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Employment creation potential, labor skills requirements and skill gaps for young people

A Uganda case study

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1. Introduction

Over the course of the last decade, Uganda's economic growth has ranked among sub-Saharan Africa's strongest; indeed, the country's annualized average growth rate was 5.4 percent between 2010 and 2019 (World Bank, 2020). Despite this impressive growth, there has been limited creation of productive and decent jobs[1] to both absorb the burgeoning labor force and improve livelihoods. The population growth rate (recorded at 3.1 percent per year) has consistently remained higher than the jobs creation rate necessary for absorbing persons joining the labor market, resulting in increasing unemployment and pervasive underemployment rates. Moreover, where jobs have been created, few young Ugandans (especially young women) have benefited from such opportunities. Indeed, a study conducted by the EPRC (2018) finds that, while the economy grew by 4.5 percent in 2016/17, this growth was largely driven by the services sector,[2] but services, in turn, contribute a mere 15 percent to total employment. In addition, due to severe skill gaps, Ugandan youth are largely engaged in low-value services (e.g., petty trade, food vending, etc.), and only few are able to secure employment in high value-added economic activities like agro-processing, horticulture, or tourism.

Uganda's economy-wide unemployment rate declined to 9.2 percent in 2016/17 from 11.1 percent in 2012/13. Among youth[3] (who represent 21.6 percent of Uganda's population), unemployment declined to 16.8 percent in 2016/17 from 20.3 percent in 2012/13, however, with less progress recorded for female youth. Underemployment, a critical development challenge faced by the youth, is widespread in Uganda and can partly be explained by low skills among job seekers (at 1 percent), time (at 43.6 percent) as well as wage-related aspects (at 30.2 percent) (UBOS 2018). At the same time, inequality of opportunity is also growing. Even among the employed youth, 21 percent are classified as poor due to the precarious jobs in which they are engaged, especially if they work in the informal sector.

In this regard, informality, underemployment, and unemployment persist in the country's labor market; as a result, many Ugandans are engaged in "vulnerable employment."[4] Vulnerable employment is often characterized by inadequate earnings, low productivity, and difficult conditions of work that undermine workers' fundamental rights. According to the Uganda Bureau of Statistics (2018), 61 percent of employed persons in the country were classified as engaged in vulnerable employment with the share being higher for female Ugandans (71 percent). Similarly, 68 percent of employed persons living in Uganda's rural areas are more likely to engage in vulnerable employment compared to 48 percent living in the country's urban areas.

While agriculture employs nearly 77 percent of the rural population, recorded growth in the sector was low at 2.8 percent in 2016/17 (UBOS 2018). However, sectors providing more productive and better-paying jobs, like agro-processing and high value-added agro-industry have clear linkages to agriculture sector's overall performance in the country. Weak economic growth in agriculture, therefore, affects agro-industrialization, which, in turn, has implications for the employment viability in the dominant agro-industry. Sector-level performance is also deterred by irregularities and erratic decisions in the business and policy environment. Consequently, the vast majority of Uganda's labor force remains

[1] By jobs, this paper refers to a status held by an individual, rather than the total number of opportunities.
[2] Services accounts for 52 percent of GDP (UBOS, 2019).
[3] This paper defines youth as per ILO to be those between 15-24 years.
[4] According to the International Labor Organization (ILO), the employed workforce who are own-account workers or contributing family workers are considered to be in vulnerable employment.

employed in labor intensive and less productive sectors. Even within agriculture, only a very small proportion of agricultural workers are engaged in the cultivation of high-value, commercialized crops.

The above narrative is also exacerbated by the small and not expanding number of formal jobs, especially in Uganda's public sector. This lack of available "white collar jobs" is met by a significant number of youth graduating annually either with a certificate, diploma, or degree who aspire to find such employment. While the private sector is coming in to fill the gap in creating jobs for this segment of the population, current efforts are not sufficient, and more opportunities for jobs to be created for this segment of the labor force need to be identified and supported.

In order to create jobs, especially for the youth, there is need to raise private investment in labor-intensive industries. Besides providing jobs, labor-intensive industries—historically manufacturing—can pave the way for continuous upgrading to higher value-added economic activities. However, the average share of manufacturing in Uganda's GDP keeps declining, from 11 percent between 2000 and 2010 to 9 percent between 2011 and 2018. Therefore, manufacturing will not be able to absorb the 600,000 young Ugandans entering the jobs market each year (AfDB, 2019).

In light of the slow growth of the manufacturing sector, Uganda needs to find alternatives for the creation of productive jobs if the country is to achieve its Vision 2040. Service oriented industries that share key firm characteristics with manufacturing firms have the potential to enhance growth and create decent employment opportunities. Such industries are called "industries without smokestacks" (IWOSS). Newfarmer *et al*. (2018) classify these as agro-industry, horticulture, tourism, business services, transit trade, and some information and communication technology (ICT) based services. This study contributes to the evidence base around this topic by analyzing the role of IWOSS in generating large-scale employment opportunities for (young) workers in Uganda, especially in the formal parts of the economy. The paper pays particular attention to three sectors: agro-processing, horticulture, and tourism, as the earlier literature indicates that these sectors have considerable potential to create large-scale formal employment opportunities for young people.[5]

Specifically, this study:

1. Assesses the current employment creation potential along the value chains of IWOSS industries under their respective current sectoral growth trajectories;
2. Aims to identify the key constraints to growth in IWOSS sectors;
3. Estimates future labor demand in IWOSS sectors when identified constraints are removed;
4. Analyzes the occupation and labor skills requirements and gaps in IWOSS sectors; and
5. Pays particular attention to the need for soft and digital skills among youth (employed and unemployed) to ensure that suggested policy interventions can bridge them.

The reminder of the paper is organized as follows: Section 2 presents the approaches adopted as well as data sources and their limitations. Section 3 presents the country context and background with emphasis on the performance of selected IWOSS sectors in Uganda. The section further delves into employment patterns and other salient features of employment in the country. Section 4 analyzes growth patterns in terms of output, productivity, and exports with emphasis on the role of IWOSS in structural transformation. Section 5 analyzes the specific characteristics regarding sectoral

[5] For example, Mbaye et al. (2019) estimate Uganda's sector level average employment elasticity for IWOSS sectors to be 0.96. In the same study, Ugandan manufacturing, transport, and tourism are found to have average employment elasticities of 0.80, 0.90, and 0.73 respectively.

employment and comparisons are made between IWOSS and non-IWOSS sectors as well as manufacturing. Section 6 presents the growth constraints that IWOSS sectors face. Section 7 provides projections for the size of labor force by 2029/30 according to skill groups, projections that inform discussion on the skills gaps that need to be filled to solve current employment gaps. Section 8 presents firm-level surveys that provide insights into future employment requirements and the need for digital skills along the IWOSS value chains selected for this study (horticulture, agro-industry, and tourism). Section 9 concludes with policy recommendations to leverage IWOSS sectors for employment generation, especially for youth.

2. Data

This section discusses the different sources of data used for the objectives of this study while also highlighting their limitations.

For consistency, when identifying economic activities in IWOSS, manufacturing, and non-IWOSS sectors, this study exploits the availability of the International Standard Industrial Classification (ISIC) level 4 codes in all data sets. Occupations were categorized using the International Standard Classification of Occupations (ISCO) Level 1, which divides jobs into 10 major groups,[6] classified by skills level and specialization to perform tasks and duties of the occupations that cascade from Level 4, "occupations titles," Level 3, "occupations class," Level 2, "occupations category," and Level 1 "occupation group."

The paper at hand largely relies on the Uganda National Household survey (UNHS) 2012/13 and 2016/17 data sets and the labor module in particular for information on sectoral employment, skills, and occupations. The surveys are conducted by the Uganda National Bureau of Statistics (UBOS). The surveys are nationally representative despite differences in the number of sampled households. Sampling weights have been utilized throughout the analysis to ensure the actual representativeness of the sample to the population.

The World Bank Enterprise Survey data (2006 and 2013) were used for the constraints analysis of the sectors as per the IWOSS framework paper on constraints to growth (Page 2019). A limitation of the Enterprise Surveys is that they do not provide a disaggregation of sectors at the granular level required to identify economic activities in IWOSS and non-IWOSS sectors. As such, this analysis is limited around agro-based industries, especially agro-processors. A further disadvantage of these data sets is that they are relatively old.

Additional administrative data were used to complement the analysis of constraints, structural growth, and productivity for IWOSS sectors. Specifically, this study relies on goods and services trade data from UNComtrade, survey data on non-tariff barriers from the International Trade Centre (ITC) and as well as corporate income tax (CIT), pay-as-you-earn and value-added tax (VAT) declarations of formal firms as well as transaction-level customs data (ASYCUDA) obtained from the Uganda Revenue Authority (URA). Using URA data sets has the following limitations: First, the data cover only formal firms reporting to URA. Second, since employment data is for workers reported by Ugandan firms to the URA, it is highly likely that the formal employment data does not capture employment in the large informal tail of agricultural sectors (e.g., farmers of export crops). Finally, the customs data only covers

[6] These are: managers, professionals, technicians and associate professionals, clerical support workers, skilled agricultural, forestry and fishery workers, craft and related trades workers, plant and machine operators, and assemblers, elementary occupations, and armed forces occupations.

cross-border commodity trade, while information on services trade is not captured. Therefore, mainly agro-processing and horticulture IWOSS sectors are analyzed using these data.

3. Country context and background

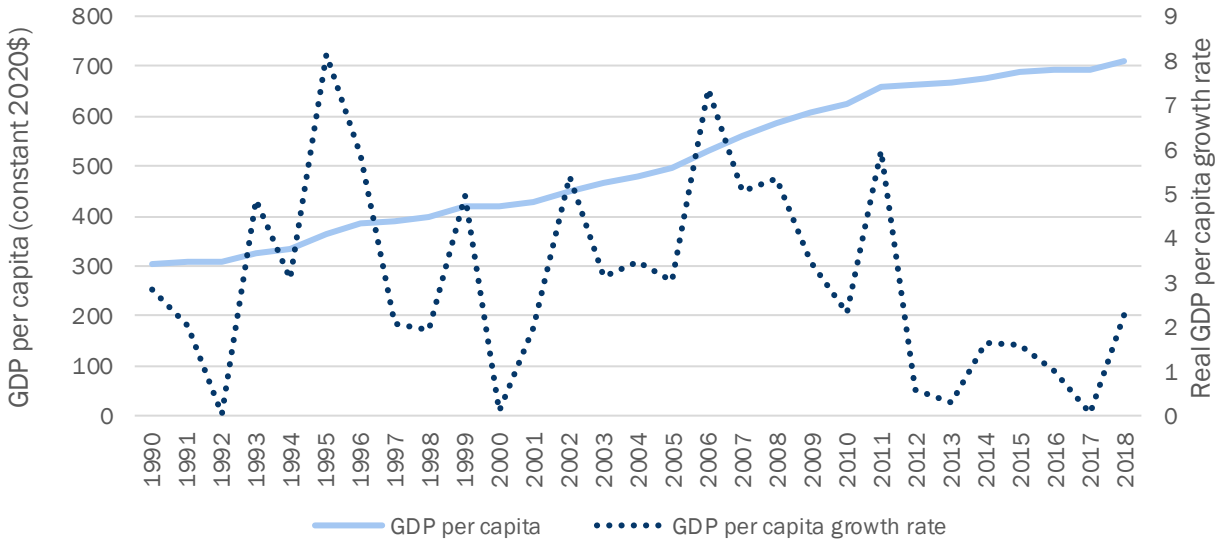
Leveraging various data sources, this section first provides some contextualizing information on Uganda. Section 3.1 provides a brief overview of Uganda's macroeconomic performance. Section 3.2 discusses employment patterns and other salient features such as demographics and unemployment, while section 3.3 considers the performance of selected IWOSS sectors in the country. Section 3.4 analyzes IWOSS performance and the policy and regulatory frameworks that govern them.

3.1 Macroeconomic performance

Uganda has achieved macroeconomic stability with single-digit annual inflation rates and a stable exchange rate. The country has registered strong economic growth averaging 6 percent since 2000, though growth has not been as strong as that experienced in the 1990s. The Ugandan economy is estimated to have grown by 6.5 percent in 2018/19 (UBOS 2020). At the same time, the country's economic growth has also led to growing income inequality and has not created enough jobs for its burgeoning labor force. While the economy grew considerably in 2018/19, this growth was largely driven by low-productivity services. Services, in turn, contribute less than 15 percent to total employment. Low-wage agriculture continues to be the largest employer.

As a result, real GDP per capita has grown steadily since the 1990s, but at a slowing pace since 2009, reaching $710 in 2018 (in 2010 constant values, cf. Figure 1). Real GDP per capita growth rates have exhibited high volatility over the years and have stayed below two percent since 2012.

Figure 1: Real GDP per capita values and growth rates, 1990-2018



Source: World Bank (2020).

3.2 Uganda's labor market: Employment patterns and salient features

Uganda's population increased from 34.1 million in 2012/13 to 37.7 million in 2016/17 (UBOS 2017) and is estimated to reach a total of at 50.7 million in 2028 (UBOS 2019). This rapid population growth implies that the working-age group (and hence the labor force) will expand considerably as well. Table

1 shows that about 2.9 million persons joined the working-age population between 2012/13 and 2016/17 yielding an annualized growth rate of 4.2 percent. In tandem with aggregate growth in the working-age population, the number of employed persons, the size of the narrow labor force, and the number of discouraged workers[7] grew by 3.2 percent, 2.7 percent, and 6.6 percent, respectively.

Table 1: Employment patterns and salient features: 2012/13-2016/17

	2012/2013			2016/2017			Absolute change	Annualized % change
Characteristics	2012/2013			2016/2017				
Labor market aggregates ('000)	**Female**	**Male**	**Total**	**Female**	**Male**	**Total**		
All (15-65 years)								
Working-age population	8,353.5	7,569.0	15,922.4	10,099.8	8,813.8	18,913.6	2,991.2	4.2
Employed	3,666.4	4,450.0	8,116.4	4,119.1	5,142.4	9,261.4	1,145.0	3.2
Narrow unemployment	299.4	261.6	857.0	510.5	249.4	759.9	-97.1	-2.9
Narrow labor force	3,965.8	4,711.6	8,973.4	4,629.6	5,391.8	10,021.3	1,047.9	2.7
Discouraged work seekers	76.6	33.5	110.1	94.1	50.2	144.3	34.2	6.6
Subsistence farmer only	3,250.9	2,250.3	5,501.2	3,738.2	2,307.3	6,045.4	544.2	2.3
Youth (15-24 years)								
Working-age population	3,078.7	2,903.5	5,982.2	3,634.6	3,244.8	6,879.4	897.2	3.4
Employed	998.3	1,159.9	2,158.1	1,055.7	1,264.6	2,320.2	162.1	1.8
Narrow unemployment	299.4	261.6	560.9	239.0	134.5	373.5	-187.4	-10.0
Narrow labor force	1,297.7	1,421.5	2,719.0	1,294.7	1,399.1	2,693.7	-25.3	-0.2
Discouraged work seekers	39.3	20.2	59.5	48.6	37.0	85.6	26.1	8.9
Subsistence farmer only	1,278.8	1,117.6	2,396.4	1,269.3	998.7	2,267.9	-128.5	-1.3
Labor force participation rate (%)								
Narrow LFPR (all)	47.5	62.2	56.4	45.8	61.2	53.0	-3.4	-1.5
Narrow LFPR (youth)	42.2	49.0	45.5	35.6	43.1	39.2	-6.3	-3.6
Unemployment rate								
Narrow unemployment rate (all)	7.5	5.6	9.6	11.0	4.6	7.6	-2.0	-5.6
Narrow unemployment rate (youth)	23.1	18.4	20.6	18.5	9.6	13.9	-6.8	-9.7
Expanded unemployment (all)	9.3	6.2	10.6	12.8	5.5	8.9	-1.8	-4.4
Expanded unemployment rate (youth)	25.3	19.5	22.3	21.4	11.9	16.5	-5.8	-7.4

Notes:
1/2: The official publications use 14-64 years as working-age population and youth to be 18-30 years..
2/2: Employment calculation exclude persons in subsistence agriculture.
Source: Authors own calculations using UBOS UNHS surveys (2012/13; 2016/17).

While the number of unemployed persons fell over the same period, the data reveals a considerable gender bias in which the number of females who were narrowly unemployed increased. Specifically, the narrow unemployment rate for females increased from 7.5 percent to 11 percent from 2012/13 to 2016/17 while for males it declined fell from 5.6 percent to 4.6 percent respectively (Table 1). Similar aggregate patterns are observed for the youth, with the key difference being that the narrow unemployment rate actually declined for both young female Ugandans (23.1 percent vs 18.5 percent) and young male Ugandans (18.5 percent vs 9.6 percent). For male youth, the unemployment rate almost halved. Notably, subsistence farming--the main source of livelihoods among Ugandans,

[7] Discouraged workers are defined as those who want work but are not actively seeking employment.

especially women--grew by 2.3 percent. Among the youth, however, the number engaged in substance farming declined, likely because this occupation is increasingly considered unbecoming for youth and many are joining lower-end services sectors such as boda-boda businesses as riders and street vendors.

Table 1 also shows that for the working-age population the (narrow) labor force participation rate (LFPR)[8] declined 3.4 percentage points translating into negative annualized growth rate of 1.5 percent. The reduction was mainly driven by the decline in LFPR for the youth. Notably, the LFPR has remained high for males despite females being the majority in the working-age population: In 2012/13, the LFPR for females was 47.5 percent, while for males it was 62.2 percent. In 2016/17 it was 45.8 percent and 61.2 percent for females and males, respectively. The decline was much observable among young females (42.2 percent to 35.6) than young males (49.0 percent to 43.1 percent) over the same time period.

Overall, Table 1 reveals that Uganda's working-age population is growing rapidly, and the rate of entry for women into the workforce has accelerated. However, the share of females actively employed in 2016/17 was less than half of the total female working-age group. While unemployment rates have declined considerably (for both the working-age population and Uganda's youth specifically), the annualized growth rate of discouraged workers—in which a potential worker would like to work but is unable to secure a job and so has given up in the process—is extremely high and more acute among Uganda's youth.

3.3 A brief background on Uganda's major IWOSS sectors

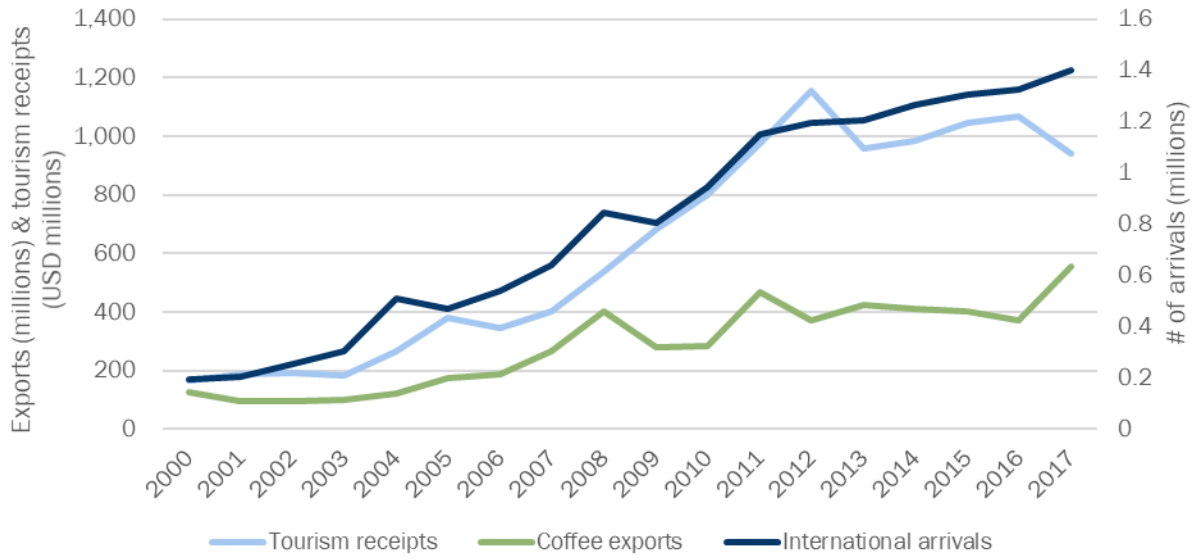
Before considering employment in IWOSS and non-IWOSS sectors, this section aims at providing some sector specific background on the three IWOSS activities under scrutiny in this study: tourism, agro-processing, and horticulture.

1.3.1 Tourism

Tourism is Uganda's leading foreign exchange earner bringing in $0.9 billion (Figure 2) and contributing 7.7 percent to GDP (WTTC 2019). Uganda is endowed with a breadth of attractive sites and activities for tourists, notably its culture and wildlife such as mountain gorillas, which are a rare local asset). The contribution to total GDP represents more than twice the earnings of coffee, the country's second-biggest export and largest commodity export (Figure 2). As a labor-intensive industry, tourism employs 264,000 people directly and an additional 403,220 indirectly (WTTC 2019), accounting for 6.7 percent of total national employment. Notably, women and youth (18-30 years) constitute the highest proportion of the employed in the sector, which offers a range of low- and medium-skilled jobs (UIA 2016). Moreover, as illustrated by the 7.4 percent growth in 2018, the tourism industry continues to grow (UBOS 2019). Finally, tourists are key target markets for Uganda's horticultural and agro-processed exports now at the country's doorstep.

[8] The (narrow) LFPR is defined as the share of the working-age population that is either in employment or actively seeking for work (i.e., narrow labor force/working-age population).

Figure 2: Uganda's tourism performance: 2000-2017



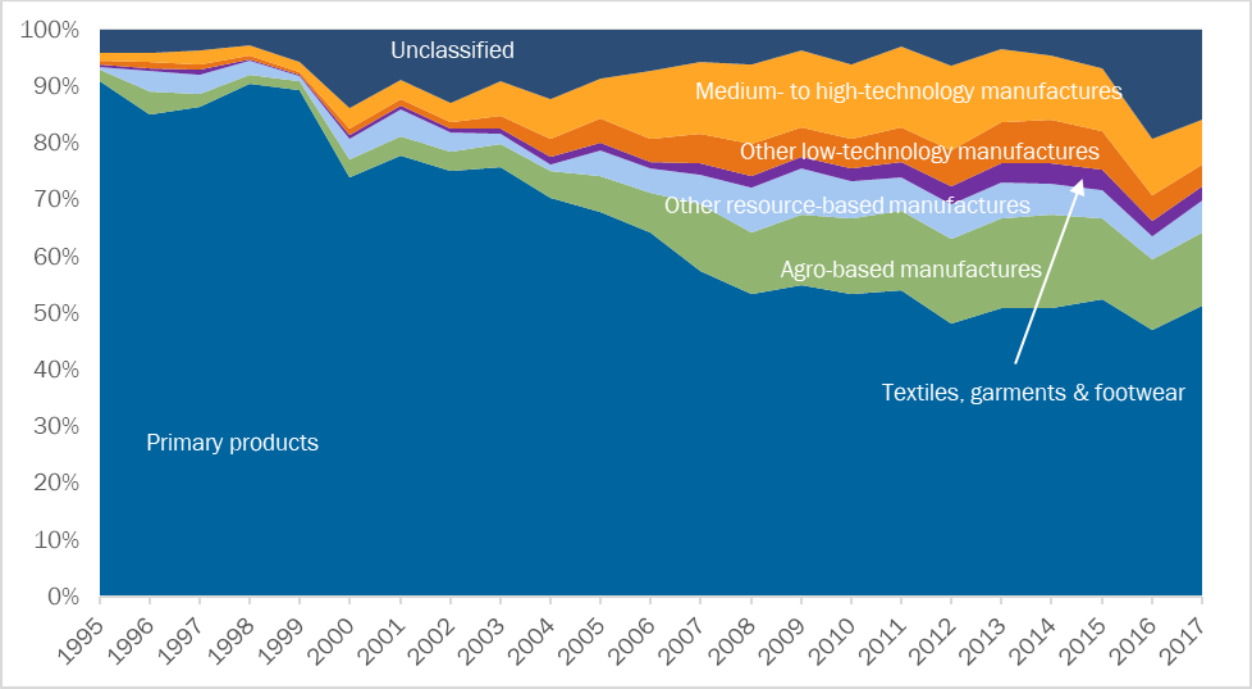
Source: World Development Indicators (World Bank, 2019), UnComtrade, (2019).

1.3.2 Agro-processing

Agro-processing is one of the most dominant activities in Uganda's manufacturing sector (UNECA 2017) and accounts for about 60 percent of its total output (Fowler and Rauschendorfer 2019). Agro-based commodities (primary products) dominate Uganda's exports, accounting for about 54 percent of the country's export earnings (Figure 3). There is even greater room for increasing both export volume and the base of agro-products given the increasing regional demand for higher-value foods arising from income growth and rapid urbanization (World Bank 2018). Encouragingly, exports in primary products have gradually declined since 1995, while exports of higher-value products (especially agro-based manufactures) have increased (Figure 3).

The index of industrial production published by UBOS (2019) affirms that agro-processing is a key player in Uganda's manufacturing sector as items such as food processing, tobacco, sawmilling, paper and printing performance have a high impact on the annual growth rate of the sector (Table 2). In this way, agro-processing will continue to be a key player in employment and livelihoods for most Ugandans, youth in particular. This trend implies, then, that Uganda's heavy reliance on agriculture as an avenue for achieving inclusive employment and wealth growth hinges on transformative manufacturing that is linked to the agricultural sector.

Figure 3: Composition of Uganda's export basket, 1995-2017



Source: UNCTAD (2019). Classification of goods according to Lall (2000); Lall, S. (2000).

Table 2: Index of production, annual production levels (2002=100), 2011-2018

	Years									Annual % change	
Description	**Weight**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2018**	**2017**
Total manufacturing	*1,000*	*186.7*	*193.4*	*199.0*	*221.7*	*224.3*	*234.7*	*243.5*	*276.0*	*13.3*	*3.7*
Food processing	400	145.0	158.0	175.0	215.8	193.4	211.6	202.1	259.3	28.3	-4.5
Drinks and tobacco	201	251.0	266.0	261.0	288.3	290.1	282.9	307.6	332.0	7.9	8.7
Textiles, clothing, and footwear	43	188.0	192.0	139.0	116.3	125.9	153.4	167.0	165.6	-0.8	8.9
Sawmilling, paper, and printing	35	212.0	234.0	249.0	222.7	246.5	250.6	295.7	325.3	10	18
Chemical, paint, soap, and foam products	97	219.0	209.0	205.0	213.8	266.2	292.3	346.5	346.6	0	18.5
Bricks & cement	75	244.0	240.0	251.0	243.7	289.3	290.0	295.3	336.4	13.9	1.8
Metal products	83	151.0	140.0	149.0	155.8	167.0	162.9	170.3	154.7	-9.2	4.5
Miscellaneous	66	157.0	153.0	161.0	190.6	200.1	214.2	202.3	230.6	14	-5.6

Source: Uganda Bureau of Statistics (2019).

1.3.3 Horticulture

The horticultural industry has two components: floriculture (flower growing) and fresh fruits and vegetables. Floriculture is the fastest-growing industry in Uganda's agricultural sector, with its growth

attributed to a suitable climate for growing profitable chrysanthemums flowers.[9] In fact, floricultural products have become Uganda's six-biggest non-traditional export after gold, coffee, fish, maize, beans and tea, earning the country approximately $61 million in foreign exchange in 2018 (UBOS 2019). According to the available information, Uganda is the fifth-largest exporter of cut flowers on the continent (Cunningham, 2007). Uganda's floriculture sub-sector largely produces cut flowers (roses) and cuttings, which are almost exclusively grown for export markets. Flower exports rose from 1,150 metric tons in 1995 to 7,000 metric tons in 2015 and 7,500 metric tons in 2018. As a result, earnings from flower exports have steadily grown from $2.3 million (8.4 billion Ugandan shillings, or UGX) to $40 million (UGX 147 billion) and $55 million (UGX 202.8 billion), respectively. In addition, there has been a tremendous increase in the number of people employed in floriculture from 4,000 workers in 2001 to 7,000 workers in 2011 (Evers et al. 2014) to over 9,000, mostly rural, workers.[10] The majority of workers employed by the flower farms are unskilled and women account for up to 70 percent with an estimated 60,000 individuals benefitting directly or indirectly (Flower Association, 2020; NAPE 2012)—indicating that the industry is capable of absorbing a large portion of unskilled and semi-skilled workers. Moreover, currently, around 70 percent of all workers in the sector are women.

Importantly, fresh fruits and vegetables (FFVs) are among the fastest-growing export sub-sectors in the country. Uganda is currently the second-largest producer in sub-Saharan Africa after Nigeria, producing an average of 5.3 million tons annually (FAOSTAT 2018). FFV exports were 5.2 percent of total exports (Figure 4) and worth $150 million in 2018 (UNComtrade 2018). A wide range of FFVs crops—coffee, tea, citrus, pawpaw, mangoes, pineapples, tomatoes, okra, carrots, pepper, cabbages, bananas, and a variety of other indigenous vegetables—are produced in nearly all parts of the country throughout the year. Cultivation of vegetables and fruits is substantially labor intensive compared to agro-processing. Importantly, the FFV subsector also employs about 50 percent of low-skilled youth.

Figure 4: Exports of fruits and vegetables (excluding coffee), share of total exports, 2000-2018

Source: Uncomtrade (2019).

[9] https://www.pwc.com/ug/en/industries/agriculture.html.

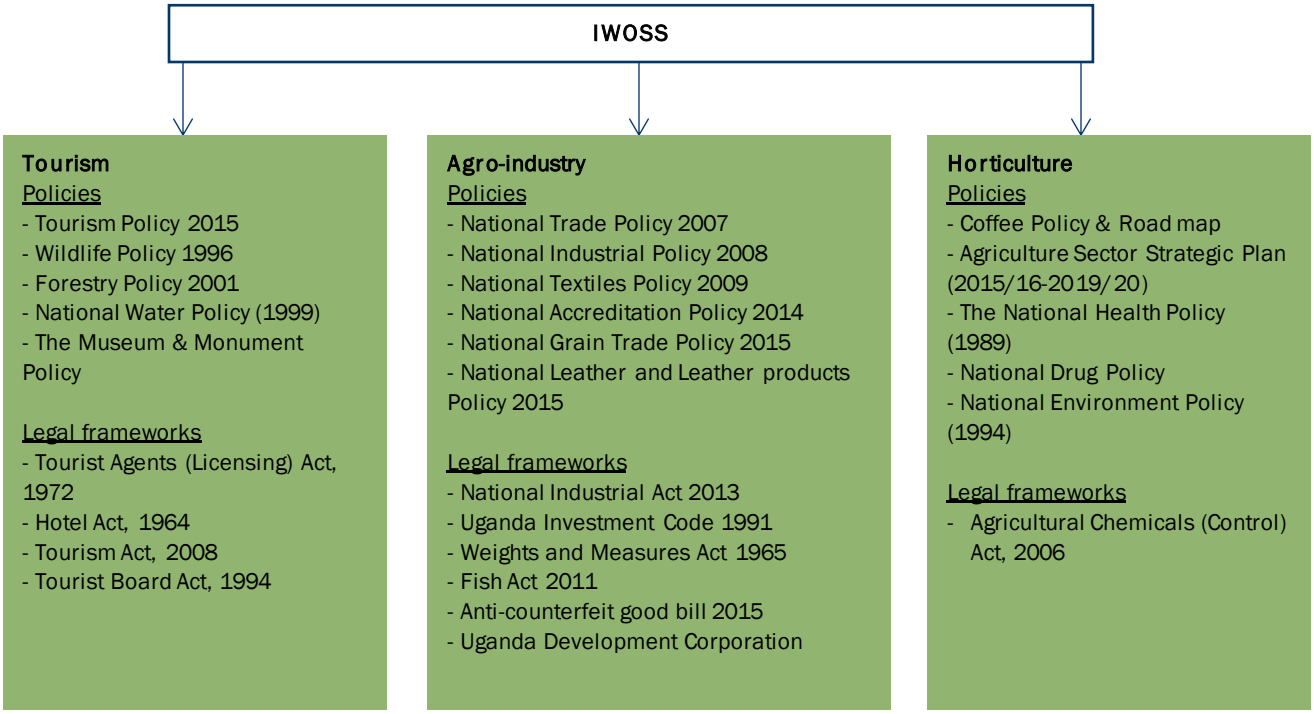
[10] Bwambale, T. (2020). Uganda's flower exports exceed Shs200b. *New Vision*. Accessed in February 2020: https://www.newvision.co.ug/news/1516644/uganda-flower-exports-exceed-sh200b.

3.4 National policies and the regulatory framework affecting IWOSS sectors

Figure 5 lays out the numerous policies and laws governing the tourism, agro-processing, and horticulture sectors.

A key document for the development of the tourism sector is the National Tourism Policy, which was revised in 2015. This document is a 10-year master plan that aims at enhancing Uganda's tourism sector's competitiveness through effective promotion, marketing, infrastructure development, and research. The policy is aligned with the Vision 2040 set by the government and the National Development Plans (NDPs).[11] The agro-industry sector operates under the overall National Industry Development Policy of 2008, which expired in 2018. The new policy to guide Uganda's industrialization agenda for the next 10 years was drafted in 2017 and is still undergoing validation processes. Horticulture coordination is set out in the Agriculture Sector Strategic Plan (ASSP). The development of key export products such as coffee and cotton are guided by crop-specific policies.

Figure 5: Regulatory and policy frameworks supporting key IWOSS in Uganda



Source: Authors' own construct based on public documents, 2020.

Despite this large number of policies, their overall impact is limited: For example, many policies do not have costed strategies for effective implementation and where they exist, they are not aligned to NDPs (EPRC 2018). There are also duplications across existing strategies and policies. For example, both the National Export Promotion Strategy and the Uganda Industrial Strategy are designed to promote Uganda's exports (ibid); however, both institutions have separate budgets, separate offices, and separate employees all of whom are paid with tax revenue (ibid).

[11] National Development Plans are a series of five-year plans that stipulate Uganda's medium term strategic direction, development priorities and implementation strategies that operationalize the Vision 2040.

4. Patterns of growth and structural transformation: The role of IWOSS

This section builds on the previous analysis and further expands the discussion beyond tourism, agro-processing, and horticulture to cover the entire spectrum of other IWOSS sectors, manufacturing, and non-IWOSS sectors. Section 4.1 first provides a snapshot of industry-level employment between 2012/13 and 2016/17. Section 4.2 provides a discussion on sectoral contribution to GDP, employment elasticities, and export performance. Finally, Section 4.3 analyzes correlates within sector changes in productivity and employment growth.

4.1 Employment at the broad industry level

Table 3 provides an industry-level breakdown of employment between 2012/2013 and 2016/2017. For the working-age group (15-65 years), the tertiary sector had both the highest employment share (49.8 percent) as well as the highest annual employment growth rate (6.6 percent). The high employment share of the tertiary sector can largely be attributed to a high share of informal trade workers (21.5 percent), although the number in this category has not changed much between 2012/2013 and 2016/17. Informal trade accounted for about 43 percent of employment in the tertiary sector. Much of the growth in the tertiary sector employment was recorded in finance, business, and professional services (31.4 percent) as well as domestic & household services (15.7 percent). Manufacturing, on the other hand, accounted for a 4.2 percent share of employment in 2016/17 with recorded negative annual growth rates. Overall, agriculture absorbed the largest share of workers (33.2 percent in 2016/17), but with a growth rate of 3.2 percent, close to the national average of 3.4 percent per year. Most of the above analysis is also true when considering Uganda's youth in Panel B of Table 3. The key difference between Panel A and Panel B is that annual employment growth is 3.4 percent for Uganda's working-age population, but only 2 percent for Uganda's youth.

These findings reveal that tertiary services are not only an avenue for GDP growth, but for employment growth as well. However, they also reveal that, as much as employment is increasing, the youth themselves are exiting the labor market (either as discouraged workers or remaining in school).

Table 3: Employment by sector, 2012/13-2016/17

	Employment ('000)			Employment share		Annual % growth
	2012/13	2016/17	Change	2012/2013	2016/2017	
Panel A: All (15-65) years						
Total	**8,064.0**	**9,250.6**	**1,186.6**	**100**	**100**	**3.4**
Primary	***3,054.8***	***3,511.4***	***456.6***	***37.9***	***38.0***	***3.4***
Agriculture	2,703.9	3,075.5	371.6	33.5	33.2	3.2
Mining	65.9	86.0	20.1	0.8	0.9	6.5
Horticulture and export crops	285.0	350.0	65.0	3.5	3.8	5.0
Secondary	***1,488.7***	***1,133.4***	***-355.3***	***18.5***	***12.3***	***-6.7***
Agro-processing	534.5	300.2	-234.3	6.6	3.2	-14.1
Manufacturing	585.8	386.6	-199.2	7.3	4.2	-10.2
Utilities	12.9	29.8	16.9	0.2	0.3	20.5
Construction	355.7	416.9	61.2	4.4	4.5	3.9
Tertiary	***3,520.6***	***4,605.9***	***1,085.3***	***43.7***	***49.8***	***6.6***

ICT	35.9	39.2	3.3	0.4	0.4	2.2
Tourism	260.3	355.3	95.0	3.2	3.8	7.6
Trade formal (excl. tourism)	60.6	1.3	-59.3	0.8	0.0	-94.1
Trade informal (excl. tourism)	1,638.9	1,987.5	348.6	20.3	21.5	4.7
Transport	305.8	500.2	194.4	3.8	5.4	12.0
Maintenance and repairs	113.4	112.7	-0.7	1.4	1.2	-0.2
Finance, business, and professional services	120.6	435.3	314.7	1.5	4.7	31.4
Domestic and household services	97.7	185.2	87.5	1.2	2.0	15.7
Government	546.1	600.2	54.1	6.8	6.5	2.3
Other services	341.7	389.8	48.1	4.2	4.2	3.2
Panel B: Youth (15-24 years)						
Overall total	**2,140.0**	**2,317.8**	**177.8**	**100**	**100**	**2.0**
Primary	***938.4***	***1,019.8***	***81.4***	***43.9***	***44.0***	***2.0***
Agriculture	805.4	882.5	77.1	37.6	38.1	2.2
Mining	22.5	28.0	5.5	1.1	1.2	5.4
Horticulture and export crops	110.6	109.4	-1.2	5.2	4.7	-0.3
Secondary	***376.6***	***265.5***	***-111.1***	***17.6***	***11.5***	***-8.6***
Agro-processing	115.4	54.7	-60.7	5.4	2.4	-18.3
Manufacturing	162.5	109.6	-52.9	7.6	4.7	-9.6
Utilities	6.0	6.5	0.5	0.3	0.3	2.0
Construction	92.8	94.8	2.0	4.3	4.1	0.5
Tertiary	***825.1***	***1,032.7***	***207.6***	***38.6***	***44.6***	***5.5***
ICT	7.2	7.8	0.6	0.3	0.3	2.0
Tourism	74.8	110.6	35.8	3.5	4.8	9.6
Trade formal (excl. tourism)	8.5	0.7	-7.8	0.4	0.0	-61.1
Trade informal (excl. tourism)	368.9	384.7	15.8	17.2	16.6	1.0
Transport	70.0	99.1	29.1	3.3	4.3	8.5
Maintenance and repairs	35.5	37.4	1.9	1.7	1.6	1.3
Finance, business, and professional services	18.0	77.3	59.3	0.8	3.3	35.7
Domestic and household services	52.3	109.7	57.4	2.4	4.7	18.1
Government	78.2	94.2	16.0	3.7	4.1	4.6
Other services	112.0	111.6	-0.4	5.2	4.8	-0.1

Notes:

1/4: Estimates for 2016/17- Trade formal (excl. tourism) did not control for enterprises that submit VAT due to the variable not being captured in the survey tool.

2/4: Employment calculations for agriculture exclude persons in subsistence agriculture

3/4: CVs are high for formal trade.

4/4: Inconsistencies in employment data arise due to some respondents indicating that they were employed but did not indicate the sector of employment.

Source: Authors' own calculations using UBOS UNHS surveys (2012/13; 2016/17).

4.2 Productivity, employment, and export growth in Uganda's IWOSS, non-IWOSS, and manufacturing sectors

This section considers key indicators of interest regarding the transformative potential of IWOSS and non-IWOSS activities. The approach, taken directly, compares indicators such as labor productivity, employment, and employment elasticities as well as export performance in IWOSS sectors with those of non-IWOSS activities. Manufacturing, a sector that shares key properties with IWOSS activities, is considered as a separate category.

4.2.1 *Labor productivity*

Table 4 presents labor productivity (value-added per worker) for different IWOSS and non-IWOSS sectors. Table 4 reveals that changes in labor productivity have been variable for all sectors between survey waves. For instance, labor productivity for IWOSS increased by 15 percent between 2009/10 and 2012/13 but fell by the same percentage points between 2012/13 and 2016/17. For manufacturing, labor productivity first decreased by about 26 percent but almost doubled in the last wave. For non-IWOSS, productivity has been increasing gradually. Per the latest survey, IWOSS sectors have higher-than-average labor productivity than manufacturing and non-IWOSS. In fact, IWOSS's labor productivity is four times higher than that of manufacturing and six times higher than the average productivity for all non-IWOSS activities. These findings imply that an extra investment of one hour of labor produces four times more output in IWOSS than in manufacturing and six times more in an average non-IWOSS sector. Within IWOSS, formal trade, agro-processing and ICT have the higher labor productivity than any sub-sector in non-IWOSS.

Table 4: Labor productivity by sector (million UGX)

	2009/10	2012/13	2016/17
Overall	**2.96**	**3.07**	**3.55**
Total IWOSS	**14.0**	**16.1**	**14.0**
Agro-processing	1,301.7	971.3	1,796.5
Horticulture and export crops	3.5	3.4	3.7
Tourism	4.5	4.7	4.3
ICT	138.7	108.7	189.8
Transport	3.6	3.9	3.3
Maintenance and repairs	13.4	14.0	13.1
Finance, business, and professional services	33.4	76.6	21.6
Trade formal (excl. tourism)	11,679.0	12,255.0	11,423.1
Manufacturing	**2.51**	**1.87**	**3.46**
Non-IWOSS	**1.95**	**1.99**	**2.27**
Agriculture	1.2	1.1	1.2
Mining	9.6	8.9	9.1
Utilities	80.9	100.2	66.4
Construction	8.8	8.1	9.5
Trade informal (excl. tourism)	1.5	1.5	1.4
Domestic and household services	1.7	2.2	1.3
Government	12.5	13.1	11.5
Other services	6.0	5.5	6.4

Notes:

1/3: We adjust categories of sectors as reported in the Uganda Statistical Abstracts into IWOSS and non-IWOSS sector categories. For where we could not group GDP at IWOSS level, we used shares of broader values as categorized in the Supply Use Tables (SUT) to breakdown the sectors. This was done as follows: Trade and repairs was broken it down into Maintenance and repairs, trade formal, and informal; manufacturing was broken down into agro-processing and manufacturing; Agriculture was broken down into Horticulture and exports, and Agriculture. Other categories were aggregated as follows: Tourism comprises of accommodation & food services plus arts, entertainment & recreation; ICT comprises of information & communication; Transport comprises of transport and storage; Finance, business and professional services comprises of finance & insurance, real estate activities plus professional, scientific and technical; Mining comprises of mining & quarrying; Utilities comprises of electricity & water; Domestic and household services comprises of activities of households; Government comprises of administrative & support services plus public administration; and Other services comprises of education, human health & social work plus other service activities.

2/3: Employment calculations for agriculture exclude persons in subsistence agriculture,

3/3: Labor productivity is calculated as value added (GDP) divided by employment.

Source: Authors' own calculations using UBOS Statistical Abstracts and Survey data sets.

4.2.2 *Sectoral contribution to GDP and employment elasticities*

Table 5 shows sectoral contributions to Uganda's GDP by IWOSS, non-IWOSS, and manufacturing as well as sector-level employment elasticities. Overall, contribution of IWOSS to GDP is less than non-

IWOSS but higher than manufacturing in both waves (Table 1). However, change in GDP between the two waves is higher in IWOSS (22.9 percent) than either manufacturing (17.2 percent) or non-IWOSS (18.4), implying that the contribution of IWOSS to GDP is increasing. Among IWOSS sectors, Finance, business, and professional services as well as ICT contributed more than half to IWOSS's total GDP contribution, reflecting the high value of outputs in these two sectors. In non-IWOSS, agriculture is the largest contributor, driven by the sheer size of the agricultural sector in Uganda. In terms of employment, change in employment share in IWOSS (22.0 percent) is also higher than non-IWOSS (17.5 percent) while that in manufacturing was on a decline. In absolute terms, at least for the three studies earmarked in this study-agro-processing, horticulture and export crops plus tourism, these contribute highly to total IWOSS employment.

Most crucially for the purposes of this paper, Table 5 suggests that growth in IWOSS sectors is associated with more jobs than growth in manufacturing and non-IWOSS sectors: A one percentage point increase in GDP in an average IWOSS sector is associated with a 0.96 percent increase in employment. On the contrary, growth in the average non-IWOSS sectors is slightly less employment intensive. Again this is largely driven by the agricultural sector which employs a sizeable number of Ugandans. For manufacturing, the employment elasticity is negative and sizeable, which could suggest that automation in the sector replaced workers. Among IWOSS sectors, agro-processing reveals negative employment elasticity, tourism a positive elasticity of 1.74, while the employment elasticity in horticulture and export crops is positive and high. Transport, maintenance and repairs, and formal trade show high employment elasticities, while Finance, business, and professional services is a clear positive outlier.

Table 5: Change in GDP and employment since 2012/13-2016/17 by sector

	GDP at constant market price 2009/10 (billion UGX)		Change in GDP %	Employment ('000)		Change in employment %	Employment elasticity
	2012/13	2016/17	2012/13-2016/17	2012/13	2016/17	2012/13-2016/17	2012/13-2016/17
Overall	**44,384**	**53,328**	**20.2**	**8,064**	**9,251**	**14.7**	**0.73**
Total IWOSS	**17,908**	**22,012**	**22.9**	**1,716**	**2,094**	**22.0**	**0.96**
Agro-processing	1,789	2,097	17.2	535	300	-43.9	-2.55
Horticulture and export crops	1,255	1,378	9.8	285	350	22.8	2.33
Tourism	1,283	1,552	21	260	355	36.5	1.74
ICT	3,836	5,657	47.5	36	39	8.3	0.18
Transport	1,323	1,674	26.6	306	500	63.4	2.38
Maintenance and repairs	322	344	6.9	113	113	0.0	0.00
Finance, business, and professional services	5,108	6,110	19.6	121	435	259.5	13.24
Trade formal (excl. tourism)	2,993	3,199	6.9	61	1	-98.4	-14.26
Manufacturing	**1,970**	**2,308**	**17.2**	**586**	**387**	**-34.0**	**-1.97**
Total non-IWOSS	**24,506**	**29,009**	**18.4**	**5,763**	**6,770**	**17.5**	**0.95**
Agriculture	10,098	11,091	9.8	2,704	3,076	13.8	1.40
Mining	631	802	27.1	66	86	30.3	1.12
Utilities	1,373	1,727	25.8	13	30	130.8	5.07
Construction	2,936	3,834	30.6	356	417	17.1	0.56
Trade informal (excl. tourism)	2,691	2,876	6.9	1,639	1,988	21.3	3.09

Domestic and household services	235	266	13.2	98	185	88.8	6.73
Government	2,062	2,659	28.9	546	600	9.9	0.34
Other services	4,481	5,753	28.4	342	390	14.0	0.49

Notes:
1/4: We adjust categories of sectors as reported in the Uganda Statistical Abstracts into IWOSS and non-IWOSS sector categories. For where we could not group GDP at IWOSS level, we used shares of broader values as categorized in the Supply Use Tables (SUT) to breakdown the sectors. This was done as follows: Trade and repairs was broken it down into Maintenance and repairs, trade formal, and informal; manufacturing was broken down into agro-processing and manufacturing; Agriculture was broken down into Horticulture and exports, and Agriculture. Other categories were aggregated as follows: Tourism comprises of accommodation & food services plus arts, entertainment & recreation; ICT comprises of information & communication; Transport comprises of transport and storage; Finance, business and professional services comprises of finance & insurance, real estate activities plus professional, scientific and technical; Mining comprises of mining & quarrying; Utilities comprises of electricity & water; Domestic and household services comprises of activities of households; Government comprises of administrative & support services plus public administration; and Other services comprises of education, human health & social work plus other service activities..
2/4: The changes in employment in this table are slightly different from those directly generated from surveys at 4-digit level as we recalculated the employment as per the GDP grouping in SUT to ensure consistency.
3/4: The overall GDP excludes taxes on products.
4/4: Elasticity is calculated as percentage change in employment divided by percentage change in GDP
Source: Authors' own calculations UBOS Statistical Abstracts and Survey data sets

4.2.3 Export performance

Table 6 provides an overview of Uganda's export performance covering the period 2011-2017. Shown are exports in different IWOSS goods and services categories as well as Uganda's manufacturing and mining exports. A first insight from Table 6 is that IWOSS exports combined contributed three quarters to Uganda's total export volume in 2017, a share that increased by four percentage points from 2011. Secondly, with an overall average export growth rate at around two percent over the period under consideration, IWOSS goods exports as well as mining exports were drivers of this performance while manufacturing exports constantly declined. IWOSS services exports grew as well, but at a much slower pace than IWOSS goods exports.

Regarding specific sub-sectors, among IWOSS services, tourism is the country's most important foreign exchange earner, but has had almost stagnant growth. Transportation, another large IWOSS services sector showed average growth, while the exports of another IWOSS sector, telecommunications (services), contracted over the period under consideration. As for IWOSS goods exports, all sub-sectors showed impressive growth rates over the period. Horticultural exports (fresh fruits and vegetables, cut flowers) grew fastest but the sector still remains a relatively small contributor to the country's export basket. Coffee and tea, as well as export of agro-processed goods, showed very strong growth rates as well. In fact, in 2017, the two sectors combined contributed about a third to Uganda's total export earnings.

Table 6: Exports and exports growth by sector

	2011			2017			2011-2017
Sector	**USD (millions)**	**Share of total exports (goods and services) %**		**USD (millions)**	**Share of total exports (goods and services) %**		**Average annual % growth**
Total IWOSS	**2,661**	**71**		**3,133**	**75**		**2.9**
IWOSS services exports	**1,391**	**37**		**1,432**	**34**		**1**
Transport	150	4		156	4		2.5
Tourism	960	26		941	23		0.5
Telecommunications	75	2		39	1		-5.5
Government and other services	164	4		260	6		9.9

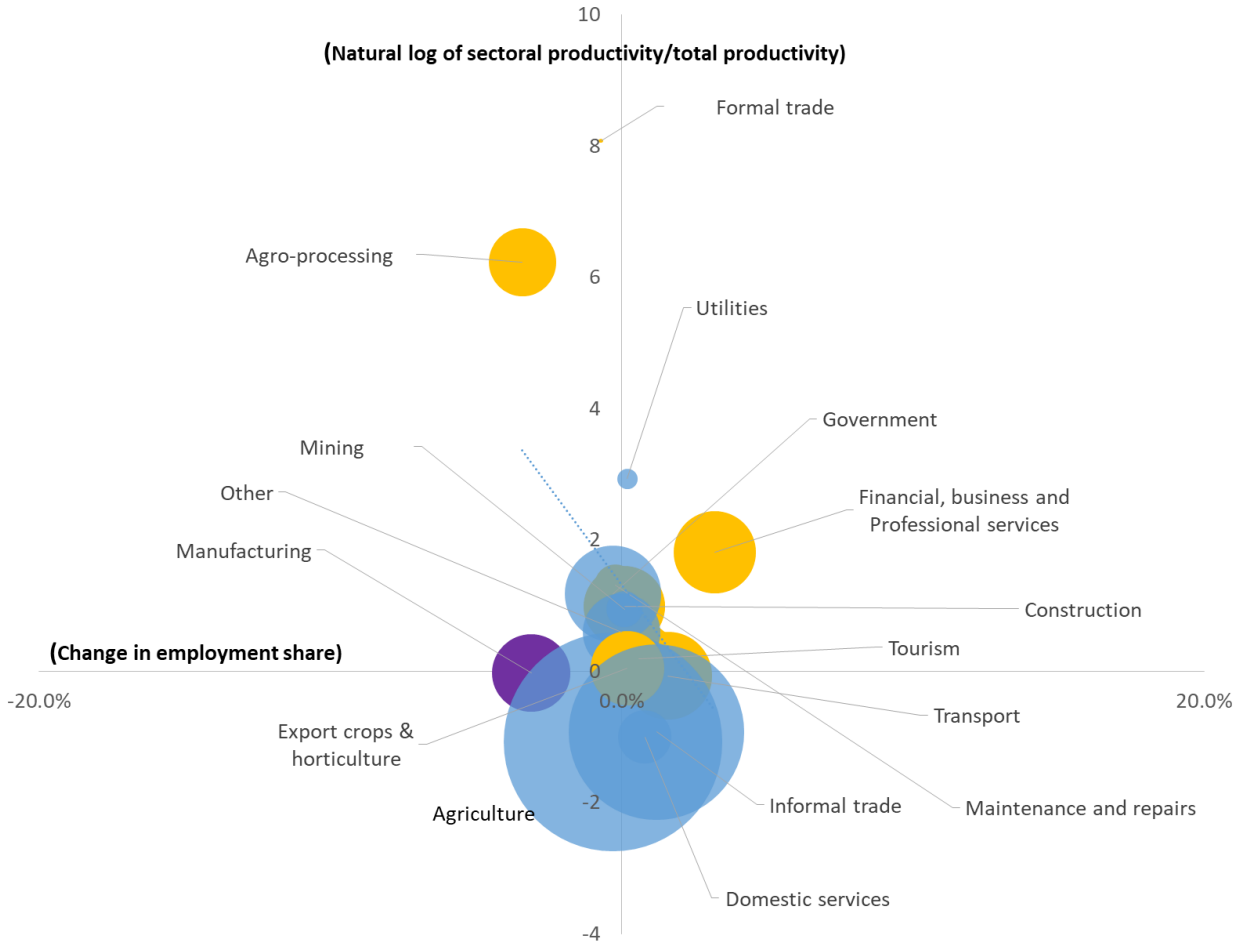
Finance, business, and professional services	43	1		35	1		2.6
IWOSS goods exports	**1,270**	**34**		**1,702**	**41**		**5.8**
Horticulture	2	0		8	0		32.2
Coffee and tea	548	15		652	16		4.7
Other agricultural products	247	7		373	9		8
Agro-processing	473	13		669	16		7.1
Manufacturing total	**390**	**10**		**334**	**8**		**-2.4**
Textiles	107	3		73	2		-0.3
Other manufacturing	283	8		261	6		-0.9
Total non-IWOSS	**429**	**11**		**575**	**14**		**6.9**
Mining	429	11		575	14		6.9
Total exports (goods and services)	**3,760**			**4,177**			**1.9**

Notes:
1/3: Goods exports are identified through the codes of the World Customs Organization's Harmonized System nomenclature, and services are classified according to the United Nation's Extended Balance of Payments Services Classification.
2/3: Tourism includes personal and business travel.
3/3 Total exports (goods and exports) also includes services categories not included in the table (e.g., exports of construction services).
Source: UNComtrade (2020).

4.3 Sectoral productivity and employment growth: Is there evidence for structural transformation?

Figure 6 combines GDP/output and employment growth to get a full picture of industry changes over time. Following the methodology outlined by McMillan and Rodrik (2011), the figure shows the correlation between the natural log of relative productivity (measured as value added per worker), and the change in employment by industry for Uganda in 2016/17. The size of the bubble represents the sector's share of employment in 2016/17. The desired change over time would be declining shares of employment in low-productivity sectors (the lower left quadrant) and increased shares of employment in high productivity sectors (the top right quadrant). However, the only sector that can be found in this quadrant is Finance, business, and professional services, while construction and tourism are inconclusive, suggesting that, by and large, little structural transformation has taken place over the time period under consideration. In other words, there has been no sizeable shift in labor resources towards high-productivity activities like manufacturing, formal trade, tourism, export crops, and others.

Figure 6: Correlation between sectoral productivity and change in employment in Uganda, 2016/17



Notes: Yellow indicates IWOSS sectors; purple indicates manufacturing; and light blue indicates other non-IWOSS sectors.
Source: Authors' own illustration using 2016/17 UNHS data set.

5. Sectoral decomposition: IWOSS in comparative perspective with manufacturing and non-IWOSS

An insight emerging from our analysis so far is that Ugandan manufacturing has declined over the last decade (both in terms of contribution to GDP as well as employment), indicating limited potential for the sector to function as an engine for structural transformation and job creation in the country. IWOSS sectors, which share many characteristics with manufacturing (they are tradeable, have high value-added per worker, reveal economies of scale etc.) could constitute an alternative. Building on our earlier productivity analysis in section 4, this section provides an in-depth comparative perspective on

employment in IWOSS and non-IWOSS sectors to explore the potential of IWOSS in driving job creation and inclusive economic growth in Uganda.[12]

5.1 Employment in IWOSS, manufacturing, and non-IWOSS sectors

Table 7 presents employment figures for the working-age group (15-65 years) in IWOSS, manufacturing, and non-IWOSS activities. The same analysis is presented for Uganda's youth (15 – 24 years) in Table 8. The presented analysis includes both formal as well as informal jobs.

Table 7 shows that, in 2016/17, IWOSS sectors employed 22.6 percent of Uganda's working-age population, an increase from 2013 by 1.3 percentage points. Within IWOSS, most subsectors (agro-processing; horticulture and export crops; tourism; transport; and finance, business, and professional services) employed persons in more or less equal shares. In non-IWOSS sectors, agriculture as well as informal trade accounted for most jobs (together these two sectors absorb 54.7 percent of all workers in 2016/17). A key insight from Table 7 is that the importance of the manufacturing sector as an employer decreased considerably between the two surveys: While in 2012/13 manufacturing absorbed 7.3 percent of all workers, in 2016/17 this share declined to 4.2 percent, corresponding to the loss of about 200,000 jobs. At the same time, the importance of informal services (non-IWOSS), transport services as well as business and financial services (both IWOSS) in providing employment grew; agro-processing became less important while employment in agriculture grew in line with the economy-wide average.

In the aggregate, an important finding is that employment in IWOSS sectors grew faster (4.9 percent annual growth) than the economy-wide average (3.4 percent annual growth) and non-IWOSS (3.9 percent annual growth), suggesting a potential of these sectors to provide employment opportunities—in line with our above labor elasticity estimates for these activities.

Table 8 shows the same analysis for Uganda's employed youth (15-24 years). The most salient feature is that the overall annual employment growth rate is considerably lower for youth than for the working-age population (2 percent annualized growth versus 3.4 percent), a pattern equally true for employment growth in IWOSS and non-IWOSS sectors. The decrease in importance of the manufacturing sector in providing jobs is similar in magnitude to the one presented in Table 7. Again, in the aggregate, employment growth in IWOSS sectors is higher than both the economy-wide average and growth in non-IWOSS sectors.

[12] The IWOSS sectors include: agro-processing, horticulture and export crops, tourism, ICT, transport, maintenance & repairs, financial & business services as well as formal trade (excl. tourism). The non-IWOSS sectors include agriculture, mining, utilities, construction, informal trade (excl. tourism), domestic and household services, government and other services. Manufacturing is listed as a separate activity. To recap, the sector categorization utilizes the International Standard Industrial Classification (ISIC) of economic activities and applies these to the Uganda National Household Surveys from 2012/13 and 2016/17.

Table 7: Overall employment in IWOSS and non-IWOSS sectors, 2012/13-2016/17

All (15-65 years old)	Employment ('000)			Employment share		Annual % growth
	2012/13	2016/17	Change	2012/13	2016/17	
Overall total	**8,064**	**9,251**	**1,187**	**100**	**100**	**3.4**
Total IWOSS	**1,716**	**2,094**	**378**	**21.3**	**22.6**	**4.9**
Agro-processing	535	300	-234	6.6	3.2	-14.1
Horticulture and export crops	285	350	65	3.5	3.8	5.0
Tourism	260	355	95	3.2	3.8	7.6
ICT	36	39	3	0.4	0.4	2.2
Transport	306	500	194	3.8	5.4	12.0
Maintenance and repairs	113	113	-1	1.4	1.2	-0.2
Finance, business, and professional services	121	435	315	1.5	4.7	31.4
Trade formal (excl. tourism)	61	1	-59	0.8	0.0	-94.1
Manufacturing	**586**	**387**	**-199**	**7.3**	**4.2**	**-10.2**
Total non-IWOSS	**5,763**	**6,770**	**1,008**	**71.5**	**73.2**	**3.9**
Agriculture	2,704	3,076	372	33.5	33.2	3.2
Mining	66	86	20	0.8	0.9	6.5
Utilities	13	30	17	0.2	0.3	20.5
Construction	356	417	61	4.4	4.5	3.9
Trade informal (excl. tourism)	1,639	1,988	349	20.3	21.5	4.7
Domestic and household services	98	185	88	1.2	2.0	15.7
Government	546	600	54	6.8	6.5	2.3
Other services	342	390	48	4.2	4.2	3.2

Notes:
1/3: Estimates for 2016/17 for trade, formal (excl. tourism) did not control for enterprises that submit VAT due to the variable not being captured in the survey tool.
2/3: Employment calculations for agriculture exclude persons in subsistence agriculture.
3/3: CVs are high for formal trade.
Source: Authors' own calculations using UBOS UNHS surveys (2012/13; 2016/17).

Table 8: Youth employment in IWOSS and non-IWOSS sectors, 2012/13-2016/17

Youth (15-24 years)	Employment ('000)			Employment share		Annual % growth
	2012/13	2016/17	Change	2012/13	2016/17	
Overall total	**2,140.0**	**2,317.8**	**178**	**100**	**100**	**2.0**
Total IWOSS	**439.6**	**496.5**	**57**	**20.5**	**21.4**	**3.0**
Agro-processing	115.4	54.7	-61	5.4	2.4	-18.3
Horticulture and export crops	110.6	109.4	-1	5.2	4.7	-0.3
Tourism	74.8	110.6	36	3.5	4.8	9.6
ICT	7.2	7.8	1	0.3	0.3	2.0
Transport	70.0	99.1	29	3.3	4.3	8.5
Maintenance and repairs	35.5	37.4	2	1.7	1.6	1.3
Finance, business, and professional services	18.0	77.3	59	0.8	3.3	35.7
Trade formal (excl. tourism)	8.5	0.7	-8	0.4	0.0	-61.1
Manufacturing	**162.5**	**109.6**	**-53**	**7.6**	**4.7**	**-9.6**
Total non-IWOSS	**1,537.9**	**1,711.8**	**174**	**71.9**	**73.9**	**2.6**

Agriculture	805.4	882.5	77	37.6	38.1	2.2
Mining	22.5	28.0	6	1.1	1.2	5.4
Utilities	6.0	6.5	1	0.3	0.3	2.0
Construction	92.8	94.8	2	4.3	4.1	0.5
Trade informal (excl. tourism)	368.9	384.7	16	17.2	16.6	1.0
Domestic and household services	52.3	109.7	57	2.4	4.7	18.1
Government	78.2	94.2	16	3.7	4.1	4.6
Other services	112.0	111.6	-0.4	5.2	4.8	-0.1

Notes:
1/3: Estimates for 2016/17 - Trade formal (excl. tourism) did not control for enterprises that submit VAT due to the variable not being captured in the survey tool.
2/3: Employment calculations for agriculture exclude persons in subsistence agriculture.
3/3: CVs are high for formal trade.
Source: Authors' own calculations using UBOS UNHS surveys (2012/13; 2016/17).

Beyond the overall lower growth rate of employment, sector level employment patterns for Uganda's youth are almost identical to those documented for Uganda's working-age population. For example, referring to the 2016/17 findings, IWOSS contributed 21.4 percent of all jobs for youth compared to 22.6 percent for the working-age population. Almost all other patterns described above for the country's employed workers of working age (15-65 years), including the shifts between the two surveys, are the same for Uganda's youth.

In the aggregate, two key messages emerge from Tables 7 and 8. First, regardless of whether we consider the working-age population or Uganda's youth, the importance of manufacturing as a source for jobs has declined rapidly between the two survey waves. This is a worrisome trend, as the sector is considered to be a key driver for structural transformation and a source of decent jobs. Second, and closely related, the findings also suggest that IWOSS sectors, which could have a similar potential for structural transformation and are growing in importance, have not yet replaced non-IWOSS sectors as the main source of employment for Ugandans, who are largely employed in low-value activities like informal trade and low-productivity agriculture.

5.2 Formal private employment in IWOSS, manufacturing and non-IWOSS sectors

Table 9 provides a different perspective and considers the importance of IWOSS, manufacturing, and non-IWOSS sectors in Uganda from the vantage point of providing formal private employment. Results are again presented for the overall working-age population (15-65 years, Panel A) and Uganda's youth (15-24 years, Panel B).

A key insight from this table is that formal private sector employment in Uganda contracted considerably between 2012/13 and 2016/17. While in 2012/13, total formal private employment provided around 200,000 jobs in Uganda, by 2016/17 this number had contracted to 141,000, a reduction of 29.5 percent. While the number of formal private sector jobs among Uganda's youth is considerably lower to begin with (e.g., in 2016/17 only 13,000 Ugandan youth had a formal private sector job compared to around 141,000 for the overall population), the contraction of formal private sector employment between the two survey waves was even stronger here: From 2012/13 to 2016/17, formal private employment among the youth fell by a staggering 50.8 percent.

Table 9 reveals a number of employment trends under IWOSS, manufacturing, and non-IWOSS. First, as seen in Table 7, the importance of the manufacturing sector as a source of employment declined between the two periods for both the overall working-age population and Uganda's youth. Second, IWOSS sectors, in line with the higher degree of formalization of these sectors, provide significantly

more formal private sector jobs than non-IWOSS sectors. Considering the numbers for 2016/17, IWOSS sectors contributed 64.2 percent of all private formal jobs for the working-age population and 74.6 percent for Uganda's youth, while non-IWOSS contributed 32.6 percent, and 20.8 percent, respectively. Interestingly, while employment shares within a given year increased, the importance of IWOSS sectors as a source of formal jobs contracted between the periods for the overall working population and youth (by 23,800 jobs and 4,900 jobs, respectively).

Within IWOSS and non-IWOSS, a number of findings are worth highlighting. First, for both Uganda's youth as well as for Uganda's broader working-age population, formal employment in Finance, business, and professional services increased considerably between the two periods. For example, with regard to the youth, while in 2012/13 there were close to no jobs in this sector, by 2016/17 the employment share had increased to 31.5 percent. For youth in particular, employment in the tourism sectors recorded considerable growth as well: While there were close to no formal private employment jobs in this sector in 2012/13, in 2016/17 the sector employed almost 3,000 Ugandan youth. A final noticeable result emerging from Table 9 is that for both the working-age population as well as the country's youth, employment in formal trading services (excluding tourism) experienced a drastic reduction between the two periods. While in 2012/13, formal trade provided 58,500 formal private sector jobs for the overall population, in 2016/17 this number had fallen to only 1,300, suggesting that trading services became increasingly informal.

Table 9: Formal private employment in IWOSS and non-IWOSS sectors in Uganda, 2012/13-2016/17

	Employment ('000)			Employment share		Annual % growth
	2012/13	2016/17	Change	2012/13	2016/17	
Panel A: All (15-65 years)						
Overall total	**199.6**	**140.7**	**-58.9**	**100**	**100**	**-8.6**
Total IWOSS	**114.1**	**90.3**	**-23.8**	**57.2**	**64.2**	**-5.7**
Agro-processing	7.7	4.4	-3.3	3.9	3.1	-13.7
Horticulture and export crops	3.3	6	2.7	1.7	4.3	14.6
Tourism	3.8	5.3	1.5	1.9	3.8	8.1
ICT	11.0	4.3	-6.7	5.5	3.1	-23.0
Transport	7.9	6.7	-1.2	4.0	4.8	-4.0
Maintenance and repairs	9.2	0.1	-9.1	4.6	0.1	-110.7
Finance, business, and professional services	13.0	62.7	49.7	6.5	44.6	38.5
Trade formal (excl. tourism)	58.5	1.3	-57.2	29.3	0.9	-93.2
Manufacturing	**9.8**	**4.7**	**-5.1**	**4.9**	**3.3**	**-18.0**
Total other non-IWOSS	**75.8**	**45.9**	**-29.9**	**38.0**	**32.6**	**-12.3**
Agriculture	11.2	2.4	-8.8	5.6	1.7	-37.7
Utilities	2.0	1.9	-0.1	1.0	1.4	-1.3
Construction	8.9	1.6	-7.3	4.5	1.1	-42.0
Domestic and household services	2.3	0.2	-2.1	1.2	0.1	-59.8
Government	33.5	36.5	3.0	16.8	25.9	2.1
Other services	18.0	3.6	-14.4	9.0	2.6	-39.4
Panel B: Youth (15-24 years)						
Overall total	**26.4**	**13.0**	**-13.4**	**100**	**100**	**-17.3**
Total IWOSS	**14.6**	**9.7**	**-4.9**	**55.3**	**74.6**	**-10.0**
Agro-processing	1.0	0.6	-0.4	3.8	4.6	-12.5

Horticulture	0.0	1.3	1.3	0.0	10.0	-
Tourism	0.0	2.9	2.9	0.0	22.3	-
ICT	2.5	0.3	-2.2	9.5	2.3	-51.9
Transport	1.3	0.0	-1.3	4.9	0.0	-
Maintenance and repairs	2.1	0.0	-2.1	8.0	0.0	-
Finance, business, and professional services	0.0	4.1	4.1	0.0	31.5	-
Trade formal (excl. tourism)	7.8	0.7	-7.1	29.5	5.4	-59.0
Manufacturing	**3.0**	**0.7**	**-2.3**	**11.4**	**5.4**	**-35.6**
Total other non-IWOSS	**8.9**	**2.7**	**-6.2**	**33.7**	**20.8**	-29.2
Agriculture	2.3	0.0	-2.3	8.7	0.0	-
Government	4.3	2.7	-1.6	16.3	20.8	-11.4
Other services	2.5	0.0	-2.5	9.5	0.0	-

Notes:
1/3: Estimates for 2016/17-formal calculations did not control for enterprises that submit VAT due to the variable not being captured in the survey tool.
2/3: Employment calculations for agriculture exclude persons in subsistence agriculture.
3/3: CVs are high for formal trade.
Source: Authors own calculations using UBOS UNHS surveys (2012/13; 2016/17)

5.3 Demographic, occupational, and skills profile of employment

Table 10 shows the demographic profile of and trends around employment in IWOSS in comparison to non-IWOSS sectors as well as manufacturing.[13]

Panel A of Table 10 shows that, in 2012/13, employment in IWOSS, non-IWOSS, and manufacturing was somewhat biased towards male workers, with about 55 percent of the workers being male in either IWOSS or non-IWOSS sectors and 57 percent in manufacturing). In the later survey period, this pattern intensified in IWOSS and manufacturing: In 2016/17, about 61.8 percent and 69.8 percent of all workers in IWOSS and manufacturing, respectively, were male. Conversely, in non-IWOSS activities, the share of female workers slightly increased (from 45.4 in 2012/13 to 47.3 in 2016/17). In the aggregate, 55.5 percent of all workers irrespective of sector were male in 2016/17, a slight increase from 2012/13 (54.9 percent).

The gender patterns found for Uganda's youth mirror the ones described above for the working-age population, with one important difference. Unlike the negative trend observed for Uganda's working-age population, employment in IWOSS for young women remained more or less the same over the time period: In 2012/13 and in 2016/17, the share of female workers in IWOSS stood at 44.4 percent and 43.1 percent, respectively (compared to 45 percent and 38.2 percent for the working-age population).

Table 10, Panel B considers employment in IWOSS, non-IWOSS, and manufacturing by disaggregated age group. In 2016/17, 35 to 65 year olds accounted for the highest proportion of employment in IWOSS sectors, non-IWOSS sectors, and manufacturing (40.3, 41.5, and 39.3 percent, respectively). The youth accounted for the lowest share of employment in all three sectors (23.7 percent, 25.3 percent, and 28.3 percent, respectively) and the age group 25 to 34 years accounted for the second-

[13] The "totals" reported in this table are the same ones as in Table 33.

highest share of employment in all three sectors (36 percent, 33.2 percent, and 32.3 percent, respectively). This overall pattern is the same for 2012/13.[14]

Table 10, Panel B also suggests that not only is the share of youth employed in IWOSS sectors declining (from 25.6 percent in 2012/2013 to 23.7 percent in 2016/2017), but also that youth employment exhibits the lowest rate of employment growth in IWOSS (3 percent annualized growth, compared to 6 percent for those aged 25-34 years and 5.1 percent for those aged 35-65 years). Labor force participation in formal employment among the youth typically starts after the tertiary school cycle, above age 22, which is a likely driver of these results. Nonetheless, it should be noted that IWOSS sectors employ a youthful segment of the population if those aged 15-24 years and 25-34 years are grouped together (together accounting for almost 60 percent of employment in IWOSS sectors), with similar results found for non-IWOSS sectors and manufacturing.

Tables 32, 33, and 34 (provided in the Annex) provide an extension of Table 10 and present gender- and age-specific findings on employment (shares and totals) in the different IWOSS and non-IWOSS sectors as well as manufacturing. A key insight coming out of this more granular analysis is that gender imbalances within aggregate IWOSS and non-IWOSS seem to be driven by specific subsectors. The gender imbalances are largely the same regardless of whether the working-age population or Uganda's youth is considered. For example, (and referring to the 2016/17), within IWOSS, almost all workers employed in transport and in maintenance and repairs were male, while in tourism about 77 percent of all workers were female. Within non-IWOSS, construction, mining, and utilities are dominated by male workers. Patriarchal norms (social and cultural) as well as the nature of the work are likely to be the drivers of gender balances within these sectors.

5.4 Education profile of the youth employed in IWOSS and non-IWOSS sectors

Table 11 shows employment in IWOSS, non-IWOSS, and manufacturing by level of educational attainment and reveals that IWOSS sectors are more skill intensive than manufacturing and non-IWOSS sectors (although there are exceptions). More specifically, Table 11 shows that the share of workers employed in IWOSS in 2016/17 that had completed "some secondary education" and above, stood at 47.6 percent, compared to 38.8 percent for manufacturing and 37.9 percent for non-IWOSS sectors. In the same time period, the same results for Ugandans aged 15-24 years were 47.1 percent (IWOSS), 43.1 percent (manufacturing), and 38.4 percent (non-IWOSS). The annualized growth rates also show that employed Ugandan workers were becoming more skilled between the two survey periods (negative growth for "no formal education" and "some primary education"). Table 11 also shows that growth of the share of workers with higher skills levels grew faster for IWOSS sectors than for both non-IWOSS and manufacturing. The findings found here for the overall working-age population are largely the same for the youth, with the difference that due to the age of the individuals involved, a larger share of workers have only completed primary forms of education.

[14] Table 33 in the Annex provides a further split of the age dimension of employment in IWOSS and non-IWOSS sectors.

Table 10: Demographic characteristics of IWOSS and non-IWOSS workers, 2012/13-2016/17

	Employment share								Annual % growth			
	2012/13				2016/17							
	IWOSS	Manu.	Non-IWOSS	Total	IWOSS	Manu.	Non-IWOSS	Total	IWOSS	Manu.	Non-IWOSS	Total
Panel A: Gender												
All (15-65 years)												
Total	21.3	7.3	71.5	100	22.6	4.2	73.2	100	4.9	-10.2	3.9	3.4
Male	55.0	57.1	54.6	54.9	61.8	69.8	52.7	55.5	7.8	-5.2	3.1	3.6
Female	45.0	42.9	45.4	45.1	38.2	30.2	47.3	44.5	0.8	-18.8	4.9	3.0
Youth (15-24 years)												
Total	20.5	7.6	71.9	100	21.4	4.7	73.9	100	3.0	-9.6	2.6	2.0
Male	55.7	64.8	51.8	53.6	56.9	69.2	52.8	54.5	3.5	-8.0	3.1	2.4
Female	44.4	35.3	48.2	46.4	43.1	30.8	47.2	45.5	2.3	-12.9	2.1	1.5
Panel B: Age group												
15-24 years	25.6	27.7	26.7	26.5	23.7	28.3	25.3	25.1	3.0	-9.6	2.6	2.0
25-34 years	34.4	29.9	30.9	31.6	36.0	32.3	33.2	33.8	6.0	-8.2	5.8	5.1
35-65 years	40.0	42.4	42.4	41.9	40.3	39.3	41.5	41.1	5.1	-12.0	3.4	2.9

Source: Authors own calculations using UBOS UNHS surveys (2012/13; 2016/17).

Table 11: Educational profile of workers by IWOSS, non-IWOSS, and manufacturing, 2012/13-2016/17

	Employment share								Annual % growth			
	2012/13				2016/17							
	IWOSS	Manu.	Non-IWOSS	Total	IWOSS	Manu.	Non-IWOSS	Total	IWOSS	Manu.	Non-IWOSS	Total
Panel A: All (15-65 years)												
No formal education	12.5	17.3	16.6	15.8	5.7	5.7	9.1	8.2	-14.3	-37.1	-10.4	-12.4
Some primary	45.1	40.5	44.7	44.5	34.3	35.6	38.3	37.3	-1.8	-13.0	0.6	-0.7
Completed primary	10.3	15.4	9.3	9.9	12.4	20.0	14.8	14.5	9.6	-3.5	15.8	12.9
Some secondary	15.2	17.3	15.6	15.6	17.4	17.2	16.8	16.9	8.2	-10.0	6.1	5.6
Completed secondary	8.0	5.0	5.7	6.1	12.1	10.3	9.1	9.8	14.9	8.0	15.9	15.2
Post-secondary plus	8.9	4.6	8.1	8.0	18.1	11.3	12.0	13.3	22.3	12.2	13.8	16.0
Total	100	100	100	100	100	100	100	100	4.9	-9.9	4.3	3.7
Panel B: Youth (15-24 years)												
No formal education	5.4	9.7	8.0	7.4	3.0	1.7	4.9	4.7	-11.7	-52.9	-10.1	-9.6
Some primary	48.8	42.6	48.1	49.9	37.8	40.1	40.7	41.0	-3.2	-11.4	-2.1	-3.0
Completed primary	10.9	16.2	10.0	10.9	12.2	15.5	16.1	15.5	5.8	-11.1	13.7	10.5
Some secondary	19.5	20.6	19.9	18.6	20.6	18.6	19.3	19.1	4.4	-12.5	1.3	2.5
Completed secondary	9.7	5.1	7.3	6.6	16.3	12.7	11.2	11.7	15.8	12.4	12.5	15.8
Post-secondary plus	5.5	4.6	5.1	5.0	10.2	11.8	7.9	8.1	18.1	13.0	12.8	13.6
Total	100	100	100	100	100	100	100	100	3.1	-9.9	2.0	1.8

Notes:
1/1: Differences in annual growth arise from when a person is reported to be employed but there is a missing education variable.
Source: Authors' own calculations using UBOS UNHS surveys (2012/13; 2016/17).

5.5 Occupation/skills profile by sector

To complement education level findings, Table 12 shows the composition of employment in IWOSS, manufacturing and non-IWOSS sectors by occupation. Findings show that low-skilled employment accounted for the largest share of employment in both IWOSS (56.7 percent) and non-IWOSS (58.7 percent) in 2016/2017. In manufacturing, 89.1 percent of all employment can be categorized as low-skilled employment. In the same period, and in line with the higher skill requirements of some IWOSS sectors, the share of high-skilled employment in IWOSS stood at 10.8 percent compared to 1.4 percent in manufacturing and 6.8 percent in non-IWOSS. Comparing employment shares of 2012/2013 and 2016/2017, there is evidence of transition of employees in IWOSS from low skilled to high skilled, a pattern not found for manufacturing and non-IWOSS sectors. In line with these findings, the average growth of employment is highest for high skilled workers in IWOSS (36 percent).

Table 12: Skills and occupational structure in IWOSS, non-IWOSS, and manufacturing, 2012/13-2016/17

	2012/13				2016/17				Annual % growth			
	IWOSS	Manu.	Non-IWOSS	Total	IWOSS	Manu.	Non-IWOSS	Total	IWOSS	Manu.	Non-IWOSS	Total
Panel A: All (15-65 years)												
Total	**22.5**	**6.3**	**71.3**	**100**	**22.2**	**4.2**	**73.6**	**100**	**11.2**	**1.7**	**12.3**	**11.5**
High skilled	3.9	2.2	8.2	6.9	10.8	1.4	6.8	7.4	36.0	-9.2	7.6	13.5
Skilled	28.0	4.4	32.8	30.0	32.5	9.5	34.5	33.0	14.9	20.8	13.5	13.9
Low skilled	68.0	93.5	58.8	63.0	56.7	89.1	58.7	59.6	6.7	0.5	12.2	10.1
Panel B: Youth (15-24 years)												
Total	**20.6**	**7.3**	**72.1**	**100**	**21.0**	**4.8**	**74.2**	**100**	**10.6**	**(0.4)**	**10.7**	**10.0**
High skilled	0.6	0.9	4.5	3.4	4.8	0.5	3.8	3.9	61.4	(17.0)	7.0	13.2
Skilled	28.8	2.1	28.2	26.4	31.5	12.2	27.9	27.9	12.8	43.1	10.5	11.4
Low skilled	70.6	97.1	67.2	70.1	63.7	87.5	68.2	68.2	8.1	(2.9)	11.1	9.4

Notes:
1/3: High-skilled occupations include managers and professionals.
2/3: Skilled occupations include technicians and associate professionals; clerical support workers; and service and sales workers
3/3: Low-skilled occupations include skilled agricultural, forestry and fishery workers; craft and related trades workers; plant and machine operators and assemblers; and elementary occupations
Source: Authors' own calculations using UBOS UNHS surveys (2012/13; 2016/17).

Tables 13 and 14 go one step further and present disaggregated results (shares and totals) for high-skilled, skilled, and low-skilled employment per the different IWOSS and non-IWOSS subsectors as well as manufacturing. Again, analysis is shown for the working-age population (15-65 years) as well as the youth (15-24 years) for 2016/17 only.

In line with the higher skills requirements in these jobs, finance, business, and professional services and ICT (as well as government, under non-IWOSS) have, by far, the highest shares of high-skilled and skilled employment, a pattern equally true for Uganda's youth. The share of skilled employment in particular is also high in utilities (non-IWOSS) as well as tourism, likely due to the fact that employment in this sector is dependent on being able to interact adequately with demanding international customers. However, many of the youth are employed as services and sales workers. In both Table 13 (overall) and 14 (youth), the share of low-skilled employment is high for agriculture-related employment: 99.2 percent in horticulture and export crops and 99.1 percent for agriculture (non-IWOSS). These shares are of similar magnitude for Uganda's youth.

Other IWOSS activities are composed of persons in low-skilled and skilled employment in a ratio of about 3:1, such as agro-processing (72 percent low-skilled and 26.2 percent skilled), transport, maintenance and repairs, and formal trade, although formal trade also provides high-skilled employment (15.4 percent of all jobs in the sector). Again, at large the patterns found for the working-age population are the same established in Table 14 which limits the sample to Uganda's youth. Against the background that certain IWOSS activities (like ICT or financial and business services) are often thought to require a higher skill set than non-IWOSS activities, it is interesting to note that the majority of jobs in informal trade classify as skilled employment (94.6 percent for the working-age population and 95.3 percent for the youth).

The key insights from the analysis in this section can be summarized as follows. Generally, IWOSS sectors reveal a greater potential in providing employment than non-IWOSS and manufacturing, the importance of which has declined rapidly over the last decades. However, the overall annual employment growth rate for IWOSS is considerably lower for youth than for the working-age population. Furthermore, while IWOSS sectors that are being championed as potential for structural transformation are increasingly becoming important, in terms of absolute numbers of employment these are still below non-IWOSS sectors and most Ugandans are still employed in less productive jobs like informal trade services and low-productivity agriculture. Demographics show that male workers are overrepresented in aggregate sectors, a pattern also true for the youth. However, at sector specific level (e.g. agro-processing or tourism) other patterns emerge. For example, while almost all workers in transport and maintenance and repairs are male, in tourism the majority of workers are female. Some non-IWOSS sectors such as construction, mining, and utilities are mostly dominated by men. Considering skills, a clear finding is that the share of workers in IWOSS have higher educational attainment than workers in non-IWOSS or manufacturing.

Table 13: Occupational structure of IWOSS and non-IWOSS employed persons by sector, 2016/17

All (15-65 years)	Absolute ('000)				Share		
	High skilled	Skilled	Low skilled	Total	High skilled	Skilled	Low skilled
Overall total	**681.9**	**3,027.6**	**5,461.5**	**9,170.9**	**7.4**	**33.0**	**59.6**
Total IWOSS	**220.4**	**663.3**	**1,155.4**	**2,039.0**	**10.8**	**32.5**	**56.7**
Agro-processing	5.4	78.6	215.9	299.7	1.8	26.2	72.0
Horticulture and export crops	0.5	2.3	347.2	350.0	0.1	0.7	99.2
Tourism	19.9	260.5	73.3	353.6	5.6	73.7	20.7
ICT	10.5	23.3	3.2	36.9	28.5	63.1	8.7
Transport	1.7	82.1	373.8	457.5	0.4	17.9	81.7
Maintenance and repairs	1.1	27.9	83.8	112.7	1.0	24.8	74.4
Finance, business, and professional services	181.4	188.8	57.5	427.7	42.4	44.1	13.4
Trade formal (excl. tourism)	0.2	0.1	1.0	1.3	15.4	7.7	76.9
Manufacturing	**5.5**	**36.7**	**344.6**	**386.6**	**1.4**	**9.5**	**89.1**
Total non-IWOSS	**456.1**	**2,327.8**	**3,961.6**	**6,745.4**	**6.8**	**34.5**	**58.7**
Agriculture	5.8	23.4	3,046.4	3,075.5	0.2	0.8	99.1
Mining	0.4	3.9	81.8	86.0	0.5	4.5	95.1
Utilities	2.7	12.5	14.7	29.8	9.1	41.9	49.3
Construction	11.2	13.8	391.4	416.3	2.7	3.3	94.0
Trade informal (excl. tourism)	13.1	1,880.9	93.5	1,987.5	0.7	94.6	4.7
Domestic and household services	0.0	24.4	160.8	185.1	0.0	13.2	86.9
Government	411.5	136.8	29.3	577.5	71.3	23.7	5.1
Other services	11.7	232.6	144.0	388.1	3.0	59.9	37.1

Notes:
1/3: Deviations in employments statistics for 2016/17 here arise due to some employed persons not indicating their occupations in the survey.
2/3: Youth in informal trade are in skilled in services and sales workers.
3/3: Employment in agriculture excludes persons in subsistence agriculture.
Source: Authors' own calculations using UBOS UNHS surveys (2012/13; 2016/17).

Table 14: Youth breakdown of sectoral employment by skill level, 2016/17

Youth (15-24 years)	Absolute ('000)				Share		
	High skilled	Skilled	Low skilled	Total	High skilled	Skilled	Low skilled
Overall total	**89.5**	**644.3**	**1,571.8**	**2,305.5**	**3.9**	**27.9**	**68.2**
Total IWOSS	**23.3**	**153.0**	**309.1**	**485.2**	**4.8**	**31.5**	**63.7**
Agro-processing	0.6	12.9	41.0	54.4	1.1	23.7	75.4
Horticulture and export crops	0.0	1.3	108.1	109.4	0.0	1.2	98.8
Tourism	4.2	78.0	28.1	110.3	3.8	70.7	25.5
ICT	1.8	4.9	1.2	7.8	23.1	62.8	15.4
Transport	0.0	17.0	71.7	88.7	0.0	19.2	80.8
Maintenance and repairs	0.0	2.5	34.9	37.4	0.0	6.7	93.3
Finance, business, and professional services	16.7	36.6	23.7	76.9	21.7	47.6	30.8
Trade formal (excl. tourism)	0.0	0.0	0.7	0.7	0.0	0.0	100.0
Manufacturing	**0.5**	**13.4**	**95.9**	**109.6**	**0.5**	**12.2**	**87.5**
Total non-IWOSS	**65.8**	**478.0**	**1,167.0**	**1,710.7**	**3.8**	**27.9**	**68.2**
Agriculture	0.0	3.9	878.6	882.5	0.0	0.4	99.6
Mining	0.0	0.3	27.8	28.0	0.0	1.1	99.3
Utilities	0.0	2.3	4.3	6.5	0.0	35.4	66.2
Construction	0.0	0.5	94.4	94.8	0.0	0.5	99.6
Trade informal (excl. tourism)	1.3	366.5	17.0	384.7	0.3	95.3	4.4
Domestic and household services	0.0	15.9	93.9	109.7	0.0	14.5	85.6
Government	61.5	27.8	3.9	93.1	66.1	29.9	4.2
Other services	3.1	61.2	47.5	111.6	2.8	54.8	42.6

Notes:
1/3: Deviations in employment statistics for 2016/17 here arise due to some employed persons not indicating their occupations in the survey.
2/3: Youth in informal trade are considered skilled as they are mainly employed as services and sales workers (e.g., street hawkers and vendors, receptionists, sales marketers).
3/3: Employment in agriculture excludes persons in subsistence agriculture.
Source: Authors' own calculations using UBOS UNHS surveys (2012/13; 2016/17).

6. Constraints to growth in IWOSS

This section examines constraints to growth of IWOSS, manufacturing, and non-IWOSS sectors in Uganda. Constraints are grouped into the following three categories: the investment climate, trade-related constraints and agglomeration.[15]

6.1 The investment climate

The investment climate refers to issues like reliable access to power, transportation costs, workers better able to perform their jobs and competition as essential drivers of firm-level productivity (Page 2019). Table 15 summaries some of these aspects.

6.1.1 Infrastructure and regulatory environment

Lack of transportation infrastructure is prevalent in Uganda and disrupts many value chain activities, consequently increasing operational costs. As of May 2019, Uganda had a road network of up to 146,000 Km (Budget Monitoring and Accountability Unit (BMAU) of the Ministry of Finance, Planning and Economic Development 2019), which translates to a road density of 60.6km/100 sq.km. Although Uganda's road density is among the highest in SSA (Raballand et al. 2009), the quality of the roads is low – only 22.2 percent of the national road network paved (BMAU, 2019). World Economic Forum (2019) also shows a low indicator of 3.7 in 2019 (scale of 1 (low) to 7 (high)) for quality of Uganda's roads. Access to financing ranked third as an obstacle to firm business operations in 2013 (Table 15). Few financial institutions are willing to extend credit to agribusiness, and where it is available, interest rates are high. In addition, credit is often rationalized and collateral is required, not forgetting the cumbersome loan application process. Inevitably, firms rely on internal sources/retained earnings for their financing needs.

About 87 percent of the firms used internal sources to finance their business operations (Table 15). What is more worrisome for agribusiness firms, is that government budget allocation to the agricultural sector is far below 1 percent, as recommended by the Maputo and Malabo declarations. Inaccessibility to financing hinders firms from expanding their capacity and developing new products. Government initiative to address the challenge of agricultural financing by recapitalizing the Uganda Development Bank (UDB) in order to improve access to affordable agricultural credit. Even with this intervention, most lending is largely short-term and to big venture, making it hard for firms to borrow for long-term investment.

According to the enterprise survey data, electricity was reported as one of the major obstacles that affects firms' competitiveness. About 35 percent of the firms reported electricity availability as an obstacle to their operations in 2013. Much as the magnitude of the obstacle has reduced since 2006 (from 81 percent); it is still significant compared to other obstacles: irregular supply, no supply or high power tariffs (Table 16).

Between 2006 and 2013, the business climate deteriorated in many aspects, a factor that could have led to closure of some firms, consequently affecting employment. For instance, days taken to clear at customs and obtaining import licenses increased between the two periods (Table 15). The table also shows that lack of financing and access to land obstacles increased as indicated by the increase in

[15] The section relies on the data sets introduced in section two of this paper.

the proportion of the firms reporting the two obstacles. The percentage of losses to total sales increased between the two periods (Table 16).

Table 15: Trade and regulatory environment outlook

Indicator(s)	No. of firms	2006	2013	Average
Trade related				
Days to clear exports at customs	269	5	11	7
Days to clear imports at customs	371	8	19	12
Days to obtain an import license	839	17	20	18
Days to obtain an operating license	5,041	13	12	13
Days to obtain a construction-related permit	715	41	17	25
Annual sales paid in informal payments (%)	2,017	8	21.1	10.5
Working capital				
Internal/retained earnings (%)	10,707	75.8	86.5	82.5
Commercial banks (%)	2,032	31.3	31.7	31.6
Non-bank financial institutions (%	760	31.9	27.2	28.1
Credit purchases of inputs (%)	4,040	25.3	16.7	22.4
Other sources (friends, relatives, money lenders) (%)	1,085		15.8	15.8
Major obstacles (self-reported) affecting operations	1433			
Access to financing (%)		6.3	11	8.9
Access to land (%)		0.5	8.3	4.9
Business licensing and permits (%)		0.5	1.3	1
Corruption (%)		0.6	2.6	1.7
Electricity (%)		81.4	34.7	55.3
Unfair practices of competitors (%)		3.3	7.4	5.6
Tax rates (%)		4	14	9.6
Transport (%)		2.8	1.9	2.3

Source: Authors' own calculations using World Bank Enterprise Survey, 2013.

Of those who reported (lack of) access to electricity as an obstacle, over 81 percent of the firms indicated to have experienced power outages in 2013 (Table 16). In a typical month, firms reported about 9 outages. The power outages resulted in significant losses to businesses, to a tune of 16 percent of total sales. Losses due to power shortages are higher in Uganda compared to other low-income countries. According to the UNECA (2017), Ugandan companies still suffer higher losses (6 percent of annual sales) than other low-income countries (5 percent) due to power shortages. Electricity coverage is also lower in Uganda than in Sub-Saharan Africa on average. In 2017, electricity transmission and supply had covered only 22 percent of the entire country compared to 44.6 percent as the Sub-Saharan African average (WDI, 2019). Unreliable water was also reported as one of the infrastructural-related constraint (Table 16). Firms reported an average of 8 incidences in 2013 when they lacked water supply. In addition, firms reported long delays for getting connected to water (about 16 days).

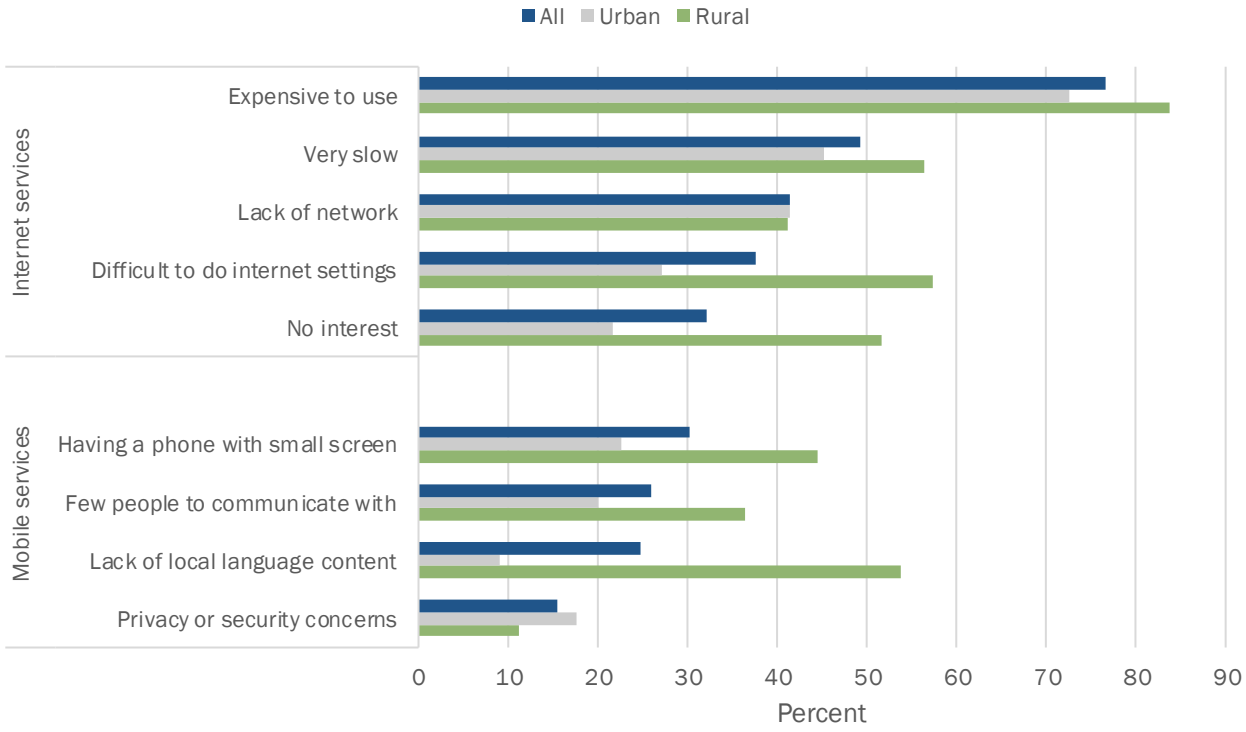
Challenges in access to and the high cost of internet connectivity and mobile phone services further erode the attractiveness of the country to investment, as information exchange between small-scale firms, agricultural traders, agro-processing plants, and global markets is cumbersome and expensive. According to 2017/18 Uganda National Information Technology survey, over 76 percent of the survey respondents reported that the high cost of internet subscriptions is a key limitation to internet use, followed by slow internet and lack of connectivity in some areas (Figure 7).

Table 16: Infrastructure-related constraints

Indicator	No. of interviewed firms	2006	2013	Average
Access to electricity				
No. of days to be connected	1,179	33	22	26
Experienced power outages (%)	9,566	96.8	81.5	87
No. of outages/month	6,512	11	9	10
Percentage of losses to total sales (%)	5,522	12.8	15.7	14.3
Water availability				
No. of days to be connected	589	23	16	16
Experienced insufficient water (%)	282	17.3	12.5	13.9
Incidents of insufficient water	170	4	8	6
Duration of the incidents (hours)	170	11	11	11

Source: Authors' calculations using World Bank Enterprise Survey, 2013.

Figure 7: Perception on internet and mobile service availability, %



Source: Uganda National IT survey, 2017/18.

6.1.2 Skills deficits

Uganda's labor market is plagued with skills mismatch: The skills level of labor supply does not match labor demand. Feedback from employers indicates that current training programs are failing to equip trainees with practical skills and job-relevant competencies (Belgium Development Cooperation, year not shown). This mismatch affects the productivity of businesses: Indeed, poorly educated workers are one of the most common business environment obstacles reported by business owners and top managers (World Bank 2014). In the reformed 10-year Business, Technical, Vocational Education and Training (BTVET) Strategic Plan (2012/13-2020/21), Uganda attempted to address the skills

mismatch among the youth. However, even with the recent reforms, the current scope of vocational training is still dominated by traditional courses like carpentry, and civil and electrical work. As such, firms that can afford to train employees in-house often do so through an in-firm apprenticeship program.

More specifically to IWOSS, agro-based industries employ a blend of workers—including full-time and part-time; permanent and temporary; skilled/technical and unskilled/non-technical staff. From the World Bank Enterprise survey, the sampled firms had an average of 50 full-time employees in 2013, of which 23 were directly involved in production, accounting for 46 percent of the permanent full-time employees (Table 17). Of those involved in production, 16 employees, or 32 percent of permanent full-time employees, were skilled. Female production workers accounted for 39 percent of total production workers, while female non-production workers accounted for 35 percent of the total non-production workers. Agro-processing firms had an average of 21 full-time temporary workers, accounting for 29.6 percent of the total firms' full-time workers. Of these, women accounted for only 14.1 percent. The analysis also reveals that the number of both permanent and temporary full-time workers had reduced by about 38 percent and 49 percent respectively, between 2006 and 2013. Similarly, the number of production workers fell by 65 percent while non-production workers increased by the same percentage in that period. Much of the reduction in production workers were women workers (77 percent). Generally, there was a reduction in the work force of the sector (both full-time and temporary) between 2006 and 2013.

Regarding skill attainment, 8.4 percent of the labor force had attained at least a university degree in 2013 (Table 17). About 63 percent of full-time workers had completed high school; about 37 percent and 46 percent of production and non-production workers, respectively, had received formal training.

Table 17: Employment status and skills attainment of agro-based firms

Indicator (s)	No. of firms	2006	2013	Ave.
Labor force by firm size				
No. of permanent full-time employees	1,441	80	50	63
No. of full-time production workers	1,431	65	23	41
No. of full-time non-production workers	1,303	17	28	23
No. of full-time skilled production workers	1,425	21	16	18
No. of permanent full-time unskilled production workers	967	56	11	34
No. of full-time female production workers	943	39	9	22
No. of full-time female non-production workers	916	7	10	8
No. of full-time temporary employees	821	41	21	29
No. of full-time temporary female employees	419	0	10	10
Full-time seasonal/temporary female workers (%)	200	39.8	-	39.8
Education and training acquired by employees				
Labor force with a university degree (%)	810	0	8.4	8.4
Full-time workers who completed a high school (%)	749	0	63.1	63.1
Permanent full-time production workers who received formal training (%)	549	63.8	37.3	48.9
Permanent full-time non-production workers who received formal training (%)	453	45.7	46.1	46
Education level of production employees (%)				
0-3 years		12.4	-	12.4
4-6 years		31.4	-	31.4
7-9 years		38.2	-	38.2
10-12 years		18	-	18

Source: Authors' own calculations using World Bank Enterprise Survey, 2013.

6.2 Trade-related constraints

IWOSS firms are often exporters that harness regional and global opportunities to expand their business activities. Firms in agro-processing and horticulture in particular are important for Uganda's success as an exporter. In both sectors combined, there are 300 exporters[16] that together account for almost 35 percent of Uganda's export basket. Horticulture exports—dominated by coffee, tea, and cut flowers—account for about 21 percent of Uganda's export basket and agro-processed goods account for another 14 percent (UN Comtrade 2020).

To assess constraints for further export growth in these sectors, we first focus on the importance of different destination markets as well as the role that trade regimes and agreements play in Uganda's export success. Table 18 reveals the role of the East African Community (EAC) and its members in shaping the success of Uganda's horticultural and agro-processing sectors. Data from 2017 highlights that the regional economic communities (REC) absorbed about 28 percent of Uganda's total exports, almost 30 percent of its agro-processed products, and roughly 12 percent of the its horticultural exports. These figures are sizeable and reflect that access to the large and fast-growing markets of Kenya and Tanzania became duty- and quota-free in 2005, accompanied by an increase in protection of the customs union's market through the introduction of the EAC Common External Tariff. The union subsequently expanded to include Rwanda and Burundi in 2007. Within the EAC, Kenya and Rwanda are the most important destination markets, absorbing 14 percent and 6 percent of Uganda's total export volume in 2017, respectively.[17] Given that the EAC is an important export destination—especially for Uganda's agro-processed goods—a distinct threat to continued success can be found in regional tensions such as the closing of the Katuna border with Rwanda for most of 2019, the civil conflict in South Sudan, the outstanding review of the Common External Tariff as a pillar of the customs union, and an ongoing feud over Uganda's dairy and maize exports to Kenya.[18]

Column 2 considers the role of the Common Market for Eastern and Southern Africa (COMESA) free trade area.[19] The figures reveal that, while COMESA is not an important market for Ugandan exports overall (absorbing only about 6 percent of the total export basket), about 10.3 percent of the country's agro-based exports flow to this country group—mainly driven by exports to the DRC. Unfortunately, data on tariffs applied to Ugandan exports entering COMESA is incomplete in the WITS database, but information from 2013 on tariffs applied by the DRC on Ugandan imports suggests that applied tariffs are still sizeable for goods originating from Uganda (averaging 15 and 13 percent *ad valorem* for agro-processed and horticultural goods, respectively).

[16] Data on exporters by sector is taken from the *Uganda Revenue Authority's* ASYCUDA data. Exporters are defined as firms that export more than UGX 25 million worth of goods per year on average. This allows us to concentrate on those companies for which exporting is a core component of their business activities.

[17] South Sudan joined the EAC in 2016, but has not yet implemented the free trade agreement due to reliance on trade revenues to finance government expenditure. The country is a major export destination for Uganda, absorbing about 9.1 percent of the country's export basket in 2017 (UNComtrade 2020), but is ridden by civil conflict undermining stable trade relationships.

[18] Kenya recently banned Ugandan milk exports from accessing their market, claiming that they were not wholly produced in Uganda. In early 2021, Kenya banned Ugandan maize over concerns related to the product's safety for human consumption.

[19] COMESA is a free trade area comprising of 21 member states. Crucially, all members of the EAC (except for Tanzania, which left COMESA in 2000) are also members of COMESA. To avoid double counting, we subtract export flows from Uganda to EAC members from the COMESA figures, as within EAC trade is duty- and quota-free while COMESA rates are lower than *Most Favored Nation* rates, but still positive.

Table 18: Agro-processing and horticulture: Key export markets and market access

	Sector				Total exports	
Trading partner	Agro-processing		Horticulture			
	% exports to market	Tariff faced (%)	% Exports to market	Tariff faced (%)	% exports to market	Tariff faced (%)
EAC	29.91	0	12.20	0	28.48	0
COMESA (excl. EAC)	10.27	15.57	0.77	13.05	5.76	
EU (28)	19.93	0	53.51	0	19.79	0
USA	0.73	0	3.70	0	2.59	0.08
UAE	3.30	5.00	0.02	0	15.33	0.09
Hong Kong	15.83	0	0.01	0	1.36	0
China	0.13	0	0.38	0	1.04	0
No. of exporters	*130*		*165*		*1,266*	
Total export volume (USD thousands)	*355,297*		*638,252*		*2,901,466*	

Notes:
1/8: Data for 2017, unless indicated otherwise.
2/8: # exporters calculated using the Uganda Revenue Authority ASYCUDA data (averaged over 2014-16).
3/8: Sector classifications are in line with the Harmonized System (HS), e.g., 0901 ("coffee") is classified as a horticultural export.
4/8: Trade data (in $1,000) is taken from *the International Trade Centre's TradeMap Database* (2020).
5/8: We employ data from the *TradeMap* database (instead of the URA's ASYCUDA data) to allow for easier comparison with the WITS database and to be able to analyze a more recent, full year of export data.
6/8: Data on trade-weighted tariffs charged by different countries and groups of countries on specific HS product lines (at the 4-digit level) is taken from the *World Integrated Trade Solution Database (WITS)* (2020).
7/8: Data for COMESA countries are incomplete in WITS, and indicated tariffs for this country group are for the DRC (in 2013) only, which absorbs almost all Ugandan exports to COMESA (excluding EAC members).
8/8: The majority of Ugandan exports to the UAE is gold, and the majority of exports to Hong Kong is processed fish.
Source: Authors' own calculations based on various databases.

Exports from Uganda to the European Union (EU 28, Column 3) are traded freely under the *Everything But Arms Agreement* (EBA), a unilateral preferential access scheme that grants duty- and quota-free access to the EU for least developed countries, subject to imports satisfying stringent rules of origin and sanitary and phytosanitary (SPS) requirements. As evident from the table, the EU remains Uganda's key market for horticultural exports, absorbing 54 percent of the country's overall exports in this category in 2017, including all cut flowers and the bulk of the country's coffee exports. In addition, almost 20 percent of Uganda's agro-processed exports are shipped to the EU.[20] Access to this high-value market is under permanent threat, though, as European authorities frequently impose bans due to Ugandan firms not being able to demonstrate the stringent SPS requirements applied to products entering their market.[21]

Unlike the EU's EBA, the African Growth and Opportunity Act (AGOA), a unilateral access scheme offered by the Unites States to eligible countries in sub-Saharan Africa, has been considerably less

[20] These include products like hides and skins or fish fillets.
[21] For example, in 2019, the EU issued a *yellow card warning* due to chemical contamination of horticultural exports and subsequently conducted an audit aimed at assessing whether Ugandan producers of agricultural exports were able to comply with international standards.

successful. Despite the U.S. (Column 5 in Table 18) being another high-value destination market and despite AGOA offering duty- and quota-free access as well, Uganda shipped less than 3 percent of its exports to the U.S. in 2017. This small figure is driven by horticultural products like coffee and vanilla. Underutilization of AGOA may be explained by a variety of factors like stringent rules of origin or an inability of LDCs like Uganda to comply with the bureaucratic and documentary requirements that need to be satisfied in order to take advantage of the preferential market access.

Finally, Columns 5, 6 and 7 reveal the role of the United Arab Emirates (UAE), China, and Hong Kong as export destinations. First, the UAE (Column 5) does not play a large role for Uganda's exports of agro-processed and horticultural exports and only imports one key commodity from Uganda, gold, which contributed about 15 percent to the country's export basket in 2017. Hong Kong (Column 6) is a major importer of processed fish from Uganda. Exports to China (Column 7) are negligible, despite the existence of a unilateral scheme that grants preferential market access to LDCs.

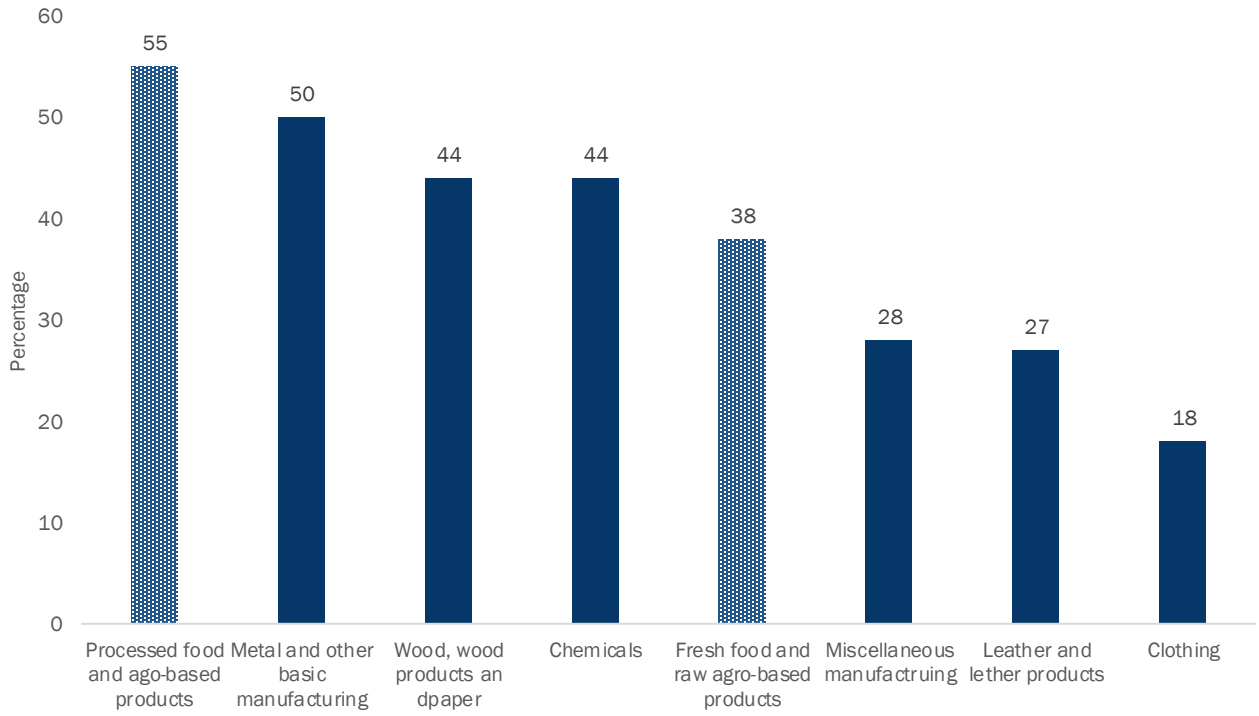
A key insight from this analysis is that with the exception of COMESA (and the DRC as a crucial export destination), Uganda's exports of horticultural and agro-based products essentially enjoy duty- and quota-free access to all key global markets. The International Trade Centre reports a similar finding, corroborating our results: For those products Uganda actually exports, almost no trading partner imposes tariffs (ITC 2018: 5).[22] The existence of duty-and quota-free access to virtually all key markets suggests that obstacles to improved export success and growth for the IWOSS sectors under consideration in this study are to be identified in other trade and non-trade specific factors like the enabling environment or *non-tariff measures and barriers* that hinder Ugandan firms from exploiting the regional and global opportunities available to them. To shed some light on factors that hinder Ugandan IWOSS firms from making full use of available regional and global market access, employed is data on non-tariff measures reported by Ugandan firms as collected by the International Trade Centre (ITC) in a survey in 2016. Non-tariff measures (NTMs) (or barriers, NTBs) are defined by the UNCTAD (2010, xvi) as "[…] policy measures, other than ordinary customs tariffs, that can potentially have an economic effect on international trade in goods, changing quantities traded, or prices or both."

The ITC NTM survey on Ugandan firms was conducted in a two-step procedure. In a first stage, surveyors compiled a list of 2,000 Ugandan exporters and importers using a registry compiled from information provided by the Uganda National Export Promotion Board, the Uganda Revenue Authority, and the Uganda Manufacturers Association. Surveyors then randomly selected a sample of 730 firms stratified by sector to be contacted for a first stage phone interview.[23] Out of the 730 firms, 493 firms agreed to and completed a first stage phone interview. At this stage, 226 companies were identified that "faced burdensome regulations or procedures over the course of the last 12 months" (ITC 2018, 11). In a second stage, surveyors conducted face-to-face interviews with 204 of these firms to understand the exact nature and origin of obstacles to trading experienced by these firms (cf. ITC 2018, 10-11).

[22] The exception is the UAE, a finding also reflected in Table 18.
[23] Stratification by sector allows for the number of firms surveyed to be proportional to the size of sectors in the underlying population of firms.

Figure 8 illustrates a key result from the first-stage phone interview, showing, per broadly defined economic sectors,[24] the share of firms that replied "Yes" to the question, "Do any of your products face restrictive regulations or obstacles to trade when exporting?"

Figure 8: Percentage of firms reporting to experience NTMs, by economic sector



Notes: The bars show the percentage of firms per each economic sector covered that answered "*Yes*" to the question "*Do any of your products face restrictive regulations or obstacles to trade when exporting?*" during a first-stage phone interview. Dark blue illustrated different types of manufacturing activities excluding agro-processing and gray patterns illustrate forms of agro processing i.e., processed and unprocessed products.
Source: Authors' illustration based on survey data provided by the International Trade Centre (2018).

Two notable findings in Figure 8 concern two agro-based sectors, covering "processed food and agro-based products" and "fresh food and raw agro-based products." While we do not have enough information to adequately and exactly identify "agro-processing" and "horticulture" in the data, it seems fair to take these sectors as proxies for the two commodity-based IWOSS sectors considered in this study. As evident from the graph, both exporters of "processed food and agro-based products" as well as exporters of "fresh food and agro-based products" struggle considerably with NTMs when engaging in exporting activities.

Next, we explore the data collected in the face-to-face interviews with those exporters that reported in the phone interview to have experienced burdensome regulations or obstacles when trading over the course of the last 12 months. Companies reported the number of cases in which an NTM hindered a

[24] Sectoral affiliation was identified in the survey through a company's main export product. For example, one company that reported to export "fruit juices" was categorized as being active in the sector "processed food and agro-based products." We drop four sectors that have fewer than 10 firms in their sample for legibility. Firms in three of these sectors ("computer, telecommunications; consumer electronics," "electronic, components" and "yarn, fabrics and textiles") do not report any NTMs. The last sector is "transport equipment" for which five out of eight firms report to have experienced NTMs when trading over the last 12 months.

trade transaction.[25] Here, the data is limited to the 152 exporting companies in the sample and further disaggregate the information into NTM cases resulting from measures imposed by trading partners and those caused domestically by an Ugandan institution. The full list is presented in Table 19.

Table 19: Reports of inhibiting non-tariff measures reported by Ugandan exporters (2015-16)

	# reported NTM cases, per category	# reported NTM cases for exports shipped to the EAC, per category
Panel A: Categories of NTM trade obstacles for exporters: Caused by trading partners		
Product characteristics, including quality or performance requirements	10	0
Tolerance limits for residues of or contamination by certain substances	6	0
Hygienic practices during production	3	0
Microbiological criteria on the final product	6	0
Fumigation	14	0
Labelling (e.g., product labels with information for consumers)	9	3
Packaging	4	1
Protection of human health or safety; environmental protection	10	1
Testing	10	2
Product certification	27	6
Inspection requirement	9	1
Origin of materials and parts	5	0
Processing history	3	1
Pre-shipment inspection	5	1
Other pre-shipment inspection and other entry formalities	8	1
Advance payment of customs duties	3	3
Rules of origin and related certificate of origin	33	12
Total	**165**	**32**
Panel B: Categories of NTM trade obstacles for exporters: Caused by Ugandan authorities		
Export inspection	3	
Certification required for exporting	52	
Licensing or permit to export	4	
Other export quantitative restrictions	3	
Export taxes and charges	10	
Other export related measures	12	
Total	**84**	

Notes: The data covers information collected in face-to-face interviews with 152 Ugandan exporters.
Source: Authors' calculations based on survey data provided by the International Trade Centre (2018).

Table 19 reveals a number of important patterns. First and foremost, Ugandan exporters report that a sizeable share (34 percent) of all NTM cases are caused by domestic institutions. For policy purposes, this finding is relevant as NTMs/NTBs with trading partners can only be solved through international dialogue, whereas solving domestic obstacles to trading (e.g., by cutting "red tape," removing export taxes and fees or simplifying licensing regimes) should be relatively easy in comparison. Notably, among the NTM cases reported to have been caused by domestic institutions, 52 out of 84 are related to certification required for exporting, requested for by Ugandan institutions like the Ministry of Trade, Industry and Cooperatives. Second, among those NTM cases caused by trading partners, the causes vary widely, with the only issues causing a large number of NTMs being related to *rules of origin* and

[25] To illustrate, in the face-to-face interview, a firm reported to have experienced obstacles to export due to issues associated with rules of origin and related certificate of origin for two different products and two different destination markets, thereby resulting in a total of four NTM cases reported from this company.

product certification. Finally, since the data includes the trading partner in each NTM case, we find that only 20 percent of NTMs experienced by Ugandan traders were caused by EAC members, Uganda's most important export destinations. Notably, *rules of origin* seem to be the most important underlying measure causing obstacles to Uganda's intra-EAC exports.

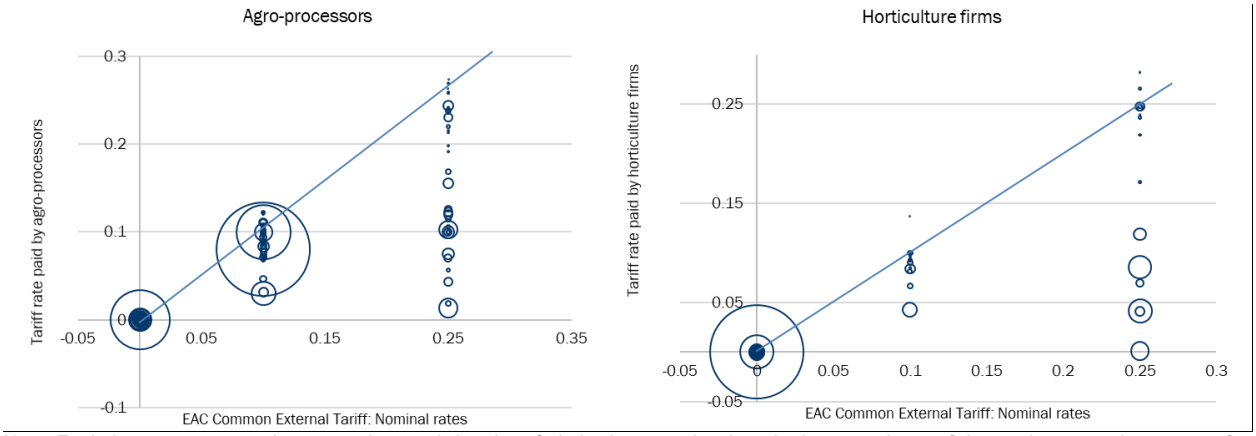
A final way through which trade impacts the competitiveness and growth of Uganda's IWOSS firms is through access to imported inputs and capital goods necessary to produce globally competitive products. As shown in Annex Table 35, Column 11, Ugandan IWOSS firms rely on imported inputs—especially agro-processing firms, which source about 19 percent of all their inputs from foreign countries.

Before assessing whether Ugandan IWOSS firms can access crucial imported inputs at competitive prices, we must first examine the country's tariff regime. First, as part of the East African Community (EAC), Uganda implements the Common External Tariff (CET) of the customs union. In broad terms, the CET consists of a three-band tariff scheme: 0 percent for raw/capital goods, 10 percent for intermediate inputs, and 25 percent for final/consumption products. Since intra-EAC trade is tariff- and quota-free, and since imports originating from the neighboring COMESA free trade area (excluding those countries that also have EAC membership) are negligible, the CET effectively regulates tariffs on almost all of Uganda's taxable imports (cf. UNComtrade 2017). Second, misclassification is common in the CET (cf. Frazer 2017), meaning that, for example, an intermediate input that should be subject to a 10 percent tariff is nominally taxed at 25 percent in the CET, inflating the price of crucial inputs for Ugandan firms. An important question is therefore whether Uganda's exemptions schemes (e.g., *Duty Remission Scheme* or VAT reimbursements) allow IWOSS firms to access imported inputs at competitive prices.

To answer this question, we employ transaction-level customs data collected by the Uganda Revenue Authority. The data allows us to observe—per firm and imported product—how much duty a firm paid on an imported product. We then compare this "applied tariff rate" with the nominal rates on the same product defined by the CET, allowing us to assess whether firms were able to circumvent high (and possibly misclassified) tariff rates through access to the country's Duty Remission Scheme. Again, we focus on agro-processing and horticulture as the two IWOSS goods sectors of prime interest in this study and compare average applied rates with nominal CET rates, per individual products imported (Figure 9).

Figure 9 reveals that firms in both of the IWOSS sectors pay lower tariffs than the nominal rate imposed by the CET on a range of products. At the extreme, sugar, a crucial input into the beverage industry but taxed at 100 percent *ad valorem* only attracts an average applied tariff of about 17 percent when imported by a firm active in agro-processing (not shown in the graphic to facilitate legibility for other data points). Notably, both graphs suggest that firms in either sector are able to circumvent misclassification of intermediate inputs into the 25 percent tariff band and overall pay tariffs lower than those regulated in the CET. The fact that these firms are able to access crucial inputs at comparatively low tariffs provides us with evidence that an important mechanism to enable the development of productive firms—the Duty Remission Scheme—is operational and available for firms active in IWOSS sectors that rely on imported inputs for globally competitive (i.e., export-oriented) production.

Figure 9: Applied vs. nominal tariff rates on imported inputs by sector: Agro-processing and horticulture firms



Note: Each dot represents an import product and the size of circles is proportional to the import volume of the product over the course of the fiscal year by all importing firms in the respective sector. The line indicates the 45-degree line. Observations below the line indicate that the firm is paying less than the listed tariff.
Source: Authors' calculations using Uganda Revenue Authority customs data for fiscal year 2015/16.

6.3 Agglomeration

Uganda, like other developing countries, still faces many barriers in the business environment that discourage (foreign) investment, most notably poorly developed infrastructure; difficulty in accessing land; and burdensome regulations. Special economic zones (SEZs) were created with in hope that they would eliminate most of these barriers. A typical SEZ is well-serviced with dedicated industrial-load electricity supply, roads, railway, fiber-optic internet, and water in order to facilitate quick set-up of factories and industries. There are two programs in Uganda fall under SEZ policies: industrial parks and free zones. Industrial parks are geographically delimited areas targeted at specific economic activities, e.g., textiles, with infrastructure adapted accordingly. Free zones are geographically delimited areas for production, where raw materials, goods, plants, and machinery are handled, manufactured, or reconfigured for export without being subject to import and export duties. They are both meant to provide an institutional framework, modern services, and physical infrastructure that may not be available in the rest of the country. In addition, firms in both receive corporate income tax incentives. The key difference between industrial parks and free zones is that the former still have to comply with the customs regulations (import and export duties) while the latter are exempted provided 80 percent of their goods are for export.

The mandate of developing and regulating industrial parks lies with Uganda Investment Authority (UIA). UIA's industrial parks development strategy planned to set up 27 industrial parks country-wide between 2009 and 2021, though the time frame has been extended to 2024. In May 2019, only 8 were operational while the rest were not yet developed. Notably, even those parks that are operating do so below their capacity. Indeed, UIA is still looking for investors to fill the Kasese Industrial and Business Park, while in Mbarara, 37 out of 41 workspaces are occupied (Uganda Update, 2019). The Mbale district industrial park currently has four factories that are operational, out of 50 expected to be housed. Firms in these parks are offered renewable land leases at a discounted rate, and the government provides road, water, and power infrastructure. In cases where government is unable to provide the infrastructure, land is offered free of charge to investors.

Lack of adequate financing explains why most of the gazetted industrial parks are not yet developed.[29,30] For those that are developed, lack of adequate infrastructure hinders investment. In some parks, the murram roads become impassable and the drainage challenges become visible in the rainy season. In addition, power and water are inadequate for the heavy investors, hence the need for upgrades. Relatedly, some investors have been frustrated by the slow and cumbersome process of surveying and acquisition of deed plans, hence affecting the pace of development.

Free zones were introduced later in 2014 by an Act of Parliament, partly to increase Uganda's trade participation in the East African region. Today, there are 22 private licensed free zones in the country, of which 18 are operational (Uganda Free Zones Authority, 2020). Like industrial parks, the development of and growth of free zones are also hindered by lack of adequate financing and poor infrastructure. For example, the Arua free zone is constrained by financing and the narrow road leading to the establishment limits its accessibility (ibid). The Kasese free zone is reportedly not serviced with piped water, and there is no power distribution. According to 2019/20 annual report of the Uganda Free Zone Authority (UFZA), the general challenges facing free zones in Uganda include: high power tariffs; bureaucracy and administrative delays in documentation by the relevant Government Institutions that issue certificates and clearances during exportation of agricultural products; and limited access to long-term finance for investment (UFZA, 2020).

7. Uganda's future employment: An illustrative 7 percent annual growth scenario

The National Development Plan III formulates the government of Uganda's highly ambitious goal of reaching a GDP per capita of $1,198 by fiscal year 2024/25, propelling the country to middle-income status.[26] The government expects the economy to grow by 7 percent per year over this period in order to achieve this goal (NDP III: xxi). This section adopts this growth ambition to provide an illustrative scenario with a view on the likely distribution of jobs across sectors in 2029/30. To compute the likely future distribution of jobs in Uganda, the forecasts rely on observed historical patterns and a number of assumptions with respect to employment elasticities as well as the distribution of jobs across various skill levels within an activity. The goal of this exercise is to make tentative statements regarding the future number of jobs for each economic activity as well as the skills required to fill these positions.

We provide projections for aggregate and sectoral GDP in 2029/30 by combining observed sectoral growth rates with Uganda's 7 percent aspiration and forecast from our baseline year (2016/17) to 2029/30.[27] To convert projected economic growth at the sectoral level into demand for labor, we combine forecasted growth rates with sectoral employment elasticities, taking into account our previous observation that IWOSS reveal greater employment elasticities than non-IWOSS activities.[28] The results of this exercise are presented in Table 20.

In this scenario, IWOSS sectors—with 8 percent annual GDP growth per year—expand somewhat faster than non-IWOSS (6 percent) and twice as fast as manufacturing (4 percent). Economy-wide

[26] For context, in 2019, Uganda's GDP per capita was $794 (World Bank 2021).
[27] Since Uganda did not grow at the envisioned 7 percent rate between the two survey periods 2012/13 and 2016/17, we scale up sectoral growth rates with a constant that results in 7 percent aggregate growth over the period 2016/17 to 2029/30.
[28] As evident from the previous analysis, for many sectors, the elasticities obtained from using two waves of household survey data that are only four years apart from each other suggest unrealistic employment elasticities, for example, due to declining sectoral employment combined with positive GDP growth at the same level of aggregation (e.g., in manufacturing). Employment elasticities used for the projection part of this paper are shown in Table 37 in the Annex alongside observed elasticities in the previous table.

employment grows at about 4.5 percent, outpaced by employment growth in the IWOSS sectors (6.3 percent). Employment in non-IWOSS (especially agriculture) is growing at a slower pace (3.8 percent) while manufacturing grows at 4.6 percent. In the aggregate, this projection suggests that the Ugandan economy will shift slightly towards the more productive IWOSS sectors, with the contribution of IWOSS to employment increasing by a sizeable 5 percentage points in contrast to the declining importance of non-IWOSS, and a close-to-stagnant contribution of manufacturing. Among the IWOSS sectors, employment in sectors that demand higher skills of their workers—such as tourism, finance and business services, ICT as well as agro-processing—grow at a faster pace than the country-wide average.

Next, we explore the educational background of the workers that are projected to hold these jobs (Table 21).[29] According to the estimates—and in line with the projected strong growth in skill-intensive IWOSS sectors—within IWOSS activities, the skill profile of workers will shift distinctively towards skilled and high-skilled workers: While in 2016/17 only about 46 percent of Ugandan workers in IWOSS were skilled or high-skilled, the scenario in 2029/30 suggests that the same figure would increase to 54 percent, driven equally by an increased demand for skilled workers and high-skilled workers. In non-IWOSS, the demand for skilled workers is projected to decrease slightly, while the demand for high-skilled workers is projected to increase, although this is primarily driven by the government sector, which has high demand with respect to educational attainment. In the aggregate, these trends indicate a distinct shift in the Ugandan economy towards a more skilled labor force.

The key question is whether Uganda will be able to meet this emerging demand for higher-skilled workers through an adequately educated and trained workforce. While recent labor market surveys seem to suggest that job-education miss-matches are not yet a severe issue for Ugandan employers,[30] future developments such as increasing automation in many agricultural activities or an emerging demand for digital skills (e.g., marketing, online payments and booking activities) may well create obstacles in the labor market going forward.

[29] To compute the number of jobs per each skill-level and sector in 2029/30 we proceed as follows: First, we employ the number of workers in 2016/17 per each sector and each of the three skill levels. To compute the distribution of additional/new jobs within a sector per each different skill level, we obtain sector- and skill-specific employment growth rates computed from the two UNHS survey waves (2012/13 and 2016/17). This provides us with projected employment at this level of disaggregation in the year 2029/30 for each of the sectors. Since the resulting aggregate figures per sector are slightly larger than our sector-level employment projections, we apply the resulting distribution of new jobs across the three skill levels to the previously calculated sectoral totals of new/additional jobs per sub-sector and add these to the skill distribution found in 2016/17. Due to data-related inadequacies, we have to smooth out sector- and skill-specific growth rates in a number of cases. For example, the values found in the data would suggest an annual growth rate for "skilled labor in transport" of 57 percent. In some cases, we additionally rely on aggregates at the IWOSS/non-IWOSS aggregates for some of the sub-sectors. These decisions are detailed in Table 38 in the Annex of this paper.

[30] For example, Khamis (2019: 19) employs the recent *Manpower Survey Uganda* (MAPU) 2016/17. The author reports that when asked the question "How many permanent/temporary/elementary employees do not have required qualification?" 96 percent of interviewed employers report to have zero employees in this category.

Table 20: The sectoral distribution of GDP and jobs in 2029/30: An illustrative 7 percent growth scenario

	GDP			Employment				Share of total employment	
	2016/17	2029/30 (proj.)	Annual growth	2016/17	2029/30 (proj.)	Add. jobs	Annual growth	2016/17	2029/30 (proj.)
	Billion UGX (2009/10 const. prices)	Billion UGX (2009/10 const. prices)	(%)	('000)	('000)	('000)	(%)	(%)	(%)
Overall total	**53,327**	**128,225**	**7**	**9,252**	**16,314**	**7,062**	**4.5**	**100**	**100**
Total IWOSS	**22,011**	**60,755**	**8**	**2,093**	**4,615**	**2,522**	**6.3**	**23**	**28**
Agro-processing	2,097	4,107	5	300	719	419	7	3	4
Horticulture and export crops	1,378	2,049	3	350	580	230	4	4	4
Tourism	1,552	3,470	6	355	738	383	6	4	5
ICT	5,657	28,879	13	39	168	129	12	0	1
Transport	1,674	4,519	8	500	1,220	720	7	5	7
Maintenance and repairs	344	455	2	113	155	42	2	1	1
Finance & business services	6,110	13,031	6	435	1,034	599	7	5	6
Trade formal (excl. tourism)	3,199	4,244	2	1	1	0	2	0	0
Manufacturing	**2,308**	**3,861**	**4**	**387**	**693**	**306**	**4.6**	**4**	**4**
Total non-IWOSS	**29,008**	**63,609**	**6**	**6,772**	**11,006**	**4,234**	**3.8**	**73**	**67**
Agriculture	11,091	16,511	3	3,076	4,685	1,609	3	33	29
Mining	802	2,206	8	86	171	85	5	1	1
Utilities	1,727	4,548	8	30	63	33	6	0	0
Construction	3,834	11,807	9	417	1,238	821	9	5	8
Trade informal (excl. tourism)	2,876	3,814	2	1,988	2,577	589	2	21	16
Domestic and household services	266	450	4	185	235	50	2	2	1
Government	2,659	7,770	9	600	1,440	840	7	6	9
Other services	5,753	16,504	8	390	597	207	3	4	4

Notes:

1/2: Baseline figures for 2016/17 are the same as for previous tables. "Agriculture" in non-IWOSS excludes Ugandans working exclusively in subsistence farming.

2/2: To project GDP in 2029/30, we adopt observed sectoral growth rates over the four-year period between the two household surveys in 2012/13 and 2016/17 and scale them up by a constant factor to meet the government's 7 percent aggregate growth ambition over this period. To project sectoral employment, we begin from the baseline figures in 2016/17 and combine projected GDP growth at the sectoral level with the employment elasticities detailed in the Annex, Table 37, of this paper. We then apply the resulting distribution of jobs in different IWOSS and non-IWOSS sectors to the projected labor force in 2029/30. We calculate projected labor force in 2029/30 by applying the labor force participation rate found in 2016/17 (53 percent) to the projected working-age population of 32.4 million Ugandans (UBOS 2015). We further assume an unemployment rate of 5 percent, down from 9.6 percent in 2012/13 and 7.6 percent in 2016/17. When projecting future employment for "trade formal (excl. tourism)," we use the observed figure for 2012/13 as the basis (61,000 workers), rather than the observed figure for 2016/17 (1,000 workers).

Table 21: Uganda's 7 percent growth scenario: Projected labor demand by skill level

	2016/17			2029/30 (projected)						Annual % growth (2016/17 – 2029/30)	
	High skilled	Skilled	Low skilled	High skilled	Skilled	Low skilled	High skilled	Skilled	Low skilled	High skilled	Skilled
	Share (%)			('000)			Share (%)			(%)	
Overall total	**7**	**13**	**79**	**2,300**	**2,842**	**11,172**	**14**	**17**	**68**	**10**	**7**
Total IWOSS	**11**	**33**	**57**	**670**	**1,812**	**2,133**	**15**	**39**	**46**	**9**	**8**
Agro-processing	2	26	72	119	371	229	17	52	32	27	
Horticulture and export crops	0	1	99	1	4	576	0	1	99	4	4
Tourism	6	74	21	52	572	114	7	78	15	8	6
ICT	28	63	9	46	115	7	27	68	4	12	13
Transport	0	18	82	1	237	982	0	19	80	-5	8
Maintenance and repairs	1	25	74	12	57	85	8	37	55	20	6
Finance & business services	42	44	13	439	456	139	42	44	13	7	7
Trade formal (excl. tourism)	15	8	77	0	0	1	15	8	77	2	2
Manufacturing	**1**	**9**	**89**	**88**	**250**	**354**	**13**	**36**	**51**	**24**	**16**
Total non-IWOSS	**7**	**8**	**86**	**1,542**	**780**	**8,685**	**14**	**7**	**79**	**10**	**3**
Agriculture	0	1	99	2	80	4,603	0	2	98	-10	10
Mining	0	5	95	1	7	164	0	4	96	5	5
Utilities	9	42	49	6	27	31	9	42	49	6	6
Construction	3	3	94	100	60	1,079	8	5	87	18	12
Trade informal (excl. tourism)	0	4	96	0	103	2,474	0	4	96	...	2
Domestic and household services	0	13	87	0	24	211	0	10	90	...	0
Government	71	24	5	1,425	14	1	99	1	0	10	-16
Other services	3	60	37	9	465	123	2	78	21	-2	5

Notes:
1/3: Baseline figures for 2016/17 are the same as for previous tables. "Agriculture" in Non-IWOSS excludes Ugandans working exclusively in subsistence farming.
2/3: Since in the original data not every survey respondent reported their skill level, we apply the shares obtained from these data to the total employment per sector reported in the previous table. The only adjustment we make is for the distribution of workers per skill-level in "*Trade informal (excl. tourism)*" since we find an unrealistic distribution in the original data. To rectify, we employ the skill distribution for this sector from a neighboring country (Rwanda): 0 percent high skilled workers, 4 percent skilled workers and 94 percent low skilled workers, and assume this distribution remains constant over the forecasting period.
3/3: To compute the number of jobs per each skill-level and sector in 2029/30 we proceed as follows: First, we employ the number of workers in 2016/17 per each sector and each of the three skill levels. To compute the distribution of additional/new jobs within a sector per each different skill level, we obtain sector- and skill-specific employment growth rates computed from the two UNHS survey waves (2012/13 and 2016/17). This provides us with projected employment at this level of disaggregation in the year 2029/30 for each of the sectors. Since the resulting aggregate figures per sector are slightly larger than our sector-level employment projections, we apply the resulting distribution of new jobs across the three skill levels to the previously calculated sectoral totals of new/additional job per sub-sector and add these to the skill distribution found in 2016/17. Due to data-related inadequacies we have to smooth out sector- and skill-specific growth rates in a number of cases. For example, the values found in the data would suggest an annual growth rate for "skilled labor in transport" of 57 percent. In some cases, we additionally rely on aggregates at the IWOSS/non-IWOSS aggregates for some of the sub-sectors. These decisions are detailed in Table 38 in the Annex of this paper.
Source: Authors' calculations using UBOS data.

8. Employment potential: Firm survey case studies along IWOSS value chains

Value chain analysis in the context of employment is key to understanding the exact job opportunities that exist at each node of the value chain. This section analyzes three IWOSS value chains selected for the study at hand: tourism, horticulture, and agro-processing. Section 8.1 provides an overview on how each of the three IWOSS value chains operates within global value chains, while Section 8.2 utilizes firm-level surveys for specific nodes within each value chain to provide additional insights, complementing the quantitative analysis undertaken in the previous sections.

8.1 Overview of value chains

8.1.1 Agro-processing value chain

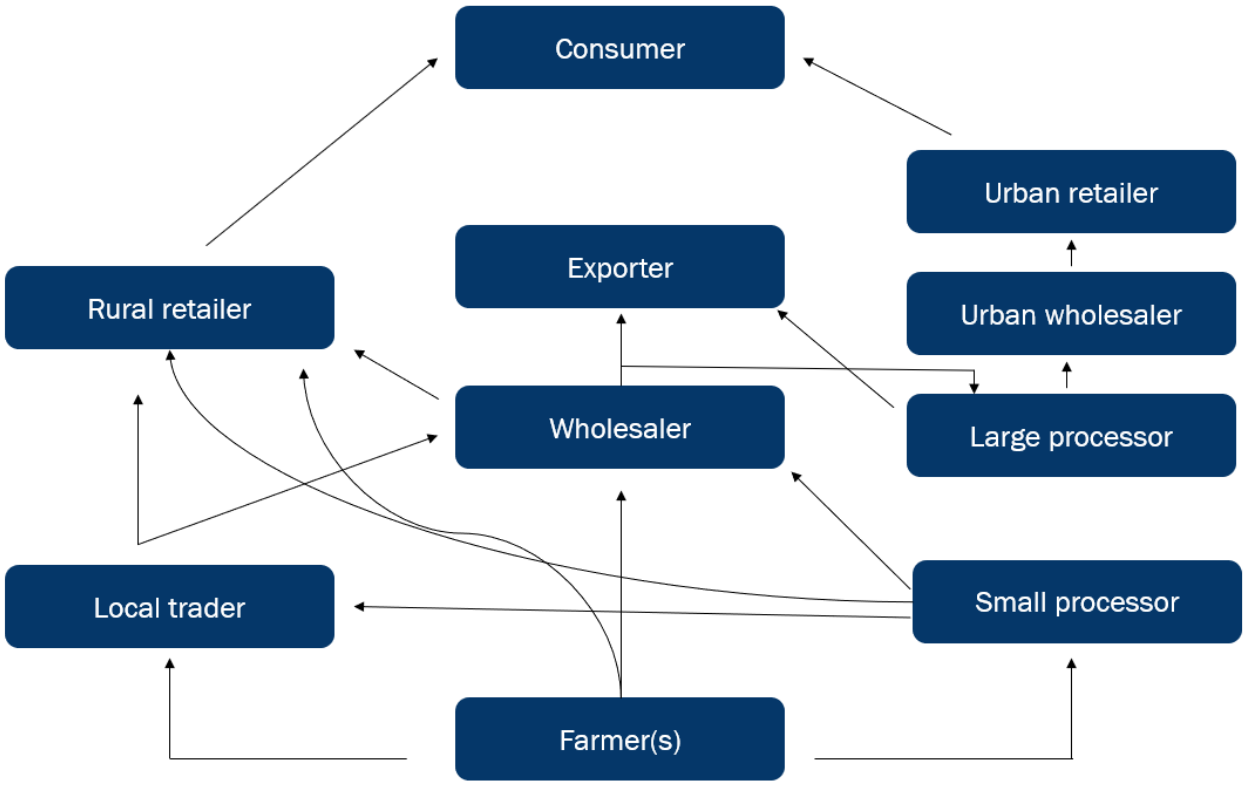
Figure 10 illustrates how a typical agro-processing value chain operates in Uganda. The main actors in the value chain are farmers, traders, processors, local consumers, and exporters. In Uganda, much of the production is done by smallholder farmers, who constitute about 68 percent of the entire population (UBOS 2017).[31] After harvesting, depending on the crop, the produce goes either to processors, wholesalers, or local traders. The local traders may collect the produce directly from farmers or farmers may transport the produce to local traders who are often located within the same village. The local traders do the bulking and sell to larger buyers in urban centers. For instance, Mukwano Group of Companies buys sunflowers from local traders in northern Uganda (cf. Wire, year not indicated).[32] In eastern Uganda, the rice wholesalers in Kampala, Mbale, and Jinja districts also buy their stock from local traders (Ibid).

Uganda's agricultural value chain also has small/medium processors who usually do primary processing. Given their location in the rural trading centers or nearby towns, such processors are accessible by farmers. Processing is mostly done to prepare the produce for the wholesalers or local consumers; it involves drying, sorting, and milling as well as other basic processing routines that tend to be produce-specific. The wholesalers purchase the bulked produce (processed or unprocessed) and either process it further, sell it in major urban centers or export to foreign markets. Finally, the produce gets to the consumers either directly from wholesalers or processors, or through retailers.

[31] UBOS (2017). State of Uganda Population Report 2017. Uganda Bureau of Statistics (UBOS).

[32] Wire, J. (*undated*). Challenges of Agriculture Value Addition in Uganda. Downloaded on June 20, 2020. https://www.academia.edu/30991763/Challenges_of_Agriculture_Value_Addition_in_Uganda

Figure 10: The agro-processing value chain in Uganda



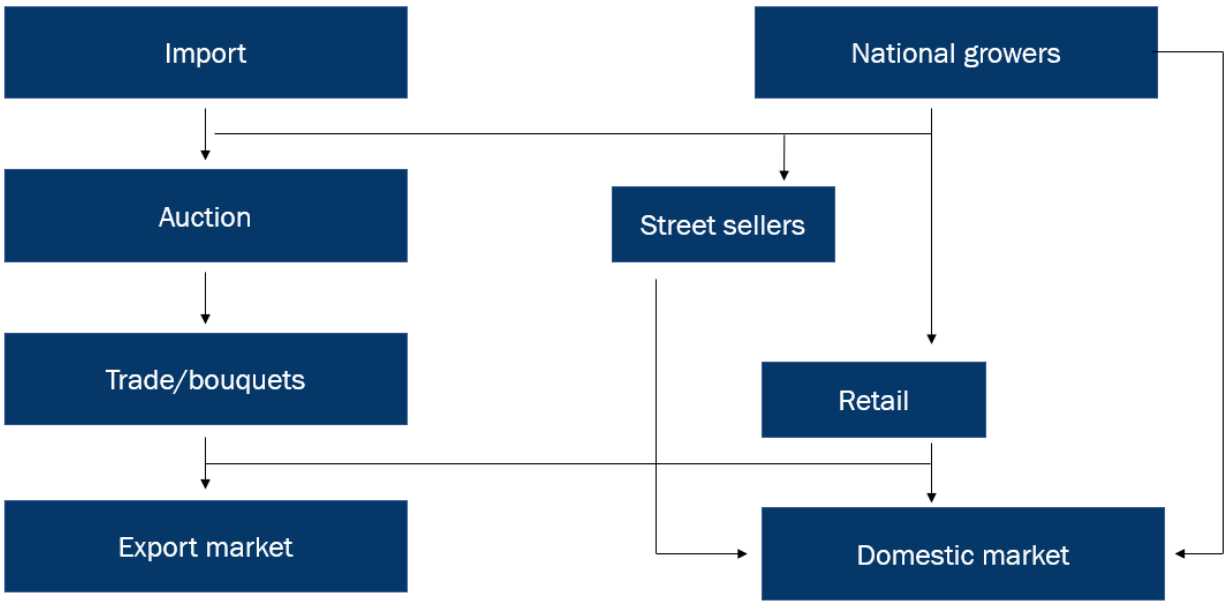
Source: Wire (year not shown).[22]

8.1.2 Horticulture value chains

Uganda's horticulture value chain comprises both flowers and fresh fruits and vegetables (FFVs), which have different, short, individual value chains. Figure 11 depicts a simplified global value chain for flowers. Uganda's floriculture value chain is not fully developed and has very few actors (Asoko 2019). There are only 22 firms in the entire flower industry, of which 21 are located in central Uganda (Kampala, Mukono, Wakiso) and one in western Uganda (Ntungamo district). The value chain largely centers around growers, who comprise the largest segment (80 percent) and are also involved in exporting. Only two of these firms have fully integrated operations and are able to manage their own transportation from farm to the airport. The other firms in the sector outsource their transport to other firms. The value chain has no local breeders, implying that all planting materials are imported and highlighting the dependency of this Ugandan high-value crop on imported inputs.[33] The value chain has just one freight forwarding company that provides cold chain logistics for the entire sub-sector. One company is a grower and wholesaler while one categorizes itself as a grower and broker. Quality assurance for flowers is done at harvesting by ensuring that only good quality flowers are picked.

[33] See also the section on trade related constraints (6.2) in the constraints analysis of this paper.

Figure 11: A sketch of the global value chain for flowers



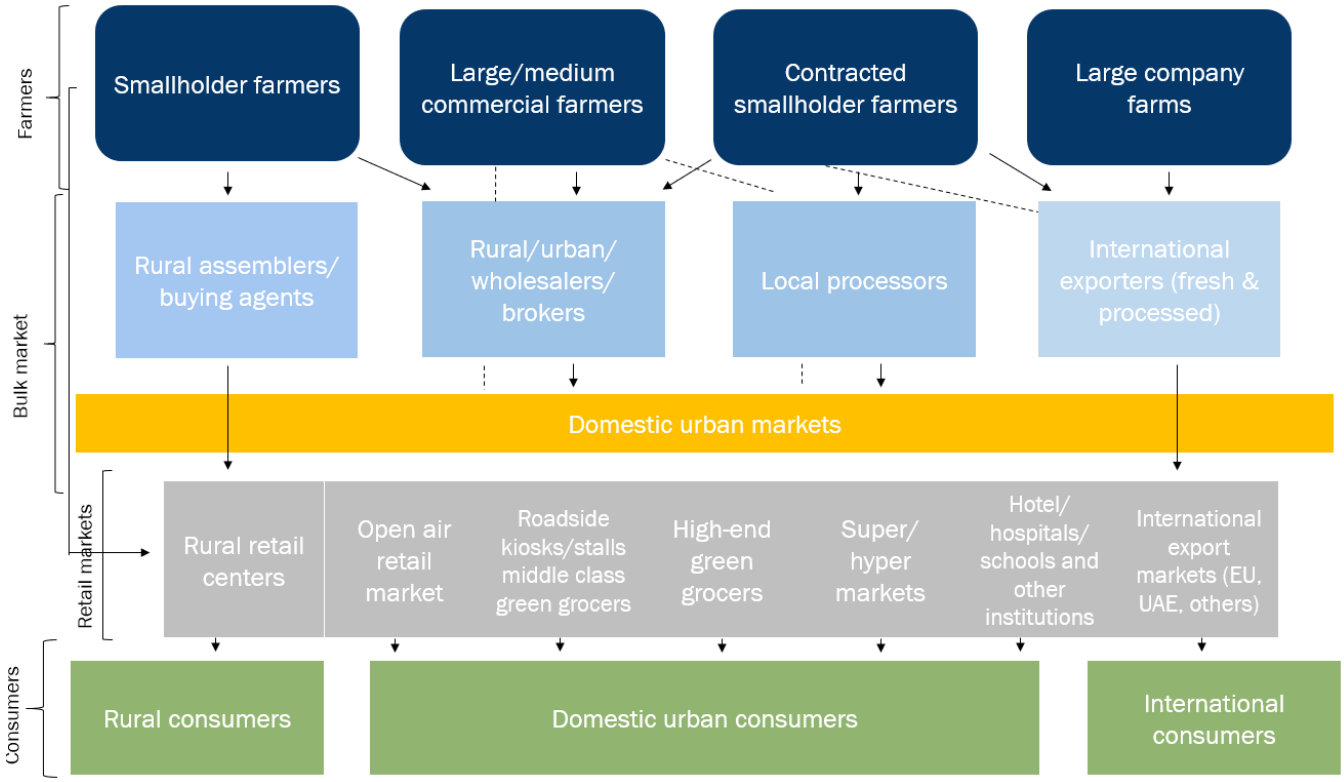
Source: Adopted from Bhorat et al. (2019).

Figure 12 maps out the large number of actors in Uganda's FFV value chain. The chain starts with production (farmers) to processors and then exporters. The processors in this case are the FFV firms, and the processing alluded to is primary in nature: washing, sorting, and grading. Our firm survey findings reveal that FFV firms are integrating backwards into production as a government requirement for all exporters because it easier for a firm to ensure compliance to sanitary and phytosanitary standards if it is producing the commodity itself. Subsequently, firms are purchasing land to begin production in the medium term. Once they begin production, agronomists will be required to manage the production activities. One of the respondents mentioned that own production already accounts for 30 percent of the total volume exported.

Nonetheless, the value chain is dominated by smallholder farmers in the southern, central, and eastern regions of Uganda who do much of the production. Pineapples and mangoes are the most developed and widely grown commodities in the fruit chain. However, much of what is produced is consumed locally. After harvesting, some of the produce is purchased at the farm while the remaining produce is transported to either rural or urban market centers. Post-harvest technologies are absent for locally consumed FFV. However, fruits exported to Europe and other destinations, like pineapples and avocados, are graded and packaged according to export standards. Currently, there are about 64 companies in Uganda exporting FFVs on a daily basis.[34]

[34]Mbabazi, J. (2020). Horticulture exporters turn to Kenya to export perishables. Article in the Daily Monitor published on Tuesday February 25, 2020

Figure 12: Fresh fruit and vegetable commodity value chain



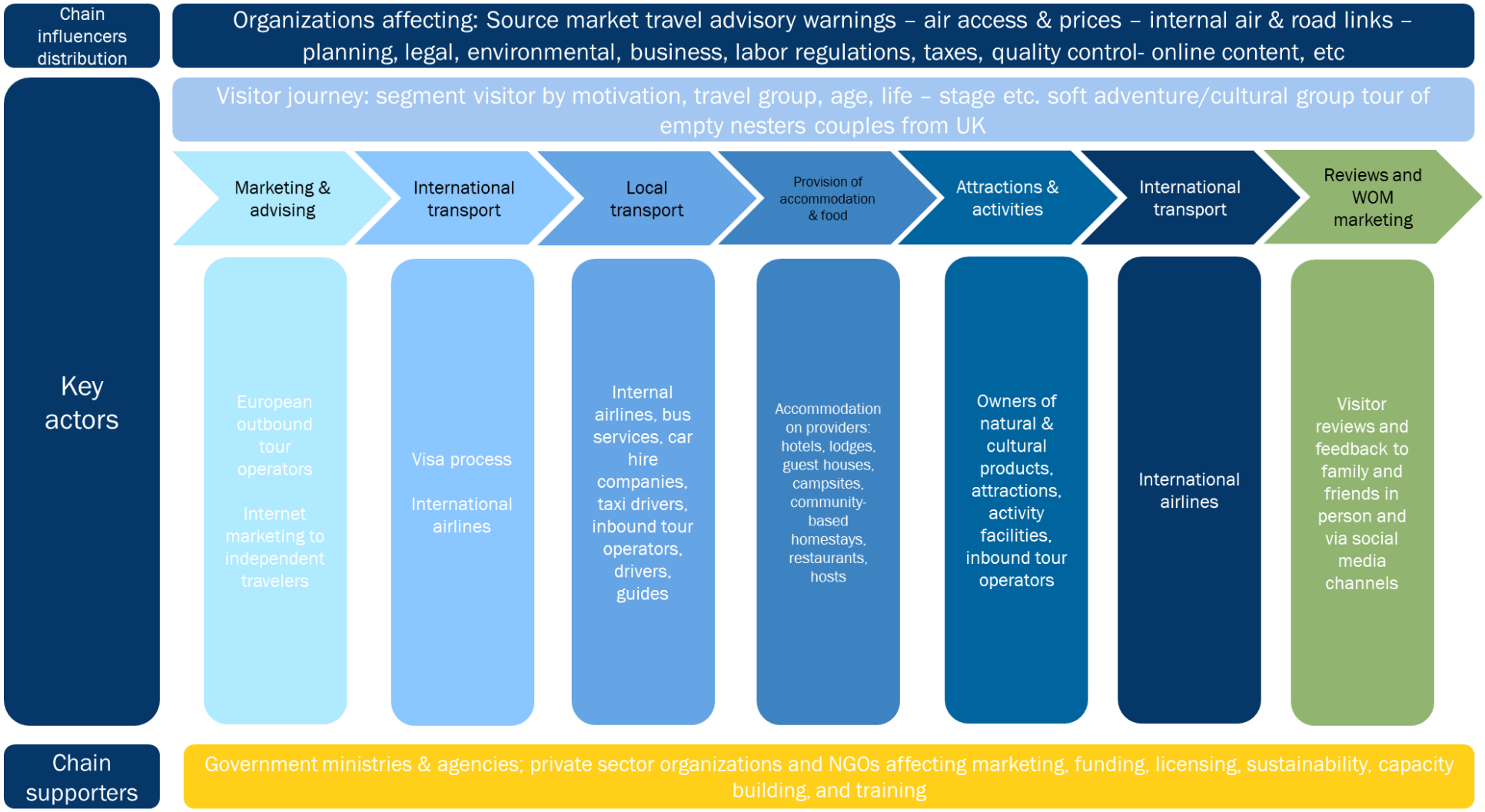
Source: Dijkxhoorn et al. (2019).

8.1.3 Tourism value chain

Figure 13 illustrates the structure of Uganda's tourism value chain. The tourism value chain actors fall under four broad categories (UIA 2016), and most of the actors within are private firms. These categories include: (i) hotel and accommodation services—there are about 2,066 registered accommodation facilities; (ii) tour and travel operators—there are currently about 400 operators, of which 80 percent are registered members of the Association of Uganda Tour Operators (AUTO) (Ministry of Foreign Affairs (MoFA) 2020)[35]; (iii) tourism auxiliary service providers—this category includes producers of promotional materials; organizers of international and internal travel markets and trade fairs; and local craft shops; and (iv) airlines and overland transport service providers. There is a direct flight to Uganda from the main outbound markets in Western Europe available on two airlines (Brussels Airline and KLM) (MoFA 2020). Uganda revived her national carrier (Uganda Airlines) and started her operations in 2019. In addition, the value chain has influencers who affect the regulatory framework through legislation, tax regimes as well as infrastructure at the international, national, regional, and local levels (MoFA 2020).

[35] Ministry of Foreign Affairs (2020). Analysis of the Tourism Value Chain in Uganda. Final Report, Uganda

Figure 13. Structure of Uganda's tourism value chain



Source: Acorn Tourism Consulting Ltd (2020).

8.2 Insights from IWOSS firm-level surveys: What are the impediments to realizing their potential?

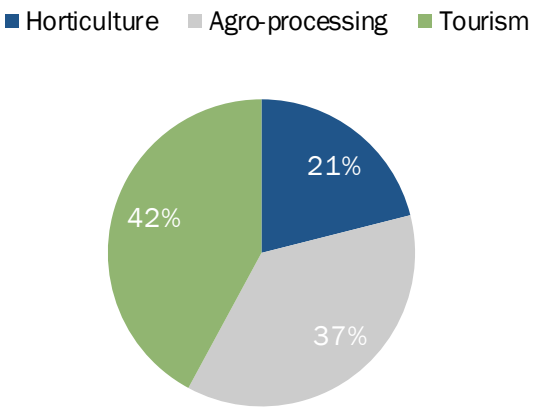
This section provides firm survey findings on the three value chains discussed in section 8.1. The findings are not for every segment of the value chain per sector but rather delve into specific components of the chain to supplement secondary analysis. Based on firm-level interviews, occupations, education levels and skill requirements for employed youth are analyzed. We also estimate a skill gap to provide insights into specific value chains gaps that youth need to fill to ensure they are competitive in the job market, and analyze the role of digital skills in facilitating employment potential.

Findings from 19 firms covering the IWOSS sectors tourism, agro-processing, and horticulture are utilized, and findings are provided at sample level. The key limitations of the analysis are: (i) the sample is not representative of the entire sector and, hence, the firm-level analysis should not be generalized for an entire value chain; (ii) there is a possibility that firms indicate employed youth numbers for those 18-30 years rather than 15-24 years as per project requirements.

8.2.1 Survey design and sample

To fill the gap in the preceding quantitative analysis, especially regarding skills where education was used as the only measure, firm surveys were conducted to offer insights on skills available and needs at identified segments within each value chain. Specifically, soft skills that make a person/youth more employable are captured beyond educational attainment (such years of schooling completed). A sample of 19 firms covering three IWOSS industries were selected to conduct case studies at the firm level within each sector. More specifically, four firms were selected in horticulture (two flower exporters and two FFV exporters), seven agro-processing firms (mainly dealing in food processing), and eight hospitability firms under tourism (Figure 14). Due to COVID-19 movement restrictions and safety protocols, all firms were located within Kampala District (Uganda's capital city).

Figure 14: Sample of firms interviewed, %



Source: Authors' own calculations based on field survey data (2020).

We used the semi-structured questionnaire provided by Bhorat et al. (2019) which was slightly modified and used to capture basic information at sector level (number of employees by age, gender, education), activities being undertaken, occupational profile of employees by education requirements and skills (soft skills), and digital skills required for the top three occupations. Future occupation and skills needs were also explored. Skill were grouped into six broad categories that include: basic, social, problem, technical, systems, and resource management skills. A Likert scale scoring was used to rank the skills set required in each category (1-"*not important*"-5 '*very important*") among the employees per value chain. Further, the skills were also ranked based on the skills employees currently had. To estimate the skills deficit/gap, we take the difference between what is required and what is currently available among employees. A negative value implies over qualification (actual skill level is higher than the

desired level, no gap), while a positive value means that the employees are under qualified, which indicates a gap/deficit.

With regard to occupations, the three main occupations at the value chain-level in which the youth are employed were captured and ranked from 1-3. To easily put into context the occupations in the firm surveys with those in the secondary data analysis, we reclassified the specific occupations and grouped them according to the International Standards Classification of occupations (ISCO) as articulated by ILO (see Table 28 on how the survey classified the occupations).

Table 20: Classification of field survey IWOSS occupations as per ISCO

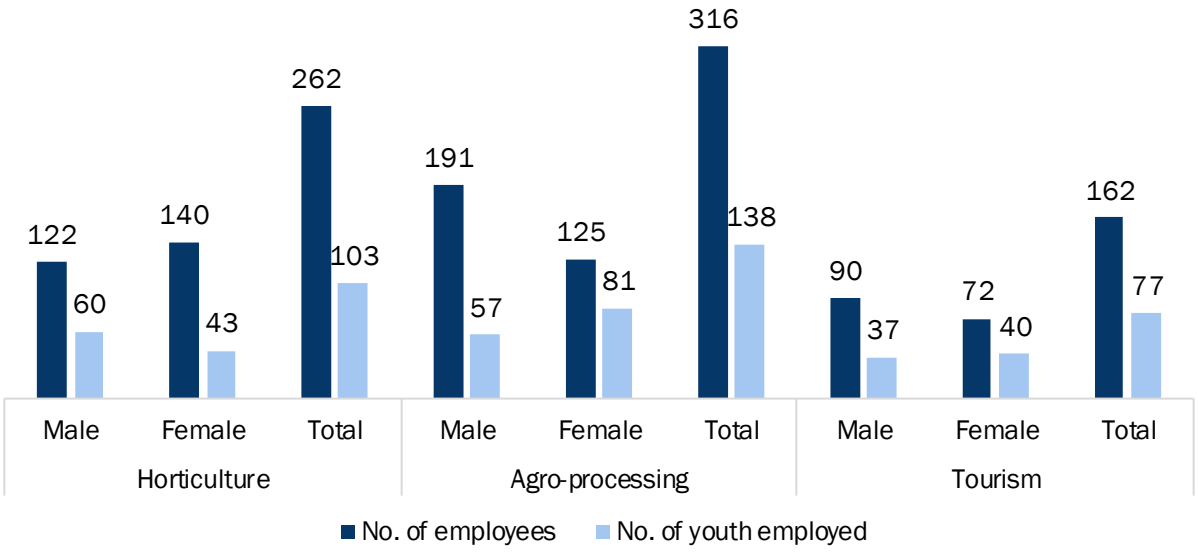
ISCO-Broad category/sectors	Horticulture	Agro-processing	Tourism
Technicians and associate professionals		Sales, distribution, quality control, inspection	Casino/gaming attendants
Clerical support workers			Receptionists/front desk officers
Service and sales workers		Drivers	Chefs, waiters, tour guides
Skilled agricultural, forestry, and fishery workers	Farm attendant, gardener, sorting/grading fresh vegetables, packaging, harvesting flowers	Packaging, dressing chicken, chicken rearing, brooder attendants	Compound maintenance
Plant and machine operators and assemblers	Construction/repair of green houses for flowers	Operating processing machines, operating hatcheries	
Elementary occupation		Cleaning	Cleaning, housekeeping, security (bouncers)

Source: Authors' own construct based on field survey data (2020).

8.2.2 Overview of employment by IWOSS sector and gender: Survey analysis

As seen in Figure 15, horticulture had the most employees and employs more females than males. In contrast, both agro-processing and tourism employ more men than women. Nonetheless, we note a higher share of female youth employed in the tourism sector (24.7 percent), while a higher number of male youth are employed in horticulture and agro-processing firms. Moreover, in comparison to other sectors, tourism firms employ a higher share of youth in their total work force (47.5 percent) compared to other IWOSS sectors (horticulture at 39.3 percent and agro-processing at 43.7 percent).

Figure 15: Number of employees by IWOSS sectors and sex



Source: Authors' own calculations based on field survey data (2020).

The next sub-sections discuss survey results at IWOSS sector level using the occupation classifications provided in Table 28.

8.2.2.1 Tourism

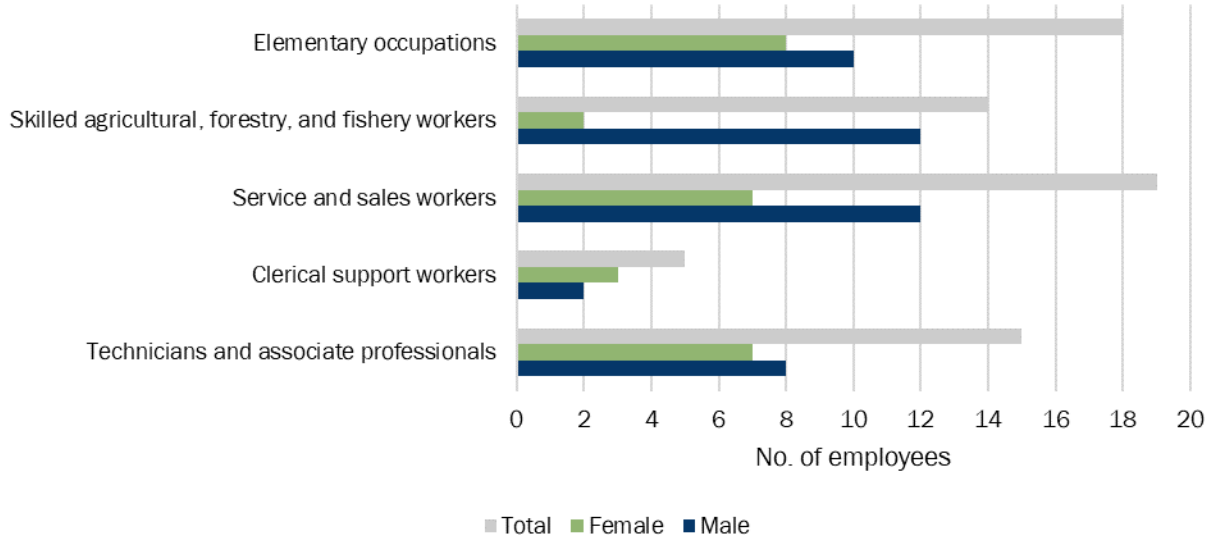
Using the international hotel classification, the eight hospitality firms in the survey (mainly hotels offering accommodation, food, and some tours) fell into the following star categories: 5*:1; 4*:1; 3*:1; 2* 1 as well as unclassified: 4. Two of the hotels were also offering additional services such as tour and excursions or gaming/casino activities. From the survey, the main economic activities that cut across all eight firms were: serving food and beverages; accommodation; laundry services; cleaning and room service; reception; and preparing food and beverages. The 5*, 4*, 3* and 2* hotels also provided transportation services to their clients.

We aggregate the results in the next discussion across employment, occupation, and skills profiles. Again, the findings are not representative of the tourism (or even the hotel) sector, but do, nonetheless, provide insights into the accommodation and food component of the tourism sector in the value chain.

Youth occupation distribution

The largest number of youth are employed as service and sales workers (19 in total, or 26.7 percent of the total youth employed in the hotels) followed by those in elementary occupations (18 in total, representing 25.4 percent (Figure 16). Disaggregated by gender, more male youth were employed as skilled agricultural, forestry, and fishery workers, as well as service and sales workers. Female youth were employed in elementary jobs, as service and sales workers, and as technicians and associate professionals. In the aggregate, the top three occupations irrespective of gender in which youth are engaged are elementary occupations; skilled agricultural, forestry, and fishery workers; and service and sales workers.

Figure 16: Youth occupational distribution by gender in tourism



Source: Authors' own calculations based on field survey data (2020).

Expected new jobs

During the survey, firms were asked whether they had plans of expanding their operations in the medium and long term, and the new occupations that might come up as a result of the expansion. In tourism, hoteliers reported that three main new occupations expected to be created were housekeepers/baristas (2), concierge (1), and IT (3) persons. IT persons would be required to do digital-related tasks.

Skills availability levels

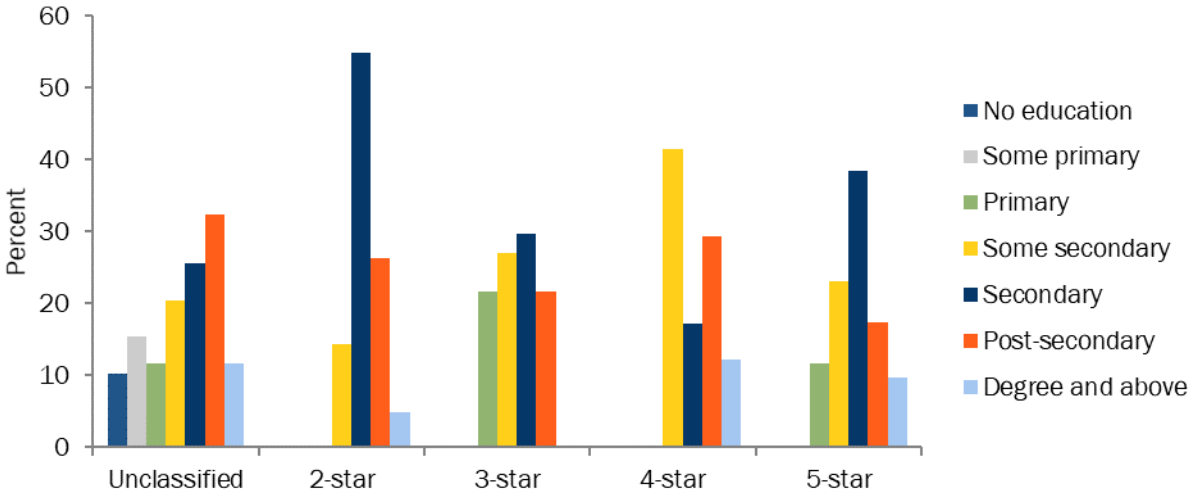
The current skills (education) levels by hotel classification indicate that at least for the classified hotels, none employ youth without any formal education and a vast majority of the youth employed in 2*, 3* and 5* hotels also have completed secondary education. The majority of the youth employed by the 4* hotels in the sample had some secondary education (Figure 17). Generally, there was variation in skills/education requirements by hotel classification. For example, the unclassified hotels employ workers with a range of skills, including degree level.

Given that staff professionalism is one of the criteria used to classify hotels, employees in such classified hotels have completed at least a secondary level of education while unclassified hotels have some employees with no education. Furthermore, hotel classification has implications on wages paid to employees. Although there is no established minimum wage in the sector, there is an established salary range provided for each occupation.[36] Consequently, wages in classified hotels are higher than those in unclassified ones. Importantly, the issue of employment in Uganda is not only a matter of unemployment but also one of *decent* employment. These surveys reveal that, in order to secure

[36] Paylab (*undated*). Salaries in the category: Tourism, Gastronomy, Hotel Business in Uganda. Available at: https://www.paylab.com/ug/salaryinfo/tourism-gastronomy-hotel-business

decent work in this subsector, youth need to acquire at least secondary education for them to be able to work in classified hotels where they can get better pay.

Figure 17: Education levels by hotel classification



Source: Authors' calculations based on field survey data (2020).

Furthermore, Table 29 reveals that the majority of the youth employed as clerical and support workers have at least completed post-secondary education (54.5 percent), with more female youth having completed a degree compared to their male counterparts. Among service and sales workers, the majority had completed secondary (42.9 percent), males contributing a higher share to this skill level while skilled agricultural, forestry and fishery workers had completed primary (57.1 percent). With regard to elementary occupations, most had lower skills, implying that this occupation does not necessary demand high levels of skills. All the top three job types had at least some level of education.

Table 21: Education levels by occupation and sex in the tourism sector, %

Job type	Sex	Some primary	Completed primary	Some secondary	Completed secondary	Post-secondary	Degree plus
Clerical support workers	Male				9.1	27.3	9.1
	Female					27.3	27.3
	Total				*9.1*	*54.5*	*36.4*
Service and sales workers	Male			4.8	28.6	14.3	9.5
	Female				14.3	19.0	9.5
	Total			*4.8*	*42.9*	*33.3*	*19.0*
Skilled agricultural, forestry, and fishery workers	Male		50.0	28.6	7.1		
	Female		7.1	7.1	0.0		
	Total		*57.1*	*35.7*	*7.1*		
Technicians and associate professionals	Male				28.6	21.4	7.1
	Female				7.1	21.4	14.3
	Total				*35.7*	*42.9*	*21.4*
Elementary occupations	Male	4.9	4.9	17.1	9.8	7.3	2.4
	Female	9.8	14.6	7.3	9.8	12.2	4.9
	Total	*14.6*	*14.6*	*24.4*	*19.5*	*19.5*	*7.3*

Source: Authors' own calculations based on field survey data (2020).

Skill capabilities required by occupation

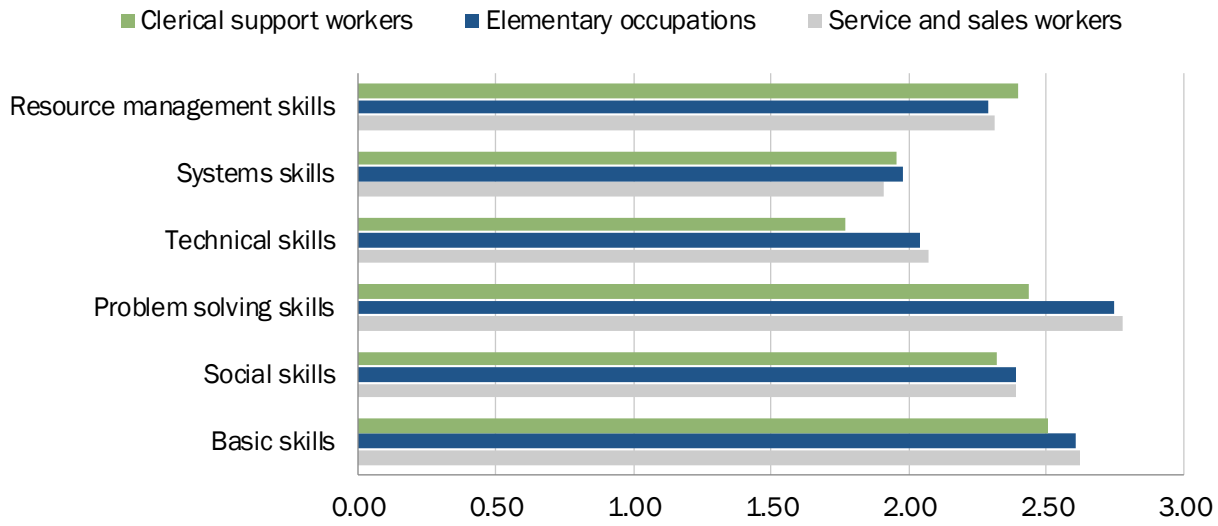
For the top-three critical occupations in each firm, respondents (managers/human resource managers) were asked to rank, using a Likert scale from 1 "*Not important*" – 5 "*Very important,*" the kind of soft skills they deem vital for successful job execution. The scores were averaged based on which skill group[37] each individual skill belonged. In order to interpret the average scores across skills requirements, five categories with a range of 0.8 were created (Table 30).

Table 22: Score ranges and their description

Category	Score range	Description
1	1.00 – 1.80	Not important
2	1.81 – 2.60	Somewhat not important
3	2.61 – 3.40	Important
4	3.41 – 4.20	Somewhat important
5	4.21 – 5.00	Very important

Figure 18 highlights the required skill requirements by occupation type in tourism's hotels and hospitality subsector. Interesting to note is that *problem-solving skills* and *basic skills* were important for elementary occupations and service and sales workers while the rest of the skills such as resource management, system skills, technical skills, and social skills were considered *somewhat not important* for all the occupations in the hotel value chain for the youth (Figure 18).

Figure 18: Importance of skills by occupation using O*NET classification in tourism-hotels



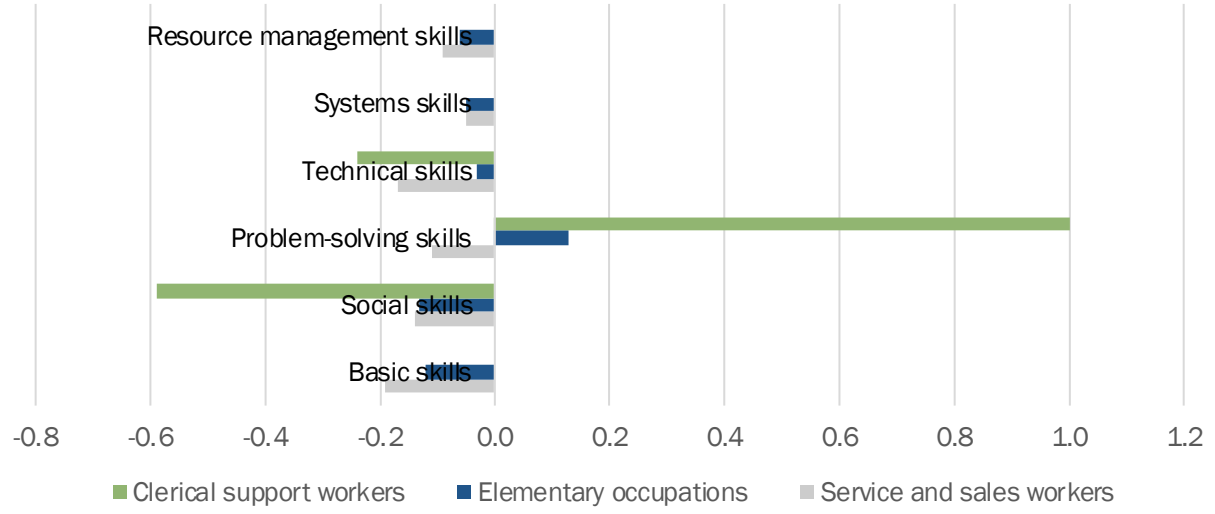
Notes: Likert scale range: 1.00 – 1.80 "Not important"; 1.81 – 2.60 "Somewhat not important"; 2.61 – 3.40 "Important"; 3.41 – 4.20 "Somewhat important"; 4.21 – 5.00 "Very important"
Source: Authors' own calculations based on field survey data (2020).

[37] The skills groups were based on the O*NET classification and fall into six categories: **Basic skills:** This refers to skills that facilitate learning or the more rapid acquisition of knowledge. **Social skills**: This refers to skills that are used to work with people to achieve goals. **Problem-solving skills**: This refers to skills that are used to solve novel, ill-defined problems in real-world settings. **Technical skills:** This refers to skills that are used to design, set-up, operate, and correct malfunctions involving application of machines or technological systems. Systems Skills: This refers to skills that are used to understand, monitor, and improve socio-technical systems. **Resource management skills:** This refers to skills that are used to allocate resources efficiently.

Skill gap

To estimate the skill gap, we computed the average difference between the desired and the actual skill level. A negative value implies overqualification (actual skill level is higher than the desired level), while a positive value means that the employees are underqualified. Generally, the surveys reveal that the youth are over skilled for the jobs they hold, with the exceptions of problem-solving and systems skills for certain jobs (Figure 19). For instance, youth working in elementary occupations and clerical support workers had skill gaps in problem-solving skills, which reflects the problem of overemployment being a big challenge in Uganda.

Figure 19: Skill gap in by occupation type



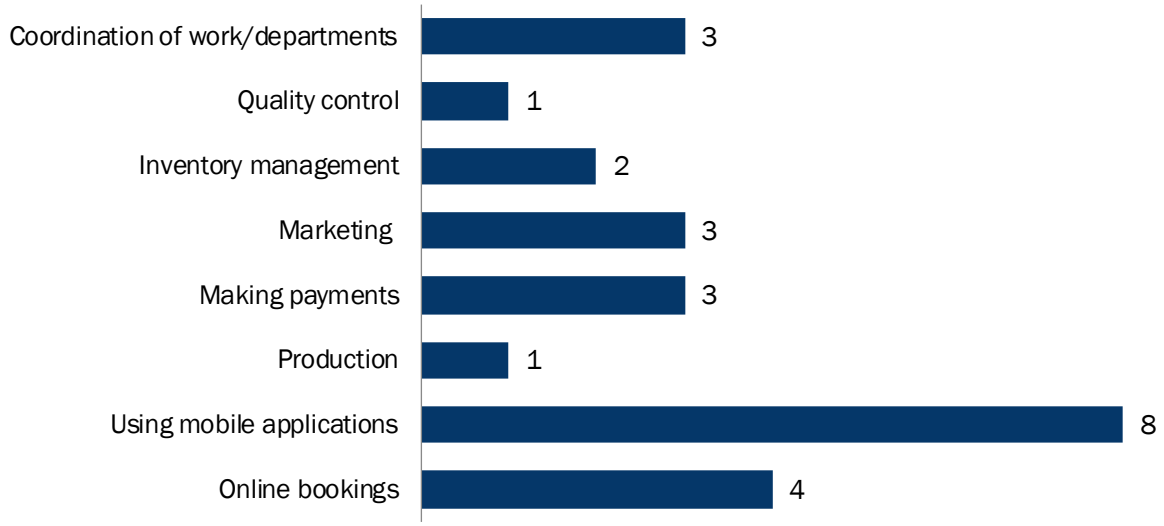
Source: Authors' own calculations based on field survey data (2020).

Future digital skills needs

Figure 20 shows the digital skills that the tourism sector and especially hotels perceive as important in their future operations. All eight sampled hotels, irrespective of classification, indicated that digital skills in use of mobile phones were required. At least half indicated that digital skills will be required in their employees for online booking while only three firms predicted a need for digitalization in areas of marketing, making payments, and coordination of work among departments. Other areas of technology needs included quality control, production, and inventory.

In conclusion, classified hotels employ youth with higher skills than unclassified ones. Only five jobs were expected to be created in the short term. The youth seemed to be overqualified in certain skills for certain jobs especially in basic, social, and technical skills but with skill gaps in problem-solving skills, especially those in elementary occupations and clerical support work. All hotels indicated that they would require digital skills in mobile applications while half of them expressed the same need in making online bookings. Some of the heterogeneities in future occupations, skills deficits, and digital needs lie in the differences in categorization of hotels and services they offer.

Figure 20: Number of hotels that require future digital skills by skill type



Source: Authors' own calculations based on field survey data (2020).

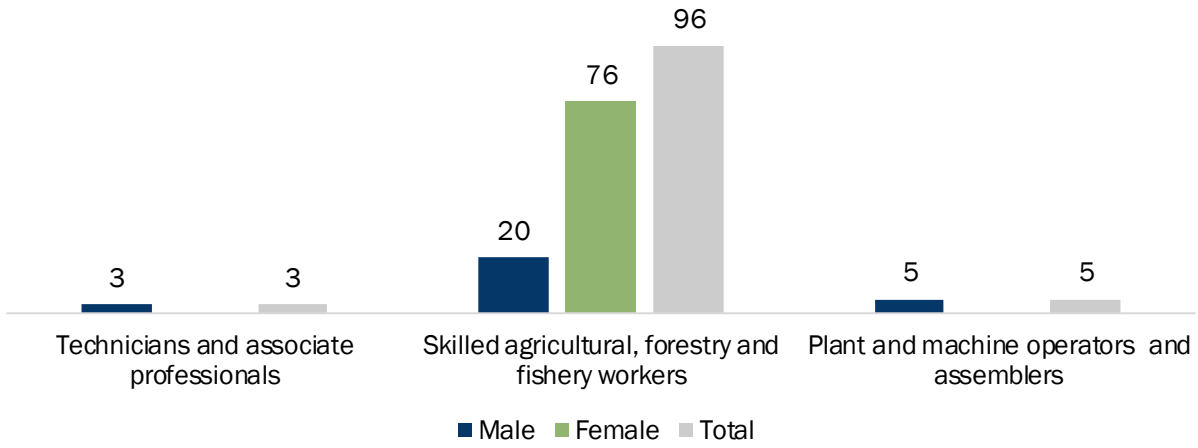
8.2.2.2 Horticulture

In the horticulture value chain, as already highlighted, two flower and two FFV firms were surveyed. The main economic activities that all firms were engaged in were production, primary processing, and packaging. Other activities include training of farmers in order to ensure compliance to SPS; transportation of the exportable commodities; and construction of shades and greenhouses, especially for flower farms.

Youth employment

The largest number of the youth (96) is employed as skilled agricultural, forestry, and fishery workers, most of whom are female (Figure 21). The activities that constitute skilled agricultural, forestry, and fishery workers include garden work (weeding, spraying, harvesting), sorting, and packaging. The occupation category with the second-largest number of youth is plant and machine operators and assemblers. The job involves picking farm produce from farmers (for FFV) and construction of greenhouses (for flower firms) and this is majorly occupied by male youth. The three occupations in horticulture that most employ youth are plant and machine operators and assemblers, skilled agricultural, forestry, and fishery workers, and technicians and associate professionals.

Figure 21: Youth occupational distribution by gender in the horticultural sector



Source: Authors' own calculations based on field survey data (2020).

Expected new jobs

During the survey, we asked firms whether they had plans to expand their operations in the medium and long term, and of new occupations that might come up as a result of the expansion. In addition to IT personnel, other expected new occupations in the horticulture industry include quality controllers, agronomists, and irrigation specialists. Horticultural firms, particularly FFV firms, reported that they would integrate backward into production as a requirement by the government for all exporters. Subsequently, the firms would need agronomists and irrigators who will be engaged in production of FFV (Figure 22). As indicated in section 7.1.2, about 64 firms are involved in exporting FFV on a daily basis. Since these firms would be required to engage in own production, there is likely to be an overwhelming demand for agronomists and irrigators, presenting both an opportunity and a challenge. The opportunity is that new occupations[38] and, hence, new jobs will be created. The challenge is that Uganda is already grappling with a shortage of extension workers, which calls for training of more youth to do the anticipated jobs. In addition, survey respondents indicated that there is need for government to reduce taxes on irrigation equipment to make them affordable for FFV producers.

Figure 22: Number of horticulture firms that require future digital skills by skill type

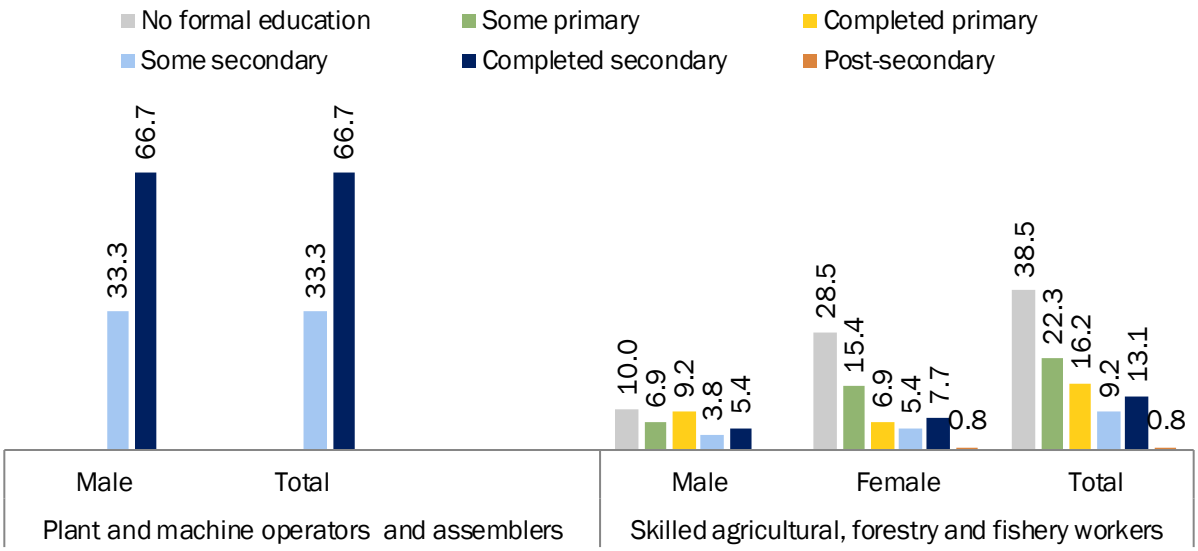
Source: Authors' own calculations based on field survey data (2020).

[38] Agronomists with a specialization in FFV production and irrigators which has been a minor occupation in Uganda

Youth skill levels by occupation

From Figure 23, most of the youth employed as plant and machine operators and assemblers were male with the majority of them having completed secondary education. The skilled agricultural, forestry, and fishery workers category was biased towards female workers, most of which had no formal education (28.5 percent females and 10 percent males). Generally, this category of occupation was characterized with low skill levels.

Figure 23: Youth level of education by sex and occupation, %

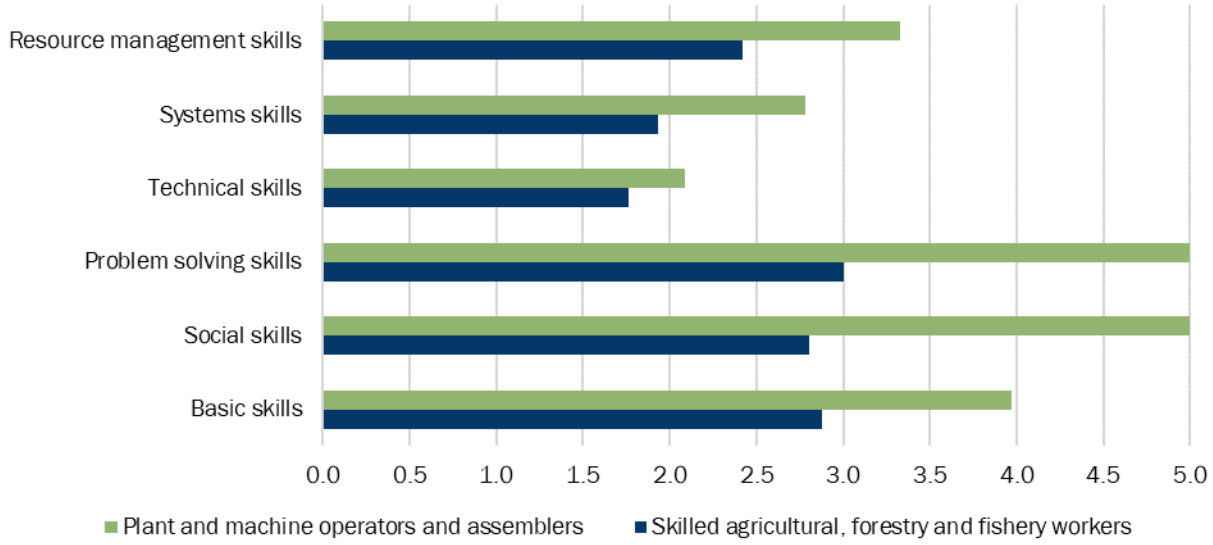


Source: Authors' own calculations based on field survey data (2020).

Skill capabilities required

According to survey respondents, problem-solving skills and social skills are considered very important and are required for youth employed as plant and machine operators and assemblers (Figure 24). Basic skills for this occupation are somewhat important, while systems and resource management skills are important for the same occupation. Considering skilled agriculture, forestry, and fishery workers, problem-solving skills, basic skills, and social skills were perceived important while technical skills were not required—hence not important—and resource management and systems skills were somewhat not important.

Figure 24: Importance of skills by occupation using O*NET classification

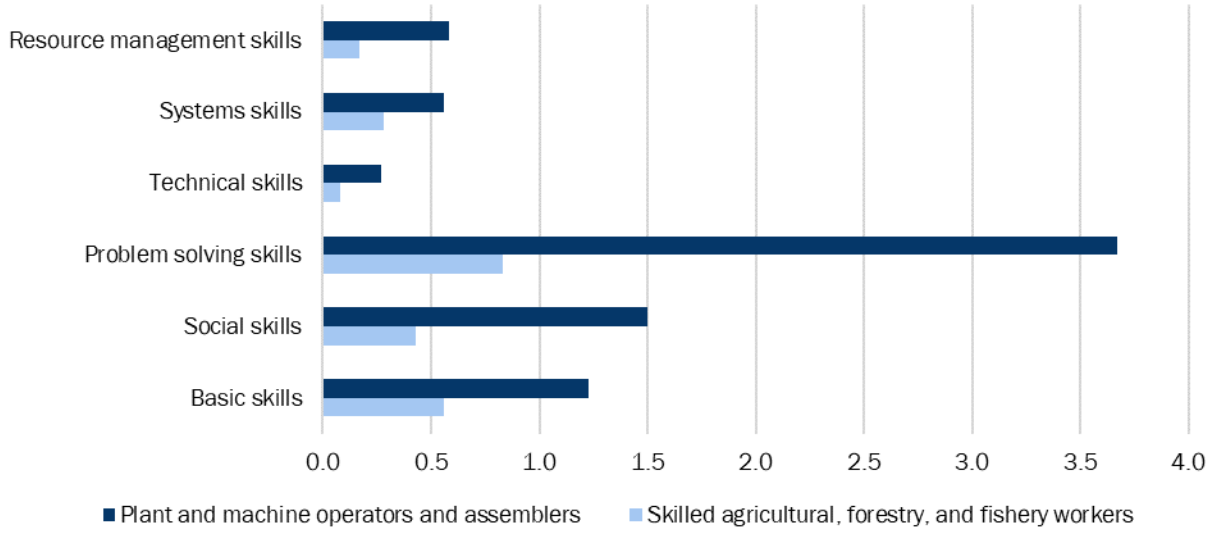


Notes: Likert scale range: 1.00 – 1.80 "Not important"; 1.81 – 2.60 "Somewhat not important"; 2.61 – 3.40 "Important"; 3.41 – 4.20 "Somewhat important"; 4.21 – 5.00 "Very important"
Source: Authors' own calculations based on field survey data (2020).

Skill gap

In the horticulture sector, the youth had significant skill gaps in soft skills for the main occupations. For both plant and machine operators and assemblers, and skilled agricultural, forestry and fishery workers, the skill gap was widest with respect to problem-solving skills (3.67 and 0.83, respectively). Overall, plant and machine operators have the widest skill gap with respect to all soft skills compared to skilled agriculture, forestry, and fishery workers (Figure 25).

Figure 25: Skill gap in the horticultural sector

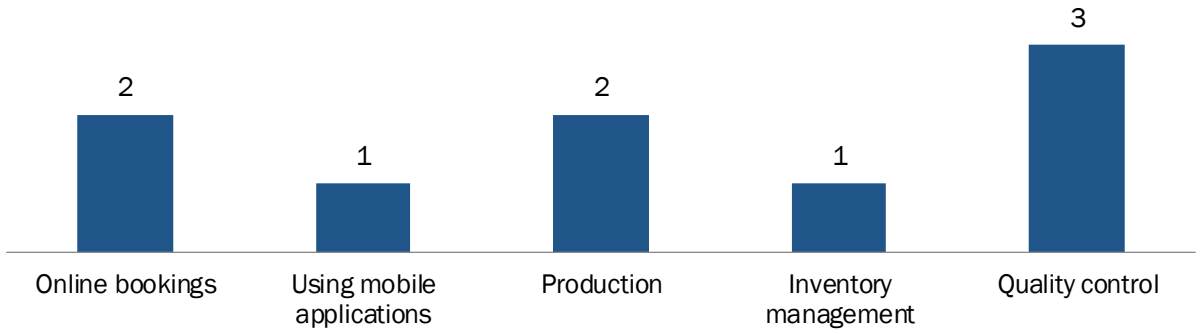


Source: Authors' own calculations based on field survey data (2020).

Future digital skills needs

In horticulture, digital skills in production will involve use of computerized mechanisms in the production of FFVs and flowers because most of the compliances to SPS begin at the farm during production, hence the need for digitalized production systems. Three horticultural firms reported requiring digital skills to regulate/control quality of the products. Two of the horticultural firms indicated a need for digitalization in online bookings to enhance business flows and customers (Figure 26).

Figure 26: Number of firms by digital skills requirement field



Source: Authors' own calculations based on field survey data (2020).

In conclusion, it is important to note that skills and occupation needs are different in the horticulture sector, especially when we differentiate between flowers and FFV sub-sectors (see Annex A, Table 36). As expected, most youth in the surveyed firms were relatively uneducated, either because higher levels of education or skills were not required for the jobs available, or the need for affordable labor compelled firms to hire youth informally who are not educated and for whom social protection requirements (such as monthly contributions by employers to employees' National Social Security Fund) can be over looked. Problem-solving skills deficits were found in most occupations in horticulture. There is a need for digital skills where technology is required for quality control given the nature of the sector especially in export businesses where standards have to be met.

8.2.2.3 Agro-processing

Of the eight agro-processing firms interviewed, most are engaged in food processing (e.g., juice making, mixing feeds/milling, meat/chicken processing, baking); transportation and sales/distribution of finished products; collection of milk and fruits; and training farmers (Figure 27). The survey targeted medium- and large-scale firms.

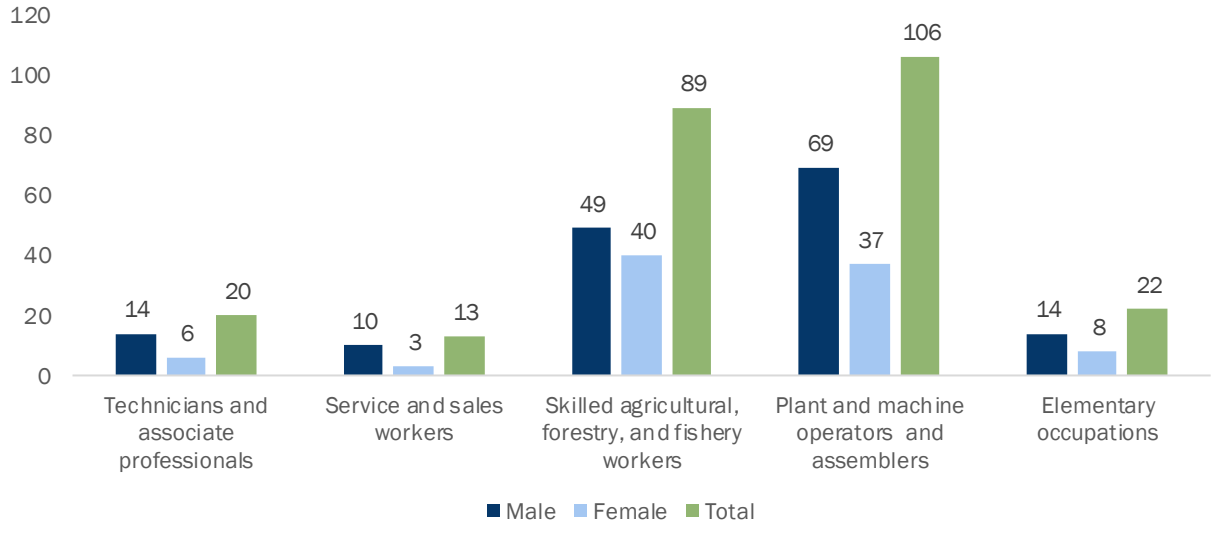
Figure 27: Number of firms by main economic activities

Source: Authors' own calculations based on field survey data (2020).

Youth employment by occupation

Both the medium- and large-scale agro-processing firms largely employ youth as plant and machine operators and assemblers as well as skilled agricultural, forestry, and fishery workers (Figure 28). A disaggregation by sex reveals that a higher number (share) of male youth than female youth are employed in agro-processing firms across all job types From Figure 28, we note that the three occupations with the largest proportion of youth are plant and machine operators and assemblers; skilled agricultural, forestry and fishery workers; and elementary occupations irrespective of gender.

Figure 28: Occupational distribution of jobs in the agro-processing sector by gender



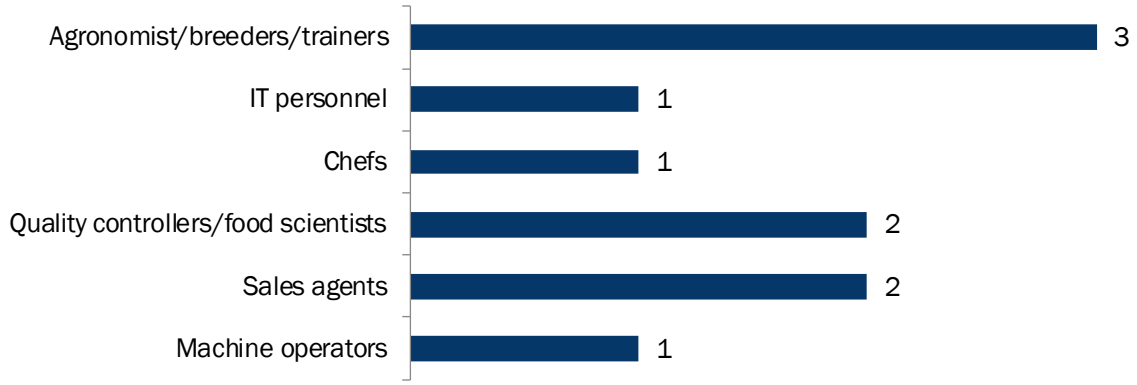
Source: Authors' own calculations based on field survey data (2020).

Expected new occupations

During the survey, we asked firms whether they had plans of expanding their operations in the medium and long term, and the new occupations that might be created as a result of the expansion. Most (3) agro-processing firms reported that the critical new occupation would be training farmers to improve

the quality of their produce. For example, a milk processing firm reported that they would need trainers to train livestock farmers at best milk handling practices (Figure 29).

Figure 29: Expected new occupations reported by agro-processing firms that require future digital skills by skill type



Notes: The one chef was mentioned by Mukono bakery, an agro-processing firm. The firm has future plans of opening up eating centers where they can sell their products as well as offering restaurant services. That plan would require the hiring of a chef.
Source: Authors' own calculations based on field survey data (2020).

Firms in the agro-processing sector exhibited heterogeneities in skills requirements by job type (Table 31). At least 6 percent of female workers in skilled agricultural, forestry, and fishery had no formal education while most had some secondary education, and some had completed secondary. All service and sales workers had some secondary education and above while the majority of those working in elementary occupations, as technicians and associate professionals, or as plant and machine operators and assemblers had completed secondary education (40.9 percent, 39.4 percent, and 36.9 percent, respectively) with male youth dominating these categories.

Table 23: Education levels by occupation and sex in the agro-processing firms, %

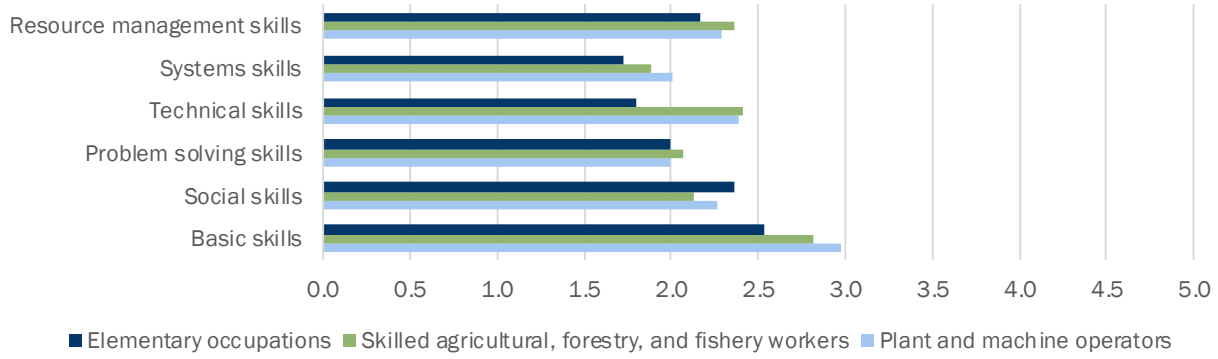
Job type	Sex	No formal education	Some primary	Completed primary	Some secondary	Completed secondary	Post-secondary	Degree plus
Service and sales workers	Male				22.2	16.7	22.2	11.1
	Female				5.6	11.1	11.1	
	Total				*27.8*	*27.8*	*33.3*	*11.1*
Plant and machine operators and assemblers	Male		12.3	7.7	6.9	28.5	3.1	3.1
	Female		3.8	5.4	16.9	8.5	1.5	2.3
	Total		*16.2*	*13.1*	*23.8*	*36.9*	*4.6*	*5.4*
Skilled agricultural, forestry, and fishery workers	Male		14.0	8.8	11.0	14.7	4.4	2.2
	Female	5.9	7.4	5.1	11.0	11.8	2.2	1.5
	Total	*5.9*	*21.3*	*14.0*	*22.1*	*26.5*	*6.6*	*3.7*
Technicians and associate professionals	Male				15.2	24.2	21.2	6.1
	Female				0.0	15.2	9.1	9.1
	Total				*15.2*	*39.4*	*30.3*	*15.2*
Elementary occupations	Male			9.1	18.2	36.4		
	Female			18.2	13.6	4.5		
	Total			*27.3*	*31.8*	*40.9*		

Source: Authors' own calculations based on field survey data (2020).

Skills importance

Looking at only the top three important occupations in this sector, basic skills were considered important for plant and machine operators and assemblers as well as skilled agricultural, forestry, and fishery workers while the rest of the soft skills were perceived somewhat not important for the same occupations (Figure 30). Resource management skills, problem-solving skills, social skills, and basic skills were perceived to be somewhat not important for youth with elementary occupations while technical skills and systems skills were considered not important for those in the same occupations in the agro-processing sector.

Figure 30: Importance of skills by occupation using O*NET classification in the agro-processing sector

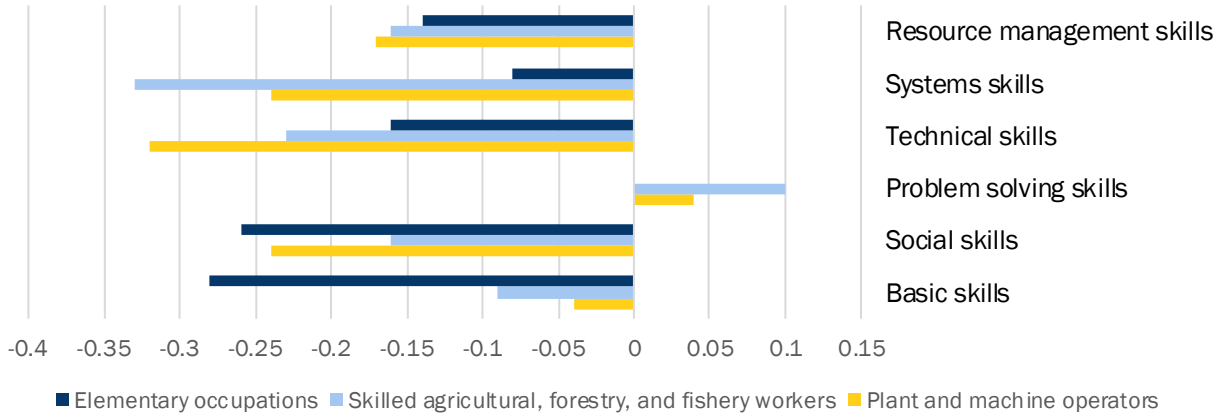


Notes: Likert scale range: 1.00 – 1.80 "Not important"; 1.81 – 2.60 "Somewhat not important"; 2.61 – 3.40 "Important"; 3.41 – 4.20 "Somewhat important"; 4.21 – 5.00 "Very important"
Source: Authors' own calculations based on field survey data (2020).

Skill gaps

Generally, for all the occupations, respondents noted that current youth employees are overqualified with respect to most soft skills other than problem-solving skills. In those cases, the gap/deficits were noted for youth employed as plant and machine operators and assemblers, and skilled agricultural, forestry and fishery workers (Figure 31). For elementary occupations, problem-solving skills were not required.

Figure 31: Skill deficits in agro-processing firms

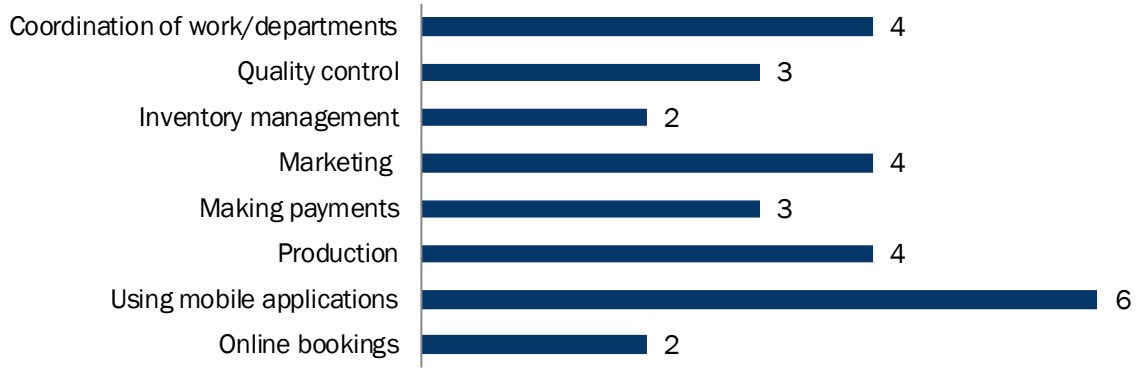


Source: Authors' own calculations based on field survey data (2020).

Future digital skills needs

As automatization progresses, digital skills will be needed for the production of primary raw materials. In agro-processing, digital skills for production involve knowledge on how to use automated machines. Agro-processing firms also highlight the need for digital skills in sales and marketing. Firms also mentioned the need to advance to digital advertising, which requires digital skills to expand market for their products (Figure 32). The firms mentioned that the regulations for health and safe food products are becoming more and more stringent, hence the need for technology helps to ensure compliance as well.

Figure 32: Number of firms by digital skills requirement field



Source: Authors' own calculations based on field survey data (2020).

In conclusion, there was a skills deficit with regard to problem solving in agro-processing firms. The sector requires a diverse set of future digital skills, especially in use of mobile phone applications. More future jobs are expected for agronomists as firms expand to start own-production to meet export needs. By and large, there is still room for employment of low-skilled workers in IWOSS industries, as indicated by a substantial number of youth employees with no/low levels education. IWOSS firms have future plans of recruiting IT personnel, which is an indicator that firms plan to digitalize their operations. However, this might have implications for the number of youth employed. There is no skill gap for most occupations except problem solving which is reported in all the industries.

9. Policy implications: Unlocking Uganda's IWOSS growth potential and overcoming skill gaps

Uganda continues to be still plagued with persistently high unemployment and underemployment challenges. Jobs being created (especially for the youth) are not enough to absorb the rapidly growing labor force. The analysis presented in this paper furthermore indicates that structural transformation in the country has been stagnant and the importance of the manufacturing sector as an employer has been declining considerably over the years. IWOSS sectors might be a viable substitute in the role of manufacturing in Africa given they are tradeable, have high value-added per worker, and reveal economies of scale, but they are currently not growing fast enough to replace the role of non-IWOSS sectors like low-productivity agriculture in providing jobs or to make up for the role of manufacturing

in driving the structural transformation process in Uganda, although employment in these sectors is growing faster than in non-IWOSS sectors.[39]

The insufficient growth of IWOSS sectors could be attributed to a number of challenges, most of which relate to the business environment. In fact, IWOSS sectors are largely formal enterprises and hence feel challenges in the business environment more keenly, particularly those that relate to trade and the regulatory environment.

Nonetheless, Uganda is on a growth path in which IWOSS sectors are increasingly driving the process of structural transformation. For example, it is evident from the findings that there has been a shift towards services, especially *finance, business and professional services, transport, ICTs, and tourism*. Employment creation in the formal sector activities is slow and sometimes even declining while a shift to informal sector activities mainly in trade (excl. tourism) is taking place. Like with the rest of the working-age population (15-64 years), many youth (15-24 years) are increasingly engaging in informal activities. We also note gender differences in participation, particularly in construction, mining, and agro-processing, as they have very few female workers. Altogether our analysis suggests stagnant worker participation in low-productivity services.

IWOSS activities such as finance, business, and professional services in this analysis are found to employ workers in jobs that require higher-level skills, while non-IWOSS activities mainly provide employment for low-skilled workers. Overall, non-IWOSS sectors still employ the majority of Ugandans—as sectors such as agriculture and informal trade (categorized as non-IWOSS) are Uganda's biggest employers, including of the youth. However, some IWOSS sectors—including ICTs, finance, business and professional services, and agro-processing—exhibited higher *potential* for employment than manufacturing.

This paper analyzes eight IWOSS sectors using labor force surveys, including agro-processing; horticulture and export crops; tourism; transport; maintenance and repairs; finance, business and professional services; and formal trade (excl. tourism). Here, we estimate future employment potential and occupation and skill gaps.

Furthermore, the paper considers three specific IWOSS sectors primed to drive sustainable and inclusive structural transformation in Uganda: horticulture, agro-processing, and tourism. Unfortunately, employment creation in the three specific IWOSS sectors is slow, suggesting a slow future labor demand in these sectors. All three sectors, and tourism in particular, employ and will require skilled workers in the future. This paper also shares the results of firm surveys within each value chain of the three selected IWOSS sectors and estimates the potential employment, occupation, and skills requirements and gaps among the youth. The nature of digital skills required for future/new occupations was identified. Tourism and horticulture increasingly employ low-skilled youth. Drawing from these firm survey results, with respect to soft skills, we find a gap in problem-solving skills and that digital skills will be paramount for future occupations. Therefore, the government should ensure that both learning and training curriculums incorporate both digital and problem-solving skills. Such a push could eradicate the skills mismatch reported by employers as one of the obstacles to their operations.

[39] 4.9 percent annualized increase for IWOSS versus 3.9 percent for non-IWOSS (cf. Table 7 of this paper).

Through the establishment of special economic zones (SEZs), the Ugandan government introduced fiscal incentives that would improve the performance of firms and/or attract new ones. However, the incentives have not achieved the intended goal. A 2019/20 performance report revealed that free zone operators still face challenges including high cost of finance, poor roads, volatile exchange rates, high cost of water and electricity and persistent outages, administrative delays including licensing, allocation of land. Dealing with such challenges requires public investment and policy interventions: For instance, there is need for improving transport and communication infrastructure through increasing and improving the roads network and reducing the cost of internet and mobile phone usage; reducing the cost of electricity and power outages; and increasing budget allocation to agriculture, which will eventually increase financing to agribusiness firms. In addition, government needs to adopt technologies that can reduce the number to days required to make clearance at customs and shorten the licensing application procedures.

9.1 Policy recommendations to drive growth in selected IWOSS sectors

Having noted that the importance of manufacturing in Uganda is declining in many ways (e.g., GDP, employment, and exports) while IWOSS sectors are gaining ground (though at a slow pace), there is need to channel support towards select IWOSS sectors to increase their pace of growth and realize their job creation potential. The following considers each of the three selected sectors and provides specific policy recommendations to achieve this goal.

Horticulture

As a first priority, government needs to intensify training for extension workers with a specialization in horticulture. Extension workers will also need to be equipped with irrigation technology necessary for most horticultural production.

Since the majority of the sector's produce (e.g., cut flowers, fresh fruit and vegetables, coffee, and tea) is exported to high-value markets in the EU or the U.S., it is paramount that government addresses barriers to continuously access these markets. The following should be priorities:

- Address non-tariff barriers, such as delays, high transport costs, and burdensome procedures when trading;
- Increase testing capacities in the country, allowing producers to verify that products are safe for human consumption;
- Ensure that access to inputs (e.g. *Kraft* paper for packaging cut flowers) is possible at affordable cost through a sensible tariff regime.

Agro-processing

The current government focus of offering fiscal incentives (e.g., tax holidays) does not appear to be effective in stimulating investment in the agro-processing sector and also comes at considerable fiscal costs to the public in the form of revenue foregone that could be used to invest in infrastructure or education.[40] Additionally, there is evidence that the investment floor for local investors is too high (currently at $10 million) and should be lowered so that more willing investors qualify for these incentives.

Given these concerns, the government should instead concentrate on solving the rampant supply-side constraints (most notably in the special economic zones and industrial parks) as well as ensuring

[40] See Eissa, Manwaring, Ntungire and Rauschendorfer (2020) who estimate that the fiscal costs of tax incentives in Uganda is just below 1 percent of the country's GDP.

access to key markets for firms in the sector, allowing firms to develop economies of scale and employ more workers in the future. Specifically, government should concentrate on the following key issues:

- Provide avenues for more affordable access to credit (e.g., through reform of the banking sector, or financing schemes executed by the Uganda Development Bank);
- Provide a cheap and stable supply of water and electricity and reduce the cost of internet usage;
- Improve physical infrastructure (e.g., roads, border crossings etc.);
- Ensure that access to key growth market in the region is maintained and expanded through working with the East African Community and towards the implementation of the African Continental Free Trade Area;
- Reducing the cost of trading through investing in physical and digital trade infrastructure (e.g., One Stop Border Posts with neighboring countries, and an expansion of digital initiatives like the Uganda Electronic Single Window); and
- Ensure that agro-processors have access to imported inputs through an adequate tariff policy.

In addition, agro-processing is heavily reliant on the performance of the agriculture sector as a whole. Low productivity in agriculture ultimately leads to fewer raw materials for agro-processing firms to operate sustainably. Public and private investment in research and development and improved links between agriculture and businesses and markets are key for boosting production and productivity. While agriculture continues to be the- country's biggest employer, its structural growth is still low. Thus, revamping agro-processing along the value chain for higher value addition might encourage transitional employment from agriculture to agro-processing.

Tourism

To boost growth of the tourism sector, there is need to enhance the skills capacity of workers in the sector to ensure that the high demands of international clients are met with an adequately skilled work force. Government needs to invest in education to enhance the skills of the youth so that they are suitable for the available jobs. Specifically, government should incorporate problem-solving and digital skills in the training curriculum starting at the lower levels of education, particularly because even the sectors that employ low-skilled workers require these skills. Skilled workers are particularly needed in the tourism industry since employees have to relate/communicate with people from different parts of the world. Given that education influences the competitiveness of the tourism industry, it is worthy of government investment efforts. Digital skills in particular are needed for marketing efforts, managing online booking systems, and the like.

Beyond this focus on training the labor force, there is scope for the government to boost growth in the tourism sectors through the following recommendations (cf. Ahebwa and English 2018):

- Improve access roads to key attractions like Bwindi National Park;
- Manage and preserve the country's wildlife, by preventing poaching and enabling local villages to benefit from tourism; and
- Strengthen the brand of Uganda as a tourism destination through targeted marketing actions.

Across all sectors, in an effort to avoid future skill mismatches, policymakers must know where *future* jobs will be. This knowledge will enable the government to decide where to best devote resources intended to improve training. For instance, this study reveals that horticulture and tourism will require many skilled workers by 2029/30, meaning that government should target training efforts enabling youth to work in these sectors.

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Annex 1. Other analytical tables on sectoral decomposition of employment

Table 24: Overall employment by gender, 2012/13-2016/17

	2012/13					2016/17					Annual % growth	
	Employment ('000)			Employment share		Employment ('000)			Employment share			
All (15-65 years)	Females	Males	Total	Females	Males	Females	Males	Total	Females	Males	Females	Males
Overall total	3,639.1	4,424.9	8,064.0	45.1	54.9	4,115.4	5,135.3	9,250.6	44.5	55.5	3.0	3.6
Total IWOSS	772.8	943.1	1,715.8	45.0	55.0	799.2	1,294.5	2,093.7	38.2	61.8	0.8	7.8
Agro-processing	377.0	157.5	534.5	70.5	29.5	176.4	123.9	300.2	58.8	41.3	-18.6	-5.9
Horticulture and export crops	128.5	156.6	285.0	45.1	54.9	157.1	192.9	350.0	44.9	55.1	4.9	5.1
Tourism	192.3	68.0	260.3	73.9	26.1	273.2	82.2	355.3	76.9	23.1	8.6	4.6
ICT	11.6	24.4	35.9	32.3	68.0	11.1	28.2	39.2	28.3	71.9	-1.1	3.5
Transport	3.3	302.5	305.8	1.1	98.9	1.5	498.7	500.2	0.3	99.7	-19.3	12.2
Maintenance and repairs	1.8	111.6	113.4	1.6	98.4	3.8	108.9	112.7	3.4	96.6	18.3	-0.6
Finance, business, and professional services	27.4	93.3	120.6	22.7	77.4	176.0	259.3	435.3	40.4	59.6	45.5	25.0
Trade formal (exl. tourism)	31.3	29.4	60.6	51.7	48.5	0.5	0.8	1.3	38.5	61.5	-101.3	-88.2
Manufacturing	251.6	334.2	585.8	42.9	57.1	116.8	269.8	386.6	30.2	69.8	-18.8	-5.2
Total non-IWOSS	2,614.8	3,147.7	5,762.5	45.4	54.6	3,199.4	3,571.0	6,770.4	47.3	52.7	4.9	3.1
Agriculture	1,211.5	1,492.5	2,703.9	44.8	55.2	1,387.0	1,688.5	3,075.5	45.1	54.9	3.3	3.0
Mining	17.2	48.8	65.9	26.1	74.1	26.0	60.0	86.0	30.2	69.8	10.1	5.1
Utilities	2.6	10.3	12.9	20.2	79.8	5.3	24.6	29.8	17.8	82.6	17.4	21.3
Construction	7.9	347.8	355.7	2.2	97.8	3.1	413.8	416.9	0.7	99.3	-22.9	4.3
Trade informal (excl. tourism)	917.5	721.4	1,638.9	56.0	44.0	1,150.1	837.4	1,987.5	57.9	42.1	5.5	3.7
Domestic and household services	72.1	25.7	97.7	73.8	26.3	143.6	41.6	185.2	77.5	22.5	16.9	11.8
Government	235.0	311.2	546.1	43.0	57.0	268.9	331.4	600.2	44.8	55.2	3.3	1.5
Other services	151.3	190.5	341.7	44.3	55.8	215.8	174.0	389.8	55.4	44.6	8.7	-2.2

Notes:
1/3: Estimates for 2016/17-formal calculations did not control for enterprises that submit VAT due to the variable not being captured in the survey tool.
2/3: Employment calculations for agriculture exclude persons in subsistence agriculture.
3/3: CVs are high for formal trade.
Source: Authors' own calculations using UBOS UNHS surveys (2012/13; 2016/17).

Table 25: Youth employment by gender, 2012/13-2016/17

	2012/13					2016/17					Annual % growth	
	Employment ('000)			Employment share		Employment ('000)			Employment share			
All (15-24 years)	Females	Males	Total	Females	Males	Females	Males	Total	Females	Males	Females	Males
Overall total	993.0	1,147.1	2,140.0	46.4	53.6	1,055.0	1,262.9	2,317.8	45.5	54.5	1.5	2.4
Total IWOSS	195.0	244.7	439.6	44.4	55.7	213.9	282.6	496.5	43.1	56.9	2.3	3.5
Agro-processing	77.5	37.9	115.4	67.2	32.8	32.2	22.5	54.7	58.9	41.1	-21.5	-12.8
Horticulture and export crops	52.2	58.4	110.6	47.2	52.8	46.3	63.1	109.4	42.3	57.7	-2.9	1.9
Tourism	50.8	24.0	74.8	67.9	32.1	81.3	29.3	110.6	73.5	26.5	11.5	4.9
ICT	3.2	4.1	7.2	44.4	56.9	1.8	6.0	7.8	23.1	76.9	-14.1	9.3
Transport	1.0	69.0	70.0	1.4	98.6	0.2	98.9	99.1	0.2	99.8	-39.4	8.8
Maintenance and repairs	1.3	34.3	35.5	3.7	96.6	0.3	37.1	37.4	0.8	99.2	-35.9	1.9
Finance, business and professional services	5.7	12.4	18.0	31.7	68.9	51.7	25.7	77.3	66.9	33.2	54.0	17.8
Trade formal (excl. tourism)	3.6	4.9	8.5	42.4	57.6	0.4	0.4	0.7	57.1	57.1	-53.8	-61.3
Manufacturing	57.3	105.3	162.5	35.3	64.8	33.8	75.8	109.6	30.8	69.2	-12.9	-8.0
Total non-IWOSS	740.8	797.2	1,537.9	48.2	51.8	807.4	904.5	1,711.8	47.2	52.8	2.1	3.1
Agriculture	342.2	463.3	805.4	42.5	57.5	371.8	510.7	882.5	42.1	57.9	2.0	2.4
Mining	3.4	19.2	22.5	15.1	85.3	5.5	22.6	28.0	19.6	80.7	11.8	4.0
Utilities	1.4	4.7	6.0	23.3	78.3	0.5	6.1	6.5	7.7	93.8	-25.2	6.4
Construction	1.1	91.8	92.8	1.2	98.9	0.1	94.8	94.8	0.1	100.0	-58.7	0.8
Trade informal (excl. tourism)	233.2	135.7	368.9	63.2	36.8	216.1	168.7	384.7	56.2	43.9	-1.9	5.3
Domestic and household services	42.4	9.9	52.3	81.1	18.9	91.3	18.5	109.7	83.2	16.9	18.8	15.3
Government	55.0	23.3	78.2	70.3	29.8	50.6	43.7	94.2	53.7	46.4	-2.0	15.4
Other services	62.4	49.6	112.0	55.7	44.3	71.8	39.8	111.6	64.3	35.7	3.4	-5.4

Notes:
1/3: Estimates for 2016/17-formal calculations did not control for enterprises that submit VAT due to the variable not being captured in the survey tool.
2/3: Employment calculations for agriculture exclude persons in subsistence agriculture.
3/3: CVs are high for formal trade.
Source: Authors own calculations using UBOS UNHS surveys (2012/13; 2016/17).

Table 26: Characteristics of IWOSS and non-IWOSS workers by age group, 2012/13-2016/17

	2012/13							2016/17							Annual % growth		
	Employment ('000)				Employment share (%)			Employment ('000)				Employment share (%)					
	15-24	25-34	35-65	Total	15-24	25-34	35-65	15-24	25-34	35-65	Total	15-24	25-34	35-65	15-24	25-34	35-65
Overall total	2,140.0	2,544.6	3,379.5	8,064.0	26.5	31.6	41.9	2,317.8	3,129.5	3,803.4	9,250.6	25.1	33.8	41.1	2.0	5.1	2.9
Total IWOSS	439.6	590.1	686.2	1,715.8	25.6	34.4	40.0	496.5	753.6	843.7	2,093.7	23.7	36.0	40.3	3.0	6.0	5.1
Agro-processing	115.4	151.0	268.3	534.5	21.6	28.3	50.2	54.7	96.3	149.4	300.2	18.2	32.1	49.8	-18.3	-11.0	-14.3
Horticulture and export crops	110.6	72.2	102.4	285.0	38.8	25.3	35.9	109.4	89.7	151.0	350.0	31.3	25.6	43.1	-0.3	5.3	9.5
Tourism	74.8	82.5	103.1	260.3	28.7	31.7	39.6	110.6	129.6	115.2	355.3	31.1	36.5	32.4	9.6	11.1	2.7
ICT	7.2	26.3	2.6	35.9	20.1	73.3	7.2	7.8	16.9	14.5	39.2	19.9	43.1	37.0	2.0	-10.8	42.1
Transport	70.0	147.0	88.9	305.8	22.9	48.1	29.1	99.1	227.6	173.7	500.2	19.8	45.5	34.7	8.5	10.7	16.4
Maintenance and repairs	35.5	33.6	44.3	113.4	31.3	29.6	39.1	37.4	41.2	34.2	112.7	33.2	36.6	30.3	1.3	5.0	-6.3
Finance, business, and professional services	18.0	56.3	46.4	120.6	14.9	46.7	38.5	77.3	152.3	205.8	435.3	17.8	35.0	47.3	35.7	24.4	36.5
Manufacturing	162.5	175.0	248.4	585.8	27.7	29.9	42.4	109.6	125.0	152.1	386.6	28.3	32.3	39.3	-9.6	-8.2	-12.0
Total non-IWOSS	1,537.9	1,779.5	2,445.1	5,762.5	26.7	30.9	42.4	1,711.8	2,251.0	2,807.7	6,770.4	25.3	33.2	41.5	2.6	5.8	3.4
Agriculture	805.4	699.7	1,198.9	2,703.9	29.8	25.9	44.3	882.5	832.5	1,360.6	3,075.5	28.7	27.1	44.2	2.2	4.3	3.1
Mining	22.5	22.7	20.8	65.9	34.1	34.4	31.6	28.0	30.9	27.1	86.0	32.6	35.9	31.5	5.4	7.5	6.5
Utilities	6.0	3.4	3.6	12.9	46.5	26.4	27.9	6.5	11.2	12.2	29.8	21.8	37.6	40.9	2.0	29.2	29.9
Construction	92.8	142.6	120.3	355.7	26.1	40.1	33.8	94.8	155.4	166.8	416.9	22.7	37.3	40.0	0.5	2.1	8.0
Trade informal (exl. tourism)	368.9	582.7	687.4	1,638.9	22.5	35.6	41.9	384.7	768.6	834.2	1,987.5	19.4	38.7	42.0	1.0	6.8	4.7
Domestic and household services	52.3	22.9	22.6	97.7	53.5	23.4	23.1	109.7	49.1	26.5	185.2	59.2	26.5	14.3	18.1	18.7	3.9
Government	78.2	198.2	269.8	546.1	14.3	36.3	49.4	94.2	250.8	255.2	600.2	15.7	41.8	42.5	4.6	5.8	-1.4
Other services	112.0	107.8	122.0	341.7	32.8	31.5	35.7	111.6	152.8	125.4	389.8	28.6	39.2	32.2	-0.1	8.5	0.7

Notes:
1/3: Estimates for 2016/17-formal calculations did not control for enterprises that submit VAT due to the variable not being captured in the survey tool.
2/3: Employment calculations for agriculture exclude persons in subsistence agriculture.
3/3: CVs are high for formal trade.
Source: Authors' own calculations using UBOS UNHS surveys (2012/13; 2016/17)

Annex 2: Productivity growth in IWOSS sectors: An alternative perspective

It is useful to characterize and contrast firms active in IWOSS and non-IWOSS sectors. How many IWOSS firms are there in Uganda? How labor intensive is the average IWOSS firms and how productively is labor used in these firms? What is the relationship of IWOSS firms with the external sector?

To answer these and related questions, we employ administrative data sets collected by the Uganda Revenue Authority (URA) for the purposes of taxation. Specifically, we use four different data sets that we link to each other at the firm level using masked TIN numbers. Our first source of data is annual Corporate Income Tax (CIT) returns, from which we take data on a firm's output and total wage bill. Second, we use monthly Pay-As-You-Earn[41] declarations, holding information on a firm's staffing to calculate the number of employees per firm. Third, transaction-level customs data (ASYCUDA) allow us to explore the relationship of a firm with the external sector through its exports. Finally, we employ monthly value-added tax (VAT) declarations from which we take information on a firm's inputs (sourced both domestically as well as internationally). We also use data from the VAT declarations to amend information on a firm's annual output from the CIT returns. As some firms submit their declarations only irregularly, we build three-year averages (2014-2016) of key variables of interest in order to improve the coverage of our data.

Next, we identify a firm's affiliation to IWOSS sectors of interest in this study. Here, we employ information on firms' four-digit International Standard Industry Classification (ISIC) code, which are reported in the Corporate Income Tax returns. While the ISIC classification is useful for identifying a firm's sectoral affiliation in most cases, we improve the accuracy of the ISIC identification of IWOSS and non-IWOSS firms by using the information on a firm's exports held by the customs data. Specifically, we identify firms that export key horticultural (and some agro-processing) export commodities in the customs data through the standardized codes provided for by the Harmonized System and update sectoral affiliation of a firm accordingly.[42] After cleaning, our final data set holds information on sectoral affiliation, output, staffing, and salaries as well as the relationship of a firm with the external sector for a total of 38,249 Ugandan firms, capturing the entire formal Ugandan economy.

Before presenting firm characteristics on IWOSS and non-IWOSS firms using this data set, it is important to highlight its limitations. First, and most crucially, the data only holds information on formal firms reporting to Uganda's tax authority.[43] Second, since we only observe employees reported by the firms to the tax authority, it is highly likely that we are unable to capture employment numbers in the large informal tail of the agricultural sectors. Finally, as the customs data only covers cross-border commodity trade, information on services trade is not captured by this type of data.[44] Table 35 employs the data set to present characteristics of firms active in IWOSS and non-IWOSS sectors.

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[41] *Pay-As-You-Earn* is a tax on income payments withheld by the employer.

[42] The *Harmonized System* is an international nomenclature of traded goods assigning standardized codes to goods traded between countries. Employing information on the type of goods exported by a firm allows us to improve the accuracy of the sector information captured by the ISIC codes that we take from the *Corporate Income Tax* returns. These are self-reported at the time of registration for a TIN and as such often do not accurately reflect the type of business activity of a firm. For example, in our customs data we find a large exporter of coffee. When registering for *Corporate Income Tax* this firm put down "Coffee Trading Processing an Exporting" as their main business activity in an unstructured text field, but selected ISIC code 8299 ("*Other business support service activities n.e.c.*"). Consequently, only relying on ISIC code information in the CIT returns would let us classify this company as "Other non-IWOSS," despite the firm being active in the horticultural sector as evident from its coffee exports.

[43] The threshold for companies having to register for *Corporate Income Tax* payments (which we primarily use in this study to identify a firm's sector affiliation) was UGX 50 million (ca. $18,000) up to 2015, when it was raised to UGX 150 million.

[44] We do find some exports by firms that have registered in a services sector, but examining the customs data reveals that all of these are goods exports and not related to the services sector a firm is active in.

Table 27: Characteristics of Uganda's formal IWOSS and non-IWOSS firms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	# firms	Labor productivity: output/worker	Labor productivity: output/wage bill	Avg. annual wage per worker (CIT data)	Avg. annual wage per worker (PAYE data)	Avg. # workers per firm	Avg. output per firm	% firms are exporters	% exporters that export to EAC	% of exporters that export outside of EAC	Imported inputs/total inputs
IWOSS											
Agro-processing	813	225	54	6.4	3.9	42	5,341	16	63	42	19
Horticulture	318	742	237	9.4	5.7	63	11,844	52	43	31	11
Agriculture (excl. horticulture)	1,233	482	62	8	5.4	48	770	9	26	19	9
Tourism	2,018	52	109	3.9	4	29	499	100			2
Transport	1,499	164	42	7.6	6.7	21	736	6	26	37	9
Finance, business, and professional services	1,905	192	363	39	14.4	40	5,127				2
Trade (excl. tourism)	11,182	414	107	6.1	5.6	13	1,383	3	39	20	22
Average	*18,968 (Total)*	*324*	*139*	*11.5*	*6.5*	*37*	*3,671*				
Non-IWOSS											
Mining	218	141	48	15.9	11.4	27	941	*17*	47	42	9
Manufacturing (excluding agro-processing)	1,211	159	74	5.1	4.4	34	2,941	*8*	60	35	15
Utilities	495	365	50	17.6	7.5	23	4,299	*3*	47	12	6
Construction	5,544	189	76	7	6.2	19	557				3
CPS	4,792	155	32	12.5	9.7	16	849				4
Other non-IWOSS	7,021	100	24	7.8	7.5	25	343				7
Average	*19,281 (Total)*	*185*	*51*	*11*	*7.8*	*24*	*1,655*				

Notes: All variables are three-year averages over the period 2014-2016. VAT data was only available for 2014 and 2015, while numbers on formal employees were only available for a full year in 2014. A firm's sectoral affiliation is identified through ISIC codes and improved by taking into account its commodity exports see footnote 40). Exporters are firms that export at least UGX 25 million worth of goods a year on average. Annual wages and annual output figures are expressed in millions of Uganda shillings.
Source: UBOS

First, in Column 1 we employ information on sectoral affiliation of a firm constructed from ISIC codes as well as a firm's export commodities and categorize firms into different IWOSS and non-IWOSS sectors. A key insight from this exercise is that IWOSS and Non-IWOSS firms make up equal parts of Uganda's formal firms network. Less than 1 percent of all firms are registered as being active in a *horticultural* business, while by far the most companies are registered in *trade (excluding tourism*).

Next, in Columns 2 and 3 we provide two measures for labor productivity: The average output per worker in million Uganda Shilling (Column 2) and the average ratio of a firm's wage bill to total output (Column 3).[45] While using either of the indicators results in different rankings of sectors, both suggest that IWOSS industries are (on average) more productive than non-IWOSS sectors, although this difference seems partly driven by a few high productivity sectors. A useful insight from the comparison of both indicators is that the employment numbers provided in the PAYE data do not reflect casual/seasonal workers in agriculture and other sectors characterized to a large degree by informal labor. For example, when considering productivity in the IWOSS sector agriculture (excl. horticulture), using the output/worker ratio suggests that the sector is the second-most productive of all 13 sectors included in this study. When using output/wage bill instead, the sector ranks well below the average for IWOSS industries, suggesting that the labor figure reported in the PAYE data really only includes formal employees and not seasonal/causal labor, whereas the total wage bill reported in the annual CIT returns seems to capture all wage payments made by a firm. Supporting this assessment, and in line with the known cost of labor, educational requirements, and high degree of formality of this sector, financial and business services ranks highest among all industries when using the ratio of firm output to wage bill instead of the output to labor ratio.

In Columns 4 and 5, we show that average annual wages (in millions of Ugandan shillings) in IWOSS and non-IWOSS firms are largely the same, although there is a higher degree of disparity among non-IWOSS sectors.[46] Agro-processing and tourism pay moderate salaries, while horticulture companies pay salaries somewhat higher than most other sectors. As would be expected by high demands with respect to working in the sector, annual wages per worker are highest in financial and business services. In Column 6, we consider PAYE data on average (formal) employment per firm in different sectors. A key takeaway here is that the average IWOSS firm employs more formal workers than the average non-IWOSS firm (37 employees versus 25), with horticulture being the most employment intensive of all sectors considered. Similarly, IWOSS firms are larger in terms of annual output as shown in Column 7. Again, Uganda's few horticulture companies rank highest with an average annual turnover of about 11.8 billion Uganda Shilling (ca. $3.18 million).

In Columns 8, 9, and 10, we consider the importance of exporting to IWOSS and non-IWOSS firms, by tracking the number of firms in a sector that engage in exporting activities.[47] Using traditional manufacturing (excluding agro-processing) as a benchmark, we find that IWOSS firms are much more likely to engage in exporting: 16 percent of all agro-processing firms export, 9 percent of all firms active

[45] Average labor productivity of a sector is calculated by averaging the annual labor (wage bill)/output ratios of individual firms across sectors.

[46] To ensure these findings are accurate, we again take advantage of all information available in our data sets, employing the wage bill reported in the *Corporate Income Tax* returns in Column 4 and the one found in the PAYE data in Column 5.

[47] We set a threshold of an annual export volume of UGX 25 million (ca. $8,000) to count a company as an exporter. We set this threshold to account for the fact that many companies engage in export transactions sporadically (e.g., when sending packages abroad to business affiliates), but exporting is not part of their core business. For tourism, we assume that, by definition, all business is from exporting, but evidently this is not captured in the formal customs data on goods trade.

in agriculture (excluding horticulture), and a staggering 56 percent of all horticulture firms.[48] The East African Community is an important export destination for exporters in all sectors (Column 9), but many exporters also reach markets outside of the customs union (Column 10).

Finally, in Column 11, we explore the other dimension through which firms engage in international trade, namely by sourcing inputs from foreign countries. To assess how much IWOSS firms rely on imported inputs for their activities, we compute the ratio of imported inputs to total inputs as reported by firms in their VAT declaration. The results suggest that IWOSS firms rely on imported inputs to a much higher degree than non-IWOSS firms. Firms active in agro-processing source 19 percent of their total inputs from abroad (compared to "normal" manufacturing firms with 15 percent). Firms active in the horticulture sector import about 9 percent of their inputs from foreign countries. Unsurprisingly, trade (excluding tourism) is the most import intensive sector, while financial and business services do not rely on imported good inputs at all. Somewhat surprisingly, although these firms need to cater to an international customer base with very high demands and expectations, firms active in the tourism sector do not seem to rely on imported inputs to any noteworthy degree.

In sum, our analysis of tax administrative data for Uganda's formal firms network suggests that on average IWOSS firms are larger (in terms of output and number of formal employees), are more productive, and engage much more with the external sector through both exporting as well as sourcing inputs from abroad. When assessing constraints to growth in IWOSS sectors it seems advisable to take into account the high interaction and dependence of these firms with the external sector. Our initial analysis seems to suggest that solving constraints to trading is especially relevant for two key sectors of interest considered in this study: agro-processing and horticulture.

[48] This partly reflects the fact that this sector includes coffee as a commodity, which is almost exclusively sold to foreign countries and is not consumed domestically.

Table 28: Skills analysis for horticulture firms (FFV & flower firms)

	FFV firms				Flower firms							
	Skilled agricultural, forestry, and fishery workers				Plant and machine operators and assemblers				Skilled agricultural, forestry, and fishery workers			
	Importance	Actual	Desired	Gap	Importance	Actual	Desired	Gap	Importance	Actual	Desired	Gap
Basic skills	3.14	2.32	3.06	0.74	3.97	2.70	3.93	1.23	2.64	1.90	2.28	0.38
Social skills	2.70	2.20	2.53	0.33	5.00	3.44	4.94	1.50	2.90	2.11	2.62	0.51
Problem-solving skills	2.60	2.60	2.80	0.20	5.00	1.00	4.67	3.67	3.40	1.20	2.67	1.47
Technical skills	1.82	1.65	1.87	0.22	2.09	1.79	2.06	0.27	1.70	1.52	1.46	-0.06
Systems skills	1.80	1.53	1.87	0.34	2.78	2.22	2.78	0.56	2.05	1.49	1.71	0.22
Resource management skills	2.00	1.65	2.00	0.35	3.33	2.75	3.33	0.58	2.83	2.30	2.29	-0.01

Source: Authors' own calculations based on field survey data (2020).

Annex 3: Additional tables related to the projections

Table 37: Employment elasticities observed (left) and employment elasticities used (right).

	Observed employment elasticities: 2012/13 - 2016/17	*Sub-sectoral employment elasticities used for projections: 2016/17 – 2029/30*
Overall total	**0.2**	
Total IWOSS	**1.8**	
Agro-processing	-2.1	1.20
Horticulture and export crops	-0.1	1.00
Tourism	1.5	0.70
ICT	-0.3	0.70
Transport	1.8	0.70
Maintenance and repairs	2.1	0.70
Finance and business services	16.5	1.00
Trade formal (excl. tourism)	2.1	0.70
Manufacturing	**-2.1**	0.90
Total non-IWOSS	**0.2**	
Agriculture	-0.1	0.75
Mining	0.9	0.45
Utilities	3.5	0.55
Construction	0.4	0.80
Trade informal (excl. tourism)	2.1	0.50
Domestic and household services	6.7	0.20
Government	1.6	0.60
Other services	0.3	0.20

Note: The economy-wide elasticity in our projections is 0.54. To compare, Kapsos (2005: 41) estimates values between 0.23 and 0.40, while more recent estimates from the IMF (2019) found an economy wide elasticity of 0.6 for the period 2000 – 2017.

Table 38: Distribution of additional jobs in 2029/30 per sector across different skill levels

	Additional jobs in 2029/30	Distribution of additional jobs by skill level			Documented edits to original computations.
		High skill	Skilled	Low skill	
Overall total	**7,062**	**34%**	**24%**	**42%**	None.
Total IWOSS	**2,522**	**27%**	**70%**	**3%**	None.
Agro-processing	419	27%	70%	3%	Edited: Employ IWOSS aggregate.
Horticulture and export crops	230	0%	1%	99%	None.
Tourism	383	8%	81%	11%	None.
ICT	129	27%	70%	3%	Edited: Employ IWOSS aggregate.
Transport	720	0%	21%	80%	None.
Maintenance and repairs	42	27%	70%	3%	Edited: Employ IWOSS aggregate.
Finance and business services	599	42%	44%	13%	None.
Trade formal (excl. tourism)	0	15%	8%	77%	None.
Manufacturing	**306**	**27%**	**70%**	**3%**	Edited: Employ IWOSS aggregate.
Total non-IWOSS	**4,234**	**11%**	**6%**	**84%**	None.
Agriculture	1,609	0%	4%	97%	None.
Mining	85	0%	4%	96%	None.
Utilities	33	9%	42%	49%	None.
Construction	821	11%	6%	84%	Edited: Employ non-WOSS aggregate.
Trade informal (excl. tourism)	589	0%	4%	96%	None.
Domestic and household services	50	0%	-1%	101 %	None.
Government	840	119 %	-15%	-4%	None.
Other services	207	-1%	112%	-11%	None.

Notes:
1/2: To compute the distribution of additional/new jobs within a sector per each different skill level, we obtain sector- and skill-specific employment growth rates computed from the two UNHS survey waves (2012/13 and 2016/17). This provides us with projected employment demand at this level of disaggregation in the year 2029/30 for each of the sectors. Since the resulting aggregate figures per sector are slightly larger than our sector-level projections for labor demand, we apply the resulting distribution of new jobs across the three skill levels to the previously calculated sectoral totals of new/additional job per sub-sector and add these to the skill distribution found in 2016/17. Due to data-related inadequacies we have to smooth out sector- and skill-specific growth rates in a number of cases. For example, the values found in the data would suggest an annual growth rate for "skilled labor in Transport" of 57%. In some cases, we additionally rely on aggregates at the IWOSS/non-IWOSS aggregates for some of the sub-sectors. These decisions are detailed in the table above.
2/2: Agriculture in non-IWOSS is exclusive of subsistence farming.
Source: Authors' own calculations using UBOS UNHS surveys (2012/13; 2016/17).