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Jobs in North Lebanon

Thomas Farole and Yasuo Konishi

Assessment of the Potato Value Chain



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JOBS IN NORTH LEBANON: ASSESSMENT OF THE POTATO VALUE CHAIN

Thomas Farole and Yasuo Konishi

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ABSTRACT

This paper applies a newly-developed survey instrument to assess the structure and dynamics of jobs in the potato value chain of North Lebanon. The analysis finds that while on-farm activities represent the largest source of jobs in the value chain, most of these are low-skilled, low quality jobs taken by seasonal workers, offering limited opportunities for young Lebanese workers. The best opportunities to develop high quality jobs would come through investment in downstream processing, which would have a spillover effect also on expanding lower-skilled jobs across the chain. Taking advantage of this opportunity will require addressing significant constraints in the trade and investment climate in North Lebanon.

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ABBREVIATIONS

| | |
|------|-----------------------------------------------------------|
| ADB | Asian Development Bank |
| ALMP | active labor market program |
| ASA | advisory services and analytics |
| CBO | community-based organization |
| CCSA | cross-cutting solutions area |
| CCT | conditional cash transfer |
| CEO | chief executive officer |
| CIS | Commonwealth of Independent States |
| CPF | country partnership framework |
| DAC | Development Assistance Committee (OECD) |
| DfID | Department for International Development (United Kingdom) |
| EBRD | European Bank for Reconstruction and Development |
| ECA | Europe and Central Asia |
| EU | European Union |
| FAO | Food and Agriculture Organization of the United Nations |
| FDI | Foreign Direct Investment |
| FCS | fragile and conflict state |
| FY | fiscal year |
| GDP | Gross Domestic Product |
| GIZ | Deutsche Gesellschaft für Internationale Zusammenarbeit |
| GNI | Gross National Income |
| GP | global practice |
| HIC | high-income country |
| HS | household survey |
| IAT | informal apprenticeship training |
| ICLS | International Conference of Labour Statisticians |
| ICR | implementation completion report |
| IDA | International Development Association |
| IE | impact evaluation |
| IDB | Inter-American Development Bank |
| IEG | Independent Evaluation Group |
| IGA | income-generating activity |
| ILC | International Labour Conference |
| IFC | International Finance Corporation |
| IILS | International Institute for Labour Studies |
| ILS | International Labour Standards |
| IMF | International Monetary Fund |
| IOE | International Organization of Employers |
| ITUC | International Trade Union Confederation |
| IZA | Institute for the Study of Labor |
| ICT | information and communications technology |
| ILO | International Labor Organization |
| ISIC | International Standard Industrial Classification |

| | |
|--------|--------------------------------------------------------|
| KILM | Key Indicators of Labor Market |
| KM | Knowledge Management |
| LDC | least developed country |
| LFS | labor force survey |
| MDG | Millennium Development Goal |
| M&E | monitoring and evaluation |
| MFI | micro-finance institution |
| MoF | Ministry of Finance |
| MIS | management information system |
| MSE | micro and small enterprise |
| MSME | micro, small and medium enterprise |
| NIS | National Institute of Statistics |
| n.a. | not applicable |
| N/A, — | not available |
| NGO | nongovernmental organization |
| NEET | not in education, employment, or training |
| ODA | official development assistance |
| OECD | Organisation for Economic Co-operation and Development |
| OOP | out-of-pocket payments |
| PER | public expenditure review |
| PEP | public employment programme |
| PES | public employment services |
| PPP | purchasing power parity |
| PHC | population and housing census |
| PRSP | poverty reduction strategy paper |
| RCT | randomized control trial |
| SME | small and medium-sized enterprises |
| SDG | sustainable development goal |
| SCD | strategic country diagnostic |
| SOE | state owned enterprise |
| STEP | skills towards employment and productivity |
| TFP | Total Factor Productivity |
| TOR | terms of reference |
| TVET | Technical and Vocational Education and Training |
| UN | United Nations |
| UNDP | United Nations Development Programme |
| UNIDO | United Nations Industrial Development Organization |
| USD | United States Dollars |
| VAT | Value added Tax |
| VET | technical and vocational education and training |
| VC | value chain |
| WBG | World Bank Group |
| WDI | World Development Indicators |
| WDR | World Development Report |
| WTO | World Trade Organization |

INTRODUCTION

OBJECTIVES OF THE VALUE CHAINS ANALYSIS

This is one of two background technical reports providing an analysis of value chains in North Lebanon, with an emphasis on their existing jobs structure and their potential to generate quality jobs. The job-focused value chain analysis presented here is intended to provide information about potential for job creation, the nature of jobs that may be created (distribution by demographics and skill levels), and identify the constraints that would need to be removed to take advantage of these opportunities.

This report focuses on the potato value chain. An accompanying report covers the solid waste and recycling value chain.

SELECTION OF THE VALUE CHAINS

A starting point to selecting value chains for focus of the study was to review the basic economic structure of North Lebanon in order to understand what the focus areas for employment are in the current economy. Table 1 shows that North Lebanon overall is highly specialized (within the Lebanese economy) in agriculture, although this is driven mainly by the Akkar and Minieh-Danniyeh districts. Outside of these districts, in the more urban parts of the region, employment is dominated by lower value services activities (trade and 'other services') as well as industry. This bifurcated structured within the economy of the North called for a selection of at least one value chain that would reach into the rural, agricultural economy, while also ensuring some link to the urban industry and services economy.

Table 1

Broad structure of the economy (employment) in North Lebanon relative to the national economy (2009)

| | Share of total employment | | | Location Quotient- North (overall) |
|--------------------------------------------|---------------------------|-------------------------------------|-----------------------------------|------------------------------------|
| | Lebanon | Akkar and Minieh-Danniyeh districts | Remaining North Lebanon districts | |
| Agriculture | 6.3 | 17.8 | 3.6 | 1.67 |
| Industry | 12.1 | 7.9 | 14.0 | 0.92 |
| Construction | 8.9 | 10.4 | 6.7 | 0.95 |
| Trade | 27.0 | 21.1 | 29.0 | 0.93 |
| Transportation, post and Telecommunication | 6.8 | 6.6 | 6.3 | 0.96 |
| Financial intermediation and insurance | 2.0 | 0 | 1.4 | 0.36 |
| Other services | 36.9 | 35.9 | 39.0 | 1.02 |
| TOTAL | 100.0 | 100.0 | 100.0 | 1.00 |

Source: Statistics Lebanon, Multiple Indicator Cluster Survey (2009)

Initial consultations and secondary research carried out under these parameters identified a ‘shortlist’ of sectors which have employment and new job-creating potential (Table 2), including both those more established sectors that have the potential to generate new employment over the shorter-term (aimed at reducing the impact of fragility and conflict), as well as those that may not be significant currently in the region but have the potential to create jobs in the future.

The shortlist of value chains were assessed through a set of selection criteria that provided a high-level evaluation of each sector in terms of: i) existing scale, sustainability, and competitiveness; ii) potential jobs impact (quantity and quality) of growth in the sector; and iii) readiness of the sector to engage in upgrading and the degree to which an initiative would offer additionality with respect to recent and ongoing initiatives. Further details on the selection criteria are included in Annex A.

Table 2

Shortlist of sectors considered for value chain analysis

| | |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Agri-processing / agriculture | <ul style="list-style-type: none"> • Vegetable processing (potatoes)¹ • Fruit processing (apples) • Olive oil |
| Other industrial | <ul style="list-style-type: none"> • Wood products (furniture) |
| Services | <ul style="list-style-type: none"> • Construction • ICT • Solid waste management / recycling |

Table 3 summarizes the results of the assessment. Four value chains stood out from the assessment: vegetables (potatoes), fruits (apples), construction, and solid waste / recycling. Following a presentation and discussion with an Interministerial Committee set up to oversee the project in January, 2016, the decision was taken to focus the initial analysis on potatoes and solid waste / recycling. Potatoes was selected primarily because it is one of the largest agricultural activities in the North, with a strong reach into the rural areas (particularly Akkar) of the region, while also connecting to urban areas through the trade and processing activities in the value chain. Solid waste and recycling was chosen primarily because of the opportunity to leverage substantial investments being made through OMSAR (funded through the European Union) in solid waste and sorting facilities across the North, the possibility to generate substantial lower-skilled jobs in the value chain, and the significant spillover benefits that could accrue both to downstream industries (paper, plastics, metals), and to the society more broadly (positive environment externalities)².

¹ The assessment of fruits and vegetables focused on the most important crop for the North in each.

² Note that the construction and ICT value chains were expected to be covered through other planned analytical work in the region.

Table 3

Summary results from the value chain selection assessment

| | Scale, sustainability & competitiveness | Jobs impact | Readiness and additionality | OVERALL | COMMENTS |
|----------------------------|-----------------------------------------|-------------|-----------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Vegetable (potato) | | | | | <ul style="list-style-type: none"> • Opportunities for fresh and processed exports • Robust skills development path, incl. industrial • Can expand output rapidly • On-farm jobs non-Lebanese; post-harvest and processing Lebanese incl. female |
| Fruit (apple) | | | | | <ul style="list-style-type: none"> • Est. 7,000 rural jobs- mainly household workers • Harvest and post-harvest jobs more Lebanese workers • Potential expansion of fresh and processed exports • Earnings v jobs; short v longer term |
| Construction | | | | | <ul style="list-style-type: none"> • Largest source of non-agricultural jobs • Substantial skills path and opportunities for Lebanese • Potential expansion with crisis / reconstruction • Strong youth employment; limited female |
| Waste and recycling | | | | | <ul style="list-style-type: none"> • Large spillover benefits • Potential for rapid job creation |
| Olive | | | | | Large number of existing programs (sufficiently covered) |
| ICT | | | | | Best addressed through other World Bank / partner initiatives (incl through Tripoli SEZ support) |
| Wood furniture | | | | | Limited value chain reach; well covered through existing EU / UN program |

Note that the two selected value chains are intended to serve as *initial pilots* and as *proxies* to illustrate opportunities and challenges for private sector-led job creation and earnings growth that will be relevant across a number of sectors in the region.

METHODOLOGY

The value chain analysis was carried out through a combination of structured surveys, semi-structured interviews, and secondary research. The surveys piloted the ‘Jobs in Value Chains’ survey instrument and approach³ - see Annex B for a copy of the survey questionnaire. Structured surveys were administered to actors across all nodes of the value chain, with the objective to be representative at each node as well as (in some nodes) between large and small firms (farms). 109 structured surveys were completed in the potato value chain.

³ Lebanon is the first country pilot for this tool

Table 4

Overview of population and survey sample by value chain node

| Value chain node | Estimated population | Surveys completed | Comments |
|------------------|----------------------|-------------------|------------------------------------------------------------------------------------------------------------------|
| Input suppliers | 10 | 5 | Included potato seed suppliers of fertilizers and equipment |
| Farmers (small) | 600-700 | 68 | Sample biased toward larger farms within this strata |
| Farmers (large) | 30 | 23 | 4-5 percent of farms, more than 30 percent of output |
| Traders | 25 | 10 | Includes mix of traders selling in local markets and those exporting; most traders are not exclusive to potatoes |
| Processors | 2 | 3 | Additional survey of processor in Bekaa included to provide comparison with main producer in the North |

Note: In addition, structured interviews were carried out with retailers and commercial bakeries

The team faced two significant challenges in implementing the survey sampling strategy. First, in the case of the potato farms, there exists no comprehensive or accurate list of farmers operating in the North. Even existing cooperatives were unable to provide full lists of their membership, and lists that were made available were often problematic – for example, several farmers on the list were operating within the same farm plot (e.g. extended family members). Second, for parts of both the potato and value chain the overall population size was extremely limited – for example, only two potato processors. This meant that refusal to participate by one firm was problematic.

The survey was complemented by the following primary research:

- *Structured interviews:* Structured interviews were carried out with firms in peripheral nodes of the value chain, particularly to test the implications of specific growth opportunities assessed in the value chain. These nodes included retailers (3) and commercial bakeries (3).
- *Semi-structured interviews:* Semi-structured interviews were carried out with key informants in both value chains both at the initial stage of the research and following completion of the structured surveys.
- *Focus groups:* Focus group discussions were held with stakeholders across both value chains on two occasions: in January, 2016 as part of the value chain selection assessment; and in May, 2016 to present and discuss results from the survey.

OVERVIEW OF THE POTATO VALUE CHAIN

GLOBAL CONTEXT

Potatoes are major staple crop, with global production reaching around 500 million metric tons. Most potato production is for domestic consumption purposes, although even the small share (less than 5 percent) that is traded results in a market of US\$10-15 billion annually⁴. Production has shifted considerably in recent decades. An industry that was once dominated by US and European production now has more than 50 percent of output in developing countries. Increasingly production is concentrated in Asia (especially China, India, Pakistan, and Bangladesh), although Europe (especially France, Belgium, Germany, and Poland), and the US are still significant players (Table 1).

Table 5

Top 10 global potato producers (2014)

| | Country | Production ('000 MT) | | | | | Percent Change 2010-2014 |
|--------------|--------------------|----------------------|--------------------|--------------------|--------------------|--------------------|-----------------------------|
| | | 2010 | 2011 | 2012 | 2013 | 2014 | |
| 1 | China | 81,594 | 88,354 | 92,808 | 95,988 | 96,136 | 17.8% |
| 2 | India | 36,577 | 42,339 | 41,483 | 45,344 | 46,395 | 26.8% |
| 3 | Russian Federation | 21,141 | 32,681 | 29,533 | 30,199 | 31,501 | 49.0% |
| 4 | Ukraine | 18,705 | 24,248 | 23,250 | 22,259 | 23,693 | 26.7% |
| 5 | USA | 18,338 | 19,488 | 20,991 | 19,715 | 20,057 | 9.4% |
| 6 | Germany | 10,202 | 11,837 | 10,666 | 9,670 | 11,607 | 13.8% |
| 7 | Bangladesh | 7,930 | 8,326 | 8,205 | 8,603 | 9,435 | 19.0% |
| 8 | France | 6,622 | 7,440 | 6,341 | 6,953 | 8,055 | 21.6% |
| 9 | Poland | 8,766 | 8,197 | 9,092 | 7,290 | 7,689 | -12.3% |
| 10 | Netherlands | 6,844 | 7,333 | 6,766 | 6,577 | 7,100 | 3.8% |
| World | | 415,212,842 | 462,408,686 | 461,559,835 | 470,451,389 | 481,210,434 | 15.9% |

Note: Ranked according to output value

Source: FAOStat

With the exception of Poland, the Netherlands, and the US, most leading producers have experienced strong output growth in recent years (Figure 1). According to data from UN Comtrade 2010, global trade in potatoes grew more than 7 percent annually, while production increased almost 4 percent. Fresh potatoes account for almost 60 percent of global trade by volume but just 30 percent by value, while trade in processed products dominates in value terms and starches represent the highest value product (Figure 2). In terms of processed products, the US remains the dominant producer – together with Canada and Netherlands they control well above 60 percent of the global market.

With the lucrative segment of potato trade coming through value added processed product, including frozen fries and chilled potato products, large processors are beginning to spread their operations globally, not only to access supply but also to establish production facilities closer to markets. Dominant global potato processing companies include both companies with established brands as well as those producing for other brands (e.g. McDonald's French Fries). Indeed, several of the largest players do both own brand and private label production. The three largest global players are North American – McCain's of Canada and Lamb-Weston, and J.R. Simplot of the US. While McCain's still has its largest production in

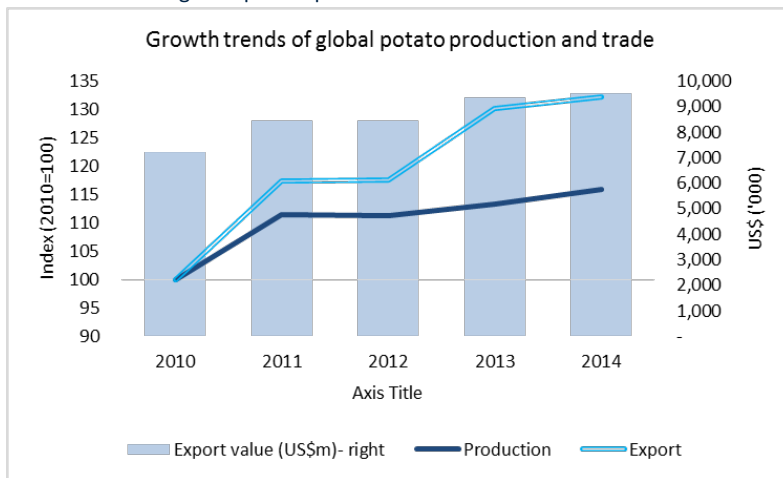
⁴ Trade figures vary widely depending on the source. FAO reports global potato trade at US\$6.44b (2013); UN Comtrade reports around US\$10 billion (2014); ITC reports US\$14.4 billion (2014).

North America, manufacturing now takes place also in Mexico, the EU, Australia, New Zealand, and China (where major potato processing operations are based). Lamb-Weston now operates plants in Netherlands, Turkey, and India; and Simplot (the largest supplier of fries to McDonald's and other leading fast food companies) established a large potato processing operation in China.

Second-tier global players include European (Netherlands-based) firms like Farm Frites and Aviko. Both these firms have also recently expanded production outside their northern European bases. For example, Farm Frites established operations in Poland, and then in both Argentina and Egypt, while Aviko established production in China. What is clear from the location patterns of these large processors is that the scale of production is key to competitiveness and scale of local supply is one critical factor to ensure a competitive production base.

Figure 1

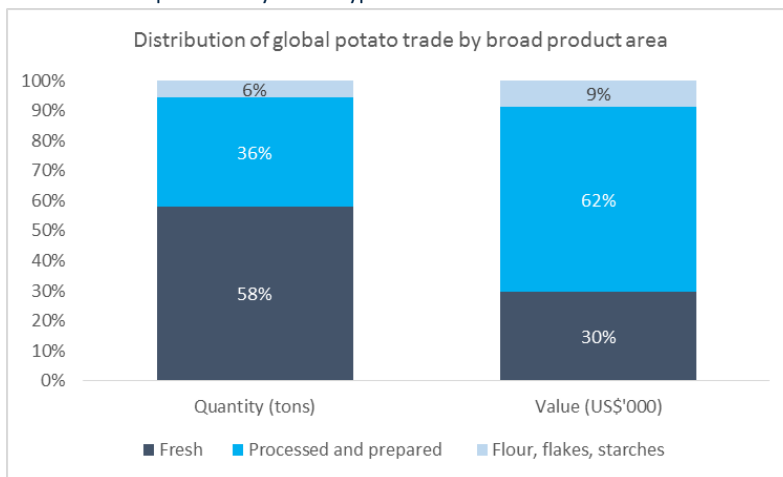
Growth trends of global potato production and trade



Source: FAOStat (production data); UN Comtrade via WITS (trade data)

Figure 2

Global trade in potatoes by broad type



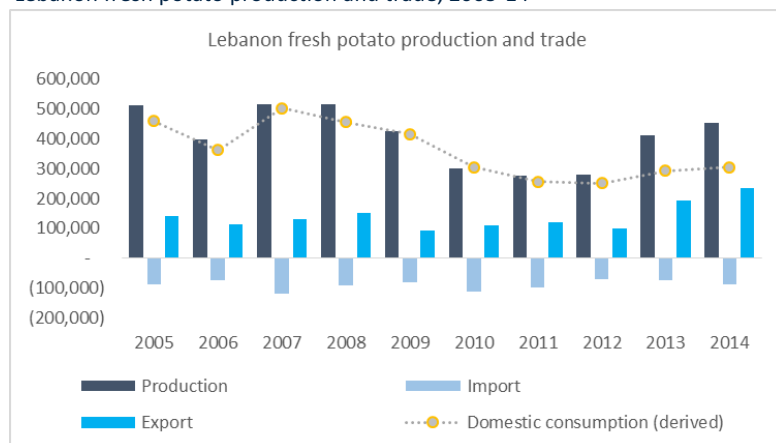
Source: ITC Trademap

THE POTATO SECTOR IN LEBANON

Lebanon has long been a significant producer and exporter, with a relatively large domestic per capita consumption and a competitive position in regional markets. Figure 3 shows that production peaked just below 515,000 tons in 2008, declining sharply thereafter, to below 300,000 tons in 2011 and 2012, due in part to a weak regional export markets. But production rose then sharply, reaching 450,000 tons in 2014, on the back of a doubling of exports. With the exception of 2010, Lebanon has run a trade surplus in fresh potatoes throughout the last decade, with an average surplus of close to 50,000 tons annually over the period. And while imports have averaged close to 90,000 tons over the past decade, domestic producers capture a 70-75 percent share of the domestic market in any one year.

Figure 3

Lebanon fresh potato production and trade, 2005-14



Source: ITC Trademap

With production yields at about 25 tons per hectare, Lebanon sits in between the highly productive markets (mainly in EU and US, with yields over 40 tons per hectare, primarily for industrial use) and the large volume, low cost producers like China and Pakistan (with yields in the 15-20 ton per hectare range). Exports are highly concentrated in the regional market, with Syria, Jordan, UAE, and Saudi Arabia together accounting for 90 percent of exports over the past decade, with all these markets contributing around the same level over this period (Table 6). In the early 2000s, Syria was the leading export market, accounting for around 35,000 tons a year. Exports to Syria declined through the decade and then collapsed after the start of the war – from over 15,000 tons in 2011 to just 1,300 in 2012. This contributed to a significant decline of exports in 2012. However, by 2013 exports recovered sharply with large increases to Jordan, UAE, Kuwait, and Egypt making up for the decline in Syria (as well as Saudi Arabia). Exports grew rapidly again in 2014 to reach above 230,000 tons, double the average annual amount over the previous decade, with even reported exports to Syria recovering. This export growth comes despite large increases in transport costs that have arisen as a result of the trade route through Syria to the regional markets being cut off. Exports to Russia, though small, have also increased in recent years, although virtually no exports are recorded to European markets.

Table 6

Lebanon fresh potato exports by market, 2005-14 (metric tons)

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | CAGR'05-14 | CAGR'10-14 |
|----------------|---------|---------|---------|---------|--------|---------|---------|--------|---------|---------|------------|------------|
| UAE | 25,174 | 22,999 | 23,254 | 38,145 | 13,779 | 19,669 | 27,783 | 25,896 | 42,064 | 51,438 | 8% | 27% |
| Jordan | 28,094 | 19,867 | 19,734 | 29,220 | 19,170 | 10,221 | 14,776 | 13,358 | 48,885 | 38,610 | 4% | 39% |
| Kuwait | 18,901 | 18,070 | 22,874 | 28,364 | 18,409 | 24,488 | 23,473 | 20,366 | 31,944 | 36,798 | 8% | 11% |
| Syria | 32,360 | 16,820 | 27,503 | 5,834 | 13,791 | 15,313 | 15,435 | 1,336 | 5,298 | 19,773 | -5% | 7% |
| Saudi Arabia | 19,022 | 24,724 | 20,496 | 30,075 | 17,029 | 23,937 | 20,825 | 23,082 | 7,223 | 22,666 | 2% | -1% |
| Other regional | 17,261 | 7,933 | 15,463 | 19,822 | 9,409 | 12,233 | 13,862 | 13,377 | 53,380 | 58,878 | 15% | 48% |
| Russia | 30 | 1,350 | - | - | 248 | 3,031 | 2,337 | 1,000 | 3,299 | 6,111 | 81% | 19% |
| Other | 162 | 380 | 125 | 184 | 1 | 58 | 236 | 95 | 49 | 133 | -2% | 23% |
| | 141,004 | 112,143 | 129,449 | 151,643 | 91,837 | 108,949 | 118,727 | 98,509 | 192,143 | 234,408 | 6% | 21% |

Source: UNComtrade

While export volumes have been robust, unit prices of potato imports have been much higher than exports contributing to a consistent, although steadily declining in recent years, trade deficit for fresh potatoes in value terms. The significant gap between export and import unit prices is likely explained in part by the fact that Lebanon imports substantial potato seed (which is high value, low weight) while it exports strictly table potatoes⁵. In addition, imports of processed potatoes have risen sharply from US\$2.2 million in 2005 to US\$17.6m in 2014 (26 percent per year), contributing to an overall trade deficit in potatoes and potato products of US\$17.2m in 2014.

Close to 18,000 hectares are estimated to be under production across the country. The largest concentration of production is in Bekaa, which accounts for 70 to 80 percent of output and exports. The majority of the remaining commercial production is in the North, mainly in Akkar, with smaller production in Mount Lebanon. Bekaa has both climatic and soil advantages, allowing for relatively high yields and two harvests annually – in June / July and in October / November. Bekaa also has a strong network of post-harvest facilities (up to 60 cold storage facilities) that enables them to have some control over market prices. Bekaa also has several large potato processing facilities, offering an important market for production.

⁵ World Bank (2010) "Lebanon Agricultural Sector Note: Aligning Public Expenditures with Comparative Advantage", January, 2010.

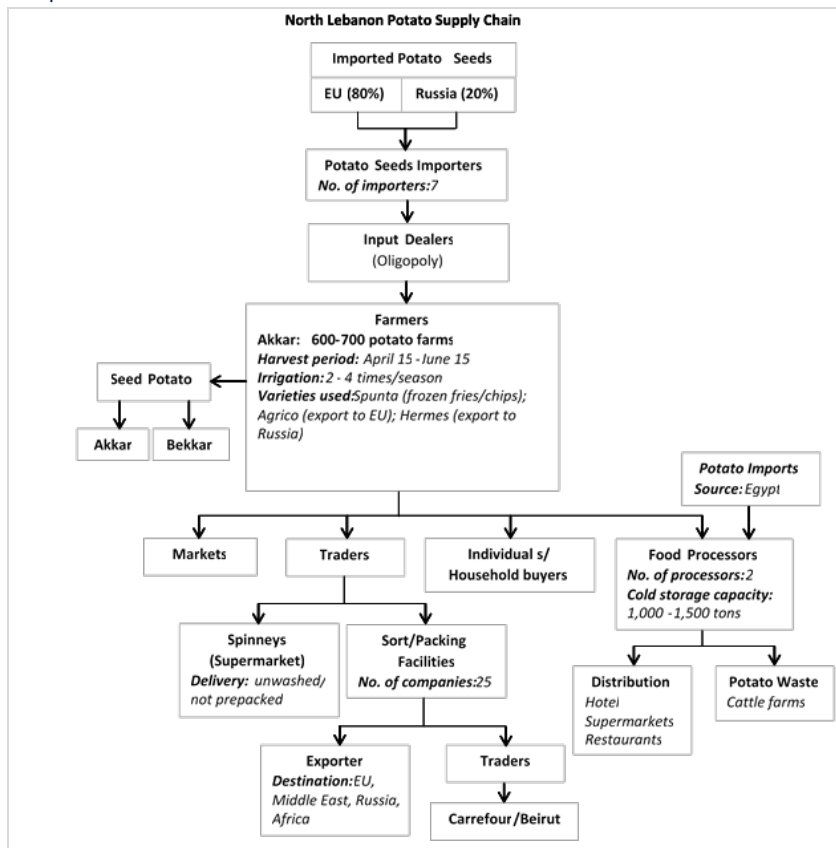
THE POTATO VALUE CHAIN IN NORTH LEBANON

OVERVIEW

The North region represents Lebanon’s second largest concentration of potato production, with approximately 80,000 tons of output, coming mainly from the Akkar plain. Figure 4 provides a basic overview of the North Lebanon potato value chain.

Figure 4

The potato value chain in North Lebanon



The current value chain is structured as follows:

- *Potato seed production*: Most potato seeds are imported, mainly from the EU. However, some farmers in Akkar for own use and for sale into the late-season Bekaa potato crop.
- *Input dealers*: There is a very small number of key input providers, who tend to supply fertilizers and key equipment as well as (often) import potato seed. The market is seen as an oligopoly in the North⁶.

⁶ ILO (2015)

- *Farmers*: This is the primary activity in the North (*see further discussion*)
- *Traders and exporters*: Around 30 traders are set up in the North; traders tend to be segmented between those that serve local markets and those that package for export markets. This is a powerful part of the value chain in the North, as it controls distribution and dominates the investment in post-harvest infrastructure. Most storage and packing facilities are located in Zgharta, just outside Tripoli.
- *Retailers*: The majority of potatoes are sold through the smaller-scale retail distribution network. However, substantial volumes go through large retailers like Spinney’s; small volumes go to Carrefour in Beirut (and only one or two farmers in the North serve this market directly)
- *Processors*: Two processing facilities exist in the North producing frozen chips – Master Frites and Super Frites.

PRODUCTION AND MARKETING

Production comes from a mix of large farms (greater than 20 hectares) which account for more than 30 percent of production and a large number of small farms (600-700) – see Table 7.

Table 7

Structure of potato production in North Lebanon

| | Estimated number | Estimated hectares under production | Average farm size |
|----------------------------|-------------------------|--------------------------------------------|------------------------------------------------------------------------|
| Small farms (<20 hectares) | 30 | 1,000 | 30-35 hectares |
| Large farms (>20 hectares) | 600 | 2,000-2,500 | 3-5 hectares; but at least 10% of this group in the 5-10 hectare range |

The majority of farms in Akkar are informal, with just 13 percent of small farms surveyed and 30 percent of large farms registered with the government. Among those surveyed, the average farm has been in operation since the late 1980s (average age of farm was 28 years); just 10 of 91 farms surveyed had been established in the past decade. Farming businesses tend to be passed along in the family and it is common for family members to farm in adjoining plots of land. However, while most of the farms are family businesses, the large majority of farmers do not own the land on which they farm but lease from absent landowners. Farmers cited high and rising costs and poor returns, as well as increasing competition (in the market, as well as for land) linked to the Syrian crisis as barriers preventing new entrants in the market.

Given the limited new entry into potato farming, it is not surprising to note that not a single firm surveyed in any part of the value chain had any foreign ownership. And while businesses in the North Lebanon potato value chain are largely male-owned, female participants is perhaps more significant than is average across industries in the region.

Table 8

Female ownership in the potato value chain of North Lebanon

| | Input suppliers (n=6) | Farmers (n=91) | Traders (n=10) | Processors (n=3) |
|------------------------------------------|-----------------------|----------------|----------------|------------------|
| Number with female ownership | 1 | 8 | 2 | 1 |
| Of those, average share owned by females | 20 | 31 | 7 | 25 |

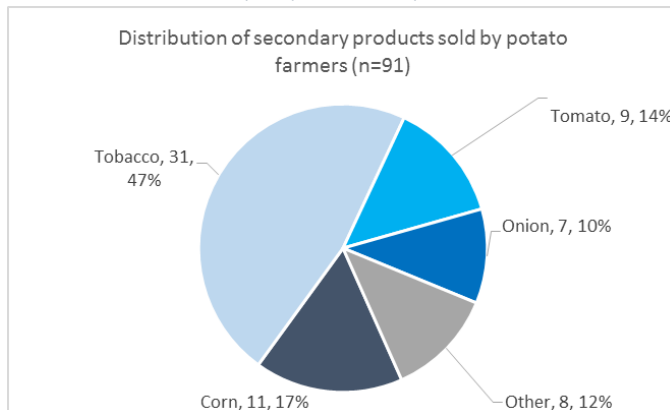
Among those surveyed, potato farming is almost exclusively a commercial (rather than a subsistence) exercise. Both large and small farmers market close to 90 percent of production. Non-marketed production is used as feed for animals (around 3% of output) and given as wage (more than 6% of output). The latter is perhaps important in considering the dynamics of the labor market in the potato value chain, where Syrian refugee labor has displaced traditional migrant labor (*see further discussion*).

Most potato farmers grow secondary products in the offseason (from June until replanting in December), although 26 of 91 surveyed farms do not produce a secondary crop. Of those who do plant secondary crops, these average just 15 percent of revenue, and only 3 farms surveyed earned more revenue from alternative crops than from potatoes. The most common secondary crop planted by Akkar potato farmers is tobacco, with tomato, maize, and onion, also important crops (Figure 5).

Farmers in Akkar grow both for domestic and (mainly regional) export markets – overall, 10-15 percent of output is currently exported, although farmers indicated the share was at least double that prior to the Syrian crisis. Up to another 20 percent of output (up to 10,000 tons) goes into two local processing factories that produce frozen fries and chips. By far the most common variety produced in the North is the ‘Spunta’, which is a favored variety in the domestic market. Some farmers produce the ‘Agrida’ (‘Agrico’) variety for export to the EU and ‘Hermes’ for export to Russia⁷.

Figure 5

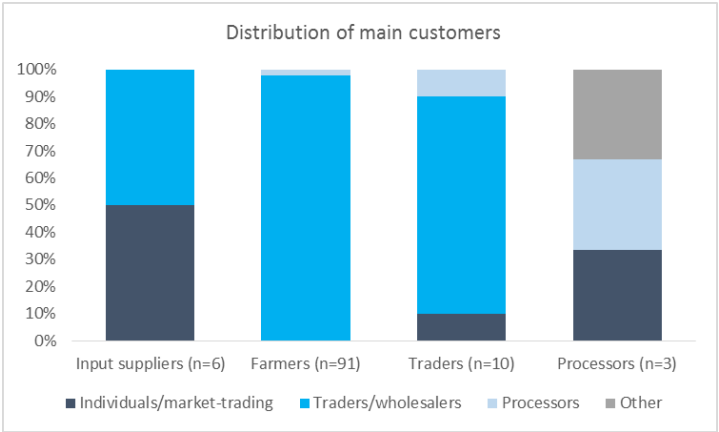
Distribution of secondary crops for Akkar potato farmers



⁷ ILO (2015)

The production system and post-harvest infrastructure (including cold storage and packing facilities) is much less developed in the North relative to Bekaa. This both results from and contributes to a market system that is much more reliant on timing. Producers in the North tend to plant immediately after receiving seed and market immediately after harvest – timing on the latter is driven by the North’s advantage of coming to the market from mid-April until early June ahead Bekaa’s June and July harvest. But this also means that even within the region, performance within the same season can vary significantly, if for example one producer is able to get to market early and capture a premium while another enters when there is a glut on the market. Without the option of storing and releasing products in response to market conditions, Akkar producers have little control over their returns.

Figure 6
Distribution of main customers by value chain node



The market system for potatoes in the North is dominated by traders, who own virtually all the post-harvest infrastructure and maintain the relationships with domestic and export buyers. Figure 6 shows that not only do virtually all farmers sell primarily to traders, but most input suppliers and traders are selling to other traders. Among 91 farmers responding to the survey, 66 have 3 or fewer customers and 36 sold all their output to a single trader, while the average small farm sold 80 percent of its output to a single trader. Larger farms appear to be more diversified, with only 60 percent of their output, on average, going to a single trader. Only two surveyed farmers export directly and only one had a contract arranged to sell directly to a processor.

RECENT PERFORMANCE

Performance of the potato value chain in the North has been greatly impacted by the Syria crisis in recent years, which has created difficult conditions impacting both the production costs and market demand.

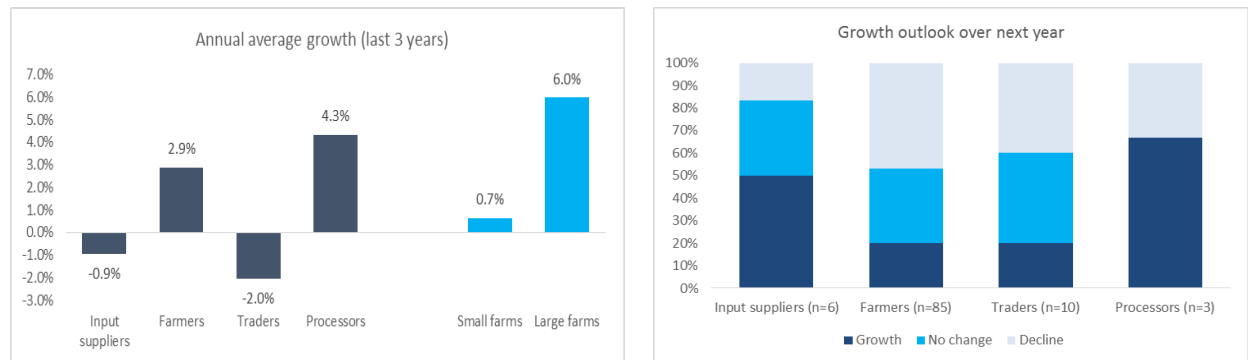
On the supply side, the Syrian crisis has contributed to rising input prices for farmers in Akkar, including increasing costs of fertilizers and pesticides (which used to be obtained across the Syrian border) and dramatically raising the costs of land rental for farmers, given high demand from Syrian refugees. Rental rates are said to have increased three to four times over the past five years, and can now reach the equivalent of LBP100 per kilogram (US\$67 kilogram), becoming the single largest cost category for

farmers. These market factors have combined with periodic climatic shocks (including hail storms and flooding) which impacted parts of Akkar production in recent years.

On the demand side, the dramatic decline of Lebanon’s main export market has been exacerbated by the fact that Syria was the main transport route for exports to Lebanon’s other main markets in Jordan and the Gulf. Thus, transport costs have risen dramatically, undermining competitiveness. These factors have hit fresh potato exports hard and forced the delayed the opening of a major new processing investment made by Daher (Masterchips) in Bekaa. At the same time, the farmers from the North have faced reported dumping of Syrian product into the Lebanese market in recent years (as they are unable to sell in their domestic market). Perhaps of more concern was the opening to cheap Egyptian imports that coincided with the Akkar harvest in 2015. According to farmers, Egyptian product came onto the market at prices as low as LBP250 per kilogram (US\$167 per ton), virtually halving the domestic market price.

At the same time, evidence from survey responses suggests that most farms, at least, experienced moderate growth in recent years, although large farms and processors performed much better than smaller farms and traders (Figure 7). Forecasts of performance over the coming year also suggests processors perceive much greater prospects, while considerably more farmers and traders anticipate decline than growth.

Figure 7
Recent growth performance and forecast



JOBS IN THE NORTH LEBANON POTATO VALUE CHAIN

JOBS IN THE CURRENT VALUE CHAIN

Drawing from the survey responses (Box 1) and secondary data, Figure 8 provides an estimate of the jobs profile of the potato value chain in the North⁸. It indicates that around 9,000 overall jobs exist across the value chain, including 1,800 permanent jobs and around 7,200 seasonal positions. Note, however, that these seasonal jobs are very short term in nature⁹, and becoming more so as the demand for jobs from Syrian refugees increases. Evidence from surveys as well as anecdotal information suggests that farms are making use of large workforces during harvest time – up to 30 workers per hectare. But the growing demand for jobs from refugees, means most seasonal workers are being rotated through quickly, so that individual workers often get employment only 4 hours per day and only 2 or 3 days during the week¹⁰. Converting seasonal workers into full-time equivalent (FTE) positions (40 hours a week, all year) results in close to 3,000 FTEs in the value chain. The large majority of these jobs come in farming, which accounts for two-thirds of permanent jobs and 85 percent of seasonal jobs (Table 9). Traders also account for a significant number of jobs – more than 500 FTEs and almost 400 permanent - jobs. Jobs in processing as well as input supplies, meanwhile, are relatively limited in the current value chain.

BOX 1: ESTIMATING EMPLOYMENT FROM SURVEY DATA – APPROACH AND DATA CHALLENGES

Estimations of employment in the potato value chain were derived through a four-step process:

1. *Calculating employment reported in the sample population:* Data on permanent and seasonal labor, split by skill level, age, and sex, were collected, as was data on wages paid for different types of workers. This data was tabulated for each node in the value chain as well as between large and small farms within the farming node of the chain.
2. *Adjusting reported employment data from the sample population:* As employment data was collected based on total activities of the firms / farms, they had to be adjusted to reflect non-marketed output (e.g. share of potatoes that are not sold but used in the household, for seeds, etc.) and, in the case of input suppliers and traders, to ensure that the labor figures were adjusted to capture only the share of the business linked to potatoes.
3. *Checking and re-adjusting:* The adjusted employment figures were then assessed at the firm level and in aggregate against other variables and known ratios in the sector, including calculating the firm wage bill as a share of reported revenue and employment per hectare (for

8 The analysis aims to estimate only jobs relevant to the potato value chain and therefore calculates proportionally activities related to potatoes in firms that do other activities – for example, traders that sell other products and farms that produce secondary products.

9 It may also double count some of these seasonal workers, for example of an individual is hired for planting in December and again for harvesting in May or to work in parallel or sequentially across more than one farm.

10 International Rescue et al (2013)

farms). The analytical check suggested that labor figures appeared accurate in the input supply, trading, and processing nodes, but had been significantly overstated by many farms. This primarily came from the calculations on seasonal labor and was a function of the fact (reported above) that many employers reported that seasonal workers worked on average for two months or more (the harvest and planting seasons), when in fact most individual workers may have worked no more than 10-12 hours a week. As a result, farm labor figures had to be further adjusted downward to arrive at a final estimate for the sample population.

4. *Scaling-up to the overall population:* The final estimate for the sample population was then scaled up to the general population based on weightings developed from the initial sample frame. In the case of processing, the sample population was the same as the general population. But for all other nodes of the chain, only limited information was available on the general population (as discussed above). Particularly for the potato farms, even the number of small and large farms had to be estimated. In this case, the weighting was derived by assessing both the estimated number of farms (and thus output) for small and large farms, but also through an assessment of the share of total potato hectares under production that were covered in the sample population.

Given the challenges identified above, the estimations presented here can only be seen as indicative and not as statistically robust within a reasonable confidence interval.

While the number of jobs in the value chain is important, it is equally important to consider the nature of those jobs. As Table 9 shows, there are big differences across the value chain nodes in the types of jobs available. Almost 85 percent of jobs on potato farms are seasonal as are close to 70 percent of jobs in trading. On the other hand, more than half of jobs in processing plants are permanent. Processing and input supply also requires a slightly higher mix of skilled labor, although the vast majority of demand across all parts of the current value chain is for low skilled labor.

Figure 8
Estimated jobs profile across North Lebanon potato value chains

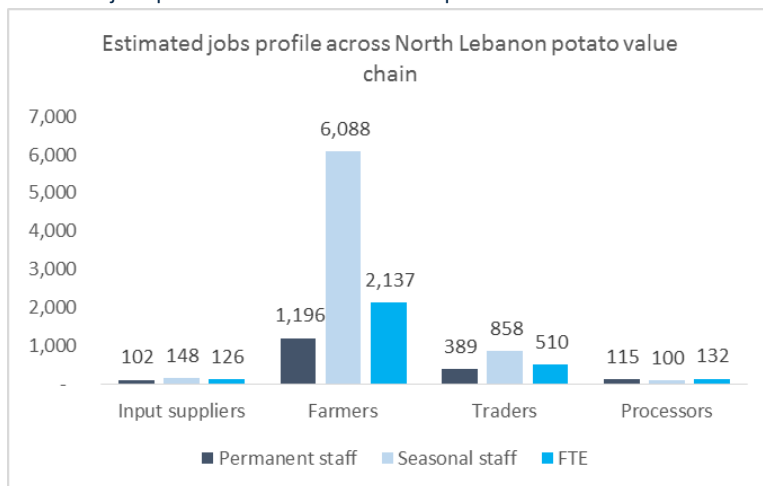


Table 9

Distribution of jobs by type across value chain nodes

| | Node share of total VC jobs | Share of total jobs | | Share of FTEs | |
|------------------------|-----------------------------|---------------------|----------|---------------|-----------|
| | | Permanent | Seasonal | High skill | Low skill |
| Input suppliers | 4% | 41% | 59% | 28% | 72% |
| Farmers | 73% | 16% | 84% | 19% | 81% |
| Traders | 18% | 31% | 69% | 16% | 84% |
| Processors | 5% | 53% | 47% | 20% | 80% |

The nature of the jobs in the chain also has implications for who takes the jobs. Foreign workers dominate seasonal employment across the chain and all low skill employment on potato farms (Figure 9). This is nothing new – potato farms have long relied extensively on migrant (mostly Syrian) labor for seasonal jobs such as harvesting and planting as well as for general, low-skill farm labor. But Lebanese workers take just about all high-skill positions across the value chain and take the large majority of low-skill permanent positions in processing and trading activities.

Table 10 breaks down the share of jobs taken by women and youth. It shows that women tend to be employed in low skill activities, with the majority of jobs held by women coming through employment of foreign seasonal workers in farming. On the other hand, there is a significant employment of Lebanese females in permanent positions in input suppliers and processors, where women account for more than 40 percent of permanent, low-skill workers. For Lebanese youth, most jobs are coming in trading, where more than 80 percent of low skill permanent jobs are held by youth.

Figure 9

Share of jobs held by Lebanese by node and type

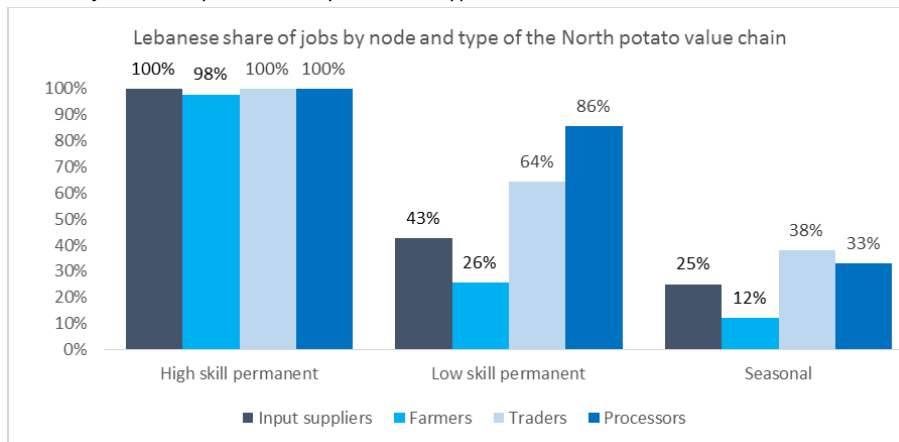


Table 10

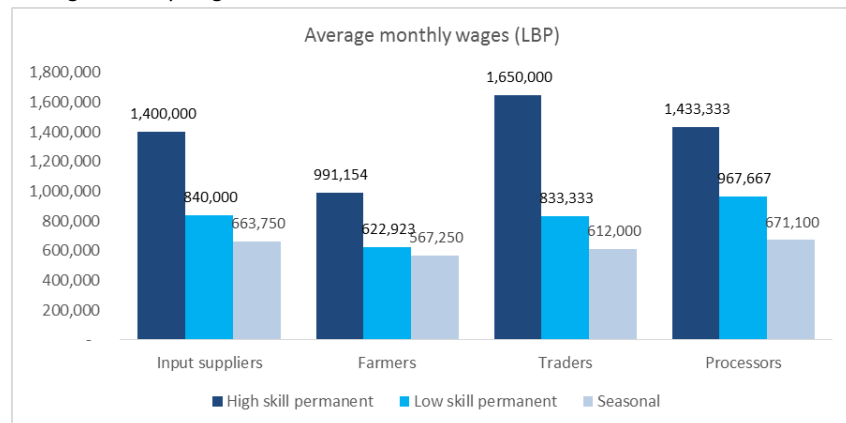
Female and youth share of jobs in the value chain

| | Women | | | Youth | | |
|------------------------|----------------------|---------------------|------------|----------------------|---------------------|------------|
| | High skill permanent | Low skill permanent | Seasonal | High skill permanent | Low skill permanent | Seasonal |
| Input suppliers | 27% | 0% | 48% | 13% | 92% | 52% |
| Farmers | 0% | 31% | 62% | 11% | 14% | 34% |
| Traders | 4% | 5% | 13% | 0% | 81% | 27% |
| Processors | 0% | 41% | 0% | 0% | 0% | 28% |

Wages also vary across nodes of the value chain. Most notably for permanent positions, farm wages are substantially below those in other parts of the chain. The premium in processing and trading over farming is 55 percent for high-skilled positions and 45 percent for low-skilled permanent positions. For seasonal workers the gap is much lower. However, it is worth noting that the wage gap between low-skilled permanent and seasonal workers is 40 percent in processors and traders but just 10 percent in farming. This most likely reflect the composition of low-skilled permanent workers in the different nodes – in processing and trading the majority of the low-skilled permanent workers are Lebanese, while in farming they are Syrian. Thus, the wage gaps in the value chain (other than for high skilled workers) are explained by the gap in wages paid to Syrians versus Lebanese. It is also worth noting that average low-skilled farm workers and the majority of seasonal workers are earning below the national minimum wage. However, assessments of wages are complicated by the fact that many of the Syrian workers are being provided housing or access to land and in some cases meals in exchange for work.

Figure 10

Average monthly wages

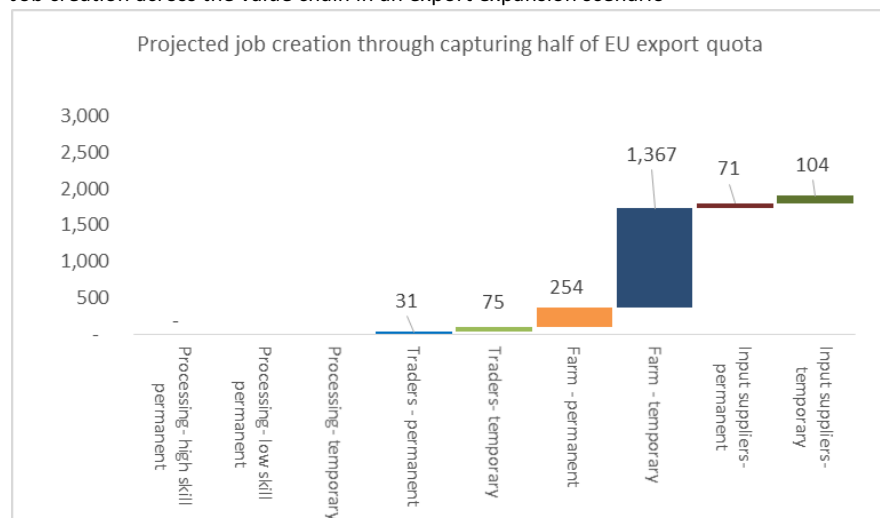


SCENARIOS FOR GROWTH AND JOB CREATION IN THE POTATO VALUE CHAIN

What might be the potential for the potato value chain to add to the current 9,000 (3,000 FTE) jobs it contributes to the economy of the North? This section provides a brief assessment of growth scenarios to see their implications on jobs in the region. The scenarios presented below are intended to assess opportunities for significant growth of the current value chain rather than simply to project employment over the years based on incremental growth. In this context, however, it is worth recalling that growth performance in the North Lebanon potato value chain has not been particularly strong in recent years, and that the majority of farmers and traders forecast no growth or decline over the next year.

Figure 11

Job creation across the value chain in an export expansion scenario



The first scenario is a significant expansion of exports. For this, we take the European quota of 50,000 tons that was opened up for exporters from the North and Bekaa. Under this scenario we assume that Akkar farmers take half of the quota (at present they are using almost none of it) and that all of this comes from new production rather than diverting from existing domestic or export markets – i.e. an increase in production and exports of 25,000 tons.

Figure 11 illustrates the impacts of this change through the value chain. An initial analysis suggests this scenario would create just over 350 permanent jobs and another 1,550 seasonal jobs. Around 70 percent of jobs would come on farms, while the remaining jobs would be in trading and inputs.

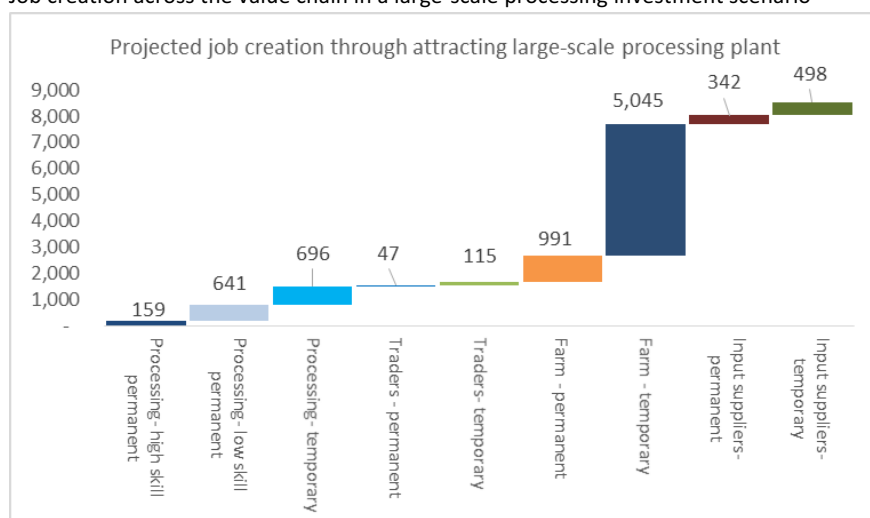
A second scenario focuses on the prospects of attracting large-scale investment in potato processing. For this scenario we use the example of the recent processing plant investment made by Daher Foods in Bekaa¹¹, which has the capacity to process 120,000 tons of potatoes. Under this scenario we again assume that all demand is met by production from the North and all of this production is new rather

¹¹ Daher Foods made a US\$35m investment in a 120,000 ton capacity potato processing plant for their Masterchips brand. The 20,000 square foot facility in Ferzol, Bekaa was expected to open in January 2016, although market conditions (in key export markets of Syria, Iraq, and Jordan) have delayed opening.

than being diverted from alternative markets. Of course, given the large scale of such a project, employment impacts on the farms would be much higher than in the first scenario. Figure 12 shows that the processing scenario could create substantial jobs across all parts of the chain. Overall, the initial analysis indicates this scenario could result in close to 2,200 permanent jobs and another 6,350 seasonal jobs. In contrast to the first case, while farms would account for almost 80 percent of new seasonal jobs, they would account for less than half of new permanent jobs – this means close to 1,200 new jobs would come in processing, trading, and input supply activities that tend to employ largely Lebanese workers, including significant skilled positions. It might be more realistic to assume that a substantial share of the potatoes sources for such a new plant would come from other sources – either Bekaa production or imports – at least in the short term. If we assume Akkar producers captured just one-quarter of processing demand this would result in an increase in potato production of 25,000 tons, equivalent to the increase under the export scenario. The difference here is that processing demand still delivers stronger job creation through the chain. Compared to 350 jobs under the export scenario, the processing scenario would deliver close to 1,100 permanent jobs.

Figure 12

Job creation across the value chain in a large-scale processing investment scenario



Both the scenarios presented here should be taken as simply attempts to get a sense of the potential scale and nature of job creation that could come from development of the potato value chain in North Lebanon – as such they are only indicative of the possibility of job creation. In practice, the number and nature of jobs created in any growth scenario will depend to a large degree on the type of investment driving growth (expansion versus greenfield investment) and the decision taken by firms on the mix of capital and labor they deploy. Indeed, the jobs figures quoted in the scenarios above will almost certainly be overstated if we consider economies of scale in production (see Box 2) –i.e. if we take the standard assumption that expansion (at least at the firm level) is driven by *marginal* costs and not *average* costs.

BOX 2: CONSIDERING THE IMPACT OF SCALE ECONOMIES ON JOB CREATION MODELS

An important issue to consider in assessing potential job creation from expansion in a value chain is how existing firms and farms would respond to growth – would they hire? or would they use the opportunity to invest in labor-saving technologies? One way to look at this is to use the data from the survey to assess the relationship between output and employment, as well as between output and capital investment. Overall, while the correlations do not show a significant relationship between farm output and labor and capital use, comparing the averages of small and large farms suggests that as farms expand they substitute capital for labor (as would be expected). The average output per worker for large farms is more than twice the level for small farms, and the level of capital stock per worker is 75 percent higher.

The survey also asks respondents to anticipate their marginal investments capital and labor use in a hypothetical situation in which they receive a long-term (three-year) contract that would double their output. As would be expected, most respondents anticipated not hiring in line with growth, and hiring low-skilled workers more intensively than high-skilled workers (Figure 13). However, the responses suggest some important differences across nodes. In particular, farmers anticipate more intensive hiring than processors and traders, and processors would make the most intensive use of capital in place of hiring labor.

Figure 13
Anticipated elasticity of labor and capital use to growth

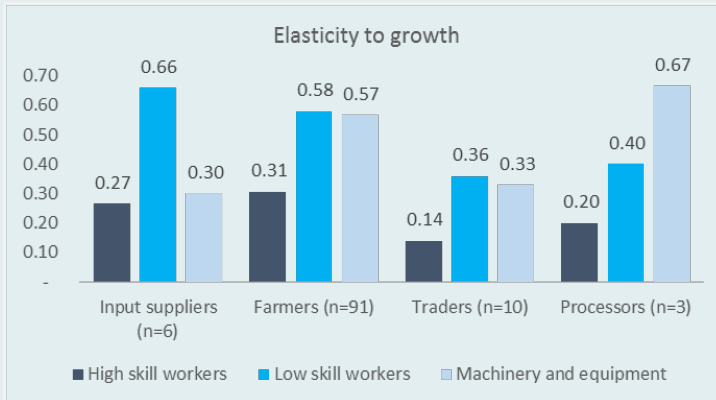


Table 11 provides a detailed breakdown of potential job creation across the scenarios presented above, including first the maximum job creation estimate where all growth involves use of factors of production at the same rate as they are used currently and then a minimum job creation estimate which takes into account firms’ estimated elasticities of factor use (Figure 13). We assume that seasonal labor would be unaffected, although capital investments are likely to also reduce the need for seasonal labor. The results suggest that the creation of high-skilled permanent jobs could be up to 75 percent lower and low-skilled permanent jobs up to 50 percent lower with scale economies. **In general, the minimum job creation estimate should be viewed as closest to the reality we would expect to see from firm entry and expansion decisions in established activities.**

In any case, what is clear from the analysis is that delivering large-scale, quality jobs will require a strategy to develop a competitive agriprocessing sector in the North. In this respect, it is important to keep in mind that the assessment of potatoes is intended to be illustrative of the wider agribusiness

sector in the North, and while potato is among the most important crops in the region, it accounts for no more than 10 percent of regional output. So scaling this opportunity up – through a strategy to upgrade the competitiveness of the wider regional agribusiness sector – could offer the potential to create 10,000-20,000 permanent jobs, and several times more seasonal positions.

Table 11

Breakdown of job creation potential by scenario, type, and node – average cost and marginal cost functions

| <i>Maximum scenario : assuming all growth involves factor use at average levels</i> | Scenario 1: 25,000 ton export | Scenario 2: 25,000 ton processing | Scenario 3: 120,000 tons processing |
|------------------------------------------------------------------------------------------------|----------------------------------|--------------------------------------|----------------------------------------|
| Processing- high skill permanent | - | 159 | 159 |
| Processing- low skill permanent | - | 641 | 641 |
| Processing- seasonal | - | 696 | 696 |
| Trading- high skill permanent | 4.82 | 2 | 7 |
| Trading- low skill permanent | 25.80 | 8 | 39 |
| Trading- seasonal | 75 | 24 | 115 |
| Farming- high skill permanent | 48.05 | 39 | 188 |
| Farming- low skill permanent | 205.85 | 167 | 803 |
| Farming- seasonal | 1,367 | 1,051 | 5,045 |
| Input supply- high skill permanent | 19.83 | 20 | 95 |
| Input supply- low skill permanent | 51.33 | 51 | 246 |
| Input supply- seasonal | 104 | 104 | 498 |
| <i>High skill permanent-total</i> | <i>73</i> | <i>220</i> | <i>449</i> |
| <i>Low skill permanent-total</i> | <i>283</i> | <i>868</i> | <i>1,730</i> |
| Permanent - total | 356 | 1,087 | 2,179 |
| Seasonal-total | 1,546 | 1,875 | 6,354 |
| <i>Minimum scenario : assuming all growth involves factor use at estimated marginal levels</i> | Scenario 1: 25,000 ton export | Scenario 2: 25,000 ton processing | Scenario 3: 120,000 tons processing |
| Processing- high skill permanent | - | 32 | 32 |
| Processing- low skill permanent | - | 256 | 256 |
| Processing- seasonal | - | 696 | 696 |
| Trading- high skill permanent | 0.67 | 0.22 | 1.03 |
| Trading- low skill permanent | 9.29 | 2.96 | 14.22 |
| Trading- seasonal | 75 | 24 | 115 |
| Farming- high skill permanent | 14.73 | 11.98 | 57.50 |
| Farming- low skill permanent | 119.32 | 97.02 | 465.72 |
| Farming- seasonal | 1,367 | 1,051 | 5,045 |
| Input supply- high skill permanent | 5.29 | 5.29 | 25.39 |
| Input supply- low skill permanent | 33.79 | 33.79 | 162.22 |
| Input supply- seasonal | 104 | 104 | 498 |
| <i>High skill permanent-total</i> | <i>21</i> | <i>49</i> | <i>116</i> |
| <i>Low skill permanent-total</i> | <i>162</i> | <i>390</i> | <i>899</i> |
| Permanent - total | 183 | 439 | 1,014 |
| Seasonal-total | 1,546 | 1,875 | 6,354 |

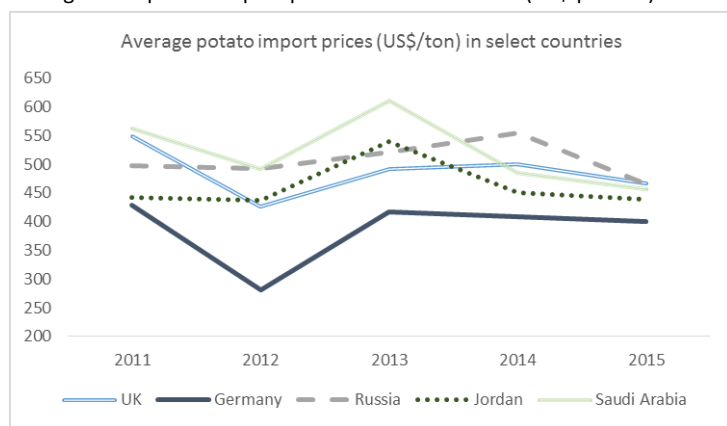
ASSESSMENT OF POTENTIAL AND REQUIREMENTS TO DELIVER JOBS GROWTH

MARKET OPPORTUNITIES AND COMPETITIVENESS

It is one thing to calculate potential job creation from a growth scenario, but quite another to achieve the growth and actually exploit the potential set out in the scenario. In this sense, what is realistic for the potato sector in North Lebanon to achieve? As discussed earlier, the global export market for potatoes remains buoyant from the perspective of global demand. While prices in export markets tend to fluctuate from year to year, prices have declined slightly over the past three years and price levels have converged across the main export markets targeted by Lebanese exporters (Figure 14). Growing the sector through exports will require tapping into new markets, in particular given that Lebanon's traditional market in Syria is not expected to recover any time soon. Lebanese exporters have not yet taken advantage of the 50,000 ton quota from the EU made available to Akkar and Bekaa producers up until at least 2017. This is understood to be related partly to phytosanitary and traceability requirements as well as to market dynamics (relative prices in the EU versus the Lebanese domestic market).

Figure 14

Average fresh potato import prices - select countries (US\$ per ton)



Source: ITC Trademap

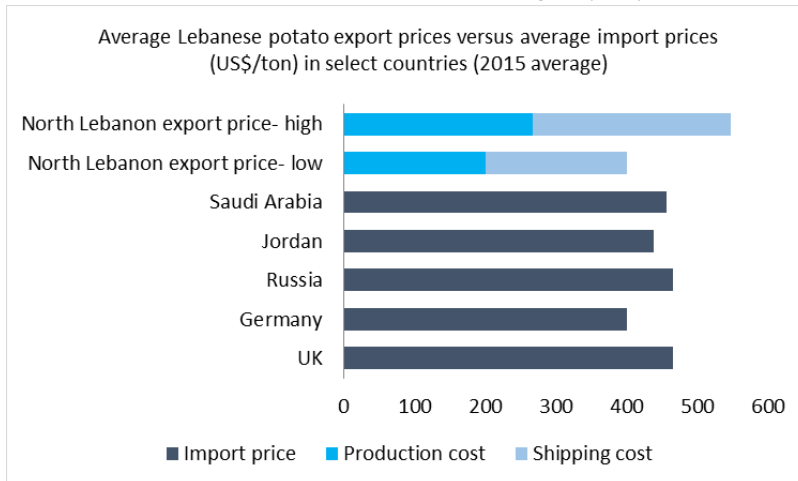
The question is whether Lebanese exporters can compete in these markets. At present, average import prices in the European markets are US\$400-500. Farmers from North Lebanon can typically produce as low as US\$200 per ton, although recent price increases have pushed prices above US\$250 toward US\$270. And with road freight access to European (and regional) markets cut off by the Syria crisis, shipping costs (which exporters indicate can be as high as US\$7,000 per container) push landed costs into these markets up above US\$500 per ton (Figure 15); and this excludes the costs and margins borne by the traders who organize export. At these shipping rates, it appears difficult for Lebanese producers to take advantage of European export markets. Regional markets look somewhat more attractive, with slightly higher prices and strong recent growth – data from ITC shows that Middle East regional imports of fresh potatoes grew 17 percent annually between 2012 and 2014. In the short term, however,

transport barriers will even make competing in these markets challenging for Lebanese potato exporters.

The difficult external environment perhaps makes it even more important to develop the processing end of the value chain, where timing risks in the market can be managed better and where higher value added potential can soften the impact of some of these extraordinary costs. Figure 16 gives a sense of much more value is available in the processing channel, where reported buying and selling prices from the survey suggest that even trader margins in the processing channel are higher than they are in the domestic retail and export channels. The Middle East regional market for processed products is already worth more than US\$600m and has been growing at close to 17 percent annually (Table 12).

Figure 15

Assessment of Lebanese landed costs relative to average import prices in select countries



Source: Author’s calculations based on data from ITC Trademap (import prices)

Figure 16

Value addition across the North Lebanon potato value chain

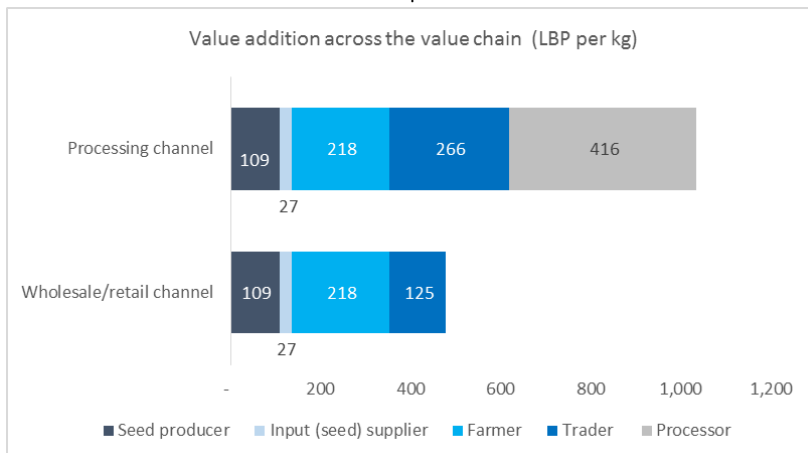


Table 12

Middle East regional processed potato imports (US\$'000)

| | 2011 | 2012 | 2013 | 2014 | CAGR |
|--------------------------------------------|----------------|----------------|----------------|----------------|--------------|
| Potatoes prepared or preserved, frozen | 251,527 | 319,400 | 371,357 | 407,299 | 17.4% |
| Potatoes prepared or preserved, not frozen | 56,993 | 49,299 | 53,123 | 93,056 | 17.8% |
| Potatoes, frozen | 20,463 | 25,124 | 16,837 | 23,821 | 5.2% |
| Potato flakes | 17,625 | 26,317 | 31,855 | 44,245 | 35.9% |
| Potato starch | 31,150 | 28,835 | 28,605 | 32,558 | 1.5% |
| Potato flour and meal | 9,627 | 9,626 | 8,525 | 10,919 | 4.3% |
| Total | 387,385 | 458,601 | 510,302 | 611,898 | 16.5% |

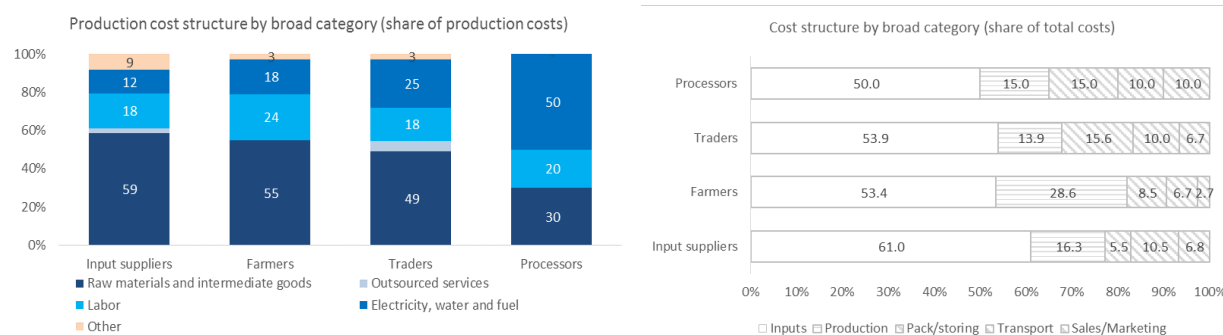
Source: ITC Trademap

Can Lebanon compete as an exporter of processed potato products in regional markets? The fact that some processors have already had some success selling frozen fries as well as branded potato chips into regional markets suggests it is possible. But whether these individual situations can translate into success on a broader scale is another question. The investment patterns of the largest global potato processors (see Section 2.1) suggests that competitiveness is driven primarily by production scale and efficiency. It also tends to be driven more by access to inputs than to markets. This is because the perishability and weight (low value to weight ratio) of potatoes makes shipping processed potatoes more economically efficient than shipping raw potatoes for most processed products (one exception to this is potato chips which, due to fragility and high volume to weight ratio, are more typically more produced closer to end markets).

Thus, investors looking to establish a potato processing facility will seek locations with: i) access to large volumes of quality, competitively priced potatoes; ii) land for relatively large factories; and iii) an environment where they can operate relatively capital intensive production and cold storage facilities cost effectively. Indeed, on the latter, comparing the structures of production costs along the value chain in Figure 17, what stands out most clearly is that 50 percent of the production cost of processors comes from electricity and fuel costs. This immediately raises concerns in the Lebanese environment where electricity reliability is so poor. It is also worth noting that post-production costs, including storage and marketing, but also transport, are relatively higher in the processing end of the potato value chain.

Figure 17

Cost structure by category and node in the value chain



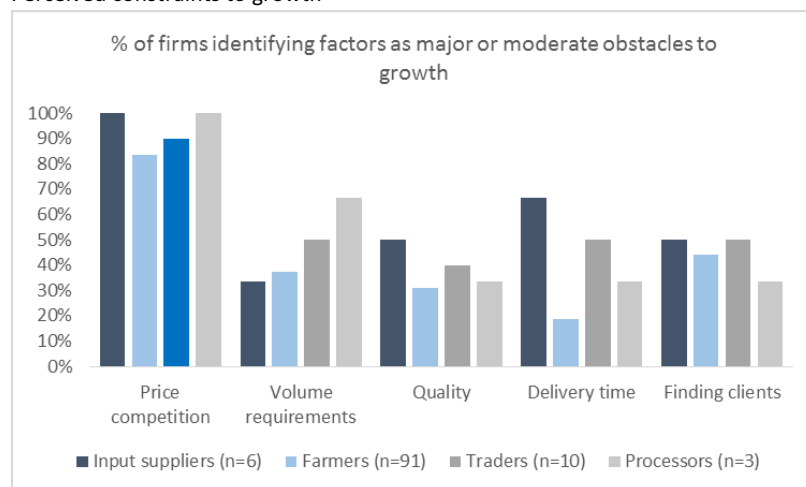
CONSTRAINTS TO COMPETITIVENESS

What are the constraints that must be overcome in order for the potato value chain to grow and be in a position to create quality jobs? To complement the issues identified as part of the competitiveness discussion above, this section describes perceived constraints by firms first to growth and market expansion, and then, relatedly, to producing competitively. Figure 18 summarizes the perceived constraints to business expansion by firms in each node of the value chain. Across the board, the main constraint identified is market competition, in particular price competition. This was highlighted as particularly acute among farmers, who have in recent years faced major competition from Egyptian imports (Box 3) – according to farmers, the government allowed traders and processors to import large quantities of Egyptian imports duty-free just prior to the 2015 harvest, which resulted in prices collapsing from LBP350 per kilogram to LBP 250 per kilogram in the domestic market.

The main processors in the North also identified volume requirements (to serve new, large customers) as a moderate constraint, as meeting volume requirements would typically require substantial capital investment.

Figure 18

Perceived constraints to growth



BOX 3: IMPORT ARRANGEMENTS FOR EGYPTIAN POTATOES

Under the Memorandum of Understanding between Egypt and Lebanon, Egypt can export potatoes duty-free to Lebanon for the months of February and March tariff up to a quota of 50,000 tons, which is subject to change determined by the Ministry of Agriculture of Lebanon based on expected yields and environmental factors. Importers wishing to make use of the duty-free access must obtain an import license from Ministry of Economy and Trade (MOET) and get approvals from both MOET and Customs.

The intention is to make potatoes available at a stable price during the offseason in Lebanon (after the end of the late season Bekaa harvest and before the Akkar harvest). However, the timing of this arrangement has often been problematic as it comes close to the Akkar harvest and traders and processors with cold storage capacity can substitute Egyptian product, potentially having a major impact on domestic prices during the period for Akkar producers.

As discussed earlier, one of the primary factors holding back growth of potato farmers is the existing market system, whereby farmers operate without any control over the market and are therefore subject to fluctuations in prices on both the input and output side. At present, no integration exists in the supply chain, with virtually all sales coming through ad hoc trading arrangements. Just 5 percent of farmers surveyed have a formal contract, and even just one of three processors sells with a formal contract (Table 13). And when formal contracts do exist, they typically do not guarantee price but specify volume commitments (from both sides, subject to quality) at prevailing (daily) market prices.

Focus group discussions with farmers uncovered issues of lack of trust between farmers and processors on contract arrangements – according to farmers, several had a contractual agreement with a processor, which specified both quantity and price, but the processor eventually failed to honor the commitment as they in the meantime were able to access cheaper imports. Processors, meanwhile, report that some contract arrangements had to be abandoned as farmers failed to honor their commitments to sell. The reality is that contract arrangements with processors often do force farmers to get locked into sales at low prices, with the trade-off being large volume commitments. At present one of the large processors indicated they are working with a small group of 8-10 farmers in Akkar, where the processor provides seed as well as agronomist support and guarantees to buy the outputs.

Table 13

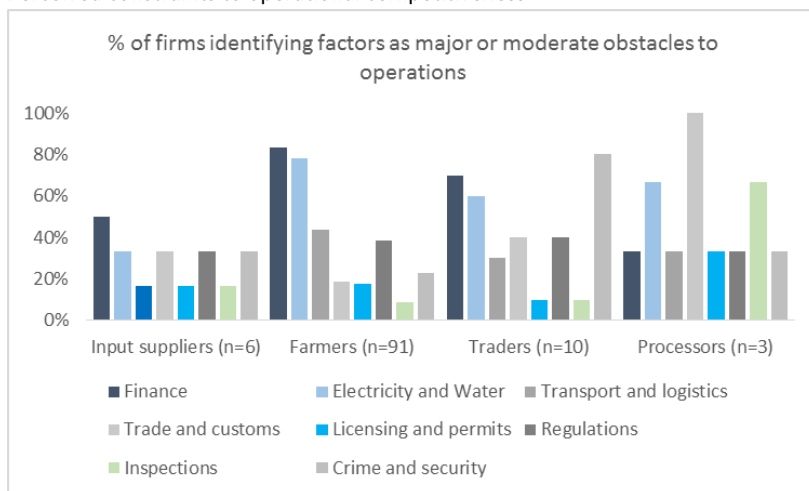
Relationships with main customers in the potato value chain

| | Share of firms with formal contract with main customer | Share of firms receiving training from main customer | Share of firms receiving supplier credit from main customer |
|------------------------------|--------------------------------------------------------|------------------------------------------------------|-------------------------------------------------------------|
| Processors (n=3) | 33 | 0 | 0 |
| Traders (n=10) | 20 | 10 | 0 |
| Farmers (n=91) | 5 | 2 | 27 |
| Input suppliers (n=6) | 0 | 17 | 17 |

The lack of supply chain integration not only has implications for managing prices and costs, but also prevents learning and technological upgrading in the chain. Table 13 shows how few actors in the value chain receive any training support from their clients in the chain. Results from the survey show similarly low levels of technical support and technology transfer. One of the implications of poor training and technology transfer in the value chain is that farmers struggle to meet the quality standards required in key markets – notably to sell into Europe, where standards like GlobalGAP are the norm. Figure 19 summarizes the main constraints to operational competitiveness across firms in each node of the value chain. Two constraints show up most clearly: access to finance and utilities (electricity and water). For farmers, the biggest constraint faced in production relates to irrigation and pesticide application. Farmers in Akkar mainly irrigate from Artesian well between 2 and 4 times per season. However, the technique used is problematic- farmers tend to use overhead sprinklers rather than drip irrigation, substantially increasing water usage and raising risks of moisture-related crop problems (e.g. blight). This has significant implications for farm productivity (output per hectare) and on quality of output; it is

also a significant barrier to entering European markets. The second main constraint farmers face that impacts level and quality of output is access to high yielding seeds. This is among the main reasons for which farmers seek access to finance. Farmers believe that bank credit would allow them to purchase better quality seed. At the moment, farmers are only able to access credit through some traders. In fact, the provision of supplier credit is the only support that exists in the current supply chain (Table 13). The issue of seeds goes beyond that of seed quality and finances to purchase it, but also to the seed varieties planted. While the North typically plants Spunta and Agrico, higher moisture levels in the growing areas makes crops susceptible to blight. Other varieties (one interviewee noted 'Remarka' and 'Asterix') may deliver better yields.

Figure 19
Perceived constraints to operational competitiveness



One of the implications of lack of access to finance is that smaller firms, with less access to financing, tend to operate with low levels of capital, which contributes to significantly lower productivity performance relative to larger firms. Table 14 shows that small farms (less than 20 hectares) invest substantially less per in machinery and equipment than larger farms, and have an even larger gap in subsequent labor productivity.

Traders also perceive significant constraints owing to lack of access to finance, which is perhaps unsurprising given the nature of the business and the fact that they are often extending credit through to farmers. They also highlight electricity as a significant constraint. This most likely reflects the fact that many traders invest in cold storage facilities, which are heavy electricity users¹². Finally, it is worth noting that the large majority of traders identify crime and security as a moderate or serious constraint to their operations; this is the only node in the value chain that highlighted this concern.

Processors face a slightly different set of constraints. Top among the most severe constraints identified by the processors is electricity. This is not unexpected as it is consistently the biggest constraint identified by manufacturing firms in Lebanon. Data presented earlier on the cost structure of processors

¹² Reardon et al (2012) estimate that energy accounts for 66 percent of cold storage costs for potatoes.

shows that electricity and fuel costs (to run generators) accounts for 50 percent of all costs in processing firms. This obviously makes competitive production, at least for reaching export markets, extremely difficult. Two other important constraints are identified by processors, although they are seen as secondary in terms of severity. The first is the environment for trade and customs, which is seen to impact processors both in terms of exporting and accessing important inputs (in particular, technology). The second constraint is factory inspections by authorities.

Table 14

Capital equipment and labor productivity in small versus large farms

| | Machinery and equipment per worker (LBPM) | Output per worker (LBPM) |
|---------------------------|--------------------------------------------------|---------------------------------|
| Small farms | 171.0 | 10.2 |
| Large farms | 391.4 | 26.7 |
| Ratio: large-small | 2.29 | 2.61 |

Finally, it is worth considering the degree to which access to skilled labor may hold back future growth in the value chain. The first point to mention in this regard is that firms in the current potato value chain appear to have little demand for skills. Three findings stand out in Table 15. First, by far the greatest demand in the value chain is for workers with no educational background (and often no experience). Second, the farming node, which accounts for the vast majority of jobs in the existing chain, has extremely limited demand for higher skilled workers. The third point, however, is that the other nodes of the chain, including processing, do hire secondary and even tertiary education workers relatively frequently.

Table 15

Education and experience levels typically hired in the potato value chain

| | No education, no experience | No education, experience | Secondary education, no experience | Secondary education, experience | Tertiary education, no experience | Tertiary education, experience |
|------------------------------|------------------------------------|---------------------------------|-------------------------------------------|----------------------------------------|------------------------------------------|---------------------------------------|
| Input suppliers (n=6) | 100% | 50% | 50% | 83% | 17% | 67% |
| Farmers (n=91) | 91% | 62% | 30% | 26% | 5% | 3% |
| Traders (n=10) | 73% | 90% | 70% | 90% | 50% | 60% |
| Processors (n=3) | 67% | 100% | 33% | 67% | 33% | 67% |

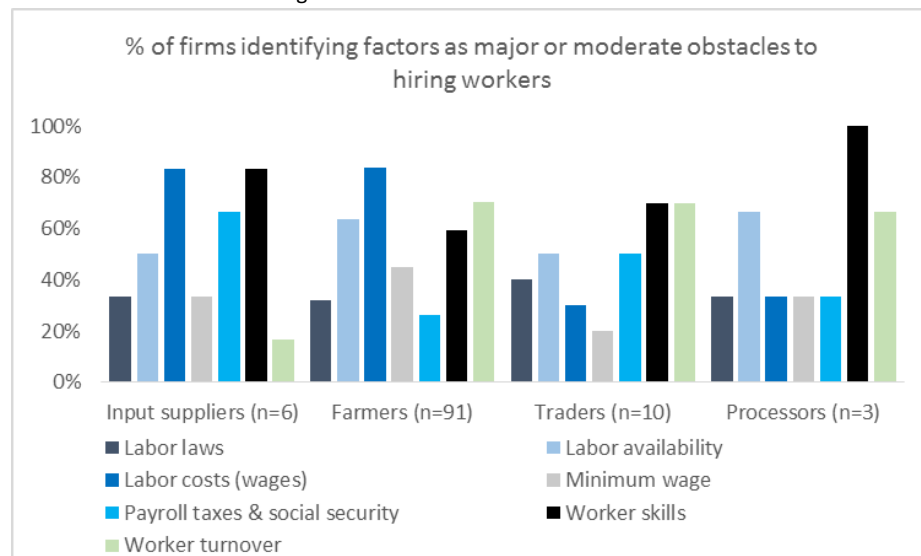
Note: share of firms indicating they hire workers with this educational profile 'often' or 'occasionally'

Evidence from the surveys does, however, suggest that labor shortages and / or skills gaps exist in the current value chain. For example, when asked why they make extensive use of seasonal labor, in addition to seasonality (the main reason), 60 percent of farmers and traders and all three processors indicated skills or labor shortages. It is unclear which of these predominates. In the case of farming, it is likely to be an issue of labor shortage, or more specifically that Lebanese workers are unwilling to take on seasonal farm labor at the low wages (at or below national minimum wages) on offer. This may also be the case for trading and processing.

But there is also some evidence that actual skills gaps exist. For example, Figure 20 shows that all processors, 80 percent of input suppliers and 70 percent of traders identify skills as a barrier to hiring.

Figure 20

Perceived constraints to hiring workers



What are the specific skills that appear to be both important and missing? Table 16 presents detailed results from the survey for employer’s perception of skills needs and availability for both high-skilled and low-skilled workers – it reports the share of respondents that rated a skill as ‘very important’ multiplied by the share that rated the skill as ‘difficult to find’ in the local market. For high-skilled workers, in addition to job-specific technical skills (for input suppliers and farmers), problem-solving skills was highlighted as most critical and difficult to find for both processors and traders. Other key skills gaps appear to exist in both cognitive (ability with calculations and numbers) and non-cognitive (leadership, time management) skills. For low-skilled workers the emphasis was almost exclusively on physical strength and dexterity although some gaps were identified also in time management skills and teamwork.

Despite skills gaps, firms do not appear to see training as a solution. This is understandable in the context of seasonal activities. And maybe even for low-skilled activities where high turnover of workers is a problem (Figure 20). Yet firms even fail to invest in training skilled, permanent workers. No processors and just one farmer out of the 91 surveyed provided even one day worth of formal training to their workers in the past year. And none provided training to skilled workers. Even on-the-job training is minimal for high skilled workers– just 8 farmers reported providing on-the-job training for high-skilled workers, while processors provided an average of just 3 hours of on-the-job training annually. For low-skilled workers, on-the-job training is somewhat more common, with farmers providing an average of 4.5 days annually and processors 7 hours. Input providers and traders report slightly higher rates of both formal and on-the-job training for both high and low-skilled workers.

Table 16

Skills measured by importance and difficulty in finding - for high skill workers

| High-skilled workers | Share indicating 'very important' and 'difficult to find' | | | |
|----------------------------------------|-----------------------------------------------------------|----------------|------------------|----------------|
| | Input suppliers (n=6) | Farmers (n=91) | Processors (n=3) | Traders (n=10) |
| Job-specific technical skills | 69% | 47% | 0% | 45% |
| Ability with calculations and numbers | 28% | 31% | 0% | 54% |
| Ability to read and write in English | 0% | 1% | 0% | 14% |
| Ability to read and write in French | 0% | 0% | 0% | 10% |
| Communication skills | 42% | 27% | 0% | 16% |
| Leadership skills | 50% | 32% | 22% | 14% |
| Teamwork skills | 17% | 4% | 11% | 0% |
| Creative and critical thinking | 42% | 16% | 0% | 28% |
| Problem-solving skills | 42% | 27% | 44% | 64% |
| Ability to work independently | 17% | 7% | 0% | 14% |
| Time management skills | 28% | 25% | 33% | 21% |
| Physical strength | 8% | 4% | 0% | 0% |
| Dexterity (ability to work with hands) | 0% | 5% | 0% | 4% |

| Low-skilled workers | Share indicating 'very important' and 'difficult to find' | | | |
|----------------------------------------|-----------------------------------------------------------|----------------|------------------|----------------|
| | Input suppliers (n=6) | Farmers (n=91) | Processors (n=3) | Traders (n=10) |
| Job-specific technical skills | 6% | 14% | 0% | 18% |
| Ability with calculations and numbers | 0% | 1% | 0% | 2% |
| Ability to read and write in English | 0% | 0% | 0% | 0% |
| Ability to read and write in French | 0% | 0% | 0% | 0% |
| Communication skills | 0% | 3% | 0% | 15% |
| Leadership skills | 6% | 5% | 0% | 5% |
| Teamwork skills | 25% | 37% | 11% | 32% |
| Creative and critical thinking | | 1% | 0% | 2% |
| Problem-solving skills | 3% | 1% | 22% | 3% |
| Ability to work independently | 11% | 7% | 0% | 15% |
| Time management skills | 28% | 26% | 33% | 42% |
| Physical strength | 100% | 83% | 22% | 40% |
| Dexterity (ability to work with hands) | 0% | 60% | 22% | 54% |

Note: category scores in bold red represent the top skills gap in the category (rated by importance and availability); category scores also shaded in grey indicate a 'skills gap' calculation above 50 percent.

CONCLUSIONS

The analysis presented here for the potato value chain indicates that while the agricultural sector provides significant employment, most of this comes in low skilled, seasonal labor with limited opportunities, in both scale and scope, for Lebanese workers. And while the sector provides an important source of earnings for Syrian refugees, the quality of jobs available to refugees is poor and based on the current trajectory in the sector, it is highly uncertain whether the potato sector can deliver sustainable earnings to the refugee population.

What is clear, however, is that development of the downstream processing sector changes the story significantly. Not only would downstream processing provide substantial opportunities for higher skilled permanent jobs both in potato processing and further downstream (e.g. in starches and downstream industrial applications), but would also open up the possibility to drive job creation and improve competitiveness and earnings in the farming sector, assuming that land and water be made available production¹³. Scaling this opportunity up beyond potatoes and into processing of other agricultural activities that are prominent in the North – including, apples, citrus, olives, and honey (sweets), among others – would offer the potential of developing quality jobs in the tens of thousands. Factoring in the induced effects of such employment, the impact could indeed be significant enough to make significant inroads into the jobs challenge of the North region.

Achieving this across a number of sectors will be a significant challenge. Indeed, achieving the potential outlined here just for the potato value chain alone will be difficult, and will require interventions at a number of levels across the chain. It will also take time – this is not likely something that can change dramatically within just a few years. Specifically, following are the high-priority issues that must be addressed to deliver on the job creation potential of the potato value chain:

- *Addressing electricity other infrastructure constraints to attract large-scale processing activity:* The lack of reliable electricity infrastructure along with high costs of land are among the main factors that make processing less competitive in Lebanon. Addressing these, for example through industrial parks and special economic zones, or direct interventions to impact electricity costs and quality appears to be a necessary condition to consider a processing-driven value chain development strategy.
- *Investing in post-harvest facilities and quality systems:* The limited availability of post-harvest facilities in the North, and their control by a few large traders, perpetuates a market system that leaves farmers without control. Availability of competitively priced storage could allow farmers to release product into the market when prices are right. In addition, facilities that included

¹³ While the majority of land in Akkar is already being farmed and most farmers rent their land, shifting land to potato cultivation from another crop is relatively straightforward. An initial assessment identified no specific, insurmountable barriers to shifting production over to potatoes from other crops in the region, although other reports (c.f. International Rescue et al, 2013) suggest there are constraints to expanding the land area available for potato crops in Akkar. In terms of water, while there are problem of groundwater contamination, the analysis did not identify any constraints to water availability on the Akkar plain.

equipment for proper cleaning and packing of potatoes (e.g. to European market standards) would open up market opportunities and potentially improve pricing.

- *Improving access to finance to facilitate access to higher quality inputs:* Lack of access to finance perpetuates a cycle of low productivity among farmers. It may also allow some farmers to invest in drip-feed irrigation. For processors, it is a barrier to investment in technologies that would allow them to compete with higher value-added products.
- *Improving farmer practices, including for irrigation and pesticide application:* Training and capacity building of farmers to improve practices such as irrigation and pesticide application can be important to improving overall value chain competitiveness. Such support can ideally come through technical support within the regional value chain (see below). It can also come through government extension services, which have extremely limited reach at present – just 2 of 91 surveyed farms indicated they had received technical support from government extension services in the past year.
- *Improving supply chain coordination and integration:* Among the least costly but most critical interventions required are efforts to improve coordination, and indeed move toward deeper integration, across the existing supply chain. A key step would likely include implementing successful models of contract farming between processors (as well as traders) and farmers, integrating inputs, technical services to improve farming practices, and marketing. Putting in place robust contracting arrangements that reduce the risk to farmers of investing in new varieties and techniques can kick-start a process of upgrading can contribute to building trust in the value chain.
- *Improving farmer-level coordination and cooperatives:* While cooperatives exist in the North, most farmers either do not belong or are not active due in part to the inability of the cooperatives to solve many of the long-standing problems facing the sector. Cooperation across farms – whether in seed and other input purchase, equipment sharing, storage and logistics, and marketing – is extremely limited. Promoting cooperation and building the capacity of existing producer organizations will be important to develop a more sustainable value chain.
- *Building skills for the future of the value chain:* The potato value chain in North Lebanon has become used to operating with low-skill demands and relatively poor working conditions. Upgrading the quality of the jobs available and investing in training to support the development of skills required to exploit growth opportunities in the sector (e.g. skills in quality control, packaging and logistics, and other skills required for a more sophisticated producing and processing industry) will be needed to put the potato value chain on a path to higher growth and better quality jobs.

ANNEX A: VALUE CHAIN SELECTION

| Criteria | Description | Measurement |
|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Scale, Sustainability, and Competitiveness | How significant is the value chain in the North today? How competitive is it in national and export markets? What is the scope and requirements for value addition? The focus will be on value chains that are already established with anchor / lead firms, but where there is potential to deepen value chain linkages, increase value addition, and expand exports. | <ol style="list-style-type: none"> Existing scale and scope* Competitiveness Upgrading / downstream value addition potential Investment requirements |
| Jobs Impact | The degree to which the value chain has the potential to deliver jobs, improved earnings, and skills upgrading for target populations – in this case for lower-skilled, less mobile Lebanese in Tripoli and the rural areas of the north. There will be emphasis on including value chains that are inclusive to women, and to balancing short term and longer-term jobs opportunities. | <ol style="list-style-type: none"> Jobs scale /intensity Employment multiplier Suitability for SMEs / smallholders Short v long-term jobs Reach to specific target groups |
| Readiness and Additionality | The degree of organization, commitment, and voice of stakeholders across the value chain, and the potential for identified interventions to be implemented. The ideal situation will be a value chain that is organized with broad representation and where nascent initiatives could be complemented. | <ol style="list-style-type: none"> Organization and representation Ongoing interventions |

Assessment through the selection criteria resulted in *four* proposed value chains for consideration and selection of *two* for initial analytical stage of the project.

Results of analysis: Assessment through the selection criteria has resulted in the following *four* proposed value chains for consideration and selection of *two* for initial analytical stage of the project. It is proposed to select one from the from among the two agriprocessing / agricultural value chains presented below and one from among the two services value chains presented below:

| | Reasons for selection | Issues to consider |
|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Vegetable processing (potato) | <ul style="list-style-type: none"> Large-scale sector (~650 farms; 3,600 jobs) Major export value chain Potential for substantial growth in exports and value addition (with strong employment multipliers) | <ul style="list-style-type: none"> Majority of on-farm job creation not taken by Lebanese workers Processing-oriented job creation will take time to develop |

| | Reasons for selection | Issues to consider |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <ul style="list-style-type: none"> • Potential for development of industrial value added applications • Robust skills development path • Potential for rapid job creation (can expand output relatively quickly) • Existing, small initiative (ILO) can be complemented | |
| Fruit processing (apple) | <ul style="list-style-type: none"> • Major production sector with around 7,000 jobs (mostly household workers) • Potential (like potato) to expand scope and value of fresh exports as well as value addition (recent investment in juicing) • On-farm labor including harvesting much more likely to be Lebanese labor than in other agricultural sectors • Sorting, packing, and processing jobs offer significant potential for women (even some on-farm jobs) | <ul style="list-style-type: none"> • Expanding output would require investment and significant time • Without expansion the potential is for increased earnings rather than job creation per se |
| Construction | <ul style="list-style-type: none"> • 15-25,000 jobs in the region; very high indirect job creation (value chain links) • Large participation of Lebanese workers (large majority of professional and skilled positions; some unskilled) • Strong skills development path • Potential for growth with infrastructure investment and future Syria reconstruction | <ul style="list-style-type: none"> • Limited female participation • Sector in slump in recent years • Large degree of informality and weak governance / regulation |
| Municipal services (solid waste / recycling) | <ul style="list-style-type: none"> • Huge demand / need – potential to address social issues and generate jobs • Short-term job creation potential | <ul style="list-style-type: none"> • Little to no existing value chain • Job creation potential not fully clear |

The following sectors are not proposed for further consideration in this first stage of analysis:

- *Olive oil*: Major sector with long history of initiatives and many ongoing initiatives in cooperative development. Limited potential seen for this project to contribute significantly to major upgrading in the value chain.
- *Wood furniture*: Although traditional sector and significant number of skilled craftsmen, it is a relatively niche, artisanal cluster with limited value chain reach (i.e. backward linkages). Cluster well served by existing UNIDO and EU initiative.
- *ICT*: Very nascent sector / cluster in the North with limited value chain reach. Addressing the challenges in the sector may be best approached through other World Bank support activities, including the SEZ development (Fairgrounds) and technology entrepreneurship programs.

ANNEX B: SURVEY INSTRUMENT



VALUE CHAIN ASSESSMENT

SURVEY QUESTIONNAIRE – AGRICULTURE

INTERVIEWER: READ THE FOLLOWING TO THE RESPONDENT BEFORE CONTINUING:

All questions contained in this questionnaire are strictly confidential. Any information you share about your farm or establishment will be aggregated with others for the sole purpose of assessing job creation potential in the value chain. Neither your name nor the name of your firm will be used in any document based on this survey.

| | | | |
|---------------------------------------------------------------|--|------------------------------------------------------------------|-------------------|
| Name(s) of respondent(s) <i>(Last, First, M.I.)</i> | | Position(s) within this farm or establishment | |
| Contact details: | | Phone: | |
| | | Email: | |
| | | Fax: | |
| Address | | # and Street: | |
| | | Village / City / District: | |
| | | Province / State / Region: | |
| GPS coordinates (decimal format) | | Latitude: | Longitude: |
| Date | | | |
| Survey Reference #: | | | |
| Enumerator ID: | | | |

A. FARM OR ESTABLISHMENT BACKGROUND

A1. Please describe this farm or establishment’s main business activity: NOTE TO INTERVIEWER: MAIN BUSINESS ACTIVITY IS DEFINED AS THE ACTIVITY WHICH IS THE MOST IMPORTANT SOURCE OF REVENUE FOR THIS FARM OR ESTABLISHMENT

a1x

INTERVIEWER – FOLLOWING THE INTERVIEW, PLEASE INDICATE RELEVANT CODE BUSINESS ACTIVITY **a1** See list

A2. Please describe the legal structure that best describes the farm or establishment:

| | |
|----------------------------------------------|---|
| Sole proprietorship | 1 |
| Family-owned business | 2 |
| Limited liability private corporation | 3 |
| State-owned enterprise | 4 |
| Cooperative or association | 5 |
| Subsidiary of a Multinational | 6 |
| Other (please specify)_____ A2x _____ | 7 |

| | | |
|---------------------------------------------------------------------------------------|---------------|-------------------------------------------|
| A10. Is this farm or establishment part of a cooperative or producer group? | yes | no |
| A3. Does this farm or establishment have a government registration number? | yes | no |
| A4. What year did this farm or establishment start operations in this country? | indicate year | |
| A5. Does this farm or establishment have any foreign owners? | yes | no IF NO, GO TO QUESTION A8 |
| A6. What percentage of this farm or establishment is foreign-owned? | % | |
| A7. Please list the countries from which the foreign ownership comes: | | |
| A8. Amongst the owners of this farm or establishment are there any women? | yes | no IF NO, GO TO SECTION B |
| A9. What percentage of this farm or establishment is owned by women? | | |

B. PRODUCTS, MARKETS, AND STRATEGY

B1. In agricultural year [insert last complete agricultural year], what are the 2 most important products or services of this farm or establishment within the [insert name of value chain] (please indicate the two most important, by order sales)? Approximately what percentage of total farm or establishment sales do these each account for?

| Products or services (Crops or livestock) | % of total farm or establishment sales in last complete agricultural year | Unit selling price (average over the year) | Units (indicate – e.g. piece, kilograms, tons, bushels, heads, etc.) |
|-------------------------------------------|---------------------------------------------------------------------------|--------------------------------------------|----------------------------------------------------------------------|
| b1a1 | b1a2% | b1a3 | b1a4 |
| b1b1 | b1b2% | b1b3 | b1b4 |

B17. What is the total area under cultivation in [enter last complete agricultural year] (or for livestock: What is the total size of the herd in [enter last complete agricultural year])?

| Total area under cultivation or size of herd/stock | Please tick the appropriate unit of measurement B17a2 | | | |
|----------------------------------------------------|--------------------------------------------------------------|---------|------|------------------|
| | Acre | Hectare | Head | Other (indicate) |
| B17a1 | | | | B17a2x |

B18. For each of the products and services listed in question B1, please use the table provided to indicate where they were sold or distributed in [enter last complete agricultural year] as a percentage of total production.

| Products or services (Crops or livestock) | Household consumption (%) | Given to landlord (%) | Given as wage (%) | Saved as seeds (%) | Feed for own animals (%) | Sold or traded in domestic markets (%) | Sold or traded in export markets (%) | TOTAL |
|-------------------------------------------|---------------------------|-----------------------|-------------------|--------------------|--------------------------|----------------------------------------|--------------------------------------|-------|
| b1a1 | b18a2% | b18a3% | b18a4% | b18a5% | b18a6% | b18a7% | b18a8% | 100% |
| b1b1 | b18b2% | b18b3% | b18b4% | b18b5% | b18b6% | b18b7% | b18b8% | 100% |

B3. Are any of the products and/or services listed above seasonal in nature (i.e. sold mainly or only in certain months of the year)?
 ___ Yes ___ No **IF THERE ARE NO SEASONAL PRODUCTS, PLEASE SKIP TO B5**

B4. If so, please indicate peak and low months for sales.

| Products or services (Crops or livestock) | Seasonality | |
|-------------------------------------------|-------------|--------------|
| | Peak month | Lowest month |
| b1a1 | b4a2 | b4a3 |
| b1b1 | b4b2 | b4b3 |

B5. For this farm or establishment's top selling product (as defined in Q B1), **is the quantity this farm or establishment sells in a typical month fairly stable (amount sold changes by 15% or less in a typical month)?**

| | |
|-----|---|
| Yes | 1 |
| No | 2 |

b5

B6. During the last month, what was the highest and lowest weekly sales volume for the top-selling product (as defined in Q B1)?

| Highest weekly volume (LCUs) | Lowest weekly volume (LCUs) |
|------------------------------|-----------------------------|
| b6a | b6b |

B7. For this farm or establishment's top selling product (as defined in Q B1), **is the price this farm or establishment sells at in a typical month fairly stable (price sold at changes by 15% or less in any typical month)?**

| | |
|-----|---|
| Yes | 1 |
| No | 2 |

b7

B8. During the last month, what was the highest and lowest average price sold at for the top selling product (as defined in Q B1)?

| Highest unit price | Lowest unit price |
|--------------------|-------------------|
| b8a | b8b |

B19. Which of the following are the most important sources of information for the farm or establishment in determining product price? (please rank the top 3 by order of importance) SHOW CARD XX

| | |
|------------------------------------------|--|
| Mobile phone / internet | |
| Newspapers / publications | |
| At market or auction | |
| Word of mouth | |
| Industry association or cooperative | |
| Price established by long term contract | |
| Other (please specify) B19x _____ | |

b19

B9. How many clients (i.e. buyers or customers) did this farm or establishment have in [enter last complete agricultural year]? please indicate the number of clients **b9**

B10. How would the largest client (i.e. buyer or customer) of this farm or establishment in terms of sales be categorized?

SHOW CARD XX

| | |
|---------------------------------------------------|---|
| Individual consumer (e.g. selling in a market) | 1 |
| Small, individual trader or wholesaler | 2 |
| Large trader or wholesaler | 3 |
| Local processor or manufacturer | 4 |
| International processor or manufacturer | 5 |
| Other (please specify) <u> B10x </u> | 6 |

b10

B11. Approximately what percentage of total sales went to the largest client (i.e. buyer or customer) in [enter last complete agricultural year]? % **b11**

B12. What length of contract does this farm or establishment have with its largest client (i.e. buyer or customer)?

| | |
|--------------------|---|
| More than one year | 1 |
| Less than one year | 2 |
| No formal contract | 3 |

b12

B13. How often has this farm or establishment received any of the following from its largest client? Please indicate a rating for EACH activity below. SHOW CARD XX

| | Never | Rarely | Sometimes | Always | NOT APPLICABLE |
|--------------------------------------------------------------------------------------------|-------|--------|-----------|--------|----------------|
| Advance payment or access to credit b13a | 1 | 2 | 3 | 4 | |
| Training of workers b13b | 1 | 2 | 3 | 4 | |
| Provision of technology b13c | 1 | 2 | 3 | 4 | |
| Help with quality assurance b13d | 1 | 2 | 3 | 4 | |
| Help with business strategy and management b13e | 1 | 2 | 3 | 4 | |
| Help with implementing health, safety, environmental, and/or social conditions b13f | 1 | 2 | 3 | 4 | |
| Other b13g (please specify) <u> </u> b13gx | 1 | 2 | 3 | 4 | -7 |

B20. How many times each year does this farm or establishment receive assistance from government agricultural or technical extension services?

| | |
|-------------------------|---|
| At least once per month | 1 |
| Once per quarter | 2 |
| Once per year | 3 |
| Never | 4 |

b20

B21. Does the farm or establishment receive technical assistance from any of the following (please indicate all that are relevant)?

b21a **b21b** **b21c** **b21d** **b21dx**
 NGO Donor programs Private sector firms Other Specify _____

B14. Which of the following are obstacles to increasing sales? SHOW CARD XX

| Criteria | No Obstacle | Minor Obstacle | Major Obstacle | NOT APPLICABLE |
|--------------------------------------------------------------|-------------|----------------|----------------|----------------|
| Price competition b14a | 1 | 2 | 3 | |
| Volume requirements b14b | 1 | 2 | 3 | |
| Quality and technology requirements b14c | 1 | 2 | 3 | |
| Delivery time requirements b14d | 1 | 2 | 3 | |
| Finding clients b14e | 1 | 2 | 3 | |
| Access to sufficient, quality inputs b14f | 1 | 2 | 3 | |
| Access to finance b14g | 1 | 2 | 3 | |
| Other b14h , please specify____ b14hx _____ | 1 | 2 | 3 | -7 |

B15. What is this farm or establishment's outlook for sales growth over the next year? please indicate most appropriate answer below

| | |
|----------------------------|---|
| Growth of 20% or more | 1 |
| Growth between 1% and 20% | 2 |
| No change | 3 |
| Decline between 1% and 20% | 4 |

| | |
|------------------------|---|
| Decline of 20% or more | 5 |
|------------------------|---|

B16. Based on the growth expectation, please indicate this farm or establishment's expectations for increasing or decreasing the workforce.

| Type of worker | Indicate if expectation to increase or decrease? | Estimated number of staff to be hired (increase) or released (decrease) |
|-------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| Managers, technicians, and other high skilled workers | <input type="checkbox"/> Increase <input type="checkbox"/> Decrease <input type="checkbox"/> Unchanged b16a1 | b16a2 |
| Laborers, clerical, and other low skilled workers | <input type="checkbox"/> Increase <input type="checkbox"/> Decrease <input type="checkbox"/> Unchanged b16b1 | b16b2 |

C. PRODUCTION STRUCTURE

INTERVIEWER: PLEASE NOTE THAT THE NEXT QUESTION REFERS TO THE TOTAL SALES OF ALL PRODUCTS AND SERVICES

C.1. In agricultural year [insert last complete agricultural year], what were this farm or establishment's total annual sales for ALL products and services?

| | |
|-------------------------------------------------------------------------|-------------|
| | LCUs |
| Sales at end of last agricultural year | c1 |
| PLEASE ALSO WRITE OUT THE NUMBER (i.e. 50,000 as Fifty Thousand) | |
| | c1x |

C.2. Three years ago, at the end of agricultural year [insert last complete agricultural year minus two], what were this farm or establishment's total annual sales for ALL products and services?

| | |
|-------------------------------------------------------------------------|-------------|
| | LCUs |
| Sales three years ago | c2 |
| PLEASE ALSO WRITE OUT THE NUMBER (i.e. 50,000 as Fifty Thousand) | |
| | c2x |

C.3. In agricultural year [insert last complete agricultural year], what was this farm or establishment's output produced as a proportion of the maximum output possible if using all the resources available (capacity utilization)? **c3**

| | |
|----------------------|----------|
| Capacity utilization | % |
|----------------------|----------|

C.10. What is the average age of the equipment used in the farm or establishment? **c10**

| | |
|-------------|--------------|
| Average age | years |
|-------------|--------------|

C.4. Please estimate the distribution of production costs across the following stages of production and the number of workers involved in each stage: **SHOW CARD XX**

| | | | | | |
|--|-------------------|--------------------------------------|---------------------------------------|----------------------|-------------------------------------------------|
| | % of costs | # of managers and supervisors | # of engineers and technicians | # of laborers | # of clerical and administrative workers |
|--|-------------------|--------------------------------------|---------------------------------------|----------------------|-------------------------------------------------|

| | | | | | |
|-----------------------------------|-------------|------|------|------|------|
| Input supply | c4a1% | c4a2 | c4a3 | c4a4 | c4a5 |
| Growing / raising, harvesting | c4f1% | c4f2 | c4f3 | c4f4 | c4f5 |
| Packaging and storing | c4c1% | c4c2 | c4c3 | c4c4 | c4c5 |
| Transport | c4d1% | c4d2 | c4d3 | c4d4 | c4d5 |
| Sales, marketing, clerical, other | c4e1% | c4e2 | c4e3 | c4e4 | c4e5 |
| TOTAL | 100% | | | | |

C.5. Please estimate the distribution of production costs across the following main categories of costs: SHOW CARD XX

| | % of costs |
|-------------------------------------------------------------------------------------|-------------|
| Raw materials and intermediate goods | c5a% |
| Outsourced services (for example, hiring a company to provide spraying or planting) | c5b% |
| Labor | c5c% |
| Fuel | c5d% |
| Electricity | c5e% |
| Other | c5f% |
| TOTAL | 100% |

C.6. Please rate the importance of the following responses that would be required if the demand for this farm or establishment's main products were to increase substantially. SHOW CARD XX

| | Not important | Somewhat important | Very important |
|----------------------------------------------|---------------|--------------------|----------------|
| Hiring more workers c6a | 1 | 2 | 3 |
| Investing in new machinery and equipment c6b | 1 | 2 | 3 |
| Subcontracting to other firms c6c | 1 | 2 | 3 |

C.7. If this farm or establishment is awarded a 3-year contract requiring output to be doubled, what percentage change in each category of inputs would be required to meet demand?

| | Expected change with doubling of output |
|--------------------------|-----------------------------------------|
| High skilled workers c7a | % |

| | |
|-------------------------------------------------|---|
| Low skilled workers c7b | % |
| Machinery, equipment, and facilities c7c | % |

C.8. Hypothetically, if this farm or establishment were to purchase the assets it uses now, in their current condition and regardless of whether the farm or establishment owns them or not, how much would they cost, independently of whether they are owned, rented or leased?

| | LCUs |
|------------------------------------|------------|
| Machinery, vehicles, and equipment | c8a |
| Land and buildings | c8b |

C.9. To what degree are the following an obstacle to the current operations of this farm or establishment?

INTERVIEWER: READ OUT

| | Not an obstacle | Moderate obstacle | Major obstacle | NOT APPLICABLE |
|--------------------------------------------------------|-----------------|-------------------|----------------|-----------------------|
| Finance (access and/or cost) c9a | 1 | 2 | 3 | |
| Electricity and water (cost and/or quality) c9b | 1 | 2 | 3 | |
| Transport and logistics c9c | 1 | 2 | 3 | |
| Trade and customs c9d | 1 | 2 | 3 | |
| Licensing and permits c9e | 1 | 2 | 3 | |
| Regulations c9f | 1 | 2 | 3 | |
| Inspections (health & safety, labor, etc.) c9g | 1 | 2 | 3 | |
| Crime and security c9h | 1 | 2 | 3 | |
| Other c9i , please specify _____ c9ix | 1 | 2 | 3 | -7 |

D. SUPPLY CHAIN

D.1. How much did this farm or establishment spend in purchasing goods and services in [insert last complete agricultural year]? _____ please indicate currency **d1**

D.2. Approximately what percentage of spending on goods and services went to local suppliers? _____% **d2**

D.3. Please indicate the top 3 goods and services inputs (by value) purchased by this farm or establishment in [enter last complete agricultural year], in terms of share of total goods and services input costs?

| | Indicate product or service (description) | % of total spending on goods and services inputs | Average unit cost | Units (kg, ton, liters) |
|-----------------|-------------------------------------------|--------------------------------------------------|-------------------|-------------------------|
| Primary input | d3a1 | d3a2% | d3a3 | d3a4 |
| Secondary input | d3b1 | d3b2% | d3b3 | d3b4 |
| Tertiary input | d3c1 | d3c2% | d3c3 | d3c4 |

D.4. For each of these top 3 goods or services (by value) purchased by this farm or establishment, please indicate the following with regard to the suppliers

| | % purchased from domestic suppliers | Number of domestic suppliers used | Number of foreign suppliers used | Name main source country(s) |
|-----------------|-------------------------------------|-----------------------------------|----------------------------------|-----------------------------|
| Primary input | d4a1% | d4a2 | d4a3 | d4a4 |
| Secondary input | d4b1% | d4b2 | d4b3 | d4b4 |
| Tertiary input | d4c1% | d4c2 | d4c3 | d4c4 |

D.5. Does this farm or establishment face any obstacles in sourcing locally produced goods and services from its suppliers?

Yes No **If no, skip to D7**

D.6. Please indicate the main obstacles in sourcing from locally produced goods and services? Please rank the top three obstacles **SHOW CARD XX**

| | | |
|----|--------------------------------------------------|--|
| a. | Their pricing is uncompetitive | |
| b. | They do not have adequate quality | |
| c. | They lack suitably trained and skilled personnel | |
| d. | Their production capacity is too small | |
| e. | They are unable to make timely deliveries | |
| f. | They do not have quality certification | |

| | | |
|----|-------------------------------------------------------------------------|--|
| g. | They cannot meet health, safety, environmental, and/or social standards | |
| h. | Other (please specify) d6x _____ | |

D.7. Please indicate the top 3 goods or services (by value) that this farm or establishment currently purchases mainly or fully from local sources

| Top 3 products or services purchased locally (Detailed description) |
|----------------------------------------------------------------------------|
| |
| |
| |

E. WORKFORCE

E1. At the end of [enter last complete agricultural year], how many permanent, full-time individuals worked for this farm or establishment? Please include all employees and managers (permanent, full-time employees are defined as all paid employees that are contracted for a term of one or more agricultural years and/or have a guaranteed renewal of their employment contract and that work a full shift) (INTERVIEWER: INCLUDE INTERVIEWEE IF APPLICABLE). e1

| | Number |
|------------------------------------------------------------|--------|
| Permanent, full-time workers end of last agricultural year | |

E2. Three agricultural years ago, at the end of [insert last complete agricultural year minus two], how many permanent, full-time individuals worked for this farm or establishment? Please include all employees and managers (INTERVIEWER: INCLUDE INTERVIEWEE IF APPLICABLE).

| | Number |
|------------------------------------------|--------|
| Permanent, full-time workers 3 years ago | |

e2

E3. How many full-time seasonal or temporary workers did this farm or establishment employ throughout [insert last complete agricultural year]? (Full-time, temporary workers are all paid for short-term (i.e. more than one week but less than one year) employment with no guarantee of renewal of contract)

| | Number |
|-------------------|--------|
| Temporary workers | |

e3

E4. What was the average length of employment for all full-time seasonal or temporary workers?

| | Months |
|---------------------------------------------------------------------------------------------|----------|
| Average length full-time seasonal or temporary employment last agricultural year, in months | |
| LESS THAN ONE MONTH | 1 |

e4

E5. Please rate the importance of the following reasons for hiring seasonal or temporary labor? SHOW CARD XX

| | Not important | Somewhat Important | Very Important |
|--------------------------------------------|----------------------|---------------------------|-----------------------|
| Seasonal demands e5a | 1 | 2 | 3 |
| Shift structure e5b | 1 | 2 | 3 |
| Labor / skills shortage e5c | 1 | 2 | 3 |
| Labor regulations e5d | 1 | 2 | 3 |
| Other e5f | 1 | 2 | 3 |
| If other, please specify _____ e5fx | | | |

E6. Based on the overall numbers indicated above for full-time permanent and full-time seasonal and other temporary workers, please estimate the number of each category of full-time worker employed by this farm or establishment across the following categories of high- and low-skill positions? SHOW CARD XX

| | Permanent, High-skill workers (managers, technicians, and skilled services workers) | Permanent, Low-skill workers (low skilled and unskilled production workers, clerical, and administrative workers) | Seasonal and other temporary workers |
|------------------------------------|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| Total | e6a1 | e6a2 | e6a3 |
| How many are unpaid family members | e6b1 | e6b2 | e6b3 |
| How many are paid family members | e6c1 | e6c2 | e6c3 |
| How many are women | e6d1 | e6d2 | e6d3 |
| How many are foreign | e6e1 | e6e2 | e6e3 |
| How many are under age 25 | e6f1 | e6f2 | e6f3 |

E7. Please provide a profile of the wages and benefits applicable to each category of full-time permanent and full-time seasonal and other temporary workers. SHOW CARD XX

| | Permanent, High-skill workers (managers, technicians, and skilled services workers) | Permanent, Low-skill workers (low skilled and unskilled production and services workers) | Seasonal and other temporary workers |
|----------------------------------------|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| Average monthly wage (local currency) | LCUs e7a1 | LCUs e7a2 | LCUs e7a3 |
| Average annual leave (days) | Days e7b1 | Days e7b2 | Days e7b3 |
| Maternity leave (yes/no) | <input type="checkbox"/> Yes <input type="checkbox"/> No e7c1 | <input type="checkbox"/> Yes <input type="checkbox"/> No e7c2 | <input type="checkbox"/> Yes <input type="checkbox"/> No e7c3 |
| Free or subsidized child care (yes/no) | <input type="checkbox"/> Yes <input type="checkbox"/> No e7d1 | <input type="checkbox"/> Yes <input type="checkbox"/> No e7d2 | <input type="checkbox"/> Yes <input type="checkbox"/> No e7d3 |

| | | | |
|--------------------------------------------|----------------------------------------------------------------------|----------------------------------------------------------------------|----------------------------------------------------------------------|
| Free or subsidized transportation (yes/no) | <input type="checkbox"/> Yes <input type="checkbox"/> No e7e1 | <input type="checkbox"/> Yes <input type="checkbox"/> No e7e2 | <input type="checkbox"/> Yes <input type="checkbox"/> No e7e3 |
| Free or subsidized housing (yes/no) | <input type="checkbox"/> Yes <input type="checkbox"/> No e7f1 | <input type="checkbox"/> Yes <input type="checkbox"/> No e7f2 | <input type="checkbox"/> Yes <input type="checkbox"/> No e7f3 |
| Free or subsidized meal(s) (yes/no) | <input type="checkbox"/> Yes <input type="checkbox"/> No e7g1 | <input type="checkbox"/> Yes <input type="checkbox"/> No e7g2 | <input type="checkbox"/> Yes <input type="checkbox"/> No e7g3 |

E8. How often does this farm or establishment recruit workers with the following education and experience? SHOW CARD XX

| | Rarely or Never | Occasionally | Often |
|---------------------------------------------------------------------------------------|-----------------|--------------|-------|
| No education and no experience e8a | 1 | 2 | 3 |
| No education, but with prior work experience e8b | 1 | 2 | 3 |
| Secondary (high school) education and no experience e8c | 1 | 2 | 3 |
| Secondary (high school), and with prior work experience e8d | 1 | 2 | 3 |
| Tertiary (university or technical college) education and no experience e8e | 1 | 2 | 3 |
| Tertiary (university or technical college), and with prior work experience e8f | 1 | 2 | 3 |

E9. In the past 3 years has this farm or establishment recruited and hired any of the following kinds of workers? If neither, please skip to E12

| | |
|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| High-skill workers <i>(managers, technicians, and skilled services workers)</i> | Low-skill workers <i>(low skilled and unskilled production and services workers)</i> |
| <input type="checkbox"/> Yes <input type="checkbox"/> No e9a1 | <input type="checkbox"/> Yes <input type="checkbox"/> No e9a2 |

E10. Were any of the following encountered when recruiting and hiring these workers? SHOW CARD XX IF "NO" TO ALL ITEMS IN E10, SKIP TO E12

| | | |
|--|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| | High skill workers <i>(managers, technicians, and skilled services workers)</i> | Low skill workers <i>(low skill and unskilled production and services workers)</i> |
|--|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|

| | | |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| There were no or few applicants | <input type="checkbox"/> Yes <input type="checkbox"/> No e10a1 | <input type="checkbox"/> Yes <input type="checkbox"/> No e10a2 |
| Applicants lacked required skills | <input type="checkbox"/> Yes <input type="checkbox"/> No e10b1 | <input type="checkbox"/> Yes <input type="checkbox"/> No e10b2 |
| Applicants lacked required experience | <input type="checkbox"/> Yes <input type="checkbox"/> No e10c1 | <input type="checkbox"/> Yes <input type="checkbox"/> No e10c2 |
| Applicants expected higher wages | <input type="checkbox"/> Yes <input type="checkbox"/> No e10d1 | <input type="checkbox"/> Yes <input type="checkbox"/> No e10d2 |
| Applicants did not like working conditions | <input type="checkbox"/> Yes <input type="checkbox"/> No e10e1 | <input type="checkbox"/> Yes <input type="checkbox"/> No e10e2 |
| Remote or difficult area to get to | <input type="checkbox"/> Yes <input type="checkbox"/> No e10f1 | <input type="checkbox"/> Yes <input type="checkbox"/> No e10f2 |
| Cultural or religious restrictions | <input type="checkbox"/> Yes <input type="checkbox"/> No e10g1 | <input type="checkbox"/> Yes <input type="checkbox"/> No e10g2 |
| Other (please specify) | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Applicable e10h1 Specify _____ e10h1x | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Applicable e10h2 Specify _____ e10h2x |

E11. If "yes" to any of the items in E10, how did this farm or establishment resolve its recruitment problem (please mark all that are relevant) SHOW CARD XX

| | High skill workers (managers, technicians, and skilled services workers) | Low skill workers (low skill and unskilled production and services workers) |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| We eventually found the right staff | <input type="checkbox"/> Yes <input type="checkbox"/> No e11a1 | <input type="checkbox"/> Yes <input type="checkbox"/> No e11a2 |
| We hired a foreign worker | <input type="checkbox"/> Yes <input type="checkbox"/> No e11b1 | <input type="checkbox"/> Yes <input type="checkbox"/> No e11b2 |
| We did not hire at all | <input type="checkbox"/> Yes <input type="checkbox"/> No e11c1 | <input type="checkbox"/> Yes <input type="checkbox"/> No e11c2 |
| We hired fewer than we needed | <input type="checkbox"/> Yes <input type="checkbox"/> No e11d1 | <input type="checkbox"/> Yes <input type="checkbox"/> No e11d2 |
| We hired a different skill and trained them | <input type="checkbox"/> Yes <input type="checkbox"/> No e11e1 | <input type="checkbox"/> Yes <input type="checkbox"/> No e11e2 |
| We used a family member | <input type="checkbox"/> Yes <input type="checkbox"/> No e11f1 | <input type="checkbox"/> Yes <input type="checkbox"/> No e11f2 |
| We outsourced the work | <input type="checkbox"/> Yes <input type="checkbox"/> No e11g1 | <input type="checkbox"/> Yes <input type="checkbox"/> No e11g2 |
| Other (please specify) | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Applicable e11h1 Specify _____ e11h1x | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Applicable e11h2 Specify _____ e11h2x |

E12. Has this farm or establishment faced any particular issues in trying to hire female workers? Please indicate yes or no for each

| | | |
|------------------------------------|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| | High-skill workers <i>(managers, technicians, and skilled services workers)</i> | Low-skill workers (<i>low skill and unskilled production and services workers</i>) |
| Problems in hiring female workers? | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Applicable e12a1 | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Applicable e12a2 |

E13.If "yes" for either category in E12, were any of the following encountered when recruiting and hiring these female workers?
SHOW CARD XX

| | | |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| | High-skill workers <i>(managers, technicians, and skilled services workers)</i> | Low-skill workers (<i>low skill and unskilled production and services workers</i>) |
| There were no or few applicants | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Applicable e13a1 | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Applicable e13a2 |
| Applicants lacked required skills | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Applicable e13b1 | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Applicable e13b2 |
| Applicants lacked required experience | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Applicable e13c1 | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Applicable e13c2 |
| Applicants expected higher wages | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Applicable e13d1 | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Applicable e13d2 |
| Applicants did not like working conditions | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Applicable e13e1 | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Applicable e13e2 |
| Remote or difficult area to get to | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Applicable e13f1 | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Applicable e13f2 |
| Cultural or religious restrictions | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Applicable e13g1 | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Applicable e13g2 |
| Other (please specify) | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Applicable e13h1 Specify _____ e13h1x | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Applicable e13h2 Specify _____ e13h2x |

E14.Please rate the importance of each of the following skills in the workforce. Please also identify the three skills that are most difficult to find when hiring new workers. SHOW CARD XX

| For high skill workers | | | | |
|-------------------------------|---------------|--------------------|----------------|----------------------------------------------------------|
| SKILLS | Importance | | | Difficult to find in hiring new workers |
| | Not important | Somewhat important | Very important | |
| Job-specific technical skills | | 2 | 3 | <input type="checkbox"/> Yes <input type="checkbox"/> No |

| | | | | |
|-------------------------------------------------------------------|---|---|---|----------------------------------------------------------|
| | 1 | | | |
| Ability with calculations and numbers | 1 | 2 | 3 | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Ability to read and write in English? | 1 | 2 | 3 | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Ability to read and write in (another) foreign language (SPECIFY) | 1 | 2 | 3 | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Communication skills | 1 | 2 | 3 | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Leadership skills | 1 | 2 | 3 | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Teamwork skills | 1 | 2 | 3 | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Creative and critical thinking | 1 | 2 | 3 | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Problem-solving skills | 1 | 2 | 3 | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Ability to work independently | 1 | 2 | 3 | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Time management skills | 1 | 2 | 3 | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Physical strength | 1 | 2 | 3 | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Dexterity (ability to work with hands) | 1 | 2 | 3 | <input type="checkbox"/> Yes <input type="checkbox"/> No |

| For low skill workers | | | | |
|---------------------------------------|---------------|--------------------|----------------|----------------------------------------------------------|
| SKILLS | Importance | | | Difficult to find in hiring new workers |
| | Not important | Somewhat important | Very important | |
| Job-specific technical skills | 1 | 2 | 3 | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Ability with calculations and numbers | 1 | 2 | 3 | <input type="checkbox"/> Yes <input type="checkbox"/> No |

| | | | | |
|-------------------------------------------------------------------|---|---|---|----------------------------------------------------------|
| Ability to read and write in English? | 1 | 2 | 3 | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Ability to read and write in (another) foreign language (SPECIFY) | 1 | 2 | 3 | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Communication skills | 1 | 2 | 3 | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Leadership skills | 1 | 2 | 3 | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Teamwork skills | 1 | 2 | 3 | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Creative and critical thinking | 1 | 2 | 3 | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Problem-solving skills | 1 | 2 | 3 | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Ability to work independently | 1 | 2 | 3 | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Time management skills | 1 | 2 | 3 | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Physical strength | 1 | 2 | 3 | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Dexterity (ability to work with hands) | 1 | 2 | 3 | <input type="checkbox"/> Yes <input type="checkbox"/> No |

E15. How much free training do workers receive? (days per year)

| | High-skill workers | Low-skill workers |
|--------------------------------|-------------------------------|-------------------------------|
| On the job training | e15a1 | e15a2 |
| Formal training | e15b1 | e15b2 |
| Certificate training/education | e15c1 | e15c2 |
| Seminar | e15d1 | e15d2 |
| Other (indicate) | e15e1 e15e1x | e15e2 e15e2x |

E16. How often does this establishment use the following types of external trainers?

| | Rarely or Never | Occasionally | Often | NOT APPLICABLE |
|-----------------------------------------------------------|-----------------|--------------|-------|----------------|
| Public training institution e16a | 1 | 2 | 3 | |
| Private training provider e16b | 1 | 2 | 3 | |
| Supplier training e16c | 1 | 2 | 3 | |
| NGO or international organization e16d | 1 | 2 | 3 | |
| Other e16e please specify _____ e16ex | 1 | 2 | 3 | -7 |

E17. Does this establishment have interaction with education and training institutions for the following?

| | |
|---------------------------------------------------------------|----------------------------------------------------------|
| Development of training and education curriculum e17a1 | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Internships, mentorships, and apprenticeships e17b1 | <input type="checkbox"/> Yes <input type="checkbox"/> No |

E18. Please indicate the degree to which each of the following labor issues are an obstacle to the growth of this farm or establishment. SHOW CARD XX

| Issues | No Obstacle | Minor Obstacle | Major Obstacle |
|---------------------------------------------------------------------|-------------|----------------|----------------|
| Employment protection legislation / labor code and laws e18a | 1 | 2 | 3 |
| Labor availability e18b | 1 | 2 | 3 |
| Labor cost – overall wages e18c | 1 | 2 | 3 |
| Minimum wage (if exists in the country) e18d | 1 | 2 | 3 |
| Payroll taxes and social security / pension payments e18e | 1 | 2 | 3 |
| Worker skills e18f | 1 | 2 | 3 |
| Worker turnover (retention of staff) e18g | 1 | 2 | 3 |

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