technical Institute	Livestock technology	8
Other agriculture skills		
MoE Vocational Schools	Agricultural machinery	9* (adjusted or figure for one year only)
Bakrajo Technical Institute	Protected agriculture	177
Bakrajo Technical Institute	Agricultural extension	160
Shaqlawa Technical Institute	Resources management technology	77

4.2 Implications of the data

This may be the first thematic study of the provision of technical and vocational programmes in the country which looks at common and differentiated offerings of the providers. As shown in the previous tables above, for example, there is clearly a need for rationalisation in some areas to reduce duplication and gain economies of scale. The recommendations in Chapter 6 may influence decision-makers to rationalise the programmes currently being offered i.e. reduce or discontinue provision in some fields and develop and/or increase in others. In many countries rationalisation has been guided by the desire to differentiate provision and create 'centres of excellence'. An advantage of increased specialisation is concentration of expertise and expensive equipment and other resources. A disadvantage is that students need to travel away from their home town in order to pursue specialised training. The skills supply tables above show that the majority of provision in Iraq is in the KR-I governorates, at the higher education level, with more graduates in crop production than livestock production. Information on the provision of programmes (skills supply) is indicative and should be used to supplement the qualitative and quantitative information on the demand for skills which is presented in Chapter 5.

Chapter 5: Demand for skills in the agriculture sector

Information on the demand for skills comes from two main sources: the meeting of the pilot Sector Council and the Enterprise Survey. The outcomes of the pilot Sector Council meeting and Enterprise Survey provide this information in the form of qualitative and quantitative data, respectively, and is presented in the following sections.

5.1 Outcomes of the Agriculture Sector Council meeting

The pilot Sector Council, representing the leadership of the sector, was established by nominations based on information gathered in fieldwork interviews and during desk research, and drawing on professional networks and databases.

A demand-led TVET system requires that the leadership of the sectors is organised into representative bodies to advise on the training needs of their sector. Thus, in the future, permanent sector councils will need to be formally established through legislation.[115] The membership of formally and legally established sector councils will need to be decided by the sector itself, probably in consultation with the members of the original pilot Sector Council.

The pilot Agriculture Sector Council meeting was held in Erbil on 24-25 May 2017. The meeting was attended by public and private representatives of the sector from Iraq and KR-I.

5.1.1 Challenges of the agriculture sector

There was consensus that while there was limited governmental support of the farmers before 2013, this has deteriorated since the advent of ISIL/Da'esh and the economic crisis. This insufficient support has resulted in a decrease in agricultural activity; reduced production and farmer income, as well as increased unemployment in the sector. At the national level, this translates into an increased reliance on imports, as well as reduced food security and self-sufficiency.

There is potential to imitate neighbouring countries, for instance by setting up agricultural export banks like Turkey, Lebanon and Iran have done to promote egg, chicken and milk export. Moreover, the governments of these countries support the agricultural sector by subsidising inputs and fixing purchase prices. Limited support, in the form of transportation services to wholesale centers is provided in KR-I.

An important shortcoming of governmental action was identified as the lack of protection for national products. Cheaper imports are said to have flooded the market, causing much of the production of local similar products to be discontinued. In turn, small profit margins do not allow investing in new technologies, which could lower the cost of production and make Iraqi farmers more competitive. It was suggested that higher taxes on imports should be put into place, as Lebanon does with honey imports, for instance. Many of the imported products should logically be produced locally.

It appears KR-I has a developed policy of protecting local agricultural production. Indeed, agricultural imports are reportedly banned during harvest; there is a list of banned products, and several products face high import tariffs. Even if there are de jure import restrictions, these are often circumvented. For instance, olive imports are banned in the KR-I but olives still make their way to shops. The same

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[115] In the document 'Government Restructuring for the TVET Sector in Iraq', developed under the UNESCO TVET Reform Programme for Iraq and KR-I, 'Sector Council' is referred to as 'Sector Skills Advisory Coordination Services (SACS)' bodies as their role includes the development and validation of respective sector national occupational skills standards and qualifications

is apparently true for Iraq's 2017 ban of watermelon and tomatoes.

There is an urgent need to update and unify the national legislative framework governing the agricultural sector. The law is said to be out-dated, rigid, and inconsistent, complicating the task of farmers and impeding the development of the private sector. In particular, the import restrictions are inefficient because of corruption at customs, and the quality assurance processes such as product quarantine result in waste of products because of long delays. Reportedly, there is also internal discrimination between Iraq and KR-I products.

Policy instability compounds such problems. Changes in governance lead to policy changes, and lawmaking is reportedly grounded in politics rather than economic analysis.

There is a neglect of agriculture research and agriculture guidance, which are weak. As a result, old and uneconomical practices are still used, while new technologies, new ideas or international best practice are not introduced. Moreover, there is room for the government to sustain crops and livestock. Currently, livestock is not well protected from diseases and there are no compensation schemes for farmers in the event of epidemics or natural disaster – the absence of support following last year's bird flu epidemics provides a telling example.

An active role could be played for targeted support in some sectors where inaction can have potential large effects. For instance, supporting the introduction of new and more varied queen bees would invigorate the bee population, which supports plant growth and slows desertification; or the recycling of bee wax could help other sectors. The public sector maintains that some new technologies are being introduced, such as embryo transfers for buffalos, and the participants agree that there is some funding available, although it seems that there is little if any monitoring of projects.

In addition, public decision-making does not rely on comprehensive, current and accurate statistics. This results in weak prioritisation and in the waste of limited financial resources.

The pilot Sector Council agreed that the skills of recent graduates do not correspond to the needs of the labour market and they lack practical experience. Agriculture colleges and institutes are producing armies of unemployed people, while at the same time there is a critical shortage of skills for agriculture. The public sector cannot absorb all agriculture graduates, while at the same time graduates have no practical training and are not skilled enough for employment in the private sector. The curriculum needs to be updated and the training needs to be far more practical, for instance by setting up training farms.

For unemployed graduates or low-skilled farmers, there is a need to reinstate international exchange programmes or twinning arrangements with international institutions, to enable skill transfers and local diffusion of international best practices and technologies.

There are foreign workers in the agricultural sector, mainly Bangladeshi that are perceived as a cheap and docile labour force, although their number is limited.

Reportedly, there is a lack of awareness with respect to the use of chemical products and pesticides. Too many are used without necessary precautions being taken; and the Ministry of Agriculture does not monitor this sufficiently. Related is an evident lack of marketing awareness amongst farmers and consumers and low capacity for marketing agricultural products. As a result, different qualities of products are mixed up, and both producers and consumers are unaware of chemical usage which may be damaging to health and welfare.

It appears that hay production, which is used to feed livestock, is insufficient and as a result hay is scarce and expensive, acting as a bottleneck for the development of livestock activity. There is room for the introduction of new methods such as silage for preservation, or the use of seeds with higher yield. Currently, production is low compared with countries using better technologies such as Iran, Turkey, or Egypt; the latter even manages to export silage to Jordan. In KR-I, production of hay is encouraged by (1) prohibiting the import of ready hay, (2) making silage and (3) guaranteeing the purchase of some of the crop.

A much-discussed concern was the scarcity and salinity of water used for irrigation or drinking, which affects all agricultural activities. Negotiating international treaties on water repartition, establishing new dams and repairing existing dams, would ensure the flow of water into Iraq. Using new technologies to exploit underground and over ground water source; and using salt-resistant crops could help to alleviate the adverse consequences or scarce and saline water, which causes farmers to flee from degraded land, and negatively affects crop and livestock production.

5.1.2 Opportunities identified by the Agriculture Sector Council

- Construct dams to retain and direct water to irrigation

- Invest in harvesting of rain and underground water for irrigation and drinking

- Use new machinery and cages to increase efficiency of breeding

- Establish private agriculture marketing companies

- Design a marketing system to categorise products according to their specifications and prices

- Encourage the plantation of olive and nut trees in areas not suitable for other farming

- Implement the principle of 'selling then planting' to guarantee the sale of crops

- Encourage the production and distribution of hybrid bee queens

- Establish factories to process wool and employ women

- Provide literacy and numeracy training to farmers

- Design entry process and criteria to decide on the acceptance of students at universities based on their skills and talents.

5.1.3 Goals of the Agriculture Sector Council

1. Establish field farm schools (FFS) in each sub-district to offer part-time education and training

2. Organise training courses for rural women in the agricultural sector in areas including literacy, dairy and other food processing, and wool processing

3. Provide temporary access to agricultural land, training and employment to IDPs and refugees to support their self-sufficiency

4. Establish public-private partnership (PPP) companies to create jobs for unemployed agriculture graduates by providing land, identifying suitable crops, mentoring and providing product marketing support

5. Establish PPPs in new technology fish farming for unemployed veterinary graduates with training, mentoring and product marketing support

6. Organise veterinary and agricultural summer training with support of international supervisors and video clip reporting by students for each competency

7. Replace chlorine by ozone in water purification processes in food factories, slaughter houses and sewage treatment

8. Establish green belts and green spaces in urban areas to decrease CO_2 emissions, using organic fertilizers to improve soil quality

9. Develop a communication campaign directed to farmers to raise awareness about the use of animal waste in the production of bio-gas and electricity.

5.1.4 In-demand occupations identified by the Agriculture Sector Council

Table 14: In-demand occupations identified by the Agriculture Sector Council

ISCO	ASCO	Occupation	Comment
2132	2132	Farming, forestry and fisheries advisors	Advisory very important; growing demand for fish farming products
6123	6123	Apiarists and sericulturists	Breeding of queen bees, shortage in this area; queens are pivotal in the process
6129	-	Animal producers not elsewhere classified	Quail breeders-quails grow quickly
6320	6210	Subsistence livestock farmers	Suitable for women; self-sufficiency for villages; dynamo of rural life
7233	7236	Agricultural and industrial machinery mechanics and repairers	Shortage
7544	-	Fumigators and other pest and weed controllers	Skill gaps and shortage; suitable for women; how to deal with chemicals and with crops after spraying; farmers don't know how to use chemical products and how to store them
8342	8341	Earth moving and related plant operators	High demand; shortage; two levels (semi-skilled and skilled)
9212	9214	Livestock farm labourers	Decrease in numbers; need to rebuild, especially raising calves (medical, feeding)

5.2 Results of the Enterprise Survey for the agriculture sector

The following sections provide both top-level and in-depth information into the labour market outlook and educational/training needs of medium- (10-29 employees) and large-sized (30+ employees) firms across the selected six governorates in Iraq and two in KR-I.

Firms were drawn in a stratified manner (by governorate and subsector) from CSO's 2009 Business Register and in some cases based on CSO field offices' knowledge of the labour market. Given the outdated Register and the significant changes in the country during the years since 2009, the Register is not thought to accurately represent the current labour market. Therefore, in all proceeding analyses, the data is not weighted according to the Register, and instead the raw results

is presented. In cases where firms' responses are quite varied by strata, this approach may lead to some strata being under- or over-represented in the total counts, but nonetheless characterises a reliable presentation of the survey results.

5.2.1 General overview of the sampled firms from the Enterprise Survey

Based on the Register the agriculture sector is comprised of a total of 504 medium and large-sized firms, of which 160 were sampled. All but 1 one firm (fishing) were involved in crop and animal production, hunting and related service activities (Table 15). The firms were relatively evenly split between KR-I (88 firms, 55%) and Iraq (72 firms, 45%), with Sulaymaniyah being the largest main governorate for agriculture with 66 medium- and large- sized firms. The numbers in brackets in Table 15 indicate the number of medium- (10-29 employees) and large-sized firms (30+ employees), respectively. The majority of medium and large size firms (87.5%) were medium-sized (10-29 employees). Wasit and Erbil had the highest proportions and number of large firms. The subsequent sections do not disaggregate the results into medium- and large-sized firms, as the responses between these groups did not differ significantly.

Table 15: Number of agriculture firms sampled by governorate and subsector

Subsector	Baghdad	Basrah	Diyala	Erbil	Kirkuk	Najaf	Sulaymaniyah	Wasit	Total
Crop and animal production, hunting and related service activities	10 (8 medium, 2 large)	3 (2,1)	22 (21,1)	22 (14,8)	2 (2,0)	22 (22,0)	66 (63,3)	12 (7,5)	159 (139,20)
Fishing and aquaculture	0	0	0	0	0	0	0	1 (1,0)	1 (1,0)
Total	10 (8,2)	3 (2,1)	22 (21,1)	22 (14,8)	2 (2,0)	22 (22,0)	66 (63,3)	13 (8,5)	160 (140,20)

Of the 160 firms, 145 (91.1%) indicated their main economic activity was the production of goods, 9 (5.6%) mainly provided services, and 6 (3.7%) were primarily involved in both. The firms varied in size from 10 to 175 employees, with a median size of 12, indicating that most firms are medium-sized.

The total number of employees across the 160 firms was 3,199; the majority of which were permanent, male employees (Table 16). There was also a large proportion of daily workers, with a similar breakdown by gender to permanent employees perhaps indicating a large number of transient roles in this sector. The predominance of males and the type of employee breakdown was consistent across all governorates (Figure 37). Najaf had the highest proportion of female employees (36% overall), while Kirkuk had the lowest (none of the 28 total employees in Kirkuk were female). The proportion of women employees in the survey data is lower than 37% reported for the agriculture sector as a whole, suggesting that women may work more in smaller businesses and/or in unpaid roles; or work more in a specific season.

Table 16: Employee type by gender

Type	Male	Female	Total
Permanent	1,919 (80%)	472 (20%)	2,391
Temporary	195 (84%)	38 (16%)	233
Daily	445 (77%)	130 (23%)	575
Total	2,559 (80%)	640 (20%)	3,199

Figure 37: Number of employees by gender in selected governorates
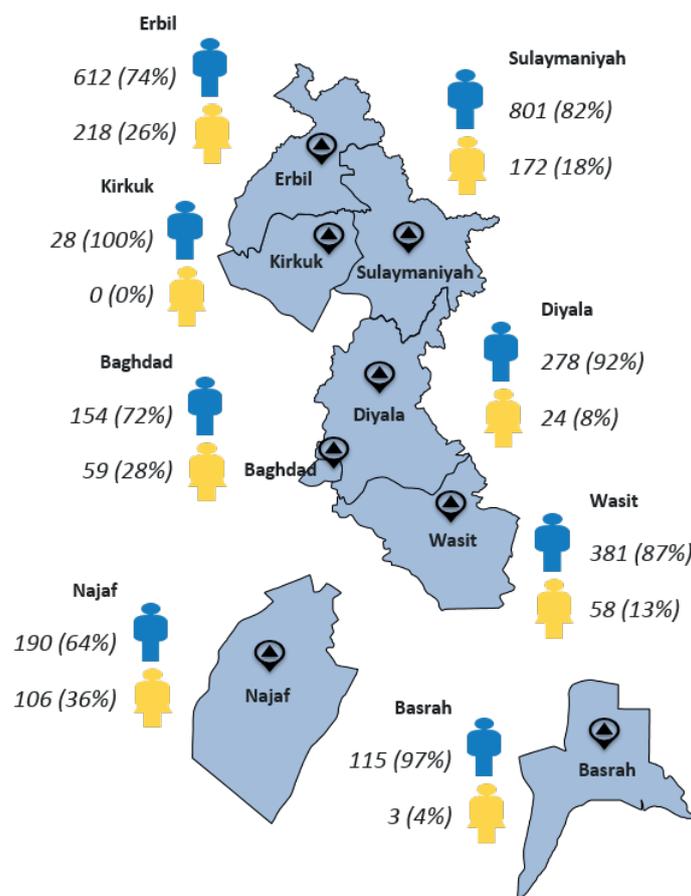
The legal status of firms was not answered in the majority of cases, as 53% of firms did not divulge this information. Of those firms who did answer, nearly all were individually owned (Table 17). Though conclusive inferences cannot be made to the greater country using this sample as the true population is unknown, it is worth mentioning individual ownership found in the survey exceeds the Ministry of Planning estimates that 64% (in Iraq) or 58% (in KR-I) of farms are owned by the farmer. Finally, the majority of firms were started after the year 2000 (Figure 38), although another significant proportion were formed between 1980 and 1995.

Table 17: Legal status of firms

Subsector	Individual ownership	Limited company	Joint stock company	Not stated
Crop and animal production, hunting and related service activities	N/A	1 (0.7%)	112 (79.4%)	28 (19.9%)
Fishing and aquaculture	1 (0.4%)	3 (1.1%)	178 (65.9%)	88 (32.6%)

Figure 38: Firms starting year of operation
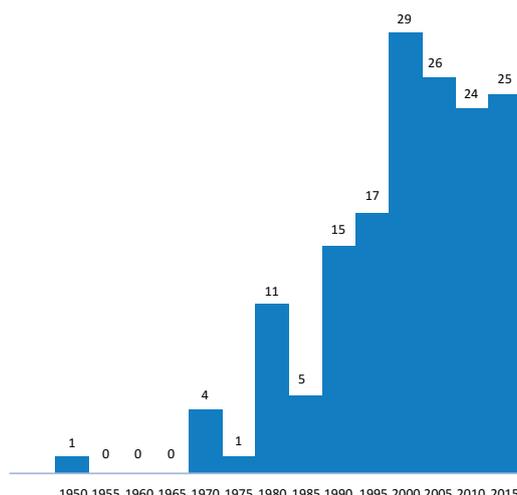
5.2.2 Analysis of occupations in the agriculture sector

Each company was asked to list the top 7 occupations (based on frequency) in their workforce as well the qualification levels of people in the occupations. The classification of qualification levels are based on these descriptions:

- Basic-skilled Worker (no diploma or a certificate for primary or middle education)
- Semi-skilled Worker (has followed some vocational training)
- Skilled Worker (professional secondary education/vocational training certificate)
- Professional Technician (diploma from a technical institute)
- Professional Academic (diploma from a higher education institute)
- Technical Specialist (bachelor degree from a technical faculty/university)
- Academic Specialist (bachelor degree from a faculty/university)
- Higher Technical Specialist (technical master degree or equivalent)
- Specialist Technical Expert (technical doctorate degree or equivalent)
- Specialist Academic Expert (doctorate degree or equivalent).

The skills levels of the employees were relatively low compared to other sectors. Overall, a significant majority (Table 18) of the occupations were classified in the lower group of skills for both subsectors. In 'A' level occupations (professional and technical) nearly half had bachelor level qualifications (48%) indicating that these professions generally require higher qualifications than those in 'B' level occupations (basic-skilled, semi-skilled and skilled). In 'B' level occupations 52% of workers had basic-skilled qualifications, 3% had semi-skilled and 33% had skilled qualifications.

Table 18: Occupation level by qualification

Occupation level	Basic-skilled	Semi-skilled	Skilled	Prof. Technician	Prof. Academic	Tech. Specialist	Acad. Specialist	Higher Tech. Specialist	Specialist Tech. Expert	Specialist Acad. Expert
'A' level	3 (3%)	1 (<1%)	34 (30%)	12 (11%)	5 (4%)	20 (18%)	34 (30%)	1 (<1%)	1 (<1%)	1 (<1%)
'B' Level	244 (52%)	13 (3%)	157 (33%)	16 (3%)	6 (1%)	14 (3%)	21 (4%)	1 (<1%)	1 (<1%)	0 (0%)

Table 19 below shows the top ten agriculture-related occupations found in the survey (in order) in 2017 in employment across the sector in Iraq and KR-I, respectively. Six of the top ten occupations appeared in both Iraq and KR-I:

- Animal breeders and dairy producers
- Agricultural, forestry and fishery department managers
- Livestock and poultry labourers
- Poultry breeders
- Animal care workers
- Vegetable farmers.

Furthermore, there was no overlap in the top four in either of the regions. It is interesting to see that in both Iraq and KR-I the main focus for employment, in the sample, is on livestock farmers rather than crop farmers; and the workforce for Iraq's major grain crops is not prominent in these results. In both Iraq and KR-I vegetable farming is in 9th place.

It should be noted that occupations that work in the role of agriculture extension technicians appear in fifth place in KR-I. Despite the acknowledged importance of the agriculture sector there have been budget cuts (see section 3.7.4) for agriculture extension services, and existing public sector employees are under-utilised due to lack of funding for extension service provision. In response to declining employment rates for agriculture extension graduates, Sulaymaniyah Polytechnic University (SPU) has taken the decision to discontinue its agriculture extension programme. This is a logical decision for SPU, but it addresses the symptom of the problem (no jobs for graduates) while the cause of the problem (not enough funding for agriculture extension services) still needs to be addressed.

Table 19: Top ten most frequent occupations by region

Rank	1	2	3	4	5	6	7	8	9	10
Iraq	Animal breeders and dairy producers	Agricultural, forestry and fishery department managers	Livestock and poultry labourers	Forestry workers	Poultry breeders	Animal care workers	Food processing machine operators	Hand-packers in manu-facturing	Vegetable farmers	Tied: Drivers and operators of agricultural machinery & Field crop farmers
KR-I	Poultry breeders	Veterinarians	Animal care workers	Agricultural, forestry and fishery department managers	Zootechny, poultry farming, apiculture and aqua life technicians	Agri-cultural machinery mechanics	Animal breeders and dairy producers	Livestock and poultry labourers	Vegetable farmers	Tied: Gardeners and nursery farmers & Butchers, fish-mongers and related food preparers

5.2.3 Analysis of job skills in the agriculture sector

One of the main purposes of the survey was to assess the skills that employers value, and need more of in their firms. To assess this, each firm was asked to provide the following for 12 key job skills (description of skills can be found in Appendix 5):

- Importance (not, somewhat or very important)
- Satisfaction (not, somewhat or very satisfied).

These questions were answered by each firm for each of their seven most common occupations. In order to better understand the gaps in skills in the relevant agriculture-related occupations we

focus our analysis on the gap between how important a skill is thought to be, and how satisfied employers are of their workers in having this skill.

To assess the overall response to these questions, the average answer of importance and satisfaction were calculated for each agriculture-related occupation. These values were then placed via side-by-side boxplots in Figures 39 (Iraq) and 40 (KR-I). A value of '1' on the y-axis indicates perceived low importance or satisfaction, while 3 indicates high importance or satisfaction. The horizontal black line in each box indicates the median value, while the bottom and top of the box indicate the 25th and 75th percentile, respectively. Black dots indicate outliers (in this case occupations with exceptionally low scores). This representation allows both the overall patterns in response and the identification of potential gaps between importance and satisfaction from a high-level of the sector. This view is only indicative for the sector as a whole, and not specific occupations.

There is some stark differences between Iraq and KR-I. For example, in general the importance of skills is ranked lower in many categories in Iraq. Advanced, technical and specialised knowledge appear to have higher importance in KR-I. Satisfaction is relatively similar between regions; and is moderate to high for all the skills. Literacy and soft skills such as communication and teamwork also appear to be considered more important and increasingly important in KR-I compared to Iraq. In both regions foreign language skills, and digital technology skills have lower importance and more variability in the responses.

In both regions there does not appear to be major gaps between importance and satisfaction with many of the categories of skills and knowledge. Exceptions are continuous learning, creative thinking, and foreign language and digital skills in Iraq, where the importance appears to be lower than the satisfaction, indicating that employees may have more expertise than is thought necessary by employers in these areas.

Overall agriculture employers have relatively low expectations of skills required for the lower level agriculture occupations and moderate satisfaction with the skills of their employees.

Figure 39: Side-by-side boxplots of the average importance and satisfaction of 12 key skills for agriculture-related occupations in Iraq
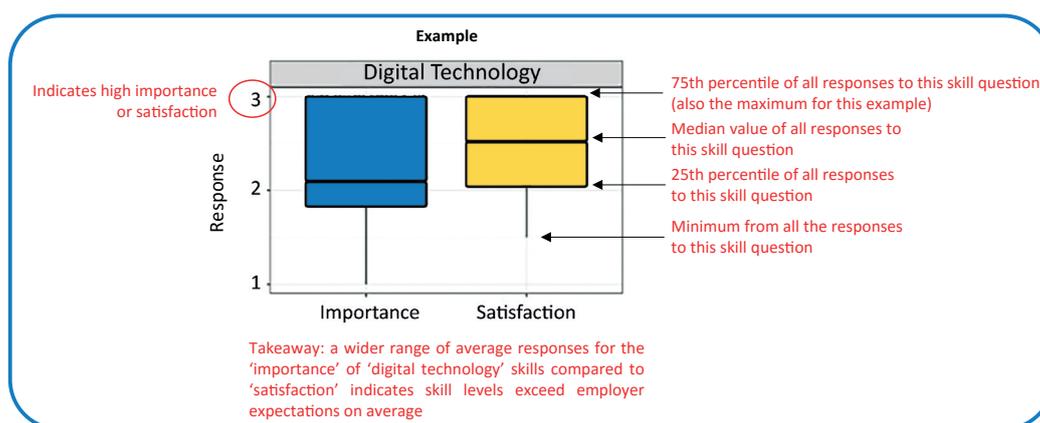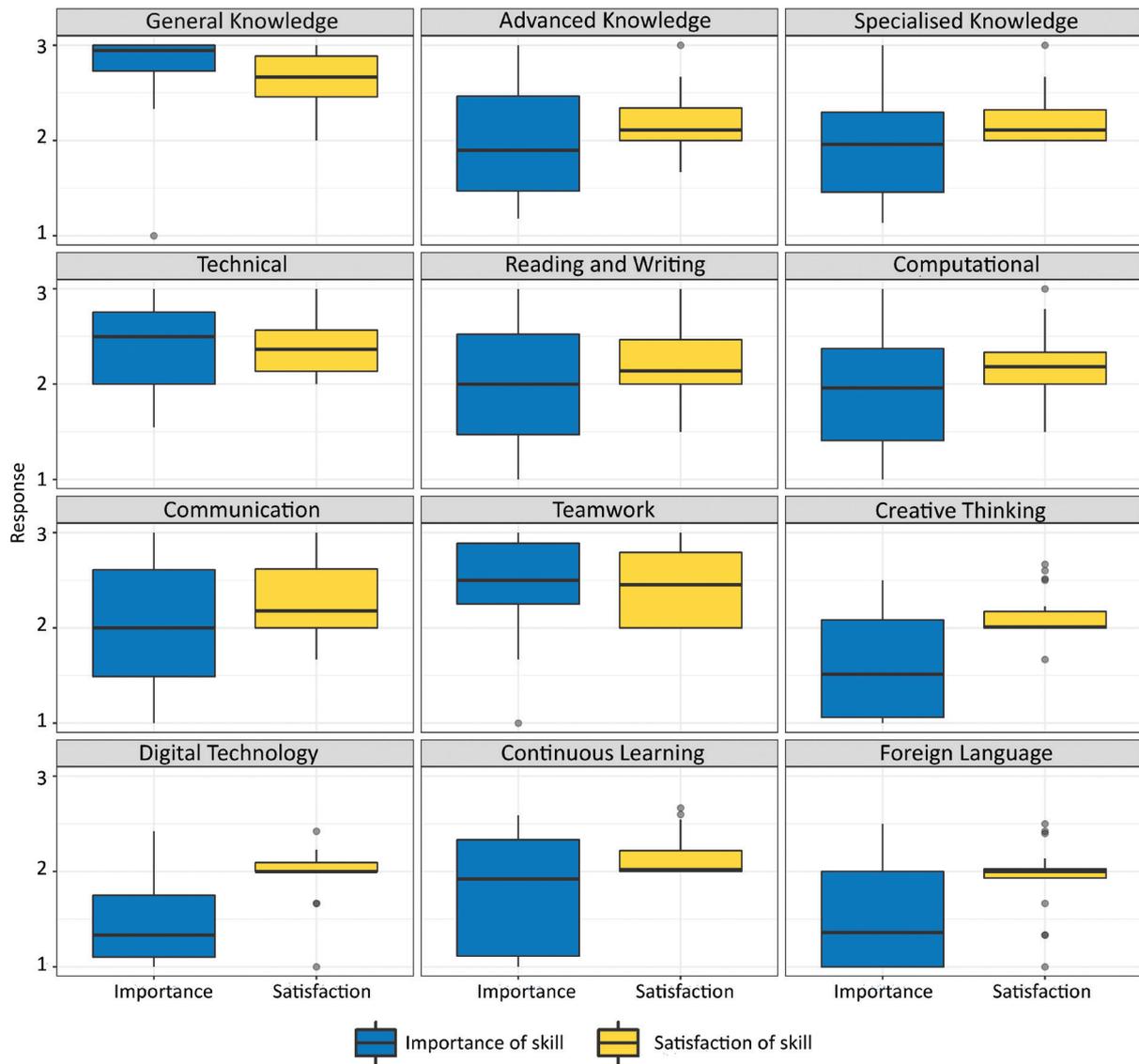
Figure 40: Side-by-side boxplots of the average importance and satisfaction of 12 key skills for agriculture-related occupations in KR-I
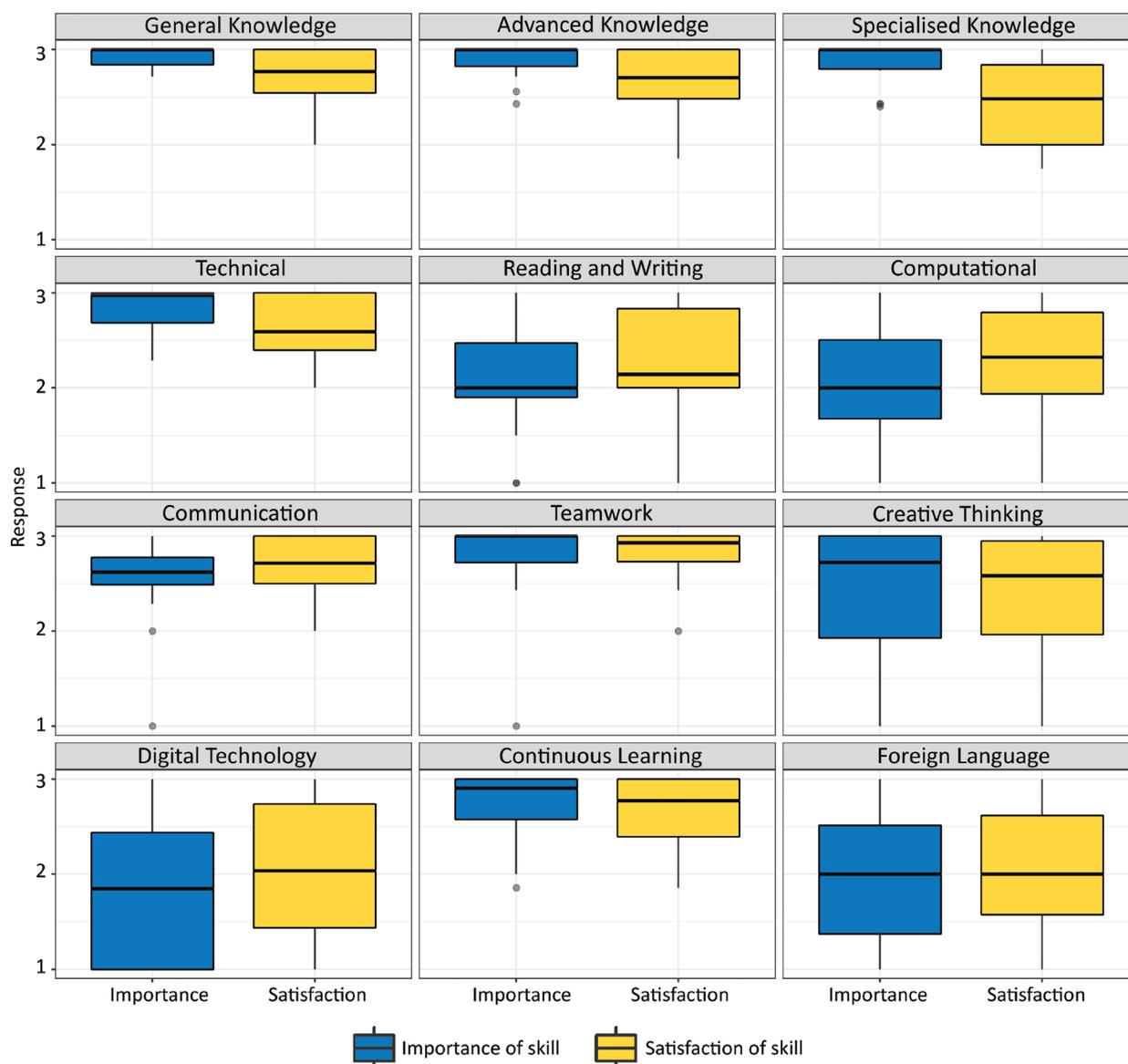
To understand potential significant skill gaps in a more granular way, we restrict our analysis to the top ten agriculture-related occupations in the sector reported in Table 19 above and plot the average differences between importance and satisfaction (Figure 41 and 42). A complete list of agriculture-related occupations and their average levels of importance and satisfaction are presented in Appendix 6, including agriculture-related occupations found in other sectors as part of this Sector Skills Analysis (SSA) Project.

A score of zero (no bar) shows no gap between importance and satisfaction. The bar shows the size of the gap between importance and satisfaction for each skill. A positive bar (above the horizontal axis) means there is a gap, and the height of the bar shows how big the gap is. A negative bar (below the horizontal axis) means that the skill level exceeds employers' expectations (i.e. the workers have skills beyond what is thought to be important for the occupation).

As in the overall graphs, there is some differences between regions. For example, in KR-I it seems that for animal breeders and dairy producers there are small gaps for basic, advanced and specialised knowledge and technical skills, while in Iraq employers' expectations are mostly exceeded in all occupations except agricultural managers, poultry breeders and vegetable farmers. In both regions

there are gaps across all skills for poultry breeders. Similar patterns are seen for animal care workers, where there is more satisfaction in Iraq and more skills gaps in KR-I. The pattern is reversed (some gaps in Iraq, not KR-I) for vegetable farmers. For many of the jobs in Iraq the values indicate that satisfaction exceeds the perceived importance of many of the occupational skill sets. This pattern is not present in KR-I, perhaps due to lower satisfaction or higher levels of the perceived importance of various skills.

Figure 41: Gap between average importance and satisfaction of 12 key skills for the top ten most frequent agriculture-related occupations in Iraq

Agricultural, forestry and fishery department managers

Animal breeders and dairy producers

Animal care workers

Drivers and operators of agricultural machinery

Field crop farmers

Food processing machine operators

Forestry workers

Handpackers in manufacturing

Livestock and poultry labourers

Poultry breeders

Vegetable farmers

Importance - Satisfaction

General Knowledge
Advanced Knowledge
Specialised Knowledge
Technical
Reading and Writing
Computational
Communication
Teamwork
Creative Thinking
Digital Technology
Continuous Learning
Foreign Language

■ Exceeds expectations   ■ Below expectations

Figure 42: Gap between average importance and satisfaction of 12 key skills for the top ten most frequent agriculture-related occupations in KR-I

Importance - Satisfaction

Agricultural machinery mechanics

Agricultural, forestry and fishery department managers

Animal breeders and dairy producers

Animal care workers

Butchers, fishmongers and related food preparers

Gardeners and nursery farmers

Livestock and poultry labourers

Poultry breeders

Vegetable farmers

Veterinarians

Zootechny, poultry farming, apiculture and aqua life technicians

General Knowledge
Advanced Knowledge
Specialised Knowledge
Technical
Reading and Writing
Computational
Communication
Teamwork
Creative Thinking
Digital Technology
Continuous Learning
Foreign Language

■ Exceeds expectations   ■ Below expectations

5.2.4 Analysis of training, recruitment and future growth of the agriculture sector

Across all the surveyed firms, only 20% have implemented training courses for their employees over the past 5 years (Table 20). This proportion is quite low and is consistently low across governorates, with the exception of Erbil (59.1%). This low proportion of in-house training does not seem to be due to having difficulty in finding relevant courses or competent trainers (Table 21) even though the number of agriculture employers who have a relationship with a training institution is low (Table 22). In all governorates, the majority of firms report no difficulty finding trainers. It is therefore likely that lack of funding for agriculture extension services is one reason why firms have not been training their employees. Perhaps if extension services and model farms were functional, firms would be more inclined to participate in bettering their employees' skills through training.

Table 20: Number of firms who have organised employee training courses in the last five years

Subsector	Baghdad	Basrah	Diyala	Erbil	Kirkuk	Najaf	Sulaymaniyah	Wasit	Total
Crop and animal production, hunting and related service activities	3/10 (30%)	1/3 (33%)	6/22 (27%)	13/22 (59%)	0/2 (0%)	0/22 (0%)	5/66 (8%)	4/12 (33%)	32/159 (20%)
Fishing and aquaculture	0	0	0	0	0	0	0	0/1 (0%)	0/1 (0%)
Total	3/10 (30%)	1/3 (33%)	6/22 (27%)	13/22 (59%)	0/2 (0%)	0/22 (0%)	5/66 (8%)	4/13 (31%)	32/160 (20%)

Table 21: Number of firms who have difficulty finding relevant training and trainers

	Difficulty finding relevant training courses	Difficulty finding competent trainers
Baghdad	4/10 (40%)	3/10 (30%)
Basrah	1/3 (33%)	1/3 (33%)
Diyala	0/22 (0%)	0/22 (0%)
Erbil	0/22 (0%)	2/22 (9%)
Kirkuk	0/2 (0%)	0/2 (0%)
Najaf	0/22 (0%)	0/22 (0%)
Sulaymaniyah	1/66 (1.5%)	1/66 (1.5%)
Wasit	0/13 (0%)	0/13 (0%)

Table 22: Number of firms who have a relationship with a training institution

Subsector	Baghdad	Basrah	Diyala	Erbil	Kirkuk	Najaf	Sulaymaniyah	Wasit	Total
Crop and animal production, hunting and related service activities	0/10 (0%)	1/3 (33%)	0/22 (0%)	6/22 (27%)	0/2 (0%)	0/22 (0%)	4/66 (6%)	2/12 (17%)	13/159 (8%)
Fishing and aquaculture	0	0	0	0	0	0	0	0/1 (0%)	0/1 (0%)
Total	0/10 (0%)	1/3 (33%)	0/22 (0%)	6/22 (27%)	0/2 (0%)	0/22 (0%)	4/66 (6%)	2/13 (15%)	13/160 (8%)

When hiring new employees, the firms from different governorates tend to have similar priorities. Table 23 indicates a weighted average of the top 5 most important factors when firms are hiring new employees. Specifically, each firm was asked from a list of 11 factors to rank the top 5 most important when hiring a new employee. To determine the aggregated rankings by governorate, a simple scoring system was used. Whenever a factor was listed as the most important by the employer

employer it is given a score of 5. The second most important factor is given a score of 4 and so forth until the 5th most important is given a score of 1. These scores are tallied for each of the 11 factors and the top 5 based on score (for each governorate) are listed in the table. Across all the governorates age and gender are consistently ranked the highest level of importance, although these factors are unrelated to skills or job performance. Social relations and nationality and are also common factors, showing that employers are more motivated by factors other than qualification.

Across all governorates, age is considered to be of high priority (no lower than 3rd most important). In 6 out of 8 governorates age of the applicant is considered the number one factor when hiring, perhaps due to younger employees coming at lower cost, or due to experience being associated with age. Gender also ranks very high in all governorates, which may be due to cultural norms around certain roles. Surprisingly, practical experience, and qualifications are not consistently highly valued.

Table 23: Rank of hiring factors

Rank	1st	2nd	3rd	4th	5th
Baghdad	Age	Social Relations	Gender	Interview behaviour	Practical experience
Basrah	Social Relations	Internal advancement	Age	Interview behaviour	Nationality
Diyala	Age	Gender	Social Relations	Interview behaviour	Practical experience
Erbil	Internal advancement	Gender	Age	Interview behaviour	Practical experience
Kirkuk	Age	Nationality	Practical experience	Interview behaviour	Social Relations
Najaf	Age	Gender	Qualifications	Practical experience	Interview behaviour
Sulaymaniyah	Age	Interview behaviour	Qualifications	Practical experience	Gender
Wasit	Age	Gender	Internal advancement	Interview behaviour	References

Table 24 indicates the proportion of firms across governorates who plan to hire new employees in the next five years. The overall percentage of firms planning to hire is only 14%, which is very low. In particular, in Sulaymaniyah (the largest governorate by firms sampled) only 7 out of 66 firms plan to hire. This is surprising as in Erbil (also in KR-I) the rate of plans for hiring is the highest (54.5%). Many of the governorates have no firms with plans to hire in the next five years.

Table 25 shows the five-year outlook by governorate. These results are more positive than could be expected, based on the hiring results. For example, in Sulaymaniyah, 44% of firms have a positive outlook over the next five years, yet as mentioned above only 11% plan to hire. The most common five-year outlook was unsure, indicating that most firms are uncertain about what the future holds and do not have a clear vision for their business success. This is likely due to the large political and overall economic uncertainty in the region.

Table 24: Number of firms planning to hire in the next five years by subsector and governorate

Subsector	Baghdad	Basrah	Diyala	Erbil	Kirkuk	Najaf	Sulaymaniyah	Wasit	Total
Crop and animal production, hunting and related service activities	2/10 (20%)	1/3 (33%)	0/22 (0%)	12/22 (54.5%)	0/2 (0%)	0/22 (0%)	7/66 (11%)	1/12 (8%)	23/159 (14.5%)
Fishing and aquaculture	0	0	0	0	0	0	0	0/1 (0%)	0/1 (0%)
Total	2/10 (20%)	1/3 (33%)	0/22 (0%)	12/22 (54.5%)	0/2 (0%)	0/22 (0%)	7/66 (11%)	1/13 (8%)	23/160 (14%)

Table 25: Five-year outlook by governorate

Outlook	Baghdad	Basrah	Diyala	Erbil	Kirkuk	Najaf	Sulaymaniyah	Wasit	Total
Negative	5/10 (50%)	0/3 (0%)	10/22 (45.5%)	3/22 (14%)	1/2 (50%)	0/22 (0%)	11/66 (17%)	3/13 (23%)	33/160 (20.5%)
Positive	0/10 (0%)	1/3 (33%)	10/22 (45.5%)	7/22 (32%)	0/2 (0%)	3/22 (14%)	29/66 (44%)	1/13 (8%)	51/160 (32%)
Unsure	5/10 (50%)	2/3 (67%)	2/22 (9%)	12/22 (54.5%)	1/2 (50%)	19/22 (86%)	26/66 (39%)	9/13 (69%)	76/160 (47.5%)

The low hiring rates do not seem to be due to a lack of satisfaction with applicant skills. Tables 26 and 27 indicate the satisfaction of the firms with applicants' soft skills (i.e. problem-solving, communication), and technical (i.e. practical) skills over the last five years. In both tables, the majority of firms are at least somewhat satisfied with the skills the applicants have. In all governorates 10% or less of firms indicate they are not satisfied. However many employers found the question 'unsure' perhaps because they are not even attempting to hire new employees. This fits with the finding that agriculture employers have limited intention (only 14%) to hire new staff in the foreseeable future in Table 24.

Table 26: Level of satisfaction with basic and operational skills of applicants over the past five years

Satisfaction	Baghdad	Basrah	Diyala	Erbil	Kirkuk	Najaf	Sulaymaniyah	Wasit	Total
Completely statsfied	2/10 (20%)	1/3 (33%)	9/22 (41%)	13/22 (59%)	1/2 (50%)	3/22 (14%)	23/66 (35%)	0/13 (0%)	52/160 (32%)
Somewhat satisfied	6/10 (60%)	1/3 (33%)	5/22 (23%)	8/22 (36%)	1/2 (50%)	0/22 (0%)	29/66 (44%)	4/13 (31%)	54/160 (34%)
Not satisfied	1/10 (10%)	0/3 (0%)	0/22 (0%)	1/22 (4.5%)	0/2 (0%)	0/22 (0%)	1/66 (1.5%)	0/13 (0%)	3/160 (2%)
Unsure	1/10 (10%)	1/3 (33%)	8/22 (36%)	0/22 (0%)	0/2 (0%)	19/22 (86%)	13/66 (20%)	9/13 (69%)	51/160 (32%)

Table 27: Level of satisfaction with technical skills of applicants over the past five years

Satisfaction	Baghdad	Basrah	Diyala	Erbil	Kirkuk	Najaf	Sulaymaniyah	Wasit	Total
Completely statsfied	2/10 (20%)	3/3 (100%)	9/22 (41%)	20/22 (91%)	0/2 (0%)	2/22 (9%)	24/66 (36%)	2/13 (15%)	62/160 (39%)
Somewhat satisfied	5/10 (50%)	0/3 (0%)	5/22 (23%)	1/22 (4.5%)	2/2 (100%)	1/22 (4.5%)	29/66 (44%)	2/13 (15%)	45/160 (28%)
Not satisfied	2/10 (20%)	0/3 (0%)	0/22 (0%)	1/22 (4.5%)	0/2 (0%)	0/22 (0%)	0/66 (0%)	0/13 (0%)	3/160 (2%)
Unsure	1/10 (10%)	0/3 (0%)	8/22 (36%)	0/22 (0%)	0/2 (0%)	19/22 (86%)	13/66 (20%)	9/13 (69%)	50/160 (31%)

Given the low plans to hire, it is important to understand what areas the firms consider to be important for the future growth of their businesses. Figure 43 indicates a variety of factors that could be considered important to growth of the firm's businesses. Across all governorates, there is high importance placed on all areas. This is not unexpected given that these questions ask about core business principles. There are a couple of outliers, such as in Kirkuk, where long term strategic planning and meeting annual profit targets are given less importance. This is specific to only two firms that were sampled in Kirkuk and therefore can be assumed to be not an overall area trend.

Firms in all governorates were more or less unanimous about the importance of meeting consumer needs and product/service quality. Policy environment conducive to economic growth is another area where there is strong agreement and is very important to agriculture businesses. This mirrors the view of the pilot Agriculture Sector Council which made strong recommendations for policy changes to support the agriculture sector, especially research and extension services; subsidised inputs and protection of local products.

Figure 43: Factors impacting future business growth
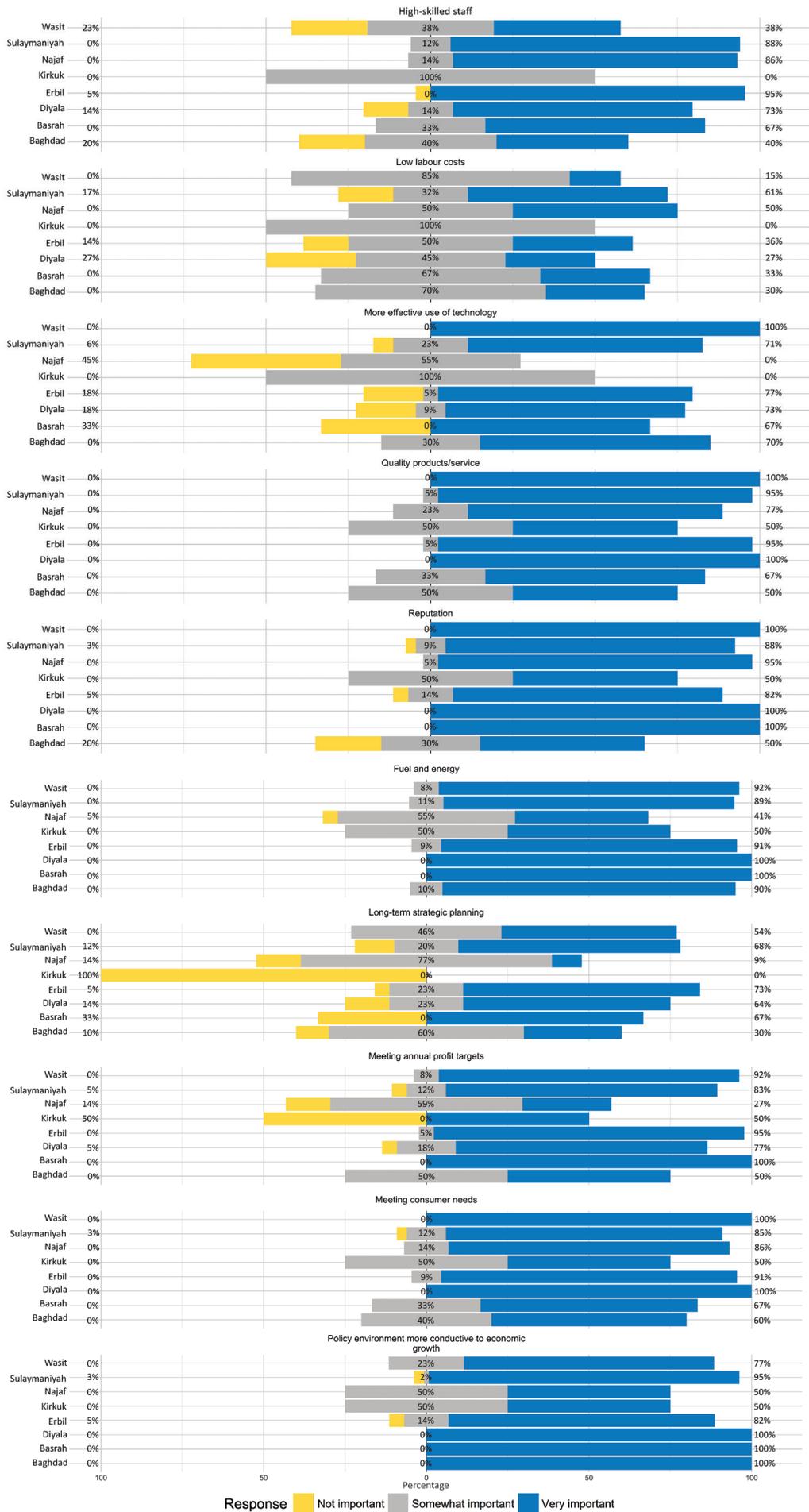
Based on these clear trends in areas that are identified as important to future growth, it is interesting to see the contrast in what has actually been implemented in the past few years (Figure 44). There is a balance between firms which have, or have not, implemented various changes to their business practices in the past few years. There appears to have been least change in areas relating to human resource management with almost all governorates, showing no changes in performance management, recruitment practices, or work environment. On the other hand, the majority of firms in all governorates have attempted to improve business processes, marketing strategies, and products and services to consumers. This indicates that firms are prioritising pleasing consumers rather than making internal changes to staff and work place environment.

Figure 44: Changes and innovations firms have implemented in the past few years, by governorate

Change to staff performance management

Governorate	No	Yes
Wasit	54%	46%
Sulaymaniyah	48%	52%
Najaf	95%	5%
Kirkuk	50%	50%
Erbil	55%	45%
Diyala	91%	9%
Basrah	100%	0%
Baghdad	60%	40%

Changes in recruitment practices

Governorate	No	Yes
Wasit	62%	38%
Sulaymaniyah	70%	30%
Najaf	100%	0%
Kirkuk	50%	50%
Erbil	55%	45%
Diyala	95%	5%
Basrah	100%	0%
Baghdad	50%	50%

Changes to work environment

Governorate	No	Yes
Wasit	31%	69%
Sulaymaniyah	56%	44%
Najaf	100%	0%
Kirkuk	50%	50%
Erbil	23%	77%
Diyala	82%	18%
Basrah	67%	33%
Baghdad	20%	80%

Improved business processes

Governorate	No	Yes
Wasit	31%	69%
Sulaymaniyah	24%	76%
Najaf	45%	55%
Kirkuk	0%	100%
Erbil	18%	82%
Diyala	23%	77%
Basrah	33%	67%
Baghdad	50%	50%

Improved marketing strategies

Governorate	No	Yes
Wasit	15%	85%
Sulaymaniyah	35%	65%
Najaf	55%	45%
Kirkuk	0%	100%
Erbil	32%	68%
Diyala	14%	86%
Basrah	0%	100%
Baghdad	60%	40%

Improved products/services

Governorate	No	Yes
Wasit	0%	100%
Sulaymaniyah	14%	86%
Najaf	9%	91%
Kirkuk	50%	50%
Erbil	0%	100%
Diyala	0%	100%
Basrah	0%	100%
Baghdad	60%	40%

Improved services for customers

Governorate	No	Yes
Wasit	0%	100%
Sulaymaniyah	21%	79%
Najaf	59%	41%
Kirkuk	50%	50%
Erbil	14%	86%
Diyala	9%	91%
Basrah	0%	100%
Baghdad	60%	40%

Percentage

Response — No — Yes

To further understand the factors that may contribute to business success, the firms were asked what external factors have contributed positively and negatively to their recent performance. Figure 45 indicates the various factors that have had positive and negative influences on the firms over the last few years. Conflict, economic downturn, and law and policy changes stand out as major negatives on business performance. Although, paradoxically, in KR-I some firms have reported conflict and economic downturn as being positives for their businesses.

This may have been due to the influx of refugees and IDPs needing work and food (increased demand) and/or reduced competition due to some firms going out of business. Policy changes have also had a positive impact in KR-I: an example of positive policy changes in KR-I discussed by the pilot Agriculture Sector Council in 2017 was the KR-I government support for hay production.

The only mainly positive factor is consumer preference. The remaining factors are generally split between positive and negative, with some variation between governorates. For example, technological change appears to be positive for about half the firms and negative for the other half. This may reflect the opinions of firms who have and have not adopted technology in their businesses. For example, a firm who has adopted technological advancements may see increased efficiency, while one that does not want, or have the means, to adopt a technological advancement may not know what they are missing out on.

Figure 45: External drivers impacting business performance during the past few years, by governorate
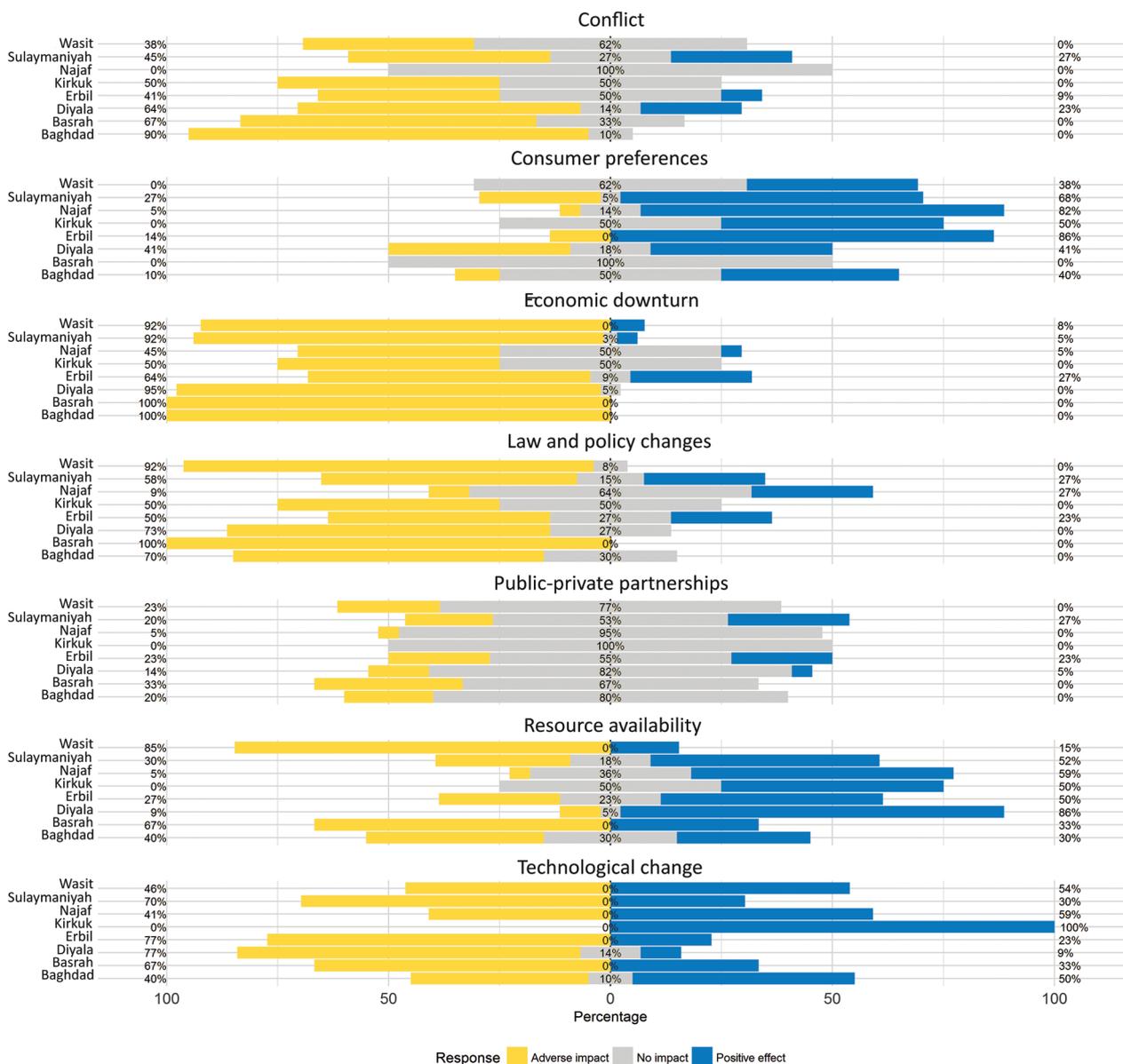
5.2.5 Analysis of small-sized firms in the agriculture sector

The main analysis of the agriculture sector focuses on firms of at least 10 employees. This is done in order to ensure that questions are relating to overall occupations and not to specific employees. That being said, some data was collected on firms of less than 10 employees. In total, 92 of these smaller firms across 5 governorates were surveyed. Given that there were responses for smaller firms from only five of the governorates, in diverse locations, comparisons (to the larger firms) at the governorate level is not possible.

The overall survey results were very similar in the smaller firms when compared to the larger firms. The top ten most common occupations were consistent with the larger firms in both rank and content. One notable absence is veterinarians in KR-I being absent in the smaller firms (second most common in larger firms).

The smaller firms' answers to the importance of, and satisfaction with, the 12 identified skills were nearly indistinguishable from the larger firms, although with slightly more variability (likely due to the issue of answering questions relating to one employee, as mentioned above). Overall gaps were similar, or less present.

The responses relating to hiring practices, plans and recent firm improvements were similar to the larger firms. The same factors were considered positive/negatives to the firms over the past few years.

These comparisons indicate that where data is available, the smaller firms have similar preferences, needs and business practices as the larger firms. Nonetheless, given the unbalanced and selectively taken sample, no strong inferences should be drawn.

5.2.6 Conclusion and limitations of the results from the Enterprise Survey

The above descriptions give an overview of the firms of at least size 10 in the agriculture industry. The sector is dominated by males and medium-sized firms across all the strata, with mostly full time workers but also a large proportion of daily employees. The majority of workers are lower skilled, and not highly technical or academic, which indicates the requirements of many of the jobs within the sector (majority of vocational rather than technical or managerial).

There was a clear spilt in the top ten occupations in each region between high and low skill jobs. In general employers had lower expectations and moderate satisfaction with low skilled workers; but noticed some small gaps in the knowledge and skills of technical and professional levels. In general the survey results may indicate that the firms see the status quo (in terms of skills) remaining steady, at least in the majority of occupations.

This is further illustrated by the low hiring plans over the next 5 years. Very few firms plan to hire (14%), and this may also indicate a sector that is remaining stagnant in terms of growth, skill trends, and hiring. The only exception to these low hiring rates was in Erbil where more firms do plan to hire. It would be beneficial to further understand what differentiates this governorate.

The only area that firms indicated as consistently (across governorate) positive for their businesses over the last few years was consumer preference. All the remaining factors were either split (or neutral) across governorates or overwhelmingly negative (law and policy, economic downturn, conflict).

Firms seemed to have emphasised changes to their interaction with customers and their products more than internal changes. Perhaps growth and business efficiency could be improved by making changes to internal structures (hiring, performance management, and work environment) as well as continued changes to services and products. In particular, hiring practices should likely be more centred on employee skills and experience and less on demographic characteristics.

Finally, there are a variety of limitations in the above data that are important to note when interpreting results. As identified in the opening paragraphs, the Register from which the data were drawn is from 2009. Given the changes in Iraq during that time, this sample frame is not considered reliable for the current labour market and therefore the data was not weighted as is typically done. Where possible, this has been mitigated by providing data at the governorate and subsector level. Furthermore, some governorates provided far less frames to the sample. This may be due to both underrepresentation and lack of economic activity in these governorates.
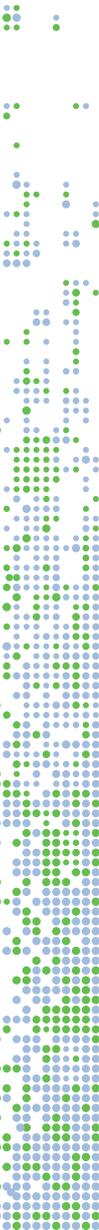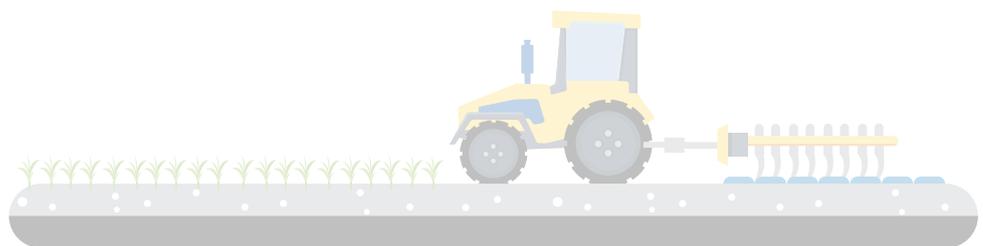
Chapter 6: Recommendations for skills development in the agriculture sector

6.1 General observations

Agriculture is a sector of great importance in Iraq in terms of the need for food security, for reduced dependence on imported goods, and good opportunities for employment, especially for women and rural youth.

The sector needs strong support from the government, especially for recovery from the devastating effects of ISIL/Da'esh incursion, with destruction of farm land, equipment and crops; and internal displacement of people. For farming to be a more viable proposition for many farmers, policy changes are needed to support farmers to survive and thrive, especially by support for locally grown produce.

Accordingly, the three pillars for the Government of Iraq's strategic plan for agriculture (in collaboration with FAO) are to improve the capacity of public institutions, enable market-based agriculture with policy reforms, and invest in local markets, irrigation, farm inputs, extension and animal health services.

However, participants in the pilot Agriculture Sector Council meeting and respondents to the survey apparently have yet to experience the enabling environment envisaged in the strategy, although there has been some progress in KR-I. In general, their combined responses describe a kind of vicious cycle: in the face of economic crisis and decreased support for farmers (e.g. less subsidised inputs), poor storage and transport services, and little protection for local products, in addition to many other political and climatic challenges, farmers down-size or give up. When farming enterprises stagnate or down-size or go out of business, and agriculture services dwindle, there is increased need for imports, and fewer jobs for agriculture graduates. With less demand for training, the institutions respond by offering fewer training courses and fewer services to support farmers to develop skills and adopt better technology. Without the level of employment that agriculture can offer (23% in 2012) and a generation of up-and-coming young farmers to feed the nation, economic hardship will be perpetuated.

Increasing the quantity and quality of agriculture training in Iraq only makes sense in parallel with the creation of the enabling environment envisaged in the Government of Iraq's strategic plan for agriculture, in which the sector could become a rewarding enterprise for skilled farmers.

6.2 Skills supply in relation to demand

In 2017 when the skills supply data for this report was collected, there was significantly more agriculture training in KR-I than in other governorates, although it must be acknowledged that at that time at least five agricultural colleges and institutes in Iraq were not operational, and some were running with very low numbers.

Very few graduates are being prepared at semi-skilled and skilled levels, as the vast majority of formal agricultural education and training is at technical and professional levels. Less than 10% in KR-I and less than one-third of agriculture graduates in the other governorates are being prepared to enter the workforce at semi-skilled and skilled levels. However, even in a time of recession, when many low skilled, casual or seasonal jobs have been lost, most of the top ten occupations in employment

in agriculture in 2017 were for semi-skilled and skilled workers.

The public sector in Iraq is reportedly downsizing, and there will be fewer public sector jobs in agriculture, so technical and professional level training needs to be less theoretical and more geared to farming enterprises than to jobs in the Ministry of Agriculture.

Practical experience is rated in the top five factors which employers use to make hiring decisions in six of the eight governorates, so graduates need to have hands-on experience of farming, in order to compete for jobs.

Employers have low expectations of skills, especially for the artisan occupations ('B' level) and many employers select new recruits based on largely on age, gender and social relations. However, internal advancement is also one of the top five hiring factors and this suggests that employers do recognise and value the increasing skills and experience of their employees. Interview behaviour was also in the top five factors which influence hiring decisions in all eight governorates. This provides an opportunity for trainers to increase the employability of their graduates, since learners can be trained to succeed in interviews.

Most of the agriculture training available in Iraq currently is in plant production, although the top ten occupations in the sample are predominantly related to livestock. In reality, most farms in Iraq are small mixed farms, but there appears to be little or no formal training available which targets small-scale mixed farming; entrepreneurial agricultural food processing, integrated farming, or organic methods. While extension services are much diminished, and research and innovation are at low ebb, there is also little training in new trends or innovations.

The UNESCO Office for Iraq, under the TVET Reform Programme, has developed competency-based training for agriculture cottage industry, farm hands, farm labourers, farmers and farm supervisors. The training is mixed crop and livestock, with specialisation in either crop or livestock only at the supervisor level. The training programmes develop knowledge and practical skills for sustainable, integrated farming practices.

The agriculture cottage industry programme is a low-level programme developed in response to the expressed need for targeted education and training and entrepreneur capacity building for rural women farmers who process food products at home and sell them in local markets.

Global analysis of the skills gaps identified in the Enterprise Survey highlights several common weaknesses already being addressed in the development of new TVET programmes by UNESCO, with specific modules designed to develop:

- Technical (i.e. practical) skills
- Reading and writing
- Continuous learning, communication and teamwork
- Foreign language skills.

Although many agriculture employers do not rate digital skills and foreign languages as very important, and some do not think creative thinking or continuous learning are very important, these skills are widely thought to be essential for success in the modern world.

To address the factors which influence hiring decisions, each UNESCO TVET programme includes preparation for employment, job search skills (including interview behaviour) and work-place based

learning. Work-place based learning includes a detailed record of task performed in relation to the learning outcomes, with employer comments, showing evidence of practical experience; and overall evaluation by the employer, which can be used as a reference document.

It is recommended that these benchmarked competency-based programmes, based on occupational standards developed in Iraq, are used as a model and a basis to develop other higher-level practical competency-based programmes for agriculture extension workers and other technical and professional roles, which can advise and support farmers in practical ways; and research and demonstrate new approaches.

With a view to providing competency-based training programmes developed by UNESCO for basic-skilled, semi-skilled, skilled and supervisory level agriculture occupations, there needs to be consideration of which institutions have mandates appropriate to deliver such training, at what level, in which venues; and to award qualifications. Currently the Ministry of Agriculture has no mandate to offer formal training programmes or qualifications, although it does have a huge network of under-utilised extension training centres. The MoE does not offer supervisory level training (post-secondary non-tertiary), and nor does MoHESR, which only offers technical and professional levels. MoLSA does not offer agriculture. The delivery of agriculture training needs to meet the needs of the target group in today's world, and not be constrained by the traditional mandates of the supply institutions.
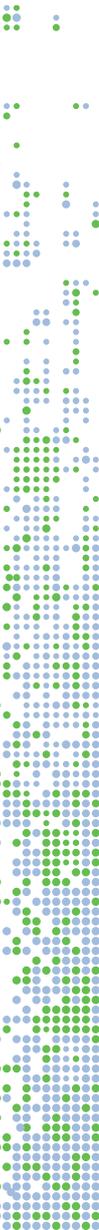
Appendix

Appendix 1 Population frame

CSO Business Register ('Population Frame')

Type of Economic Activity		1-4	5-9	10-49	50-99	100-499	500-999	1000 +	Not Stated	Total
						No. of Employees				
Agriculture, Forestry and Fishing	01 - Crop and animal production, hunting and related service activities	187,854	4,625	772	48	25	0	0	1,238	194,562
	03 - Fishing and aquaculture	990	30	14	0	1	0	0	9	1,044
	Subtotal	188,844	4,655	786	48	26	0	0	1,247	195,606
Manufacturing	10 - Manufacture of food products	13,375	2,965	593	48	20	3	2	366	17,372
	11 - Manufacture of beverages	182	92	95	11	8	2	0	16	406
	19 - Manufacture of coke and refined petroleum products	135	113	175	14	12	1	0	27	477
	20 - Manufacture of chemicals and chemical products	476	135	102	3	7	0	3	56	782
	21 - Manufacture of basic pharmaceutical products and pharmaceutical preparations	80	4	12	4	3	0	2	4	109
	22 - Manufacture of rubber and plastics products	1,011	185	71	2	2	3	2	37	1,313
	23 - Manufacture of other non-metallic mineral products	4,515	2,719	1,480	124	36	9	9	142	9,034
	24 - Manufacture of basic metals	1,144	111	23	4	1	0	2	37	1,322
	25 - Manufacture of fabricated metal products, except machinery and equipment	29,735	1,227	187	12	4	0	0	226	31,391
	26 - Manufacture of computer, electronic and optical products	346	15	8	2	1	0	0	7	379
	27 - Manufacture of electrical equipment	312	73	34	3	10	4	3	10	449
	28 - Manufacture of machinery and equipment	512	55	39	4	1	0	0	10	621
	32 - Other manufacturing	708	21	5	1	0	0	0	7	742
	Subtotal	52,531	7,715	2,824	232	105	22	23	945	64,397
Construction	41 - Construction of buildings	2,501	434	335	30	18	3	2	97	3,420
	42 - Civil engineering	360	86	155	27	19	5	4	21	677
	43 - Specialized construction activities	4,049	96	77	14	10	0	0	34	4,280
	Subtotal	6,910	616	567	71	47	8	6	152	8,377
Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	45 - Wholesale and retail trade and repair of motor vehicles and motorcycles	102,817	2,588	411	24	10	0	5	612	106,467
	Subtotal	102,817	2,588	411	24	10	0	5	612	106,467
Transportation and Storage	49 - Land transport and transport via pipelines	952	168	143	20	16	2	1	60	1,362
	52 - Warehousing and support activities for transportation	59,153	1,414	812	104	68	5	10	6,518	68,084
	53 - Postal and courier activities	76	59	161	16	10	1	0	7	330
	Subtotal	60,181	1,641	1,116	140	94	8	11	6,585	69,776
Accommodation and Food Service Activities	55 - Accommodation	2,487	524	432	40	19	1	0	327	3,830
	56 - Food and beverage service activities	33,504	2,466	735	20	6	1	1	261	36,994
	Subtotal	35,991	2,990	1,167	60	25	2	1	588	40,824
Information and Communication	61 - Telecommunications	3,089	355	371	54	31	2	1	41	3,944
	62 - Computer programming, consultancy and related activities	255	10	4	0	0	0	0	1	270
	63 - Information service activities	268	68	58	7	3	1	0	14	419
	Subtotal	3,612	433	433	61	34	3	1	56	4,633
Total		450,886	20,638	7,304	636	341	43	47	10,185	490,080

Appendix 2 Sample frame

Sample frame: 8 governorates, 27 subsectors, 10+ employee-sized firms

Type of Economic Activity		Governorate								
		Sulaymaniyah	Kirkuk	Erbil	Diyala	Baghdad	Wasit	Najaf	Basrah	Total
Agriculture, Forestry and Fishing	01 - Crop and animal production, hunting and related service activities	132	25	69	32	116	46	32	41	493
	03 - Fishing and aquaculture	1	0	1	0	0	3	0	6	11
	Subtotal	133	25	70	32	116	49	32	47	504
Manufacturing	10 - Manufacture of food products	28	26	31	29	211	15	32	36	408
	11 - Manufacture of beverages	8	9	5	5	33	2	5	4	71
	19 - Manufacture of coke and refined petroleum products	21	12	14	13	16	10	4	18	108
	20 - Manufacture of chemicals and chemical products	3	5	4	0	53	5	4	7	81
	21 - Manufacture of basic pharmaceutical products and pharmaceutical preparations	0	0	1	1	13	0	0	0	15
	22 - Manufacture of rubber and plastics products	9	6	14	0	18	0	3	5	55
	23 - Manufacture of other non-metallic mineral products	101	73	52	94	300	47	97	43	807
	24 - Manufacture of basic metals	1	2	0	0	13	0	1	4	21
	25 - Manufacture of fabricated metal products, except machinery and equipment	23	8	21	3	62	3	11	9	140
	26 - Manufacture of computer, electronic and optical products	0	1	1	0	2	1	1	0	6
	27 - Manufacture of electrical equipment	2	2	0	7	26	0	1	3	41
	28 - Manufacture of machinery and equipment	4	2	5	1	9	2	1	3	27
	32 - Other manufacturing	0	0	1	0	2	0	0	1	4
	Subtotal	200	146	149	153	758	85	160	133	1,784
Construction	41 - Construction of buildings	42	8	32	9	91	18	16	48	264
	42 - Civil engineering	26	12	18	6	28	7	6	18	121
	43 - Specialized construction activities	25	1	6	0	16	3	9	12	72
	Subtotal	93	21	56	15	135	28	31	78	457
Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	45 - Wholesale and retail trade and repair of motor vehicles and motorcycles	39	13	50	9	140	11	17	29	308
	Subtotal	39	13	50	9	140	11	17	29	308
Transportation and Storage	49 - Land transport and transport via pipelines	10	13	11	3	50	3	6	22	118
	52 - Warehousing and support activities for transportation	94	29	53	29	290	28	28	88	639
	53 - Postal and courier activities	16	4	17	13	34	6	9	13	112
	Subtotal	120	46	81	45	374	37	43	123	869
Accommodation and Food Service Activities	55 - Accommodation	52	12	85	9	108	13	40	27	346
	56 - Food and beverage service activities	73	26	73	10	196	24	23	41	466
	Subtotal	125	38	158	19	304	37	63	68	812
Information and Communication	61 - Telecommunications	37	21	44	16	120	18	13	32	301
	62 - Computer programming, consultancy and related activities	0	0	0	0	1	0	0	2	3
	63 - Information service activities	12	2	12	6	13	0	2	6	53
	Subtotal	49	23	56	22	134	18	15	40	357
Total		759	312	620	295	1,961	265	361	518	5,091

Appendix 3 Target sample size

Target sample size: 8 governorates, 27 subsectors, 10+ employee-sized firms

Type of Economic Activity		Sulaymaniyah	Kirkuk	Erbil	Diyala	Baghdad	Wasit	Najaf	Basrah	Total
						Governorate				
Agriculture, Forestry and Fishing	01 - Crop and animal production, hunting and related service activities	104	25	62	32	94	44	32	39	432
	03 - Fishing and aquaculture	1	0	1	0	0	3	0	6	11
	Subtotal	105	25	63	32	94	47	32	45	443
Manufacturing	10 - Manufacture of food products	28	26	31	29	144	15	32	35	340
	11 - Manufacture of beverages	8	9	5	5	32	2	5	4	70
	19 - Manufacture of coke and refined petroleum products	21	12	14	13	16	10	4	18	108
	20 - Manufacture of chemicals and chemical products	3	5	4	0	50	5	4	7	78
	21 - Manufacture of basic pharmaceutical products and pharmaceutical preparations	0	0	1	1	13	0	0	0	15
	22 - Manufacture of rubber and plastics products	9	6	14	0	18	0	3	5	55
	23 - Manufacture of other non-metallic mineral products	85	65	49	80	178	45	82	41	625
	24 - Manufacture of basic metals	1	2	0	0	13	0	1	4	21
	25 - Manufacture of fabricated metal products, except machinery and equipment	23	8	21	3	57	3	11	9	135
	26 - Manufacture of computer, electronic and optical products	0	1	1	0	2	1	1	0	6
	27 - Manufacture of electrical equipment	2	2	0	7	26	0	1	3	41
	28 - Manufacture of machinery and equipment	4	2	5	1	9	2	1	3	27
	32 - Other manufacturing	0	0	1	0	2	0	0	1	4
	Subtotal	184	138	146	139	560	83	145	130	1,525
Construction	41 - Construction of buildings	40	8	32	9	78	18	16	45	246
	42 - Civil engineering	26	12	18	6	28	7	6	18	121
	43 - Specialized construction activities	25	1	6	0	16	3	9	12	72
	Subtotal	91	21	56	15	122	28	31	75	439
Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	45 - Wholesale and retail trade and repair of motor vehicles and motorcycles	38	13	47	9	109	11	17	29	273
	Subtotal	38	13	47	9	109	11	17	29	273
Transportation and Storage	49 - Land transport and transport via pipelines	10	13	11	3	47	3	6	22	115
	52 - Warehousing and support activities for transportation	80	29	50	29	174	28	28	76	494
	53 - Postal and courier activities	16	4	17	13	33	6	9	13	111
	Subtotal	106	46	78	45	254	37	43	111	720
Accommodation and Food Service Activities	55 - Accommodation	49	12	74	9	89	13	39	27	312
	56 - Food and beverage service activities	65	26	65	10	137	24	23	39	389
	Subtotal	114	38	139	19	226	37	62	66	701
Information and Communication	61 - Telecommunications	36	21	42	16	97	18	13	32	275
	62 - Computer programming, consultancy and related activities	0	0	0	0	1	0	0	2	3
	63 - Information service activities	12	2	12	6	13	0	2	6	53
	Subtotal	48	23	54	22	111	18	15	40	331
Total		686	304	583	281	1,476	261	345	496	4,432

Appendix 4 Actual sample size

Actual sample size: 8 governorates, 25 subsectors, 10+ employee-sized firms

Type of Economic Activity		Governorate								
		Sulaymaniyah	Kirkuk	Erbil	Diyala	Baghdad	Wasit	Najaf	Basrah	Total
Agriculture, Forestry and Fishing	01 - Crop and animal production, hunting and related service activities	66	2	22	22	10	12	22	3	159
	03 - Fishing and aquaculture	0	0	0	0	0	1	0	0	1
	Subtotal	66	2	22	22	10	13	22	3	160
Manufacturing	10 - Manufacture of food products	20	11	23	27	81	8	57	25	252
	11 - Manufacture of beverages	7	11	4	5	12	1	6	5	51
	19 - Manufacture of coke and refined petroleum products	10	2	6	3	0	0	0	9	30
	20 - Manufacture of chemicals and chemical products	4	1	1	0	10	4	5	1	26
	21 - Manufacture of basic pharmaceutical products and pharmaceutical preparations	0	0	1	0	4	0	0	0	5
	22 - Manufacture of rubber and plastics products	9	4	5	0	10	0	7	3	38
	23 - Manufacture of other non-metallic mineral products	70	19	16	74	116	31	46	25	397
	24 - Manufacture of basic metals	1	1	0	0	1	0	2	1	6
	25 - Manufacture of fabricated metal products, except machinery and equipment	20	5	12	0	5	1	5	8	56
	26 - Manufacture of computer, electronic and optical products	0	0	0	0	0	0	1	0	1
	27 - Manufacture of electrical equipment	1	0	0	0	4	0	0	2	7
	28 - Manufacture of machinery and equipment	3	1	1	1	0	1	0	0	7
	32 - Other manufacturing	0	0	0	0	0	0	0	0	0
	Subtotal	145	55	69	110	243	46	129	79	876
Construction	41 - Construction of buildings	30	0	16	2	18	6	8	32	112
	42 - Civil engineering	15	0	6	1	1	0	0	5	28
	43 - Specialized construction activities	11	0	0	0	1	1	0	3	16
	Subtotal	56	0	22	3	20	7	8	40	156
Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	45 - Wholesale and retail trade and repair of motor vehicles and motorcycles	32	2	22	6	43	7	14	14	140
	Subtotal	32	2	22	6	43	7	14	14	140
Transportation and Storage	49 - Land transport and transport via pipelines	6	4	9	1	0	0	8	12	40
	52 - Warehousing and support activities for transportation	46	0	15	6	11	4	1	28	111
	53 - Postal and courier activities	0	0	1	0	1	0	0	0	2
	Subtotal	52	4	25	7	12	4	9	40	153
Accommodation and Food Service Activities	55 - Accommodation	26	4	36	0	24	2	42	7	141
	56 - Food and beverage service activities	58	18	51	10	71	17	13	32	270
	Subtotal	84	22	87	10	95	19	55	39	411
Information and Communication	61 - Telecommunications	21	11	26	4	23	1	6	7	99
	62 - Computer programming, consultancy and related activities	0	0	0	0	0	0	0	0	0
	63 - Information service activities	8	0	7	0	0	0	0	0	15
	Subtotal	29	11	33	4	23	1	6	7	114
Total		464	96	280	162	446	97	243	222	2,010

Appendix 5 List and description of the 12 key job skills in the Survey

Skill	Definition
General Knowledge	Basic in the field of work
Advanced Knowledge	Including the understanding of theories in the field of work
Specialised Knowledge	As a basis for research in the field of work
Technical	Technical and professional skills including "specific technical know-how to perform their functions"
Literacy (Reading & Writing)	Reading refers to the skills necessary to understand and apply information in sentences and paragraphs Writing refers to the skills necessary to create handwritten or printed text to communicate information and ideas
Computational	Computational skills indicate the necessary skills to understand, understand and apply mathematical concepts and information
Communication	Oral communication skills indicate the necessary skills to share information and ideas with others by speaking, listening, and using nonverbal signals and hints, such as body language At work, people use oral communication skills to talk to customers, discuss products with processors, explain work procedures for assistant employees, participate in virtual sales meetings with customers, or other activities that involve verbal exchanges
Teamwork (working with others)	Working with others means the necessary skills to interact with others (one or more people) In the workplace, people work with others in binary, small or large groups to coordinate tasks, share resources, plan, make decisions, negotiate, resolve disputes, or complete other activities that involve group work
Creative Thinking	Creative thinking refers to the necessary skills needed to solve problems, make decisions, think critically, plan, remember details, and find information At work, people use thinking skills to accomplish tasks, such as solving electronic equipment problems, assessing workplace safety, identifying people to be employed, planning meetings, memorising and remembering passwords, and finding the information needed to assess project costs
Digital Technology	Digital technology refers to the necessary skills needed to understand and use digital systems, tools and digital applications, and digital information processing At work, people use the skills of digital technology to access, analyse, organise, find and communicate information and ideas using computers, software, electronic sales equipment (credit card devices), e-mail, podcasts, internet applications, smartphones, and other digital means
Continuous Learning	Continuous learning refers to the necessary skills necessary to continuously develop and improve a person's skills and knowledge for effective action and adaptation to changes In the workplace, people use continuous learning skills to identify and develop the knowledge and skills they need to do a good job, build a career, and adapt to changes in processes, technology, instructions, and employer requirements
Foreign Language	Foreign language skills indicate the ability to communicate (oral and written in English, Arabic, or any language other than the person's native language)

Appendix 6 List of agriculture-related occupations

Averages of importance and satisfaction across 12 key skills for agriculture-related occupations found in all the sectors as part of the Enterprise Survey

(I=importance, S=satisfaction)

ISCO code	Profession	No. of mployees	Iraqi	Foreign	Advanced Knowledge		Communication		Computational	
					I	S	I	S	I	S
7233	Agricultural machinery mechanics	19	19	0	2.73	2.82	2.36	2.82	2.18	2.82
7233	Agricultural machinery mechanics (from other sectors)	173	162	11	2.68	2.65	2.51	2.58	2.23	2.46
1311, 1312	Agricultural, forestry and fishery department managers	83	83	0	2.85	2.78	2.94	2.87	2.96	2.83
1311, 1312	Agricultural, forestry and fishery department managers (from other sectors)	9	9	0	2.57	2.71	2.86	3	2.71	3
6121, 7513	Animal breeders and dairy producers	208	208	0	2.11	2.25	2.75	2.61	1.26	2.09
7513	Animal breeders and dairy producers (from other sectors)	18	12	6	2.33	3	3	2.67	3	2.67
5164	Animal care workers	195	179	16	2.24	2.34	2.45	2.34	1.68	1.68
5164	Animal care workers (from other sectors)	2	2	0	3	2	3	3	1	1
6320	Animal husbandry workers	2	2	0	3	2	1	2	1	1
7511	Butchers, fishmongers and related food preparers	24	24	0	3	2.5	3	3	1	2
7511	Butchers, fishmongers and related food preparers (from other sectors)	11	11	0	1.75	2.25	3	2.75	2.5	2.5
8341	Drivers and operators of agricultural machinery	27	27	0	1.33	2	1.33	2	1.33	2
9211, 9213	Farm hands and labourers	20	18	2	2	2	1.5	2	1.5	1.5
9211	Farm hands and labourers (from other sectors)	25	25	0	3	2	3	2	3	1
6111	Field crop farmers	64	64	0	1.33	2	1.67	1.67	1.67	1.67
6221	Fish and aquaculture educators	3	3	0	3	3	2	3	3	3
9216	Fish breeding and hunting workers	5	5	0	3	2	2	2	2	2
9216	Fish breeding and hunting workers (from other sectors)	1	1	0	1	3	3	3	2	3
8160	Food processing machine operators and their associated	72	72	0	1.5	2.14	1.5	2.07	1.79	2.07
8160	Food processing machine operators and their associated (from other sectors)	904	901	3	2.53	2.64	2.63	2.57	2.34	2.41
9215	Forestry workers	86	86	0	1.18	2.18	2.86	2.77	1.14	2.23
6113	Gardeners and nursery farmers	16	13	3	2.8	2.8	2.2	2.4	1.6	1.8
6113	Gardeners and nursery farmers (from other sectors)	8	8	0	3	3	1	2	1	2
9321	Handpackers in manufacturing	30	30	0	1.67	2.11	2	2.44	1.44	2.22
9321	Handpackers in manufacturing (from other sectors)	3668	3449	219	1.99	2.5	2.46	2.53	2.05	2.26
9212	Livestock and poultry labourers	185	177	8	1.47	2.18	1.58	2.24	1.53	2.13
6130	Mixed animal husbandry and crop cultivation workers	8	8	0	2	2	2	2	2	2
6122	Poultry breeders	401	371	30	2.79	2.55	2.69	2.66	2.52	2.35
3139	Quality and specification technicians	52	52	0	3	3	3	3	2	2
3139	Quality and specification technicians (from other sectors)	115	97	18	2.95	2.42	2.53	2.47	2.26	2.32
6210, 6310	Subsistence agricultural workers (small farms)	16	16	0	1.67	1.67	3	2.67	2	2.33
6112	Tree and shrub farmers	3	3	0	3	3	2.5	2.5	2	2.5
6114	Vegetable farmers	168	165	3	2.3	2.7	2.6	2.7	2.7	2.6
2250	Veterinarians	32	30	2	2.97	2.97	2.67	2.7	2.5	2.77
2250	Veterinarians (from other sectors)	4	4	0	3	3	2.5	3	3	3
3142	Zootechny, poultry farming, apiculture and aqua life technicians	33	33	0	2.81	2.57	2.43	2.48	2.38	2.62

Continuous Learning		Creative Thinking		Digital Technology		Foreign Language		General Knowledge		Reading and Writing		Specialised Knowledge		Teamwork		Technical	
I	S	I	S	I	S	I	S	I	S	I	S	I	S	I	S	I	S
2.64	2.82	2.36	2.73	2.55	2.82	2.27	2.73	3	3	2	2.82	2.73	2.82	3	3	3	3
2.42	2.49	2.51	2.54	2.15	2.35	1.86	2.31	2.94	2.79	2.48	2.55	2.52	2.62	2.72	2.59	2.85	2.66
2.72	2.7	2.69	2.7	2.56	2.59	2.48	2.48	2.98	2.93	2.81	2.81	2.81	2.76	2.94	2.87	2.89	2.8
2.71	2.86	2.71	2.71	2.43	2.71	2.57	2.71	2.86	2.86	2.71	2.57	2.57	2.57	3	3	2.86	2.86
1.18	1.98	1.19	2	1.18	2.05	1.19	2	2.96	2.6	1.42	2.16	1.98	2.19	2.82	2.81	1.86	2.25
2.67	2.67	3	2.67	2.67	2.33	2	2.33	3	3	2.33	2.67	2.33	3	3	2.67	3	3
2.16	2.08	1.53	1.71	1.76	1.82	1.74	1.71	2.79	2.53	2.03	1.82	2.03	2.34	2.58	2.45	2.42	2.39
3	2	1	1	1	1	1	1	3	3	2	3	2	2	3	3	2	2
3	3	2	2	1	1	1	2	3	2	1	1	3	2	1	2	3	2
2.5	2	1	1.5	1	1	1	1	3	2.5	1	2	3	2.5	3	3	2.5	2
2.75	2.75	2.75	2.75	1.5	2	2	2.5	3	2.75	2.5	2.5	2	2.25	3	3	3	2.75
1.67	2	1.33	2	1.33	2	1	1.33	2.67	2.67	1.67	2	1.33	2	1.67	2	2.33	2.33
1	2	1	2	1	2	1.5	2	3	3	1.5	1.5	2	2	2.5	2.5	2.5	2.5
1	2	1	2	1	2	1	1	3	1	3	1	3	1	3	3	3	1
2	2	1.33	1.67	1.33	1.67	1.33	1.33	2.33	2	1.67	2	1.67	2	1.67	2	2	2
2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	2	3
1	2	1	2	1	1	1	1	3	2	2	2	3	2	2	2	2	2
1	3	3	3	1	3	2	3	3	3	2	3	2	3	3	3	3	3
1.57	2.07	1.43	2.07	1.43	2.14	1.29	2.07	2.93	2.79	1.5	2.07	1.71	2.14	2.64	2.36	2.86	2.57
1.97	2.25	2.11	2.3	1.96	2.23	1.46	2.08	2.92	2.74	2.43	2.46	2.36	2.55	2.8	2.65	2.7	2.63
1	2.05	1	2.05	1.05	2.09	1	2.05	2.64	2.5	1.27	2.27	1.14	2.18	2.91	2.95	1.55	2.23
2.8	2.6	2.8	2.4	1	1.4	1.6	1.4	2.6	2.8	1.6	2.2	2.8	1.8	2.6	2.8	3	2.8
1	2	1	2	1	2	2	2	3	3	2	2	3	3	3	3	3	2
1.22	2.11	1	2	1.11	2	1.11	1.89	2.78	2.67	1.56	2.11	1.67	2.11	2.44	2.67	2.78	2.56
1.84	2.07	1.85	2.09	1.48	2	1.19	1.74	2.82	2.67	2.14	2.26	1.81	2.42	2.71	2.58	2.46	2.43
1.63	2.18	1.26	2.11	1.26	2.11	1.16	1.97	2.95	2.87	1.42	2.13	1.53	2.13	2.66	2.47	2.74	2.55
2	2	2	2	2	2	1	2	3	3	2	2	2	2	2	2	2	2
2.79	2.46	2.5	2.2	2.18	2.1	2.25	1.94	2.92	2.7	2.59	2.43	2.7	2.44	2.85	2.7	2.77	2.48
3	3	3	3	1	2	3	2	3	3	2	2	3	2	3	3	3	3
2.89	2.53	2.53	2.32	1.89	2.05	2.05	2	2.95	2.68	2.68	2.32	2.79	2.21	2.68	2.58	2.89	2.37
2.33	2.67	2.33	2.67	1.67	2	1.67	2	3	2.67	2	2	1.33	2.33	3	2.67	2.67	2.67
3	3	3	3	1	1.5	1	1.5	3	3	2	2	3	2.5	3	3	3	2.5
2.5	2.7	2.7	2.7	2	2.4	2.3	2.6	2.8	2.6	2.1	2.5	2.5	2.4	2.7	2.8	2.7	2.6
2.97	2.9	2.9	2.9	2.37	2.67	2.73	2.73	3	2.97	2.73	2.9	2.97	2.93	2.73	2.73	2.97	2.93
3	3	3	2.5	3	3	3	3	3	3	2.5	3	3	3	2.5	3	3	3
2.71	2.62	2.67	2.57	2.43	2.43	2.43	2.33	2.76	2.62	2.48	2.62	2.81	2.52	2.67	2.57	2.62	2.52