PRIORITY SKILLS REPORT

March 2025

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Foreword

The HRDC provides policy advice to the government of Botswana on all matters of human resource development. The HRDC Act No 17 of 2013 encapsulates the main functions of the Council including providing advice on tertiary education financing and work-place learning. The Council coordinates and promotes the implementation of the national human resources development strategy. To discharge on the mandate, the HRDC works with diverse stakeholders to ensure the collection, analysis, and dissemination of data to ensure policy advice can be shared with stakeholders. On behalf of the HRDC Board, Management and Staff, it is my sincere pleasure to share with you the 2025 Priority Skills Report following a comprehensive review of the skills in demand through a consultative and inclusive process of research and engagement.

The Priority Skills Report is a key report produced annually that provides advice on current, emerging, and future skills to enable strategic use of financial resources for tertiary education leading to the development of a globally competitive human resource. The report provides advice to end users on a range of education and training issues including highlighting niche areas for tertiary education financing. The report provides critical advice to the Department of Tertiary Education Financing (DTEF) on sponsorship for young people applying for tertiary placement to ensure that they are sponsored for programmes that are aligned to current and future market needs. Furthermore, the Botswana Qualification Authority (BQA) uses the report to consider and approve accreditation of new qualifications and programmes. The Education Training Providers use the report to identify current and future skills requirements to proactively review their curriculum and develop relevant programs that address local and global skills needs.

The disruptions resulting from rapid technological change, environment crises and climate change, pandemics and business transformations are driving the demand for new skills. To this end, the Council has commenced the process of skills forecasting and these will be reviewed on a quarterly basis to match the rapid evolution of skills. We will remain responsive to feedback from our stakeholders especially Gen Z and Gen Alpha whose learning needs and expectations for the world of work will be different from ours.

Professor Alinah K. Segobye
Chief Executive Officer
Human Resource Development Council

1.0 **Executive Summary**

1.1 Botswana through VISION 2036 has committed to **developing an internationally competitive workforce that is productive, creative and has international exposure.** Continuous foresight analysis enhances the development of medium to long term skills plans' that will guide the development of future skills for future jobs.

1.2 A globally competitive human resource will drive the development of a diversified economy with a capacity to sustainably create decent jobs and improve the socio-economic status of Batswana. According the 2024 World Economic Forum Report, the Fourth Industrial Revolution(4IR) has accelerated the pace of adoption of technologies and shifted the frontier between humans and machines across most sectors of the economy.

1.3 Given the rapid evolution of skills it is of paramount importance for the Council to conduct annual review of the skills in demand to inform development of new programmes as well as re-tooling and up-skilling the workforce to continually make them relevant and competitive.

1.4 In 2024, the Council conducted a comprehensive review of the skills in demand. To this end the Council developed for the first time, the long-term skills forecasts to enable pro-active responses to the emerging, future skills, & future jobs in the local and global markets. These skills forecasts will be reviewed on quarterly basis to adjust the forecasts to the rapid evolution of skills.

1.5 The findings of the annual review of the skills in demand shows that there are few job openings resulting in an increase of graduate unemployment rate. The demand for skills is currently due to vacancies which require several years of working experience and therefore favour experienced job seekers. The situation is worsened by the slow economic growth leading to low job creation. In this regard, there is need for education and training reforms that enables a shift from education for employment only to education for job creation, research, and innovation.

1.6 The 2025 Priority Skills Report comprises of skills forecasts that will be useful to a wide range of stakeholders that include: Employers, Education Training Providers (ETPs), Students, Policymakers & Planners, Regulators, Professional Bodies, among others.

1.7 The Council will conduct capacity building and dissemination workshops on skills forecasting to enhance effective and efficient use of the report.

Chapter 1: Introduction and Methodology

1.1   Introduction

The Vision for HRDC is to develop a globally competitive human resource. As encapsulated in the National Human Resource Development Strategy (NHRDS), the formulation of the National and Sector Human Resource Development (HRD) Plans adopted the human resource development planning approach, which is industry driven, more comprehensive, inclusive, strategic and embraces the whole HRD lifecycle from early childhood to lifelong learning.

One of the key functions of the Council is to provide policy advice on all matters of human resource development. In this regard, the Council continually reviews the priority skills on an annual basis to inform development of new programmes, up-skilling, and re-tooling of workers to make them relevant and competitive. As trends such as globalisation, automation and advances in artificial intelligence change the demands of the labour market and the skills needed for workers to succeed also change rapidly.

1.2   Objectives of the annual skills review

1.2.1 Conduct a comprehensive review of the skills in demand.
1.2.2 Develop the future skills forecasts for the next five years.
1.2.3 Provide recommendations for local and external training.

1.3   Methodology for the Skills Review

1.3.1 The key methods used to review the skills in demand are the mixed research methodologies and continuous monitoring of the labour market. Figure 1 shows the various quantitative and qualitative methods used to review the skills in demand on an annual basis.

1.3.2 Mixed research methodologies allow researchers to gather and integrate multiple data sources to study complex problems and gives them the ability to view a problem from different perspectives and research lenses. By accumulating and analysing both quantitative and qualitative data, researchers triangulate their findings, which means that they can use multiple sources of evidence to confirm or clarify their results (Rovai, Baker, & Porta, 2014).
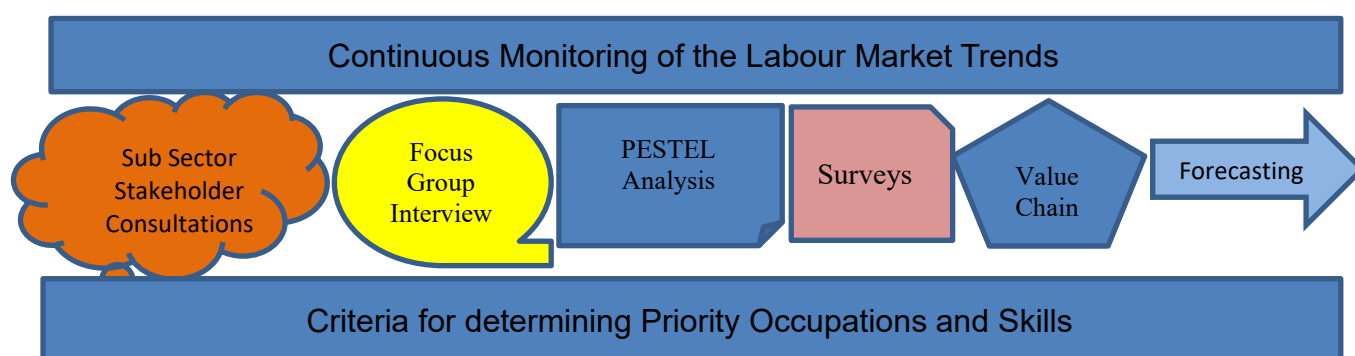
Figure 1. Methodology for skills review

Table 1 shows how quantitative and qualitative data was collected and the rationale for selecting respondents:

Table 1: Data collection methodologies and respondents

Data Sources & Respondents	Research Methodologies	Rationale
Statistics Botswana	Quantitative	Collects primary data for secondary analysis on employment, unemployment, job creation, etc.
HRDC	Quantitative	Collects primary data on tertiary education enrolment trends (Universities & TVET's)
Public & Private Sector Employers	Quantitative & Qualitative	*Quantitative*: Collects manpower estimates *Qualitative*: Conducts stakeholder workshops, focus group interviews, one-to-one interviews to identify occupations in high demand and define both the technical and soft skills needed.
Regulators	Quantitative & Qualitative	*Quantitative*: Collects data on accredited programmes *Qualitative*: Participate in stakeholder consultations to provide standards for education and training
Policymakers & Planners	Qualitative	Conduct focus group interviews and map current, emerging, and future skills through value chain developments, PESTEL analysis, etc.
Professional Bodies	Qualitative	Participates in stakeholder consultations to complement regulators to provide standards used to certify their professionals.
Sector Associations	Qualitative	Participates in stakeholder consultation to complement employers in defining soft & technical skills and future skills needed in the sector

Education Training Providers	Qualitative	Participates in stakeholder consultations to promote partnerships with the industry for continuous update on skills in demand to inform curriculum review

1.3.3 **Criteria for Prioritising Skills:** The criteria for prioritising skills have been developed. This model is customised to each sector based on the strategic direction, profile, and socio-economic importance of the sector. The model is based on policy and strategic frameworks, key enablers, human resource development issues and human resource management issues.

Figure 2: Criteria for Skills Priority
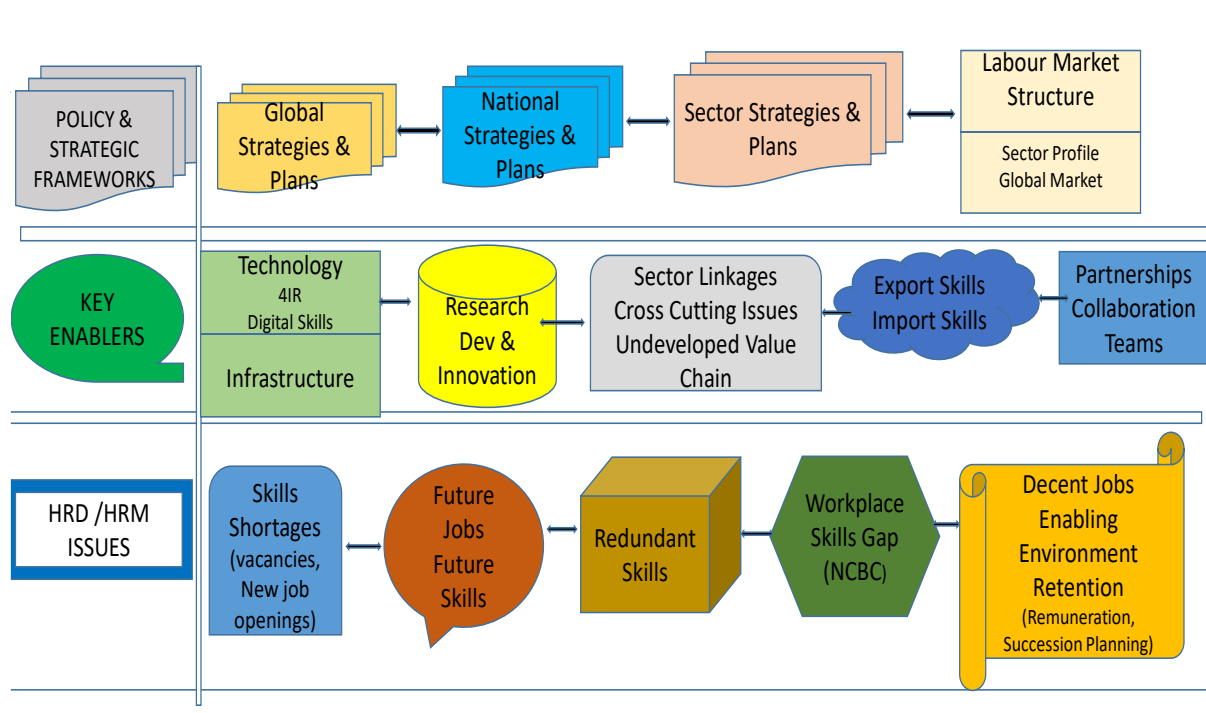
1.3.4 **Policy, Strategic Frameworks & National Plans:** The identification of priority skills is informed by the strategic direction of the sectors and other factors that drive socio-economic development of the country. Therefore, critical factors that informed the priority skills include:
- Vision 2036
- National Transformative Strategy (2023- 2030)
- Draft National Development Plan (NDP) 12
- 2024 State of the Nation Address (SONA)
- 2025/26 Budget Speech
- Value Chain Development
- Sector Linkages
- Digital Economy (Fourth Industrial Revolution-4IR)
- Green Economy (Sustainable Environment and Climate Change)

Chapter 2: Labour Market Analysis

2.1 Introduction

The HRD Planning process of demand led (sector led) was adopted to ensure graduates acquire skills needed by the employers. Therefore, HRDC continually monitors the absorption capacity of employers to minimise over supply of graduates across sectors. To this end, the key indicators that are tracked include economic growth rate, employment rate, unemployment rate and tertiary education enrolment rate, among others.

2.2 Economic Growth

When giving the 2025/26 budget, the Minister of Finance said:

> *"Consistent with global economic developments, the domestic economic performance remains subdued, directly impacted by the slump in the diamond market. The economy grew by 3.2 percent in 2023 compared to 5.5 percent in 2022, reflecting lower than expected global demand for diamonds. In 2024, the domestic economy declined by 3.3 percent during the first three quarters of the year compared to a positive growth of 3.5 percent in the same period in 2023. The latest estimates project the domestic economy at -3.1 percent in 2024. In 2025, the economy is projected to grow below its potential at 3.3 percent".*

Given the above projections on the growth of the economy, it will be difficult for the economic sectors to create sustainable jobs and hence the country faces the risk of continued increase in the unemployment rate.

2.3 Employment

2.3.1 According to the 2024 first quarter Multi-Topic Survey report released by Statistics Botswana; job creation has been lagging. This has resulted in unemployment being structurally high at 27.6% (Q1: 2024). The level of Inequality (Gini index of 53.3) is among the highest in the world. Growth is projected to slow down to 1% in 2024, from 2.7% in 2023, reflecting a decline in diamond production and prices due to weaker global demand (Statistics Botswana, Quarterly Multi-Topic Survey, 2024).

Table 2 shows the trends of employment growth rates for the past five years.

Table 2: Trends of Employment Growth Rates

Indicator	Totals					
	Q4 2019	Q4 2020	Q4 2021	Q4 2022	Q3 2023	Q1 2024
Employed Population	742,378	733,875	717,418	717,725	788,616	754,147
Changes (Number)		-8,503	-16,457	307	70,891	-34,469
Changes (Percent)		(1.1)	(2.2)	0.0	9.9	(4.4)

Source: Statistics Botswana, Quarterly Multi-Topic Survey, 2024

2.3.2 Employment growth rate declined from 9.9% in 2023 to -4.4 % in 2024. The decline in the employment growth rate is due to several factors including heavy reliance on the diamond industry which has low labour intensity, and recent economic shocks like the COVID-19 pandemic and geopolitical tensions in some major economies. Employment growth rates significantly declined mostly in Real Estate's Activities, Electricity, Gas, & Air Conditioning Supply, Construction and Manufacturing as shown in Table 3. **Therefore, priority occupations in demand do not guarantee employment due to few job opportunities.** Most of the employment opportunities are due to vacancies.
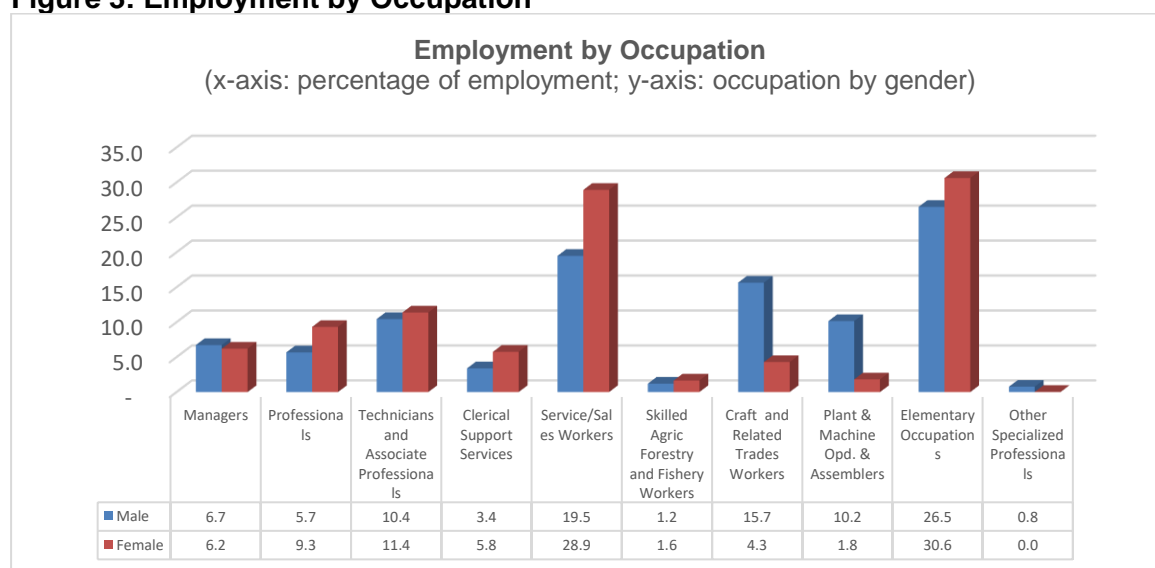
Table 3: Top Ten Activities Contributing to Decline in Employment Rates.

Activities that contributed to most of the Significant Job Losses	Q3 2023	Q1 2024	Changes (No)	Changes (%)
Real Estate Activities	3,382	1,568	(1,814)	(53.6)
Electricity, Gas, & Air Conditioning Supply	3,641	2,368	(1,273)	(35.0)
Construction	58,884	46,373	(12,511)	(21.2)
Manufacturing	56,947	45,864	(11,083)	(19.5)
Professional, Scientific and Technical Activities	14,628	12,022	(2,606)	(17.8)
Information and Communication	7,014	6,043	(971)	(13.8)
Mining and Quarrying	11,412	9,918	(1,494)	(13.1)
Other Service Activities	18,554	16,164	(2,390)	(12.9)
Transport & Storage	21,595	19,032	(2,563)	(11.9)
Accommodation and Food Service Activities	38,661	34,997	(3,664)	(9.5)

Source: Statistics Botswana, Quarterly Multi-Topic Survey, 2024

2.3.3 Further analysis on employment indicate that the labour market structure is dominated by semi-skilled workers and unskilled workers as reflected in Figure 3. This trend has been recorded since 2015. As a result, every year there are few jobs created for professionals and management trainees which are the entry job positions for most university and college graduates. In this regard, every graduation cohort increases the graduate unemployment rate.

Figure 3: Employment by Occupation

Employment by Occupation
(x-axis: percentage of employment; y-axis: occupation by gender)

	Managers	Professionals	Technicians and Associate Professionals	Clerical Support Services	Service/Sales Workers	Skilled Agric Forestry and Fishery Workers	Craft and Related Trades Workers	Plant & Machine Opd. & Assemblers	Elementary Occupations	Other Specialized Professionals
Male	6.7	5.7	10.4	3.4	19.5	1.2	15.7	10.2	26.5	0.8
Female	6.2	9.3	11.4	5.8	28.9	1.6	4.3	1.8	30.6	0.0

Source: Statistics Botswana, Quarterly Multi-Topic Survey 2024

2.4   Graduate Unemployment

2.4.1   **Graduate unemployment has increased from 59 528 in 2023 to 70 512 in 2024 recording 18.5% increase** (Statistics Botswana, QMTS, Q1- 2024).

2.4.2   Most of the unemployed graduates are trained in Finance and Business Services as shown in **Figure 4**. Furthermore, Botswana Qualification Authority records(www.bqa.org.bw) indicate that Business, Commerce and Management fields has the highest number of qualifications registered in the National Credit Qualification Framework (228 out 994 registered qualifications).

2.4.3   Graduate unemployment in Science Technology Engineering and Mathematics (STEM) field is gradually increasing in ICT, Mining, Energy, Water, Manufacturing, Agriculture and Health Sectors. However, there is an opportunity for STEM graduates to participate in sustainable economic development through research development and innovation that will lead to commercialisation of products and services. To this end graduates will have great potential to establish businesses and create jobs.

2.4.4   The Ministry of Health recently employed 300 health professional graduates that included 161 nurses and midwifes; 75 medical doctors while the balance included other cadres like clinical psychologists, pharmacists, pharmacy technicians and medical scientific officers (ref MHW 1/13/1 II (2001)). However, Figure 4 show that 9565 unemployed health graduates are still waiting for employment in the Health Sector (ref. Appendix 3).

Figure 4: Unemployed Graduates by Sector
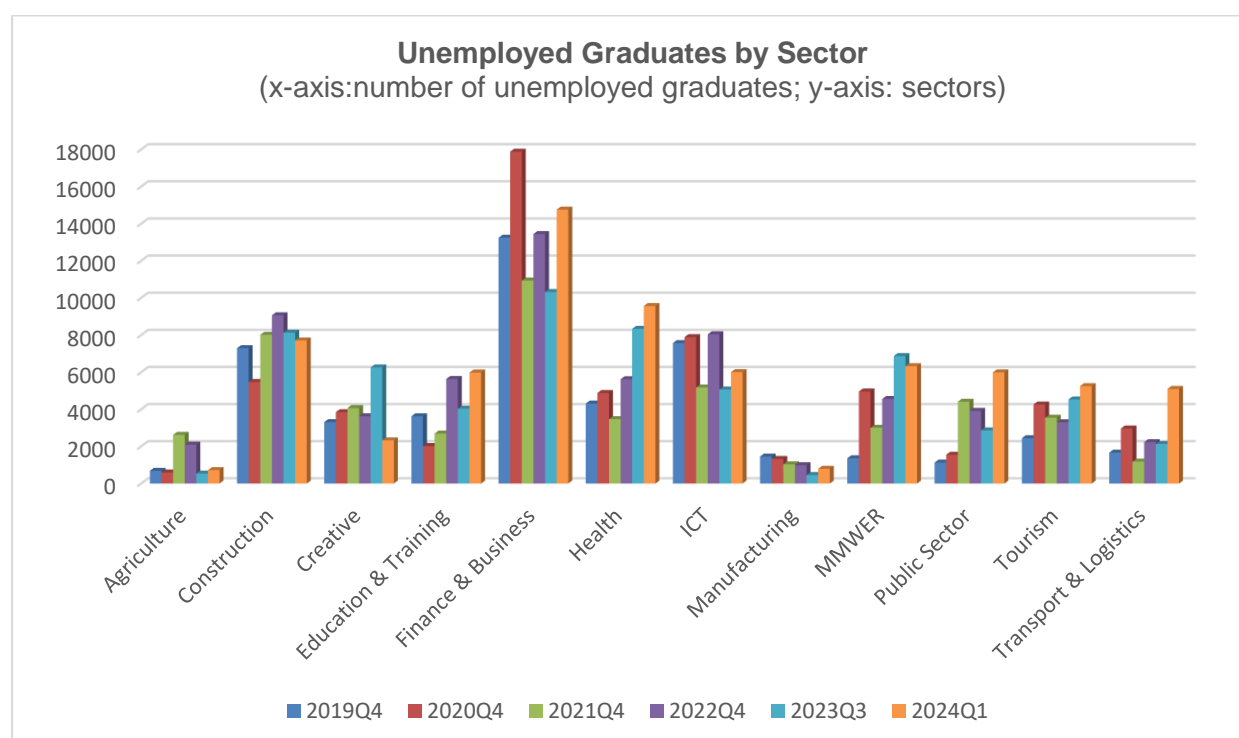
Source: Statistics Botswana, Quarterly Multi-Topic Survey 2024

2.4.5 Further analysis on the unemployed graduates indicate that graduates with qualifications in Business, Finance, ICT, Building and Trade are at the top of the list of unemployment graduates as reflected in Table 4.

Table 4: Top 10 Unemployed Graduates classified by Occupations.

Unemployed graduates classified by occupations	Q3-2023	Q1-2024
Business, Administration, & Associate Professionals	8288	10789
Building and related trades workers	7141	7864
Health and Associated professionals	6713	7586
Hotel retailers and other Service Workers	6365	5248
Legal, Social, Cultural, Associate Professionals	5532	4672
Primary, Pre-Primary, TVET Teachers	3731	4606
Stationary Plant and Machine Operators	2125	4299
Business and Administration Professionals	2174	4140
Information and Communications Technicians	1557	3837
Engineering and related professionals	1624	3130

Source: Statistics Botswana, Quarterly Multi-Topic Survey 2024

2.5 Tertiary Education Enrolments

2.5.1 Figure 5 shows that most of the students are enrolled in Business, Administration and Law fields across all the universities and colleges.

2.5.2 As stated in **paragraph 2.4.2** and shown on Table 5 most of the programmes accredited by Botswana Qualification Authority (BQA) are in Finance and Business Administration. Most of the ETP's offer programmes in Finance and Business Administration as this area is less capital intensive as compared to STEM and TVET fields that needs infrastructure and specialised facilities.

Table 5: NCQF Registered Qualifications by Fields of Learning

Field of Learning	Number of Qualifications
Generic Skills	1
Mining	7
Law and Security	28
Physical Planning and Construction	39
Services	44
Culture, Arts and Crafts	56
Natural, Mathematical and Life Sciences	56
Agriculture and Nature Conservation	62
Information and Communication Technology	65
Humanities and Social Sciences	76
Health and Social Services	96
Education and Training	100
Manufacturing, Engineering and Technology	136
Business, Commerce and Management Services	228
Grand Total	**994**

Source: www.bqa.org.bw

Figure 5: Tertiary Education Enrolment by Learning Fields (2022)
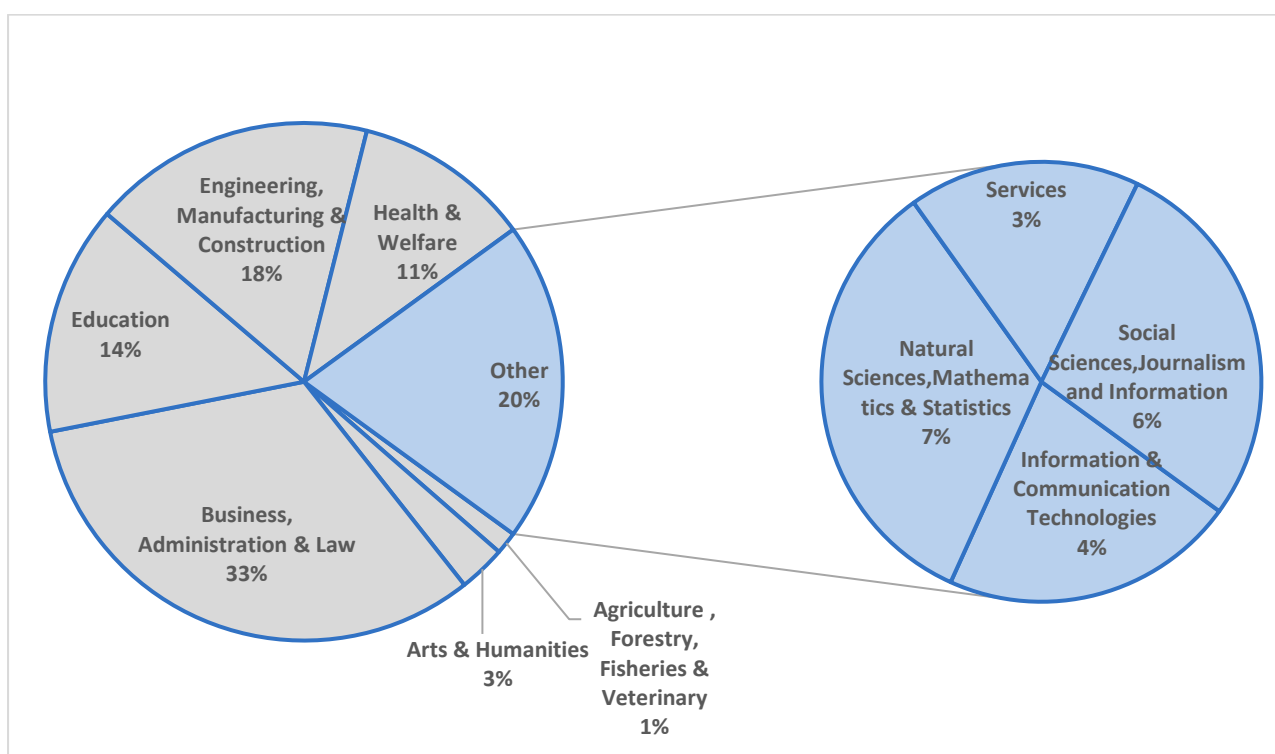
Source: Tertiary Education Statistics 2022

2.6   Structure of the Labour market Force

2.6.1 Figure 6 shows that formal sector employment is dominated by workers with secondary qualification (43.9%) indicating that most of the employers require semi-skilled to unskilled workers. Therefore, if high-end quality jobs that require skilled workers are not created then our country will continue to experience an increase in the unemployment rate for graduates.

Figure 6: Formal Sector Employment by Education/Training Level
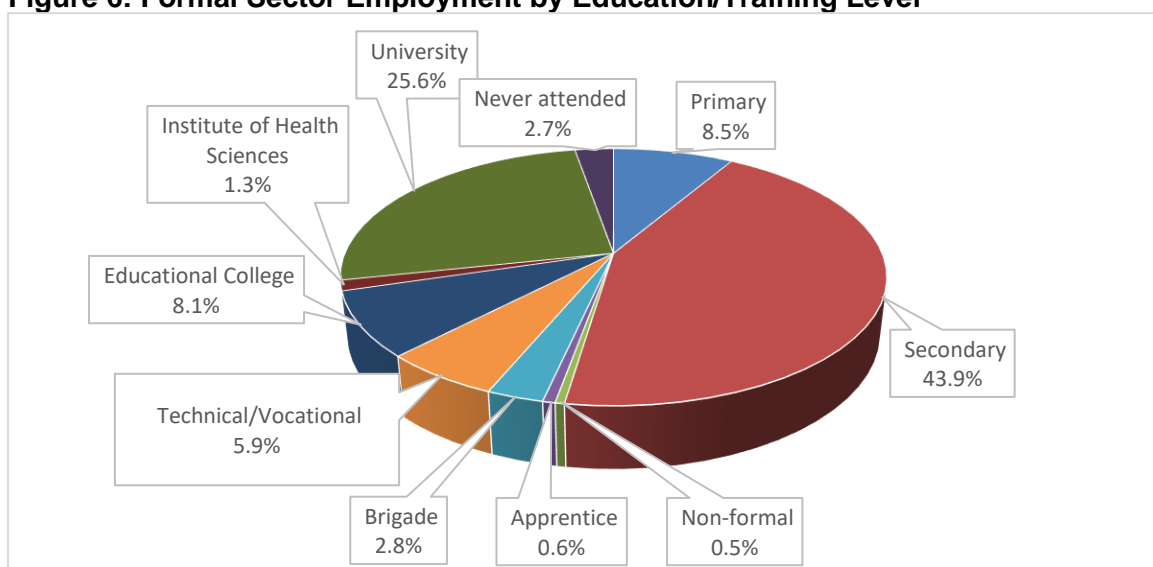
Source: Tertiary Education Statistics 2022; Statistics Botswana, Quarterly Multi-Topic Survey Report- Q1, 2024

Chapter 3: Priority Skills

3.1   Introduction
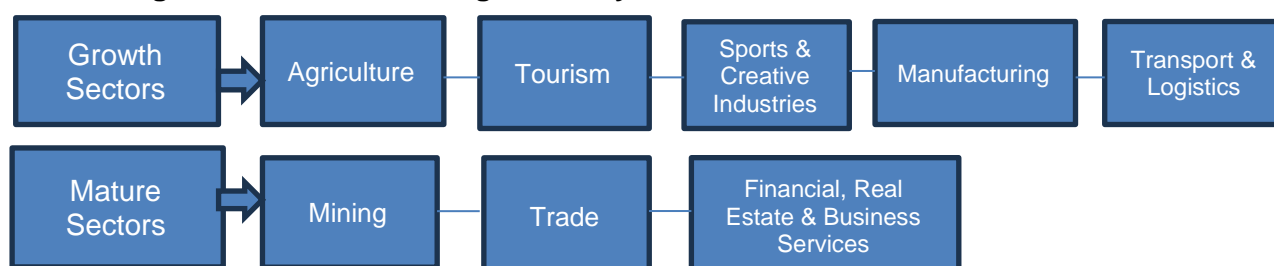
3.1.1   **Priority Skills** are skills that are informed by the strategic direction of the socio-economic development of a country. The country needs a skilled workforce to drive the economic growth and diversification. Botswana Qualification Authority (BQA) will use the priority skills to consider the approval and accreditation of new qualifications and programmes. The Education Training Providers (ETPs) will also use the priority skills to pro-actively review the curriculum and develop new programmes that responds to the emerging and future skills demands of the local and global economies.

3.1.2   **Priority Sectors**- A sector-based strategy is an approach that focuses on specific industries or sectors of the economy to drive economic growth, development, and competitiveness. It involves identifying key sectors that have potential for high growth, competitive advantage, job creation, export, and positive spillover effects on the overall economy (National Transformative Strategy, 2023-2030, pp13). The strategy has identified eight priority sectors.

Figure 7 illustrates the Eight Priority Sectors

| Growth Sectors	→	Agriculture	Tourism	Sports & Creative Industries	Manufacturing	Transport & Logistics
Mature Sectors	→	Mining	Trade	Financial, Real Estate & Business Services		

3.1.3   **Criteria for Priority Skills**- The identification of priority skills is informed by the strategic direction of the sectors and other factors that drive socio-economic development of the country. Therefore, critical factors that informed the priority skills include:

- Vision 2036
- National Transformative Strategy (2023- 2030)
- Draft National Development Plan 12
- 2024 State of the Nation Address (SONA)
- 2025/26 Budget Speech
- Value Chain Development
- Sector Linkages
- Digital Economy (Fourth Industrial Revolution)
- Green Economy (Sustainable Environment and Climate Change)

3.1.4   **Priority Occupations and Skills**- These include the Future Job Openings, Technical Skills (Top-up Skills) and Soft Skills as illustrated in Figure 8

Figure 8: Priority Occupations and Skills
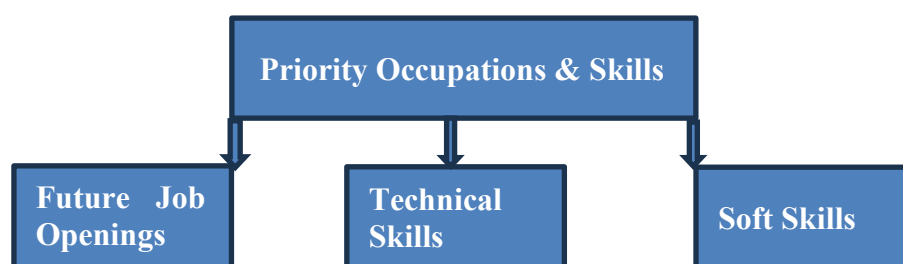
3.1.4.1 **Future Job Openings (Occupations)-** are jobs that will be created in the next two or three years as the sectors implement their key projects in the National Transformative Strategy and National Development Plan (NDP 12). These occupations inform curriculum review and development of new programmes.

3.1.4.2 **Top Up Skills (Technical Skills)**- are skills that existing workers need due to the emergence of technological disruptions, climate change and other environmental factors, among others. The workers are either re-tooled or up skilled to ensure that they have relevant and competitive skills needed in the sector. These Technical Skills can be used to update the existing educational programmes.

3.1.4.3 **Soft Skills**- These are skills needed to ensure that the workers are productive and provides effective and efficient service delivery.

3.2   Guidelines for using Priority Skills

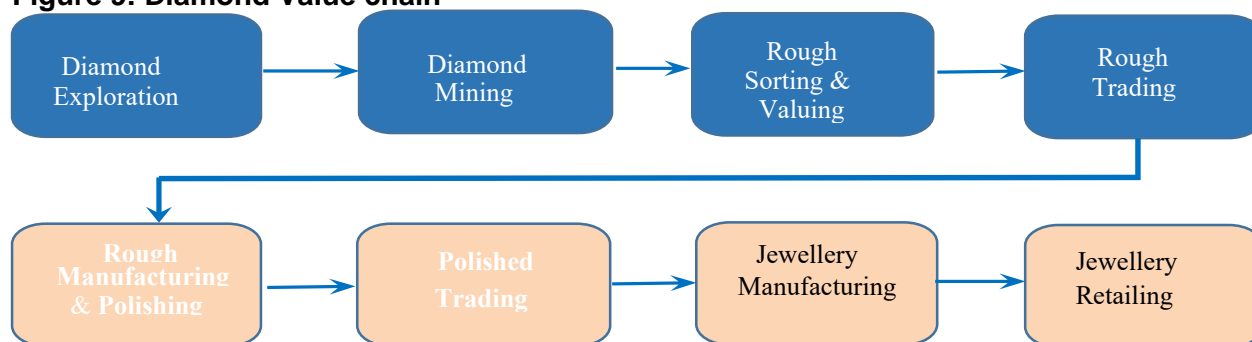**Table 6: Guidelines for using the Priority Skills report by various stakeholders.**

Type of Skills	Stakeholders
Priority Skills	**BQA**- use the information to consider and approve accreditation of new qualifications and new programmes (short to medium term). **ETP**- information used for review of the curriculum and development of new programmes that responds to sector's emerging skills as they implement the National Transformation Strategy and NDP 12 (short to medium term). The information is also used by ETP to pro-actively develop the necessary infrastructure and re-tool & up-skills the trainers. **DTEF:** use the information to determine priority areas for Government sponsorship to ensure that students are sponsored on programs that responds to the national and global market needs. **Students**- information will be used for career guidance at primary and secondary schools.
Top-up-Skills.	**Employers**- use the information to re-tool and up-skill their employees and leverage on the Human Resource Development Fund (HRDF). **HRDC**- use the skills to consider and approve Non-Credit Bearing Short Courses **ETP & Trainers**- use the information to develop new Non-Credit Bearing Short Courses
Future Skills	**BQA**- use the information to consider and approve accreditation of future qualifications and future programmes (long term) **ETP**- use the information to pro-actively develop future programmes that responds to the future skills and future jobs (long term). The information

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	is also used to pro-actively develop the necessary infrastructure and re-tool & up-skills the trainers. **Students**- information will be used for career guidance at primary and secondary schools with more emphasis on the future career development pathways.
Skills Forecasting	**DTEF:** information used by DTEF to determine the quota(s) for the learning fields and programmes during the award of Government sponsorships to the prospective learners of tertiary education. **ETP**: information is used by ETP to plan for their future students' enrolments
Recommendation Local & External Training	**DTEF:** information used by DTEF to determine the quotas for the learning fields and programmes during the award of Government sponsorships to the prospective learners of tertiary education.

3.3   Mining Sector

3.3.1 Mining is considered a mature sector which still has opportunities to optimise and innovate for additional growth through mineral beneficiation, digitisation, adopting innovative technologies and developing a waste-to-waste strategy for the sector. The development of the value chains around mining and mineral beneficiation is imperative to diversifying the economy and creating employment (National Transformative Strategy, 2023- 2030).

3.3.2 Investment in education and skills development is key to developing minerals value chain development and beneficiation. Skills needs in mining and in downstream industries vary by mineral value chain development.

3.3.3 **Mega Projects**- Most of the mines are transitioning to underground mining and this presents an opportunity for new job openings with new skills requirements. Debswana, Khoemacau and Karowe mines have all commenced underground mining transition. Continuous up-skilling of the workforce in the mining sector is imperative due to the emergence of new machinery and technology used in diamond exploration and production levels.

3.3.4   **Figure 9** shows the Diamond Value Chain used to map and determine future job openings, current and future skills that are in high demand for the Mining Sector. The other minerals value chain also has similar value chain developments with variations on the post- production stage of the minerals.

Figure 9: Diamond Value chain

```
Diamond          Diamond          Rough            Rough
Exploration  →   Mining      →    Sorting &    →   Trading
                                  Valuing
                                                      │
                                                      ▼
Rough            Polished         Jewellery        Jewellery
Manufacturing →  Trading      →   Manufacturing →  Retailing
& Polishing
```

3.3.5 Table 7 shows the future job openings in the mining sector which were mapped throughout the various phases of the value chain development.

Table 7 Future Job Openings in the Mining Sector (Value Chain Development)

EXPLORATION		PROCUCTION (UNDERGROUND MINING)	
Occupation	**Training Level**	**Occupation**	**Training Level**
Data Engineers	Degree	Plant Operators	Certificate
Geochemists	Post-Graduate	Control and Instrumentation	Certificate
Geophysicists/Seismologists	Post-Graduate	Drillers	Certificate
Hydrogeologists	Post- Graduate	Heavy Truck Drivers	Certificate
Geoscientists	Post- Graduate	Mechanical Eng. Technicians	Diploma
		Chemica Eng. Technicians	Diploma
		Control & Instrumentation Tech.	Diploma
		Ventilation Engineers	Degree
		Control Systems Engineer	Degree
		Robotics Engineers	Degree
		Automation Engineers	Degree
		Big Data Engineers	Degree
		Occupational Hygienists	Degree
		Geotechnical Engineers	Post-Graduate
		Mineral Surveyors	Post-Graduate
ROUGH SORTING & TRADING		**MANUFACTURING**	
Occupation	**Training Level**	**Occupation**	**Training Level**
Diamond Sorters & Graders	Certificate	Diamond Polishers	Certificate
Diamond Valuers	Degree	Jewellery Manufacturers	Certificate
Compliance Officers	Degree		
Commercial Lawyers	Post-Graduate		
Diamond Sales Experts	Post-Graduate		
Mineral Economists Experts	Post-Graduate		

3.3.6 **Top -up- Skills:** Table 8 shows the current, emerging, and future skills needed for the minerals value chain development. Employees are either re-tooled or up skilled for the specialized skills needed across the value chain. The workforce is continually re-tooled and up skilled to cope with the emergence of high-tech machinery and other digital and green skills requirements in the

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mining sector especially on the new projects that include smart mining and underground mining, among others.

Table 8- Current and Future Skills (Top-up Skills)

Value Chain Development	Current Skills	Future Skills
Exploration	Remote sensing	Artificial Intelligence
	Seismology	Geophysical imaging
	Geochemical surveying	Amplitude analysis
	Geographic Information System	Drones
	Digitisation	
Production (Mining)	X-Ray Transmission Technology	Artificial Intelligence
	Automation	Thermal Imaging
	Coded Welding	Drones
	Metallurgy	
	Digitisation	
	Big data analysis	
Sorting and Valuing	Sorting	
	Grading	
	CAD & CAM	
Trading and Sales	Negotiation & Lobbying	Digital Marketing
	Tariff analysis & Tariff setting	Digital Sales
Diamond Manufacturing	Planning and Sorting	Brillianteering
	Polishing & cutting	
	Valuation	
	CAD & CAM	
Jewellery Manufacturing	Model making and casting	Artificial Intelligence
	Rubber moulding & waxing	
	Grinding and filing	
	CAD & CAM	

3.3.7 **Recommendation for Training** for the mining sector is provided for in Appendix 1. It includes a comprehensive list of occupations and skills needed for filing vacancies, replacements, new job openings for both existing and new organisations. The occupations have been aligned to the training programmes to determine recommendation for internal and external training.

3.4 Energy Sector

3.4.1 Energy is essential for promoting growth and innovation in sectors such as mining, agriculture, and manufacturing. Diversifying the country's energy sources will ensure a more secure and reliable supply of energy. Due to its high solar irradiation, Botswana has a potential to be a producer and exporter of solar energy. Therefore, investment in renewable energy can lead to job creation in the energy sector (National Transformative Strategy, 2023- 2030).

3.4.2 Government through the 2024 State of the Nation Address (SONA) has prioritised supporting the development of skilled workers to install and maintain solar power systems and other renewable energy systems.

3.4.3 **Mega Projects**- Diversifying the national energy mix that includes integration of new and renewable energy sources such as solar, biofuels, coal bed methane, wind, and waste to meet the local demand and be a net exporter. To this end, the energy sector has prioritised the independent power resource producers' program, roof top solar project and biogas program to be implemented during NDP 12.

3.4.4 **Table 9** shows the future job openings that will be created during the implementation of the National Transformative Strategy and NDP 12.

Table 9 Future Job Openings in the Energy Sector (Value Chain Development)

EXPLORATION & GENERATION		TRANSMISSION & DISTRIBUTION	
Occupation	Training Level	Occupation	Training Level
Solar Photovoltaics Green	Certificate	Masons Operators	Certificate
Electrical Eng. Technicians	Diploma	Renewable Energy Installers	Certificate
Maintenance Technician	Diploma	Renewable Energy Technician	Diploma
Thermography Technician	Diploma	Renewable Energy Installation	Diploma
Power Plant Laboratory Tech.	Diploma	Renewable Energy Installation	Degree
Chemical Engineers	Degree	Quality Control Specialist	Post-Graduate
Occupational Hygienists	Degree		
Renewable Energy Engineers	Degree		
Power Plant Lab. Engineer	Degree		
TRADING & CONSUMPTION			
Occupation	Training Level	Occupation	Training Level
Compliance Officers	Degree		
Commercial Lawyers	Degree		
Digital Marketing & Sales	Degree		
Cybersecurity Analysts	Degree		
Big Data Engineers	Degree		
Energy Modelers	Post-Graduate		

3.4.5 **Top -up- Skills**: There is a high demand for green skills as evidenced by an increase in the use of solar energy and other renewable source of energy in Agriculture, Mining and Manufacturing. Table 10 shows the current, emerging, and future skills needed for the energy value chain development. Employees are either re-tooled or up skilled for the specialized skills needed across the value chain.

Table 10- Current and Future Skills (Top-up Skills)

Value Chain Development	Current Skills	Future Skills
Exploration & Generation	Lean Six Sigma Black Belt	Artificial Intelligence
	System Automation	
	Environmental management	
	Green Energy	
	Solar Energy Engineering	
	Solar Installation	
	Project Management	
Transmission & Distribution	Risk Management	
	Supervisory Data Acquisition	
	CAD	
	Coded Welding	
	Research & Development	
Trading & Consumption	Energy Modelling & Analysis	Digital Marketing
	Negotiation & Lobbying	Digital Sales
	Tariff Analysis & Tariff Setting	Financial modelling
	Data Analytics	
	Digitisation	

3.4.6 **Recommendation for Training** for the energy sector is provided for in Appendix 1. It includes a comprehensive list of occupations and skills needed for filing vacancies, replacements, new job openings for both existing and new organisations. The occupations have been aligned to the training programmes to determine recommendation for internal and external training.

3.5 Manufacturing Sector

3.5.1 Government in partnership with the Private Sector will create mega-manufacturing industries to drive economic growth, job creation and increased incomes by leveraging on the sector's immense potential for productivity improvements, transitioning from low-value to high-value activities. Given the small size of Botswana's population, economy, and domestic market, it is inevitable that high and sustained manufacturing growth will have to be export-driven (National Transformative Strategy, 2023- 2030).

3.5.2 **Mega Projects**: Development of value chains with special focus on mineral beneficiation, food processing, pharmaceutical manufacturing, and automotive manufacturing (e.g. electric vehicle). These prospective industries will create jobs and development of future skills on the use of high-tech machinery and other digital skills is imperative.

3.5.3 **Table 11** shows the future job openings in the manufacturing sector that will be created during the implementation of the National Transformative Strategy.

Table 11: Future Job Openings in the Manufacturing Sector

LEATHER PROCESSING		TEXTILE & CLOTHING	
Occupation	**Training Level**	**Occupation**	**Training Level**
Tanners	Certificate	Machine Operators	Certificate
Leather Technicians	Diploma	Industrial Machinists	Certificate
Leather Chemists	Degree	Spinning Technicians	Diploma
Leather Technologists	Degree	Textile & Clothing Technicians	Diploma
Leather Designers	Degree	Textile Designers	Degree
Researchers	Post-Graduate	Textile Technologists	Degree
		Button Manufacturers	Post-Graduate
SODA ASH & SALT		**PHARMACEUTICAL**	
Occupation	**Training Level**	**Occupation**	**Training Level**
Electrician Artisan	Certificate	Health Care Auxiliary	Certificate
Machinist	Certificate	Industrial Pharmacy Technician	Diploma
Draughts Persons	Diploma	Industrial Pharmacist	Degree
Quantity Surveyor	Degree	Pharmaceutical Scientists	Degree
Reliability Engineer	Degree	Toxicologist	Post-Graduate
Mechanical (Plant) Engineer	Degree	Geriatric Pharmacists	Post-Graduate
Hydrogeologist	Degree		
Quality Assurance & Standards	Post-Graduate		

3.5.4 **Top -up Skills:** Table 12 shows the current, emerging, and future skills needed for the manufacturing value chain development. Employees are either re-tooled or up skilled for the specialized skills needed across the value chain. There is a window of opportunity in the manufacturing sector for re-tooling and up-skilling to be extended to the unemployed youth and elders in the community. In return for this investment the youth can form companies and compete for part-time jobs in the households, business enterprises, and government departments.

Table 12- Current and Future Skills (Top-up Skills)

Value Chain Development	Current Skills	Future Skills
Leather Processing	Automation	Artificial Intelligence
	Computer Aided Manufacturing	
Textile & Clothing	Packaging and branding,	Grey Fabric Dye
	Entrepreneurial Skills	Visual Merchandising
	Machine Maintenance	Yarn Spinning
	Fabric Knowledge	Garment Manufacturing
	Occupational Health & Safety	
	Quality Standards	
Soda Ash & Salt	Coded Welding	Artificial Intelligence
	Health and Safety awareness	
Pharmaceutical	Market research	Machine e-Learning (ML)
	Project Management	
	Quality assurance	
	Packaging and Labelling	

3.5.5 **Recommendation for Training** for the manufacturing sector is provided for in Appendix 1. It includes a comprehensive list of occupations and skills needed for filing vacancies, replacements, new job openings for both existing and new organisations. The occupations have been aligned to the training programmes to determine recommendation for internal and external training.

3.6 Agriculture Sector

3.6.1 Agriculture is a potential growth sector that is in transition from a subsistence to commercial farming with scaled production. The aim is to promote commercial agriculture, move away from highly subsidised, fragmented and subsistence agriculture, and re-organise the agriculture sector to realise the potential for high economic impact in job creation (National Transformative Strategy, 2023- 2030).

3.6.2 The use of high-tech machinery, drones and other technologies in agriculture is gradually transforming the sector from a subsistence to commercial farming. Therefore, the sector needs TVET skills, high-tech skills, and green skills development to unlock value chain development from production to industrial processing (agro- processing).

Figure 10: Generic Value Chain Development for Agriculture

Pre-Production	→	Production	→	Post-Production	→	Industrial-Processing

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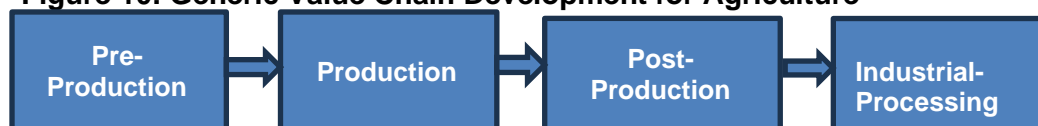
3.6.3 **Mega projects:** In its endeavour to improve food security through the development value chains, the Ministry of Agriculture has prioritized the following key projects: Selibe Phikwe Economic Development Unit (SPEDU) Projects, Pandamatenga Special Economic Zone, Milk Africa, Ramatlabama Artificial Insemination Centre, etc. As new jobs are created there is need to plan for both emerging and future skills development.

3.6.4 To assist and encourage Batswana to transit from subsistence to commercial farming, Government introduced Temo Letlotlo, Thuo Letlotlo and Majaaikgorosa. This transition requires Batswana to be equipped with modern methods of farming and hence re-tooling and up-skilling of farmers is of paramount importance.

3.6.5 Table 13 shows the future job openings in the agriculture sector which were mapped throughout the various phases of the value chain development.

Table 13 Future Job Openings - Agriculture Sector (Value Chain Development)

CROP HUSBANDRY		CROP HUSBANDRY	
PRE- PRODUCTION		**PRODUCTION**	
Occupation	**Training Level**	**Occupation**	**Training Level**
Fire Impact Assessors	Diploma	Irrigation technician	Diploma
Meteorologist -Technician	Diploma	Agronomist	Degree
Meteorologist	Degree	Horticulturalist	Post-Graduate
Seed technologist	Degree	Agrochemical specialist	Post-Graduate
Soil scientist	Degree	Weed scientist	Post-Graduate
Agro meteorologist	Post-Graduate	One health specialist	Post-Graduate
Hydro meteorologist	Post-Graduate		
Climate Scientist	Post-Graduate		
POST- PRODUCTION		**INDUSTRIAL PROCESSING**	
Occupation	**Training Level**	**Occupation**	**Training Level**
Post-harvest technologist	Post-Graduate		
Food safety specialist	Post-Graduate		
ANIMAL HUSBANDRY		**ANIMAL HUSBANDRY**	
PRODUCTION		**PRODUCTION**	
Fish technical officer	Diploma	Process Engineer	Post-Graduate
Lab technician	Diploma	Biotechnologists (agriculture)	Post-Graduate
Range managers	Degree	Fire Ecologists	Post-Graduate
Extension Officers	Degree	Ecologists	Post-Graduate
Animal Breeder	Degree	Social researcher	Post-Graduate
Irrigation engineer	Degree	Monitoring & evaluation specialist	Post-Graduate
Nutritionist	Degree	Manufacturing Engineer	Post-Graduate
Animal scientist	Post-Graduate	Fish pathologist	Post-Graduate
Animal bio statistician	Post-Graduate	Entomologist	Post-Graduate
Aqua culturist	Post-Graduate	Bee pathologist	Post-Graduate
Wildlife specialist	Post-Graduate	Veterinary pathologist	Post-Graduate
Chemistry Specialists	Post-Graduate	Veterinary epidemiologist	Post-Graduate
Microbiology	Post-Graduate	Molecular biologist/geneticist	Post-Graduate
Animal welfare specialist	Post-Graduate	Animal Reproduction Physiologists	Post-Graduate
Industrial biotechnologist	Post-Graduate	Plant Pathologist	Post-Graduate
Green Chemistry	Post-Graduate	Veterinary Specialists	Post-Graduate
Analytical Chemistry	Post-Graduate		
POST- PRODUCTION		**INDUSTRIAL PROCESSING**	
Meat Inspectors	Diploma	Meat Processor	Certificate
Milk Technician	Diploma	Leather Technologists	Diploma
Refrigeration Technologists	Degree	Laboratory Technician	Diploma
Meat Scientist	Post-Graduate	Automation Specialists	Post-Graduate
Food Technologist	Post-Graduate	Bloc- Chain Technologist	Post-Graduate

3.6.6 **Recommendation for Training** for the agriculture sector is provided for in Appendix 1. It includes a comprehensive list of occupations and skills needed for filing vacancies, replacements, new job openings for both existing and new

organisations. The occupations have been aligned to the training programmes to determine recommendation for internal and external training.

3.7   Tourism Sector

3.7.1   Tourism is anticipated to be a major growth sector. The tourism industry will be diversified to provide economic growth and employment opportunities for local communities. Diversification of the sector will be achieved through specialised marketing, product development and diversification, skills development, development of suppliers, infrastructure development and improved general coordination (National Transformative Strategy, 2023- 2030).

3.7.2   **Mega Projects**: These include Meetings, Incentives, Conferences, and Exhibitions (MICE); Leveraging on Technology to improve service delivery and product development; astro-tourism (low impact tourism); share prosperity projects under tourism, development of specialised digital marketing and sales platforms and continuous re-tooling and up-skilling of tourism workforce.

3.7.3   Table 14 shows the future job openings that will be created in the tourism sector during the implementation of the National Transformative Strategy.

Table 14: Future Job Openings in the Tourism Sector

OPERATIONS & SERVICES		TECHNOLOGY(4IR)-FUTURE JOBS	
Occupation	**Training Level**	**Occupation**	**Training Level**
Professional Hunters/Guides	Diploma	Digital Branding & Marketers	Degree
Professional House Keepers	Certificate	AI Data Analyst	Degree
Certified City Tour Guides	Diploma	AI Solutions Architect	Degree
Certified Cultural Tour Guides	Diploma	AI Ethics Consultant	Degree
Gastronomy Tour Guides	Diploma		
Astro Tour Guides	Diploma		
Artifacts Guides	Diploma		
Ecotourism Guides	Diploma		
Monuments Guides	Diploma		
Specialized Chefs	Degree		
Wildlife Wilderness Entrepreneurs	Degree		
MICE		**ENVIROMENTAL SUSTAINABILITY-**	
Occupation	**Training Level**	**Occupation**	**Training Level**
Customer Experience Specialist	Degree	Environmental Sus. Scientist	Degree
Event Planners	Degree	Environmental Policy Analyst	Degree
Travel Planners	Degree	Adventure/sustainable Tourism	Degree
Foreign Language Translators	Degree	Ornithologists	Degree
Tourism Entrepreneurs	Degree		

3.7.4   **Top -up Skills:** The Tourism Sector will leverage on technology to improve their services and products. To this end the sector will prioritise up-skilling of

the workers on the latest high-tech skills. The success of tourism rest in sustainable environmental management and hence the need to up-skill workers on the green skills. Table 15 shows the current, emerging, and future skills needed for the tourism sector.

Table 15: Current and Future Skills

Current Skills	Future Skills
Storytelling	Machine learning and AI algorithms
Cultural sensitivity	Data protection and cyber security
Foreign languages translation	Sensitive data processing
Digital currency	Blockchain
Digital marketing and branding	Knowledge of retrofitting
Data analysis, research, and market intelligence	Carbon management
Customer experience management	
Sustainability certification	
TedQual certification	
Biodiversity and sustainability management	
Resource-efficiency management	

3.7.5 **Recommendation for Training** for the tourism sector is provided for in Appendix 1. It includes a comprehensive list of occupations and skills needed for filing vacancies, replacements, new job openings for both existing and new organisations. The occupations have been aligned to the training programmes to determine recommendation for internal and external training.

3.8 Trade Sector

3.8.1 Trade has the potential to be a growth sector through digital transformation, innovation, and diversification. Trade in diamond commodities has reached maturity while trade in other commodities and services still needs to be developed. Given its location, Botswana will position itself as a trade hub. (National Transformative Strategy, 2023- 2030).

3.8.2 Botswana is party to several trade agreements which grant preferential markets access to local exports. The country's membership to the African Continental Free Trade Area (AFCFTA) presents new opportunities for domestic firms to access a larger regional market and to potentially participate in Global Value Chains (GVCs).

3.8.3 **Key Projects**: These include diversification of the economy through priority commodities and services per sector, ease of doing business, and leveraging on technology to transform commodities and services.

3.8.4 Table 16 shows the future job openings in the trade sector that will be created during the implementation of the National Transformative Strategy

Table 16: Future Job Openings in the Trade Sector

Trade Negotiations	Trade lawyers
Forensic Auditors	Business Intelligence Analysts
Market Research Analysts	Big Data Analysts
Business Development Managers	Products Design Specialists
Innovation Strategy Specialists	

3.8.5 **Top-Up Skills:** There is urgent need to up-skill and re-tool the workforce for the trade sector to cope with technological disruptions and geopolitics that impact on global trade negotiations. Table 17 shows the skills in demand for the Trade Sector

Table 17 Skills in Demand for the Trade Sector

ECONOMIC DIVERSIFICATION		EASE OF DOING BUSINESS
Trade Negotiations		Contract Management
Research		Networking and Interface
Strategic Management		Teamwork
Financial Management		Emotional Intelligence
Impact Assessment		Leadership
Fraud Investigation		
Advanced Public Speaking		
Data Analysis		
Mandarin (Chinese language)		
Corporate Law		
TECHNOLOGY AND INNOVATION		RESEARCH DEVELOPMENT & COMMERCIALISATION
Digital Transformation		Policy Analysis
Automation		Applied Research
Digital Platforms		Commercialisation
		Business Modelling
		Monitoring and Evaluation

3.8.6 **Recommendation for Training** for the trade sector is provided for in Appendix 1. It includes a comprehensive list of occupations and skills needed for filing vacancies, replacements, new job openings for both existing and new organisations. The occupations have been aligned to the training programmes to determine recommendation for internal and external training.

3.9 Transport and Logistics Sector

3.9.1 Transport and Logistics is a potential growth sector and is supportive of increased trade and improved economic efficiency, maximising the benefits of Botswana's strategic location in the centre of Southern Africa. It can lead to

direct job creation in the sector and facilitate job creation in the other sectors (National Transformative Strategy, 2023- 2030).

3.9.2 **Mega Projects**: These include the Transport Special Economic Zone projects, e.g. Airport City Logistics; Infrastructure Development for Transport and Logistics Sector; Integration of air, rail, and road with digital communications; North- South Corridor with Zambia; North-East and North-West Corridor with Namibia-Mozambique connecting to the Zambian Link. These projects have a potential of job creation once implemented under the National Transformative Strategy.

3.9.3 Table 18 shows the future job openings that will be created during the implementation of the National Transformative Strategy.

Table 18: Future Job Openings in the Transport and Logistics Sector

AIRPORT CITY LOGISTICS HUB (SEZA PROJECTS)		DIGITAL COMMUNICATIONS	
Occupation	Training Level	Occupation	Training Level
Heavy Plant Mechanics	Certificate	ICT Technicians	Diploma
Trailer Air System Technicians	Diploma	Vehicle Telematics Technician	Diploma
Trailer Technicians	Diploma	Cybersecurity architect	Degree
Hydraulic Technicians	Diploma	Freight Village logistics	Degree
Terminal Managers	Degree	Software Developers	Degree
Transport Logisticians	Degree	Terminal Managers	Degree
Business Development Manager	Degree	Transport Logisticians	Degree
SHEQ Manager	Degree	Transport Planners	Degree
Operations Specialist	Degree	Dry Port Managers	Degree
NORTH – SOUTH -WEST- EAST CORRIDORS		TRANSPORT HUB	
Occupation	Training Level	Occupation	Training Level
Bulk Vehicle Operator	Special License	IT Technicians	Diploma
Telecommunications Technician	Diploma	Vehicle Telematics Technician	Diploma
Transport Logisticians	Degree	Freight Village logistics	Degree
Dry Port Managers	Degree	Software Developers	Degree
Digital Sales & Marketing	Degree	Terminal Managers	Degree
Terminal Logistics	Degree	Transport Logisticians	Degree
Transport Management	Degree	Transport Planners Experts	Degree
Freight Village Managers	Degree	Dry Port Managers	Degree
Safety Regulators	Degree	Cyber Security Architect	Degree
Operations Manager	Degree	Civil Engineers	Degree
Civil Engineers	Degree	Telecommunication Engineers	Degree
Signals Telecommunicators	Degree	Operations Specialists	Degree
Terminal Manager	Degree		
Transport Logistics	Degree		
Freight Village Managers	Degree		
Transport Planners	Post-Graduate		
Transport Economists	Post-Graduate		

3.9.4 **Recommendation for Training** for the transport and logistics sector is provided for in Appendix 1. It includes a comprehensive list of occupations and skills needed for filing vacancies, replacements, new job openings for both existing and new organisations. The occupations have been aligned to the training programmes to determine recommendation for internal and external training.

3.10 Sports and Creative Industries

3.10.1 The Sports and Creative Industries are potential growth sectors in the knowledge economy with high job creation opportunities that will create wealth, especially for the youth. For this sector to grow, there is a need to be creative, cultivate and preserve culture, Indigenous knowledge, and talent for commercialisation, thereby ultimately contributing to economic growth. Botswana can be a continental cultural hub and sports centre (National Transformative Strategy, 2023- 2030).

3.10.2 **Projects**- The key projects include up-skilling and re-tooling the sports and creative industries practitioners to equip them with business and entrepreneurial skills to create new jobs.

3.10.3 **Table 19** shows the potential future job openings in the sports and creative industries sector.

Table 19: Future Job Openings in the Trade Sector

Tapestry Weavers	Cinematographers
Yam Splinter	Curators
Painters and Drawers	Script Supervisors
Film Producers	Muralists
Film Distributers	Creative Coding
Film Editors	Content Creators
Gaffer	Film Props Designers
Content Writers	Digital Marketing and sales
Directors for the Creatives	Digital Branding

3.10.4 The emergence of the fourth industrial revolution has transformed the sports and creative industries sector. The sector is already leveraging on technology to improve their services and products. Table 20 shows the skills in demand in the creative industries sector.

Table 20: Skills in Demand in the Sports and Creative industries Sector

Current Skills	Future Skills
Collaboration	Digital Marketing and Sales
Communication	Artificial Intelligence (AI)
Leadership	Big Data Analysts
Negotiation	Digital Designers
Critical thinking	Audience Surveying
Product design	
Creativity	
Equipment management	
Organizational skills:	
Events management	
Knowledge of IP Laws	
Copyright laws and Standards	
Marketing	
Financial Management	
Budgeting	
Mobilization	

3.10.5 **Recommendation for Training** for the sports and creative industries sector is provided for in Appendix 1. It includes a comprehensive list of occupations and skills needed for filing vacancies, replacements, new job openings for both existing and new organisations. The occupations have been aligned to the training programmes to determine recommendation for internal and external training.

3.11 Financial, Real Estates and Business Services

3.11.1 Financial, Real Estate and Business Services Sector is considered a mature sector. However, there are opportunities for improved access to private sector credit markets, increased sophistication of capital markets, and roll out of financial technology (fintech) in the financial service industry (National Transformative Strategy, 2023- 2030).

3.11.2 **Projects**- The Finance, Real Estate and Business Services sector is leveraging on technology to improve their service delivery and product development. To this end, new job openings are emerging that requires specialised digital and business services skills.

3.11.3 The Knowledge-Intensive Business Services(F&KIBS) provide inputs based heavily on advanced technological and professional knowledge to business processes of other organizations. Innovative and specialised F&KIBS industry requires development of diverse skills to promote competitiveness.

3.11.4 Table 21 shows the future job openings that will be created during the implementation of National Transformative Strategy.

Table 21: Future Job Openings in the Finance, Real Estate & Business Services

Occupation	Training Level	Occupation	Training Level
Printing Technician	Diploma	Data Scientists	Degree
Procurement Specialists	Degree	Cloud Computing Engineers	Degree
Buyer (procurement oversight)	Degree	Robotic Engineers	Degree
Risk Officers	Degree	Big Data Analysts	Degree
Software Developers	Degree	Automation Engineer	Degree
Business Intelligence Analysts	Degree	Behavioral Scientists	Degree
Actuarial	Degree	Artificial Intelligence Engineer	Post-Graduate
Tax Specialist	Degree	Forensic Accounting/Audit	Post-Graduate
Fintech Analysts	Degree	IT Auditor	Post-Graduate
Financial Services Supervisors	Degree	Investment Principal	Professional
Underwriter (short-term)	Degree	Investment Analyst	Professional
Auctioneer	Degree	Financial Analyst	Professional
Quantity Surveying	Degree	Financial Engineer	Professional
Property Valuers	Degree	Financial Planner Experts	Professional
Estate Agents	Degree	Collective Investment Analyst	Professional
Cyber Risk Managers	Degree	Energy Auditors	Professional
Facility Manager	Degree	Chartered Accountants	Professional
Asset Manager	Degree	Portfolio Manager	Professional

3.11.5 **Top -up- Skills**: The emergence of the fourth industrial revolution has accelerated the need to up-skill and re-tool the workforce to cope with new demands and disruptions caused by technology. Table 22 shows the specialised skills in demand for the finance, real estate, and business services sector.

Table 22: Skills in Demand in the Finance, Real Estate, and Business Services

Current Skills	Future Skills
Financial Technology	Artificial Intelligence
Printing Origination	Robotics Technology
Machine Printing	
Printing Electronics	
Printing Mechanics	

3.11.6 **Recommendation for Training** for the financial, real estates and business services sector is provided for in Appendix 1. It includes a comprehensive list of occupations and skills needed for filing vacancies, replacements, new job openings for both existing and new organisations. The occupations have been aligned to the training programmes to determine recommendation for internal and external training.

Chapter 4: TVET for Sustainable Economic Development

4.1   Introduction

4.1.1   Technical and Vocational Education Training (TVET) is not just an educational pathway, but its strategic investment in human capital. By equipping individuals with the industry's needs, TVET enhances the productivity and employability of the workforce, making it a vital driver of sustainable economic growth (UNESCO Strategy for TVET, 2022-2030). By providing technical skills and business acumen, TVET can empower individuals to start their own ventures, further contributing to job creation. The demand for green skills and green jobs for sustainable energy solutions presents an opportunity for development of technicians and repairers at the TVET institutions (UNESCO-UNEVOC, 2023).

4.1.2   When presenting the 2024 State of the Nation Address (SONA), the President emphasised the role of TVET in developing a sustainable economic development when he said:

> *"We will launch nation-wide vocational training programs and create apprenticeship opportunities to empower young people with hands-on skills for the workforce. Additionally, we will provide small business grants to encourage youth entrepreneurship and innovation".*

4.1.3   Figure 11 shows strategic themes that will guide development of TVET skills for sustainable economic development.

Figure 11: TVET for sustainable economic development
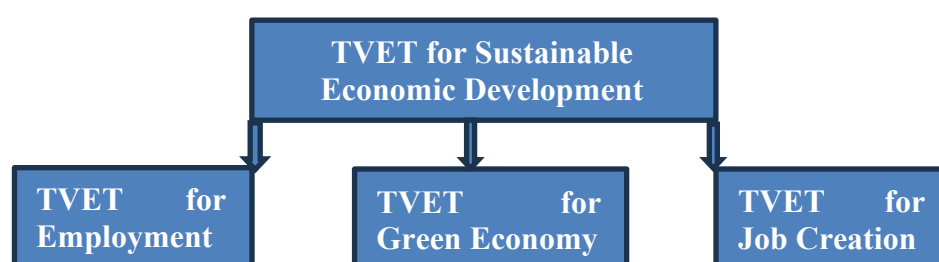
4.1.4   Given the existing problems of unemployment and the significant pressure on future employment, it is critical to develop TVET skills that will enable individuals to compete for opportunities available for employment and job creation in the local and global market. Table 23 therefore present the TVET skills that are in high demand:

Table 23: TVET Skills in High Demand

TVET Skills for Employment	TVET Skills for Green Economy	TVET Skills for Job Creation
Coded Welding	Solar Energy Technicians	Entrepreneurship
Machine Repairers	Solar Energy Repairers	Creativity
Maintenance Technicians	Wind Service Technician	Innovation
Specialised Machine Operators	Wind Turbine Operator	Business Management
Hydraulics	Waste Recycling Operator	Digital Branding
Mechatronic Technicians	Wind Energy Repairers	Digital Marketing & Sales
Millwright Artesian	Solar energy entrepreneur	Collaboration
Heavy duty maintenance specialist	Wind energy entrepreneur	Social Media Analyst
Boilermakers	Carbon trader/broker	Content Creator
Scaffolding and Rigging	Smart Energy Technician	Data Analysts
Bricklayers (*Robotic Bricklaying*)	Eco-Designer	Business Modelling
Chefs (including Specialists)	Recycling Technician	Creative Writing
Tour Guides (including Specialists)	Environmental Technician	Proposal Writing (Tenders)

4.1.5 **Recommendation for TVET Training** across various sectors and fields of learning is provided for in Appendix 1. It includes a comprehensive list of occupations and skills needed for filing vacancies, replacements, new job openings for both existing and new organisations. The occupations have been aligned to the training programmes to determine recommendation for internal and external training.

Chapter 5: Global Future Skills and Future Jobs

5.1 Introduction

5.1.1 Botswana through VISION 2036 has committed to **developing an internationally competitive workforce that is productive, creative and has international exposure.** Continuous foresight analysis enhances development of medium to long term skills plans' that will guide the development of future skills for the future jobs.

5.1.2 A globally competitive human resource will drive the development of a diversified economy with a capacity to sustainably create decent jobs and improve the socio-economic status of Batswana.

5.1.3 According the 2024 World Economic Forum Report, the Fourth Industrial Revolution has accelerated the pace of adoption of technologies and shifted the frontier between humans and machines across sectors and nationalities around the world.

5.1.4 **Future Skills and Future Jobs**: To cope with technological disruptions caused by the fourth industrial revolution the world is prioritising the development of future skills for the **green economy, digital economy, and care economy** (Global Job Skills Report, 2024).

5.2 The Green Economy

5.2.1 Many existing jobs will require green skills, as companies across sectors adopt more environmentally sustainable practises and develop sustainable targets for compliance and reporting. According to the 2024 Global Skills Report the global demand for the skills in the green infrastructure and mobility domain has grown by approximately 200% from 2018 to 2021. Table 24 shows the emerging green domain and skills for the green economy.

Table 24: Emerging Green Domain and Skills

Domain	Occupation	Technical Skills
Energy, Resource Circularity and Decarbonisation	*Solar Photovoltaic Engineer *Energy System Engineer *Automation Engineer *Food Safety Specialist *Food Technologists *Quality Assurance and Control Specialists	*Renewable Energy System Management and Integration *Solar photovoltaic Energy Assessment *Farming Implementation and Management *Food processing and management

		*Farming Business Development and Management
Green Infrastructure and Mobility	*Architect Specialists *Building Supervisors *Automotive Electric Technician *Automotive maintenance and repairs	*Climate- mitigation features in Built Environment *Green Facilities Management *Hybrid Electric Vehicle Maintenance and Repairs and Management
Environmental and Sustainability Management	*Health, Safety & Environmental Manager *Smart Facilities Managers Engineering Managers *Solar Photovoltaic Development Engineer *Process Engineer *Health, Safety & Environmental Engineer	*Green facilities management *ESG- Environmental, Social & Governance *SHEQ-Safety Health, Environmental and Quality *Sustainable process engineering
Sustainable Finance	*Investment managers *Investment Analysts *Credit and Risk Managers *Digital Sales, Marketing Specialists	*Carbon Markets and Decarbonisation Strategists management *Sustainable Investment Management *Impact Indicators, Measurement & Reporting

World Economic Forum report, 2024.

5.2.2 Unlocking Opportunities for Skills Development and Job Creation in the Botswana's Green Economy

5.2.2.1   Government has prioritised development of the green economy in the National Transformative Strategy (NTS). The 2024 State of the Nation Address (SONA) highlighted key initiatives that are critical in developing the green economy and thereby presenting an opportunity for job creation and skills development.   Table 25 shows opportunities available for skills development and job creation in Botswana's Green Economy.

Table 25: Unlocking Opportunities in Botswana's Green Economy

Extracts from SONA & NTS	Key Projects in NTS and NDP 12	Opportunities for Skills Development & Job Creation
Environmental, Social and Governance (ESG) Strategy- Government will launch and implement the National ESG Strategy that focuses on environmental sustainability, climate change and green finance.	**The ESG Strategy** cuts across various sectors and priority will be given to renewable energy, waste management and conservation.	*Develop future green skills in Environmental & Sustainability Management and Sustainable Finance (Ref. Geen Skills shown in Table 24) * There is opportunity for the green jobs as both the public and

		private sector are considering compliance to the ESG reporting.
Renewable Energy: Government will invest in renewable energy projects such as solar, wind and bioenergy and hence reducing reliance on fossil fuels.	***Smart Mining**- Most of the mines are gradually shifting towards the use of renewable energy and technology to drive implementation of their strategies that includes **underground mining** and **open cast mining**. * The demand for solar energy is also increasing in Agriculture and Manufacturing.	*The demand for renewable energy skills is increasing especially in Mining, Energy, Agriculture and Manufacturing (Ref. Green Skills in Table 24) * There is an opportunity for **transforming TVET** with specific focus on developing **green skills** for both **employment** and **job creation** * Currently there is high demand for **repairers and technicians** for **solar energy** in **Agriculture** and **Mining**.
Conservation of Natural Resources- Government will prioritise policies focused on environmental protection, climate change mitigation and sustainable resource management	***NTS**- Government will expand efforts to protect Botswana's unique wildlife and ecosystems. Eco-tourism will play a vital role in both preserving our environment and generating sustainable income for local communities	*There is an opportunity for Universities and TVET institutions to develop new programmes on Environmental and Sustainability Management (Refer to Table 24 on green skills).

5.3   **The Digital Economy**

5.3.1   Riding on the post-COVID 19 wave, the need for digital skills and jobs continue to see the high demand. According to the 2023 Microsoft Annual Report, the estimated number of technology-oriented jobs in the world will increase to 190 million in 2026. Table 26 shows the emerging digital domain and skills for the digital economy.

Table 26: Emerging Digital Domain and Skills

Domain	Occupation	Technical Skills
Artificial Intelligence (AI), Data & Analytics	*Artificial Intelligence Applied Researcher *Data Scientists *Big Data Analytics Specialists	* Artificial Intelligence Application Research and Information System *Big Data Analytics *Data facilities Management
Cloud, Systems, and Infrastructure	*Radio Frequency Engineer *Artificial Intelligence Engineer *Infrastructure Engineer *Infrastructure Architect *Infrastructure Technicians *Data Architect	*Radio Frequency Engineering *Data Visualisation *Infrastructure Design *Infrastructure Management

	*Data Centre Operating Engineer	*Automated Maintenance & Repairs
Cybersecurity and Risk Management	*Health, Safety & Environmental Manager *Smart Facilities Managers Engineering Managers *Solar Photovoltaic Development Engineer *Process Engineer *Health, Safety & Environmental Engineer	*Security Governance *Data Protection Management *Cyber Risk management *Cyber and Data Breach Incident Management
Software Development	*Quality Assurance Tester *Vulnerability Assessment and Penetration Testing Analyst *Application Support Engineer *Product Designers *Associate Software Engineer *Software Architect *Embedded System Engineer *Software Engineer	*Software Design *Software Testing *Solution Architect *User Experience Design *
E-Commerce and Digital Marketing	*E-Commerce Manager *Digital Marketing & Sales Experts *Merchandising Specialists *Product Development Manager *Principal Service Designer	*E-Commerce *Digital Marketing *Merchandising *Digital Designing *Product Development *Interaction Design practise
Technology Application and Management	*Technology Application Researchers *Technology Engineers	*Emerging Technology Scanning *Technology Analysts

World Economic Forum report, 2024

5.3.2 Unlocking Opportunities for Skills Development and Job Creation in the Botswana's Digital Economy

5.3.2.1 Government has prioritised digitisation to automate services to improve service delivery. To this end, priority will be given to the development of the ICT infrastructure to enable both the public and private sectors to leverage on technology to increase productivity levels for economic growth and diversification. Table 27 shows opportunities for skills development and job creation in Botswana's Digital Economy.

Table 27: Unlocking Opportunities in Botswana's Digital Economy

Extracts from SONA & NTS	Key Projects in NTS & NDP 12	Opportunities for Skills Development & Job Creation
A Smart Botswana will be achieved through investments in the state-of-the-art ICT infrastructure, increased access, and affordable prices. (National Transformative Strategy, pp11) **Fourth Industrial Revolution**-Government is committed to working with local and global technology companies to rapidly prepare Botswana for the Fourth Industrial Revolution (State of the Nation Address, pp 20-21)	**Key Projects on SONA SpaceX** and **Starlink** have been engaged to invest in ICT infrastructure to accelerate affordable connectivity to the entire country. ***Acceleration of Rural Connectivity and School Connectivity programme**-The target is to connect three hundred schools by end of 2025.	The Starlink project present opportunities for skills transfer and job creation during the development of the infrastructure for high-speed internet connectivity. Therefore, there is need for development of digital skills in the Cloud, Systems, and Infrastructure domain (Refer to Table 26: digital skills) *This project presents opportunities for **Attachments** of **ICT Unemployed Graduates** to gain practical working experience that will make them more competitive in the local and global market.

5.4 The Care Economy

5.4.1 Preventive care, workplace learning, transformative human resource, learning and development practises, as well as importance placed on mental wellbeing are driving changes to jobs and skills in the care economy. According to the World Health Organisation Report (2024), the number of people aged sixty and above is projected to increase by 40%, creating significant demand for care workers within the care economy due to the rapidly aging population. Table 28 shows the emerging care domain and skills for the care economy.

Table 28: Emerging Care Domain and Skills

Domain	Occupation	Technical Skills
Health and Wellness	*Occupational Therapist *Speech Therapist Director of Nursing (Clinical) *Senior Staff Care Nurse *Social Worker Experts	*Resilience and Self-Care *Health, Hygiene and Nutrition for Children *Health Promotion *Effective Client Communication *Intervention Implementation in Therapy Support
Person-Centred Care	*Learning and Organisational Manager *Patience Service executive *Learning Solution Specialists	*Change Management *Excellence in Service *Human Resource Advisory *Individual Intervention Planning and Implementation

Teaching and Learning	*Manager-Performance Rewards *Nurse Manager *Physiotherapist *Learning and Development Specialists *Manager- Talent Management *Psychologists	*Performance Management *Coaching and Mentoring *Career Coaching *Talent Management *Critical Thinking *Leaning Needs Analysis
Collaboration and Stakeholders	*Childcare Centre Manager *Volunteer Manager *Nurse Clinician *Employee Experience & Relations manager	*Community Partnership *Professional Consultation *Family and Caregiver Engagement

World Economic Forum report, 2024.

5.4.2 Unlocking Opportunities for Skills Development and Job Creation in the Botswana's Care Economy

5.4.2.1   As encapsulated in the National Transformative Strategy (2023-2030), the mental, social, and physical well-being of the population is the basis for national productivity and competitiveness. To achieve the universal health care, the Health Sector will need a holistic infrastructure development and maintenance strategy, including a clear human resource plan for health specialists, specialised health machinery, and availability of medication.

Table 29: Unlocking Opportunities in Botswana's Care Economy

Extracts from SONA & NTS	Key Projects in NTS and NDP 12	Opportunities for Skills Development and Job Creation
The goal of the Health Sector is to design, develop and implement a sustainable health safety net that is inclusive. (State of the Nation Address, pp21) The **2025/26 Budget Strategy Paper** has identified four national priorities: *Improving Quality of Life *Modernising and Transforming Infrastructure *Building and Inclusive Economy *Innovation and Digital Transformation	**Key Projects on 2024 SONA** *National Mandatory Health Insurance Scheme *Universal Health Coverage Plan for All Citizens *National Health Digitisation Roadmap to modernise our systems *Investment in infrastructure, capacity building, human resource development and public awareness.	*The key projects indicated on the 2024 SONA for Inclusive Health Care presents opportunity to continually addressing the shortages of specialised health professionals. *This presents an opportunity for job creation and development of emerging and future skills (Ref: Appendix 1 & 2 Recommendation for Local and External Training) *Opportunities for Inclusive Health Care include **re-tooling and up-skilling the unemployed health graduates to provide health care to the elderly** across the country especially in remote areas where there is limited access to critical medical services

Chapter 6: Skills Forecasting

6.1 Introduction

6.1.1 Skills forecasting is the process of determining future skill needs based on economic modelling of future labour demands (Brustis, 2021). The forecasting process detects early warning of the behaviours of the labour market to help key stakeholders to be more responsive to the risks associated with over supply or under supply of skills. Continuous review of skills forecasts is critical for managing unemployment and underemployment levels effectively because production would be adjusted continually and timeously to respond to what is required by the industry at any given time.

6.1.2 The skills forecasting model is a tool that integrates modelling and forecasting into the HRD planning process. The key processes of forecasting include but are not limited to the following:

- Identifying the concentration of potential future job openings in the country.
- Identifying implications of these potential jobs in terms of occupations and qualifications.
- Comparing the skills needs with the supply of skills to identify if there will be any imbalances.

6.1.3 Figure 12 shows the **Occupational Demand and Supply Model** adopted by Botswana. This model is used worldwide, with an option to customize it to each country's situation on data availability. The choice of the model was driven by the availability of information. The **model requires two critical steps**:

- Collecting data on past trends in economy (Gross Domestic Product), labour market, demography, and education.
- Setting assumptions on the future of economy (GDP Projections), labour market, demography, and education.

6.1.4 The adopted model framework for Botswana is similar to the UNESCO Skills Forecasting Model which embraces Forecasts of Labour Supply by Occupation. The supply side of the model capsulate two major determinants of labour supply being graduates who are coming out from the education system (flow) and the unemployed population (stock). Therefore, this means that at the end, two sets of imbalances/balances can be produced largely to indicate the extent to which graduates are affected by labour demand. This analysis is important for Botswana given that the country is faced with high graduate unemployment.

Figure 12 Skills Forecasting Model (Occupational Demand and Supply Model)
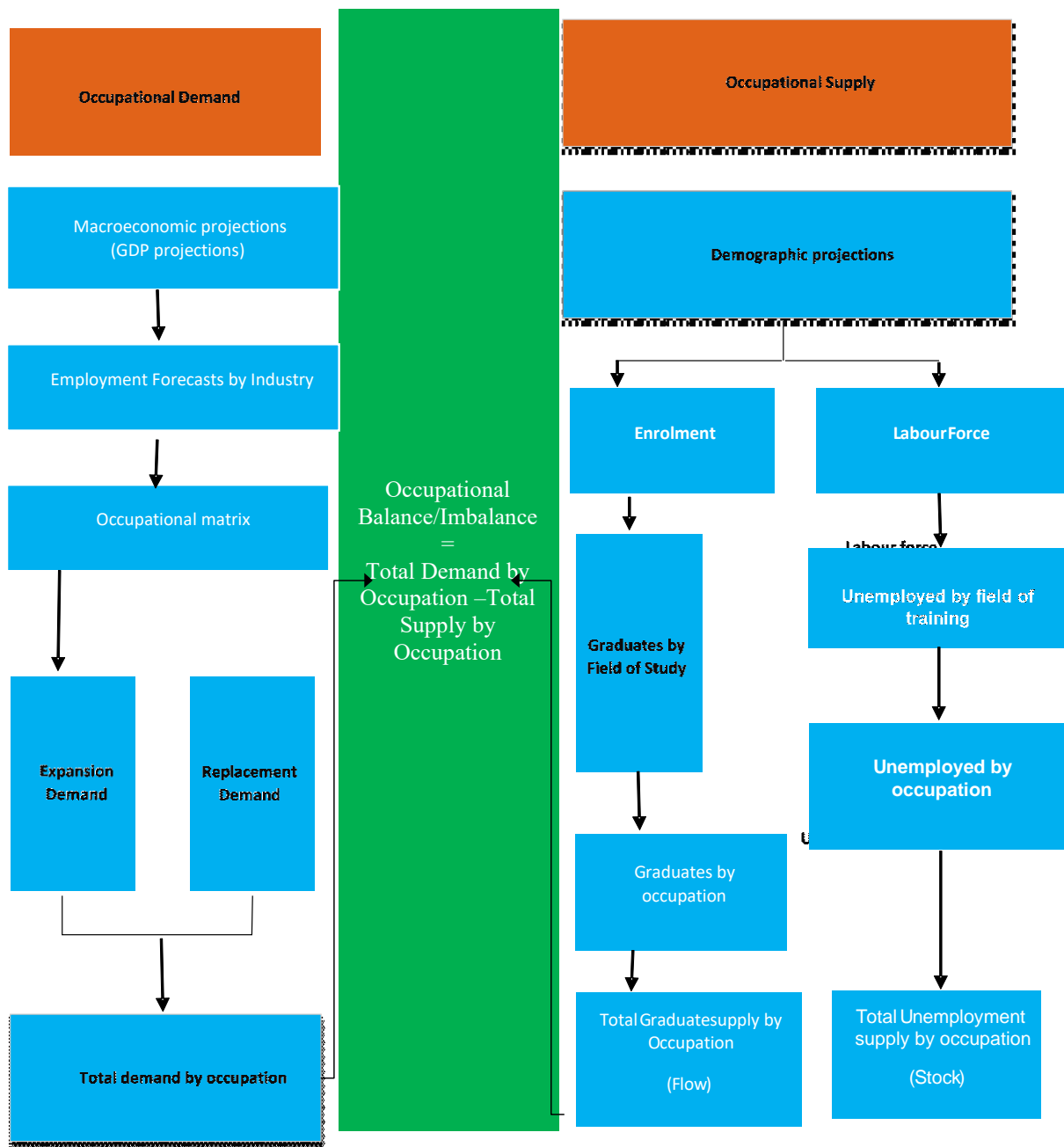
Source: UNESCO Skills Forecasting Model

Summary of the Skills Forecasting Results

6.1.5 **Table 30** shows that the demand for more occupations is increasing at an insignificant rate, suggesting that the growth of the economy is insufficient to generate more jobs. The results further shows that production from ETPs is faster than the employment growth rate. This scenario however requires close monitoring of both growth and enrolments trends to safeguard the imbalances widening again.

Table 30: Occupations in demand by Economic Sectors and year (2025-2028)

SECTORS	2025	2026	2027	2028
AGRICULTURE	936	901	880	849
BUSINESS & FINANCIAL SERVICES	1143	1111	1148	1196
CONSTRUCTION	866	759	715	666
CREATIVE INDUSTRIES	1530	1474	1674	1548
EDUCATION & TRAINING	334	353	382	451
HEALTH	2217	1745	1576	1428
INFORMATION AND COMMUNICATION TECHNOLOGY	451	472	512	539
MANUFACTURING	872	901	857	1013
MMEWR	1913	1783	2003	1908
PUBLIC SECTOR	248	202	228	226
TOURISM & HOSPITALITY	799	753	682	660
TRANSPORT & LOGISTICS	3287	3089	3231	3288
Grand Total	**14596**	**13544**	**13889**	**13771**

6.1.6 The forecasts for the Transport and Logistics Sector indicate that it is projected to lead in terms of the demand for jobs in the short to medium term. The sector has been prioritised under the National Transformation Strategy (NTS) for the period 2023-2030. Major projects outline by the NTS that specifically focus on improving and developing transportation infrastructure and systems include the following: airport city, high-speed rail line connecting major cities and towns, smart public transportation system and Trans-Kalahari rail line.

6.1.7 The second largest forecasted contributor to employment is the Health Sector, mainly due to the need to increase ratios of physicians, nurses and midwives, pharmacists and dentists per 10 000 population which are currently at 3.8, 30.5, 0.5 and 0.3 respectively compared to the global benchmark of 17.2, 37.7, 4.8, and 3.3 per 10 000 population in 2022 respectively (World Health Organisation, May 2024 - https://data.who.int/indicators). This projected increase also resonates well with the national aspiration of attaining universal health coverage.

6.1.8 **On-Job Training:** It is also worth noting that most of the projected forecasts for Health, Finance and Business are specialised areas at 57.5% and 53.5% respectively are not necessarily creating job openings.

6.1.9 Table 31 shows forecasts for occupations which are in short supply by fields of study for the period 2025 to 2028. The demand for the different training fields shows a stagnated growth, mainly because of sluggish economic growth and slow sector expansion. There is a slight decline in 2026 followed by a pick in 2027 due to the projected increase in economic growth and the emerging occupations and future jobs.

Table 31: Occupations in demand by Field of Study and year (2025-2028)

FIELD OF STUDY	2025	2026	2027	2028
AGRICULTURE	936	901	880	849
TOURISM & HOSPITALITY	1446	1488	1462	1631
HUMANITIES	20	23	26	24
SCIENCE & TECHNOLOGY	1191	1156	1256	1249
SOCIAL SCIENCES	363	321	370	363
TRANSPORT & LOGISTICS	2649	2469	2629	2851
MANUFACTURING	849	882	832	987
BUSINESS & FINANCIAL SERVICES	1143	1111	1148	1196
CREATIVE INDUSTRIES	1509	1451	1648	1524
CONSTRUCTION	917	823	719	681
EDUCATION & TRAINING	334	353	382	451
ENGINEERING	1876	1769	1774	1593
HEALTH	2290	1805	1625	1471
INFORMATION TECHNOLOGY	133	139	155	163
Grand Total	**15657**	**14693**	**14907**	**15033**

Chapter 7: Recommendations

7.1 Introduction

7.1.1 The recommendations in this report came from stakeholder consultations as outlined in the methodology chapter (paragraph 3.1, Table 1).

7.2 Education and Training Reforms across all Levels of Training

7.2.1 Education and Training should shift from a focus on Education for Employment only to Education for Entrepreneurship, Job Creation, Research Development, and Innovation.

7.3 Technical and Vocation Education and Training (TVET)

7.3.1 Increase the budget for TVET to enable increase in students' enrolment and requisite infrastructure.

7.3.2 Establish Industry Simulations to improve the training and acquisition of industry skills to prepare the graduates for the world of work.

7.3.3 Improve private sector participation in TVET with the aim of using partnerships to improve the quality of graduates through the trainer's attachments and students' attachments.

7.3.4 Introduce Schools of Excellence for emerging and future skills that include digital skills and green skills to reduce costs and avoid duplication. Development of digital skills and green skills is highly capital intensive, and schools of excellence will reduce costs.

7.4 STEM to STEAM

7.4.1 Fast track implementation of transition from Science, Technology, Engineering and Mathematics (STEM) to Science, Technology, Engineering, Arts and Mathematics (STEAM) to support the latest government priorities to integrate technology in the arts to improve their competitive edge.

7.4.2 Increase investment on STEM field with special focus on promoting research development and innovation. This will give the graduates opportunities for

product development, commercialisation of products, and development of new technologies for the global economy.

7.5 Student Sponsorship

7.5.1 To reduce the saturation of the same qualifications in the labour market, government sponsorship should focus more on priority skills for the priority sectors identified in the National Transformative Strategy. The skills forecast provided should guide quota(s) for the various fields of learning.

7.5.2 Incorporate graduate sponsorship in the budget for students' sponsorship to increase the number of post graduate students who will explore opportunities in research development and innovation.

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Appendix 1

RECOMMENDATION FOR LOCAL TRAINING

TRAINING AT CERTIFICATE LEVEL FOR TVET
(Crafts, Trades, Artisans & Others)

OCCUPATION	AREAS OF STUDY	FORECASTS
FIELD 1: AGRICULTURE		
Meat Processor	Meat processing	76
Milk Technician	Milk Production	66
FIELD 4: CREATIVE INDUSTRIES		
Production Runners	Film Production	94
Gaffers	Electrical and Electronic Technology	105
Best Boy	Electrical and Electronic Technology	117
Actors	Theatre and Film	17
Muralist	Fine arts	14
Tapestry weaver	Weaving	17
Beadwork workers	Jewellery making	11
Painters and Drawers (Fine arts)	Fine arts	14
Leatherwork workers	Leathercraft	11
Film Make-up artist	Cosmetology	98
Music Producer	Music Production	14
Light Engineer	Light Engineering	14
FIELD 5: CONSTRUCTION		
Steel Fixers	Welding & Fabrication	48
Grass Roof Thatchers	Carpentry & Joinery	17
Plumbers	Plumbing and Pipefitting	54
Stone Masons	Specialized Bricklaying	32
Coded Welders	Specialized Welding	49
Riggers	Carpentry & Joinery	64
Special Coaters	Painting and Decoration	28
Scaffold Erectors	Scaffolding Erection	52
Boiler Makers	Boiler Making	91
Pipe Fitters	Plumbing and Pipefitting	54
Aluminium Fabricator	Welding & Fabrication	55
FIELD 7: ENGINEERING		
Drillers	Mining Engineering	8
Mining Operators	Mining Engineering	29
FIELD 10: TOURISM & HOSPITALITY		
Travel Consultants	Travel and Tourism	33
Hotel Receptionists	Hospitality	18
Travel Guides	Hospitality	32
Bartenders	Hospitality	21
Certified City Tour guides	Travel and Tourism	32
Certified Cultural Tour guides	Travel and Tourism	32
FIELD 14: SCIENCE & TECHNOLOGY		
Photovoltaic (PV) Installers	Electrical/Electronic Engineering	46

Solar Thermal Installers	Electrical/Electronic Engineering	46
PV Solar Installer (Artisan)	Solar Installation	46
Borehole	Mechanical Engineering	143
FIELD 16: TRANSPORT AND LOGISTICS		
Engine Man / Locomotive driver	Rail Transportation	17
Trailer Mechanics	Mechanical Engineering	39
Locomotive Artisan	Mechanical Engineering	39
Wagon Artisan	Mechanical Engineering	39
Helicopter Pilot	Helicopter Flying	42
Sales Personnel	Retail & Marketing Management	74
FIELD 17: MANUFACTURING		
Machine Operator/Industrial Machinists (Pharmaceutical)	Maintenance, Fitting and Machining	24
Diamond Manufacturers (Polisher, Cutter, Grader, Valuer)	Jewellery Manufacturing	87
Sewing Machine Operators	Maintenance, Fitting and Machining	96
Tanners (Leather)	Leather Science and Technology	88
Mould Makers	Manufacturing	17
Jewellery Manufacturers (Jeweller)	Jewellery Manufacturing	96
Mould Designer	Manufacturing	17

TRAINING AT DIPLOMA LEVEL
(Technicians and Others)

OCCUPATION	AREAS OF STUDY	FORECAST
FIELD 1: AGRICULTURE		
Meat Inspectors	Meat Safety & Inspection	19
Irrigation Technician	Irrigation technology	19
FIELD 4: CREATIVE INDUSTRIES		
Camera Operators	Creative Media Production	37
Film Producer	Film Production	\56
Film Props Designer	Art and design, prop making or technical theatre	37
Music Arranger	Music	12
Computer Aided Designer	Art and Design	46
FIELD 5: CONSTRUCTION		
Mechanical Engineering Technicians	Mechanical Engineering	89
Control and Instrumentation Technicians	Electrical and Electronics Engineering	76
Chemical Engineering Technicians	Chemical Engineering	21
Construction Technologists	Building and Construction	51
FIELD 7: ENGINEERING		
Mechatronic Technician	Mechatronics	129
Locomotive Technicians	Mechanical Engineering	29
Wagon Technicians	Mechanical Engineering	29
Trailer Air System Technician	Mechanical Engineering	29
Hydraulic Technician	Mechanical Engineering	129
Trailer Technician	Mechanical Engineering	129
Design Technician	Civil Engineering	51
FIELD 9: HEALTH		
General Nurses	General Nursing	300
Psychiatric Nurses	Psychiatric Mental Health	17
Family Nurse Practitioners	Family Nurse Practitioner	18
Midwives	Midwifery	25
Pharmacy Technicians	Pharmacy Technology	985
Medical Records Officers	Health Information Management	40
Patient Navigators	Health Care Management	10
Case Managers	Health Care Management	8
Patient Experience Officers	Health Care Management	8
FIELD 10: TOURISM & HOSPITALITY		
Professional Housekeeper	Hospitality	17
Event Planners	Travel and Tourism	7
Chefs	Culinary Arts	13
Professional Hunter /Guides	Travel and Tourism	27
Gastronomy Tour Guides	Travel and Tourism	27
Sommeliers	Hospitality	18

FIELD 12: INFORMATION TECHNOLOGY		
Information & Communications Technology User Support Technicians		58
Computer Network & Systems Technicians		12
Web Technicians		19
Broadcasting and Audio-visual Technicians		17
Telecommunications Engineering Technicians		36
FIELD 14: SCIENCE & TECHNOLOGY		
Renewable Energy Technician	Electrical/Electronic Engineering	346
Printing Technician		25
FIELD 16: TRANSPORT AND LOGISTICS		
CNC Machinist	Mechanical Engineering	39
Service Technician	Mechanical Engineering	39
Air Worthiness Liaison Officer	Aeronautical Engineering	38
Sales & Marketing	Retail & Marketing Management	92
Auto Electricians technician	Auto Electrical	122
Signal & Telegraph Technician (S&T)	Telecommunication Systems	36
Instructor (Pilot)	Helicopter Flying	17
Aviation Security	Security Management	42
Flight Aviation Officer	Aviation Management	47
Customs Clearance Managers	Customs Clearing & Freight Forwarding	35
Accident Investigator	Investigative training	42
Track Masters	Civil Engineering Technicians	48
FIELD 17: MANUFACTURING		
Textile & Clothing Technicians	Textile and Clothing	29
Yarn Spinners	Spinning and Weaving	11

TRAINING AT DEGREE LEVEL
(Professionals)

OCCUPATION	AREAS OF STUDY	FORECAST
FIELD 1: AGRICULTURE		
Extension Officers	Agriculture Extension	18
Range managers	Range Science	18
Animal Breeder	Animal production	7
Irrigation engineer (civil engineer)	Civil engineering/Irrigation engineering	13
Animal Nutritionist	Nutrition Science/Nutrition & Dietetics	49
Agronomist	Agronomy	11
FIELD 3: BUSINESS & FINANCIAL SERVICES		
Sales Experts	Business Administration	58
Data Analyst	Data Analytics	12
Buyer	Purchasing & Supply	25
Risk Officers	Risk Management	11
Business Intelligence Analysts	Business Info. Systems	323
Property Valuers	Real estate management	14
Estate Agents	Real estate management	29
Asset Manager	Asset Management	11
Facility Managers	Real estate management	29
Data Scientists	Computer Engineering / Computer Science	12
FIELD 4: CREATIVE INDUSTRIES		
Film Distributors	Film Distribution and Marketing	32
Film Producers	Film Production	47
Film Directors	Film Directing	47
Film Editor	Film Editing	47
Cinematographers/ D.O. P	Cinematography	47
Script Supervisors	Creative Writing	12
Industrial Designer	Industrial Design	44
Sound Engineer	Sound Engineering	32
Stage Designer	Graphic Design/ Fine Arts/Drafting	30
Animator	Fine Art/Computer Graphics/Animation	30
Author/Creator	Creative Writing	12
Script Writer	Theatre and Film	12
Digital Archivist	Library / Archival Science	46
Radio Director	Radio Directing	25
Digital Designer	Graphic Design	40
FIELD 5: CONSTRUCTION		
High Voltage Engineers	Electrical Engineering	62
Quantity Surveying	Quantity surveying	31
FIELD 6: EDUCATION & TRAINING		

Primary School Educators	Primary Education	113
Secondary School Educators	Secondary Education	60
Special Education Teachers	Special Needs Educators	185
University and College Educators	University Education	48
Education Psychologists	Psychology	45
FIELD 7: ENGINEERING		
Control Systems Engineer or Protection Engineer	Electrical and Electronics Engineering	123
Renewable Energy Engineer	Electrical Engineering	56
Mechatronics Engineers	Mechanical & Electronic Engineering	108
Mechanical Engineers	Mechanical Engineering	108
Electrical Engineers	Electrical and Electronics Engineering	56
Control and Instrumentation Engineers	Electrical and Electronics Engineering	56
Geotechnical Engineers	Geology	12
Environmental & Sustainability Engineer	Environmental Engineering	13
Robotics and Automation Engineers	Robotics Engineering / Artificial Intelligence	73
Civil Engineers specializing in Permanent Way (Rail track)	Civil Engineering	32
FIELD 9: HEALTH		
Medical Doctors	Medicine and Surgery	50
Community Health Nurses	Community Health Nursing	9
Environmental Health Officers	Environmental Health	150
Pharmacists	Pharmacy	372
Physiotherapists	Physiotherapy	64
Chaplain/Clergy	Theology/Chaplaincy	8
Histotechnologists	Histotechnology/Cytotechnology	7
Cytotechnologists	Histotechnology/Cytotechnology	5
Medical Laboratory Technologists	Medical Laboratory Technology	50
Physical Therapists	Physical Therapy	15
Occupational Health and Safety	Occupational Health	12
Hospital Administration Managers	Health Care Management	4
Occupational Medicine Practitioners	Occupational Health	7
Internal Medicine Physicians	Internal Medicine	8
Emergency Medicine Physicians	Emergency Medicine	2
Food Science Technologists	Food Science Technology	30
Chemists	Chemistry	10
Occupational Therapists	Occupational Therapy	56
Optometrist	Optometry	23
Medical Laboratory Scientists	Medical laboratory Science	50
Nurses	Nursing	40
FIELD 10: TOURISM & HOSPITALITY		
Hotel Managers	Hospitality Management	38
Restaurant Managers	Hospitality Management	10

Foreign Languages Translator	Travel and Tourism	5
Ecotourism guide	Travel and Tourism	23
Environmental Scientists	Environmental Science	9
Environmental Sustainability Policy Analyst	Environmental Science	9
Monuments guides	Travel and Tourism	23
FIELD 12: INFORMATION TECHNOLOGY		
IT Infrastructure Managers	Computer Science/Computer Engineering/Information Systems + Cisco Certified Network Associate (CCNA), Cisco Certified Design Expert (CCDE), Computing Technology Industry Association (CompTIA ITF+, CompTIA A+)	**7**
Data Managers	Database Management	11
Information Security Managers	Computer Science/Information Technology/Information Systems + Certificate in Information Security Management (CISM)	6
IT Risk Managers	Computer Science/Information Technology/Information Systems + IT Risk Management and Assessment	5
Data Centre Engineers	Cloud Computing/Information Systems/Computer Engineering/Computer and Telecommunications Engineering + professional certifications (Dell /Cisco/AWS Microsoft, Google etc)	18
Information Systems Auditors	Computer Science/Information Technology/Information Systems/IT Audit + Certified Information Systems Auditor (CISA)	5
FIELD 14: SCIENCE & TECHNOLOGY		
Photovoltaic (PV) Installers	Electrical/Electronic Engineering	51
Solar Thermal Installers	Electrical/Electronic Engineering	51
Occupational Hygienist	Occupational Hygiene	51
Project Management & Commissioning Specialist	Project Management	14
Risk Management Specialist	Risk Management	58
Renewable Energy Technician	Electrical/Electronic Engineering	324
PV Solar Installer (Artisan)	Solar Installation	51
Borehole Mechanic	Mechanical Engineering	185
Geologist scientists	Geology	12
Geophysicists	Geology and Physics	12
Hydrogeologists	Geology and Physics	12
Geochemists	Mining and Geological Sciences	12
Geo Metallurgist	Material and Metallurgical Engineering	33
Mineral Surveyors	Mining and Mining Surveying	14

IT Infrastructure Managers	Computer Science/Computer Engineering/Information Systems + Cisco Certified Network Associate (CCNA), Cisco Certified Design Expert (CCDE), Computing Technology Industry Association (CompTIA ITF+, CompTIA A+)	7
Data Centre Managers	Computer Science/Information Systems	12
Mobile Application Developers	Software Engineering	22
Software Engineers	Software Engineering/Computer Science	21
Application Security Developers	Software Engineering + Security	14
Fintech Developers	Computer Science	32
Ethical Hackers	Computer Science/Information technology + Ethical Hacking	26
3D Printing Technicians	3D Printing Technology	2
Mobile Financial Officers	Software Engineering	12
IT Business Analysts	Computer Science/Business Information Systems + Certifications	9
Digital Forensics Experts	Computer Science + Information Technology Forensics, Certified Information Security System Professional (CISSP), Certified Information Security Manager (CISM), Certified Information Security Auditor (CISA)	31
Cyber Security Experts	Software Engineering + Certification	32
Information Security Engineers/ Architects/Analysts	Information Systems/Computer Engineering/Computer and Telecommunications Engineering/ Information Security + Ethical hacking/Certified Information Security Manager (CISM)/CISSP/CISA	26
IT Quality Assurance Specialist	Computer Science/Computer Engineering + Certified Quality Engineer (CQE), Certified Quality Auditor (CQA), Six Sigma.	4
Network Security Officers	Network Security	4
Network Security Specialists	Information Systems/Computer Engineering/Computer and Telecommunications Engineering/Computer Science/Information Security + Ethical hacking/Certified Information Security Manager (CISM)/CISSP/CISA	7
Core Network Specialists	Information Systems/Computer Engineering/Computer and Telecommunications Engineering	3

	+CCIE/Juniper/Huawei/Fortinet/NSE 7	
Cloud and Network Solutions Specialists	Computer science/Information Systems/Computer Engineering + Cloud IT/Network Certifications	11
Network Engineers	Computer Science/Computer Engineering/Networking + CCNA, CCNP, CCIE, NSE 4(+)	13
Internet of Things Engineers	Computer Science/Computer Engineering	8
Occupational Hygienist	Occupational Hygiene	51
FIELD 15: SOCIAL SCIENCES		
Lawyers	Law	49
Lawyers Administrators	Law & Public Administration	25
Social Workers	Social Work	43
Economic Planners	Economics	4
Information and Knowledge Managers	Knowledge Management	15
Data Analysts	Statistics	15
Legal Secretary	Law & Public Administration	17
FIELD 16: TRANSPORT AND LOGISTICS		
Flight Operations	Transport & Logistics Management	49
Aircraft Engineers	Aircraft Maintenance Engineer	32
S & T Engineers	Telecommunication Systems	16
Town and Traffic Planners	Transport & Logistics Management	4
Aviation / Transport Lawyer	Law	49
Transport Planners	Transport & Logistics Management	4
Environmentalist	Environmental Science	5
Freight Village Managers	Transport & Logistics Management	48
Pilots	Flight Training	14
Permanent Way Inspectors	Mechanical Engineering	108
Sales Manager	Retail & Marketing Management	115
Process Improvement Specialist	Mechanical Engineering	108
Dry Port Manager	Transport & Logistics Management	10
Warehousing and Logistics Manager	Transport & Logistics Management	277
Transportation Safety Manager/Administrator/ Officer	Transport & Logistics Management	39
Traffic Safety Engineers	Civil Engineering	32
Traffic Safety Engineers	Civil Engineering	32
Traffic Safety Analyst	Civil Engineering	32
Aviation Inspector	Aircraft Maintenance Technology	108
Aviation Specialists	Aviation Management & Technology	108
Bridge Engineers	Civil Engineering	32
Geotechnical Engineers	Civil Engineering	32
Archaeologists	Archaeology	24
Drainage Design Engineers	Civil Engineering	32

Contracts Specialist/ Construction Lawyers	Law	49
FIELD 17: MANUFACTURING		
Nutritionist	Nutrition & Dietetics	6
Textile & Clothing Engineers	Textile Spinning Technology	14

POST GRADUATE TRAINING
(Masters, Doctorate, Professional & others)

FIELD 1: AGRICULTURE		
Meat Scientist	Meat Science	20
Food Technologist	Microbial Food Safety	6
Molecular biologist/geneticist	Molecular Biology/Genetics	23
FIELD 3: BUSINESS & FINANCIAL SERVICES		
Forensic Accounting/Audit	Forensic Science	93
Digital Marketer	Business Information System	127
Commercial Transaction Advisors	Business and Finance	58
FIELD 7: ENGINEERING		
Ventilation Engineers	Mechanical Engineering	108
FIELD 9: HEALTH		
Anaesthetists	Anaesthesia	8
Paediatricians	Paediatrics	10
General Surgeons	General Surgery	9
Obstetrician/Gynaecologists	Obstetrics and Gynaecology	12
Psychiatrists	Psychiatry	15
FIELD 12: INFORMATION TECHNOLOGY		
Artificial Intelligence Engineers	Artificial Intelligence + Data Lakes	6
Machine Learning Engineers	Machine Learning	6
Cyber Risk Manager	Software Engineering	1
IT Auditor	Computer Science / Information Technology	11
FIELD 14: SCIENCE & TECHNOLOGY		
Project Management & Commissioning Specialist	Project Management	14
Risk Management Specialist	Risk Management	58
Geologist scientists	Geology	12
Geophysicists	Geology and Physics	12
Hydrogeologists	Geology and Physics	12
Geochemists	Mining and Geological Sciences	12
Geo Metallurgist	Material and Metallurgical Engineering	33
Mineral Surveyors	Mining and Mining Surveying	14
FIELD 15: SOCIAL SCIENCES		
Legal Manager	Law & Administration	49
Contracts Specialist	Law & Administration	14
Social researcher (Research and Development Managers)	Social sciences	24
Monitoring & evaluation specialist	Monitoring and Evaluation	3
FIELD 16: TRANSPORT AND LOGISTICS		
Dry Port Managers	Transport & Logistics Management	13
Maintenance Manager	Mechanical Engineering	108

Workshop Manager	Mechanical Engineering	108
Terminal Managers	Transport & Logistics Management	13
Technical Manager	Mechanical Engineering	108
Transport/Operations Managers	Transport & Logistics Management	277
Project Manager	Project Management	13
FIELD 17: MANUFACTURING		
Pharmaceutical Chemists	Industrial Pharmacy	20
Pharmaceutical Microbiologist	Industrial Pharmacy	20
Pharmaceutical Scientists	Industrial Pharmacy	20
Product developer	Science and Technology	44
Production Specialist	Manufacturing	30
Regulatory Affairs Specialist	Quality Management	3

PROFESSIONAL TRAINING
(Certification)

OCCUPATION	AREAS OF STUDY	ESTIMATE
FIELD 13: PROFESSIONAL PROGRAMMES		
Investment Analyst	Chartered Financial Analysis (CFA)	11
Investment Principal	Chartered Alternative Investment Analysis (CAIA)	93
Financial Analyst	Chartered Financial Analysis (CFA)	29
Financial Engineer	Chartered Financial Analysis (CFA)	73
Financial Planner	Chartered Financial Analysis (CFA)	11
Collective Investment Undertaking Analyst	Chartered Financial Analysis (CFA)	11
Chartered Accountants	BICA/ACCA/CIMA	93
Portfolio Manager	Chartered Financial Analysis (CFA)	93
Merchandisers	CIPS	25

Appendix 2

RECOMMENDATION FOR EXTERNAL TRAINING

EXTERNAL TRAINING

TRAINING AT DIPLOMA LEVEL
(Technicians and Others)

OCCUPATION	AREAS OF STUDY	FORECAST
FIELD 1: AGRICULTURE		
Meteorologist -Technical Officer	Meteorology	12
Fish technical officer	Aquaculture	19
Fire Impact Assessors	Fire Risk Assessment	16
FIELD 9: HEALTH		
Clinical Technologists	Clinical Technology	3
Biomedical Equipment Technicians	Biomedical Equipment Technology	3
Orthopaedic Technicians	Orthopaedic Technology	10
FIELD 12: INFORMATION TECHNOLOGY		
Information & Communications Technology Operations Technicians	Information & Communications Technology	0
Information & Communications Technology User Support Technicians	Information & Communications Technology	58
Computer Network & Systems Technicians	Information & Communications Technology	-2,539
Web Technicians	Information & Communications Technology	0
Broadcasting and Audiovisual Technicians	Information & Communications Technology	-147
Telecommunications Engineering Technicians	Information & Communications Technology	36
FIELD 17: MANUFACTURING		
Leather Processing Technicians	Leather Science and Technology	80
Leather Technicians	Leather Science and Technology	12
Textile Spinning Technicians	Textile Spinning Technology	29
Textile Printing Technician	Textile Design and Printing	29
Leather Technologists	Leather Products Manufacturing Technology	-33

TRAINING AT DEGREE LEVEL
(Professionals)

OCCUPATION	AREAS OF STUDY	FORECAST
FIELD 1: AGRICULTURE		
Meteorologist	Meteorology	11
Seed technologist	Seed Science	15
Animal scientist	Animal Nutrition/Animal Breeding & Genetics	7
FIELD 3: BUSINESS & FINANCIAL SERVICES		
Actuarial	Actuarial science	23
FIELD 4: CREATIVE INDUSTRIES		
Creative Coding Specialists	Programming	30
Curators	Art History / Archaeology / Museum Studies	46
Copyright Specialist	Copyright Law	99
Illustrator	Fine Arts	30
Arts Manager	Arts Management	44
FIELD 9: HEALTH		
Trauma Nurses	Emergency Care/Trauma	11
Ophthalmology Nurses	Ophthalmic Nursing	8
ENT Nurses	Ear, Nose and Throat	7
Theatre Nurses	Theatre Nursing	13
Palliative Care Nurses	Palliative Care Nursing	8
Endocrinology Nurses	Endocrinology Nursing	7
Orthopaedic Nurses	Orthopaedic Nursing	8
Occupational Health Nurses	Nursing Science	10
Wound Care Nurses	Wound Care Nursing	12
Audiologists	Audiology	22
Speech Therapists	Speech Language Pathology	20
Radiographers	Radiography	24
Sonographers	Sonography	27
Therapeutic Radiographers	Therapeutic Radiography	25
Diagnostic Radiographers	Diagnostic Radiography	22
Medical Instrumentation Specialists	Biomedical Equipment Technology	10
Nuclear Medicine Technicians	Nuclear Medicine Technology	6
Cath-lab Technicians	Cardiovascular Technology	5
Clinical Dietitians	Nutrition and Dietetics	20
Nutritionists	Nutrition	40
Psychotherapists	Clinical Psychology	12
Microbiologists	Microbiology	10
Prosthetists /Orthotists	Prosthetics/Orthotics	17
Dentists	Dentistry	32
Dental Laboratory Technologists	Dental laboratory Technology	21
Dental Therapists	Dental Therapy	20

Monitoring and Evaluation Officers	Monitoring and Evaluation	20
Paramedics	Forensic Paramedian	40
Disaster Response Officers	Emergency Management	40
Epidemiologists	Epidemiology	20
Biomedical Engineers	Biomedical Engineering	50
FIELD 10: TOURISM & HOSPITALITY		
Chefs	Culinary Arts	7
Specialised Chefs	Culinary Arts	13
Ornithologist	Travel and Tourism	2
FIELD 12: INFORMATION TECHNOLOGY		
Digital Transformation Managers	Digital Transformation Management	12
Virtual/Mixed Reality Developers	Computer Engineering/Game Development	17
Robotics Engineers	Robotics Engineering/Artificial Intelligence	35
Big Data Analytics	Data Science	26
FIELD 14: SCIENCE & TECHNOLOGY		
Blockchain Developers	Software Engineering/Virtual Reality	33
FIELD 17: MANUFACTURING		
Industrial Pharmacist	Industrial Pharmacy	20
Leather Scientists & Chemist	Leather Science and Technology	57
Textile Spinning Engineers	Textile Spinning Technology	14

POST GRADUATE TRAINING
(Masters, Doctorate, Professional & others)

OCCUPATION	AREAS OF STUDY	FORECASTS
FIELD 1: AGRICULTURE		
Soil scientist	Soil science	18
Agrochemical Specialist	Toxicology/Chemistry/Analytical Chemistry	57
Hydrometeorologist	Meteorology	4
Agro meteorologist	Meteorology	4
Climate Change Officer /Climate Scientist	Meteorology	4
Horticulturalist	Pomology/Floriculture/Olericulture	18
Weed scientist	Weed Science	18
Post-harvest technologist	Harvest Horticulture and Grain Production	18
Food safety specialist	Microbial Food Safety	10
Animal bio statistician	Biometry	23
Aqua culturist	Aquaculture	18
Scientific officer	Chemistry/Biology	18
Animal welfare specialist	Animal welfare	18
Industrial biotechnologist/ microbiologist	Microbiology/Biotechnology	10
Senior Researcher,	Green Chemistry/Analytical Chemistry	12
Biotechnologists (agriculture)	Animal or Plant Biotechnology	10
Ecologists	Ecology	18
Wildlife specialist	Wildlife medicine	10
Fish pathologist	Fish pathology	10
Entomologist	Entomology	10
Bee pathologist	Bee Pathology	10
Veterinary pathologist	Pathology	10
Veterinary epidemiologist	Veterinary epidemiology	16
Animal Reproduction Physiologists	Animal Reproduction physiology	10
Plant Pathologist	Plant science/Botany	18
Veterinarian (Recearch specialist)	Veterinary Medicine/ Science	16
One health specialist	Veterinary Epidemiology & Public Health	16
Fire Ecologists	Fire Ecology	18
FIELD 3: BUSINESS & FINANCIAL SERVICES		
Tax Specialist	Taxation	27
Fintech Analysts	Financial Technology	93
Financial Services Supervisors	Financial Technology	93
Underwriter	Underwriting	27
Auctioneer	Auctioneering	12

Marketing Managers	Fintech (Financial Technology)	127
FIELD 9: HEALTH		
Infection Prevention Specialists	Infection Prevention & Control	4
Oncologists	Oncology	13
Radiologists	Radiology	9
Paediatric Surgeons	Paediatric Surgery	5
Neurosurgeons	Neurosurgery	5
Cardiovascular Surgeons	Cardiovascular Surgery	5
Medical Oncologists	Medical Oncology	16
Surgical Oncologists	Surgical Oncology	14
Radiation Oncologists	Radiation Oncology	13
Intensivists	Critical Care Medicine	8
Maxillofacial Specialists	Dentistry & Surgery	2
Urologists	Urology	3
Nephrologists	Nephrology	9
Clinical Pathologists	Clinical Pathology	2
Prevention Medicine Specialists	Preventative Medicine	5
Occupational Medicine Practitioners	Occupational Health	7
Infection Prevention Specialists	Infection Prevention & Control	6
Cardiologists	Cardiology	9
Endoscopic Surgeon	Endoscopic Surgery	6
Gastroenterologists and Hepatobiliary Surgeons	Gastroenterology	4
Ophthalmologists	Ophthalmology	6
Podiatrists	Podiatric Medicine	3
Colorectal Surgeons	Intestinal & Anorectal Physiology	5
Paediatric Cardiac Surgeons	Paediatric Cardiac Surgery	5
Plastic & Reconstructive Surgeons	Plastic & Reconstructive Surgery	1
Transplant Surgeons (Renal, Liver, Cardiac, Pulmonary/Lung)	Transplant Surgery	4
Cardiac Anaesthesiologists	Cardiac Physiology	4
Rheumatologists	Rheumatology	9
Fetomaternal Medicine Specialists	Maternal-Fatal Medicine	8
Urogynaecologists	Obstetrics and Gynaecology	5
Pulmonologists	Pulmonology	9
Orthopaedic Surgeons	Orthopaedic Surgery	7
ENT Specialists	Ear, Nose and Throat Medicine	5
Neurologists	Neurology	7
Internal Medicine Physicians	Internal Medicine	8
Clinical Haematologists	Haematology	7
Bone Marrow Transplant Surgeons	Haematology/Oncology	3
Cardiac Surgeons	Cardiothoracic Surgery	4
Orthopaedist	Orthopaedics	5
Teleradiology Specialists	Musculoskeletal Radiology	2
Emergency Medicine Physicians	Emergency Medicine	2
Paediatric Intensive Care Nurses	Paediatric Intensive Care Nursing	15

Critical Care Nurses	Critical Care Nursing	13
Neo-natal Intensive Care Specialised Nurses	Neonatal Intensive Care Nursing	9
Anaesthetic Nurses	Anaesthesia Nursing	15
Perfusionists (Nurse Technicians)	Perfusion Science	4
Theatre Nurses (Cardiac & Urology)	Theatre Nursing	12
ICU Nurses	Critical Care Nursing	14
Cardiac/ Coronary Nurses	Cardiac Nursing	12
Child Health / Paediatric Nurses	Child Health Nursing	17
Neo-natal Care Nurses	Neonatal Nursing	8
Lactation and Mother Care Nurses	Lactation and Mother Care Nursing	13
Cath lab Care Nurses	Cath lab Care Nursing	4
Geriatric Nurses	Gerontology Nursing	16
Renal/Nephrology Nurses	Renal/Nephrology Nursing	14
Oncology Nurses	Oncology Nursing	12
Infection Prevention and Control Nurses	Infection Prevention and Control Nursing	15
Geriatric Pharmacists	Geriatric Pharmacy	7
Nutritional Support Pharmacists	Nutrition Pharmacy	8
Nuclear Pharmacists	Nuclear Pharmacy	8
Oncology Clinical Pharmacists	Oncology Pharmacy	9
Clinical Pharmacists	Pharmacy	10
Orthodontists	Orthodontics	9
Paediatric Dentists	Paediatric Dentistry	6
Periodontists	Periodontics	4
Prosthodontists	Prosthodontics	3
Speech/Language Pathologists/Therapists	Speech Language Pathology	41
Optometrists	Optometrists	7
Virologists	Biology Sciences/Applied Microbiology	8
Biochemists	Biochemistry	8
Anaesthetic Lecturers	Anaesthesia	2
Braille Specialists	Unified English Braille System	12
Medical Physicists	Medical Physics	2
Clinical Psychologists	Clinical Psychology	65
Child Psychologists	Child Psychology	12
Neuro Psychologists	Neuro Psychology	8
Sports Psychologists	Sports Psychology	8
Career Psychologists	Psychology	10
Rehabilitation Psychologists	Rehabilitation Psychology	15
Forensic Psychologists	Forensic Psychology	11
Clinical Social Workers	Social Work (Clinical)	13
Oncology Social Workers	Oncology Social Work (Oncology)	16
Genetic Counsellors	Genetic Counselling	9
Clinical Counsellors	Counselling	9
Physical Therapists	Physical Therapy	15
Medical Economists	Healthcare Economics	2

Health Economists	Health Economics	10
Health Informatics Specialists	Health Information Management	250
Bioinformatics Specialists	Bioinformatics	7
Medical Facilities/Healthcare Architects	Health Care Design & Engineering	4
Biostatisticians	Biology and Statistics(combined)	5
Nutritionists	Nutrition	10
FIELD 12: INFORMATION TECHNOLOGY		
Artificial Intelligence Engineers	Artificial Intelligence + Data Lakes	38
Machine Learning Engineers	Machine Learning	26
FIELD 15: SOCIAL SCIENCES		
Mineral Economists	Economics	4
Energy Economist	Economics	3
Commercial Transaction Advisors	Commercial/Business Law	49
FIELD 17: MANUFACTURING		
Industrial Pharmacist	Industrial Pharmacy	20
Leather Shoe Designer	Leather Science and Technology	52

Appendix 3

UNEMPLOYED GRADUATES BY QUALIFICATIONS
(SUBJECT OF TRAINING)

APPENDIX 3: UNEMPLOYED GRADUATES BY SUBJECT OF TRAINING

SECTORS	2019Q4	2020Q4	2021Q4	2022Q4	2023Q3	2024Q1
Agriculture	**684**	**595**	**2623**	**2096**	**538**	**724**
Agricultural economics		387			69	
Agricultural Engineering Programs			400	265		
Animal Husbandry Programs			487			
Bsc. Agricultural extension		208			196	220
Certificate in Pasture and range management	160			223		
Crop Production Programs			155			127
Degree In Agricultural Education						
Diploma in Horticulture and Forestry	303			67	105	110
Horticulture and Gardening Programs			518		168	
Livestock Production Programs			576	212		
Production management	221					
Range and Pasture Management Programs			487			
Bsc in Animal Health				356		267
Certificate in Agriculture				256		
Certificate in Crop Farming				259		
Degree in Animal Science				249		
Certificate in Horticulture Enterprise Management				209		
Construction	**7293**	**5474**	**8014**	**9064**	**8129**	**7708**
Building and construction		165		647	56	708
Building and Construction (Valuation) Programs			397			
Carpentry and joinery	1269	739	3047	965	1118	2080
Carpentry and shop fitting		148				
Certificate in Bricklaying	1605			1002	820	220
Certificate in bricklaying and construction	159					
Certificate in Bricklaying and plastering	2287	1842		1908	4131	3061
Certificate in Carpentry	288	307		1742	531	
Certificate in painting	262			307		
Certificate in plumbing		211		696		169
Certificate in Plumbing and Pipe fitting	436	948				203
Certificate in welding	227	437				
Diploma in Construction		229			176	238
Diploma in Construction Industry		93				
Diploma in welding Fabrication	143	222		297		
Masonry and Bricklaying Programs			2651			
National Craft Certificate in Plumbing	193					
National Craft Certificate in welding and fabrication	206			569		
Other Building and Construction Trades Programs NEC			69	703		441
Plumbing			1243			
Plumbing and pipe fitting	218			228		

	Col1	Col2	Col3	Col4	Col5	Col6
Trade C electrical installation		133				
Welding and Fabrication Programs			607		1297	588
Creative	**3307**	**3846**	**4067**	**3626**	**6256**	**2326**
Architecture and design	204			328	239	275
Archival Sciences			445		234	
Archives and record management	288					235
Bachelor's degree in arts and Humanities	467	334		135		324
Bachelor of arts and humanities English and History	642					
Bachelor of Arts in archaeology	129					
Certificate in decorations and paintings		214			760	
Certificate in Dressmaking	166	197		272	823	389
Certificate in Media studies		162				
Certificate in sewing		144				
Certificate in Tailoring and Design		213		194		
Certificate in Theology		212				
Creative Multimedia		276			430	142
Degree in fashion design	232					258
Design and Craft Skills, including Jewellery Making Courses			347		201	
Diploma in clothing and textile design	159					
Diploma in Events and Management		212			461	
Diploma in Multimedia		261				
Diploma in Tailoring and fashion design		170				238
Faculty of Arts - degree in Architecture	221				188	
Fashion and design		101		257	712	
Fashion and fabrics		218				
Fine Arts: Drawing, Painting and Sculpture Subjects			338			
Film and production		218				
Graphic and Audio-Visual Arts: Photography, Music Production,			335			
Graphic and design		165			274	
Interior architecture		217		189	304	
Linguistics Courses			217			
Music and instruments	642					
Music production		259			76	
Other Personal Services Programs NEC			167			165
Public relations	157					
Public Relations Programs			69			
Radio and Television Production			281			
Sewing and patch work		273				
Sports and Leisure Programs			194		384	
Textiles and Clothes Programs			1674	772	454	
Honors Degree in Professional Communications				241		
Degree in Broadcasting and Journalism				491		
Certificate in Homecraft in Catering				238		
Arts in Motion picture medium				194	716	300
Degree in Media studies				315		

Education & Training	3624	2019	2691	5637	4033	5980
Basic General Programs, Pre-primary			947			
Certificate in adult education	384					
Certificate in Early Childhood	1010	1044		793	1268	727
Degree in faculty of Education		269		435		
Design and Technology	268			225		
Diploma in Early childhood	1122	273		657	1360	2101
Diploma in primary education	375	233		426	239	537
Early childhood education	215	200		777	631	760
Educational Research and Other Education Science Programs NEC			325	449		
General and Specialized Teacher-Training Programs.			300			
Physical Education	250			153		
Primary Teachers Training Programs			228	331		
Secondary Teachers Training Programs			384	478		1047
Teacher Training for Pre-school, Kindergarten, Elementary School			507			
Bachelor's degree in early childhood				375	302	808
Certificate in Health Assistant Education				289		
Diploma in Sign Language for the Deaf				249	233	
Finance & Business	13244	17879	10936	13443	10317	14760
Accounting and business studies		315		194		561
Accounting and Finance	428	967		432		553
Accounting, Auditing and Bookkeeping Programs			1915			201
Advance Diploma in Secretarial Studies		338				
Advance Diploma in Secretary	196					
Advanced diploma in project management						220
Advanced Certificate in Procurement and Supply		151				
Associated Degree in Business Management	268					
Association of Accounting Technician (AAT)	1542	1064		916	1071	479
Applied Business Computing						294
BA in Business Administration, BBA marketing (Marketing course)	165				465	
Bachelor of Accounting	183			228	297	129
Bachelor of Arts in entrepreneurship and business leadership						168
Bachelor of bank and finance		262				
Bachelor of business administration in marketing	228					
Bachelor of Commerce degree		204		225		
Bachelor of Commerce in Real Estate	231					510
Bachelor of Commerce (Risk management)		573				
Bachelor of honours in Business management		419				
Bachelor of Business Management and Administration		128			220	
BCOM in Risk Management (business management, insurance, commerce)		289				
Bookkeeping and accounting	242					
BSc (Honors) Finance and Banking	129				220	
Bsc degree in Finance		41		197		

Program	C1	C2	C3	C4	C5	C6
Business Administration	160	755				95
Business Management	546	1326			383	625
Business Studies		98				
Business\Commercial Administration Programs			3748			
Certificate in Accounting		114				
certificate in accounting and business studies						202
Certificate in Accounting and Finance		459		1555		
Certificate in Administration and Management						350
Certificate in advanced type writing		249				
Certificate in bookkeeping and accounting		187			1669	
Certificate in Business Administration						107
Certificate in Business Management	576	190				416
Certificate in Human resource management	420	183			223	
Certificate in insurance	291					
certificate in Leadership						215
Certificate in office procedures and administration		326				
Certificate in Receptionist						485
certificate in Sales and marketing						168
Certificate in Secretarial Studies	459			108	1293	517
Certificate in small business management		705				
Certificate in Strategic management and supervisory effectiveness	303					
Certificate in typing		419				216
Certificate of Proficiency (C.O.P.).	279	184		1033		207
Chartered institute in Procurement supply (CIPS)						270
Chartered Institute of Management Accounting		238			589	
Chartered institute of secretaries and administrators		260				
Degree in Accounting	1315	80				178
Degree in Accounting and Finance		233				
Degree in Business Administration	92					
Degree in Business Management	201	261				542
Degree in Entrepreneurship						376
degree in event management						265
Degree in Human Resource Management	59	286		371		
Degree in Industrial Psychology	221					
Degree in Procurement and Supply						276
Degree in Purchasing and Supply						241
Degree in Public Finance and Accounting	236					
Degree in Real estates						335
Degree in Risk Management						220
Diploma in Accounting						751
Diploma in Accounting and Business Studies	868	264			1359	559
Diploma in Accounting Technician						215
Diploma in Business Administration	371					210
Diploma in Business Information Systems		226				
Diploma in Business management		497			481	257
Diploma in Business Skills		146				

Program						
Diploma in Events Management	192					
Diploma in Human Resource management	916	41			245	
Diploma in Insurance		303				
Diploma in merchandising and Retailing	143			176		
Diploma in Public Relations		201				
Diploma in Purchasing and Supply Management		128			342	701
Diploma in Real Estate		297		540		
Diploma in Sales and marketing						239
diploma in stores management						48
Economics and accounting,		185				
Economics and Economic History Programs			346			
Economics and international relations		133				
Finance Accounting	244					207
Finance and Banking Programs;			154			
Front office operation and Administration	127					
Honors degree in entrepreneurship		185			188	
Human resource management	336	627				
Industrial engineering management		218				
International Diploma in Sales and marketing	237				139	
international finance and banking		208				
Management and Public Administration Programs,			684			714
Masters in Global Finance		249				
Master's in project management						458
Master of Business Management						207
Materials Management Courses			388			
Merchandising and Retailing	254				201	
Other Business and Administration Programs NEC			138	7468		604
Personnel Administration Programs;			673			
Public relations		419				
Purchasing and supply		149			732	169
Real Estate Programs		411	252			
Sales and Marketing	421					
Secretarial and administration	186					
Secretarial and administration	179	1205				
Secretarial and Office Work Programs.			2621			
Secretarial Studies		231				
Statistics and Other Allied Fields Programs.			17			
Supply management		252				
Masters in business administration					200	
Health	**4306**	**4877**	**3469**	**5622**	**8334**	**9565**
Bachelor's degree in emergency medical care						215
Bachelor of Nursing Science						177
Biological sciences	188				566	211
Biology, Botany, Bacteriology, Microbiology and Genetics Programs			171		120	
Certificate in Auxiliary Nursing	419				214	238

Program						
certificate in health care assistance						177
Certificate in Health safety						286
Certificate in occupational health and safety management	394	543			2253	1406
Certificate in phlebotomy		190				
Certificate in Science Laboratory Technology		167			252	276
Childcare Programs			143			
Clinical Psychology						206
Degree in counselling		504		251		
Degree in nutrition and dietetics						216
Degree in Occupational Health and Safety	268			358		
Degree in Pharmacy						300
Degree in physiology		160		148		
Degree in Psychology		224				55
Degree in Public Health	385				169	1077
Degree in Safety and Health Education		170			457	
Degree in Safety Health Management		209		382		230
Dental therapy		69				
Diploma in Emergency Medical Care		428		708	250	
Diploma in General nursing	356				254	468
Diploma in health and safety		249			1067	
Diploma in Health Care Management						499
Diploma in midwifery	162					
Diploma in Occupational Health and Safety	176	218		2142	272	275
Diploma in occupational health and safety and environmental law	230					
Diploma in pharmacy		208			257	
Diploma in safety Environment						276
General nursing		289		127		
Health Care Assistance	285	101		189	247	
Health care auxiliary	157					
Health care management	288			183		
Health care service management		322				
Health education	371			149		
HIV Testing and counselling		190		194	234	737
Male Peer (Teaching others about HIV/Aids)	195					
Medical laboratory sciences	170					
Other Health Programs NEC			353	396	1722	1033
Occupational health and safety						999
Paramedical Training Programs			308			
Pharmacy and Pharmacology Programs			323	191		
Pharmacy technician	262	191				
Psychology Programs			316			
Public health		226		204		
Public health and safety		219				
Public Health Services, Hygiene Programs and Sanitation Programs			1855			
ICT	**7568**	**7886**	**5175**	**8041**	**5068**	**6002**

Program						
Advanced Diploma in Information Technology		286				
Associate degree Broadcasting in television and radio	223			296		
Associate degree in information technology	189	326		418		
BA Honors in broadcasting and journalism		278			256	
Bachelor of Science -Computing with finance		85				950
Bachelor of Sciences Honors in Computing.	166			241		
Bachelor of Network Engineering		381			212	
Bachelor of science information technology		204		224		
Broadcasting radio and television	230			115		
BSc in Network Infrastructure Management		381			281	
BSc (Hons) in computing and it's practice		378			173	
Business Information Technology		233		133	250	
Business systems (information technology)		218		189	229	
Certificate in computer studies	3006	1971		674	817	1546
Computer Programming Programs			136	333	300	
Computer network technician		190		301		
Computer sciences	404	221		331	211	
Degree in Computing	247			180		
Degree in Broadcasting and journalism		453		272		
Degree in Computer engineering-mathematics.		250		70	691	206
Degree in computer science	371			924		374
Degree in Computer science and software engineering	311			604	451	366
Degree in information technology		181			454	270
Degree in Network Engineering	426					458
Degree in Software Engineering	182			299		302
Diploma in computer studies	427					209
Diploma in Information Technology	358			604		47
Diploma in telecommunications		152				230
Information technology	419	1006		536		
Journalism Courses			252	46	256	
Masters in computer applications		289				
Network engineering	421	184		299		162
Network technician	188			417	192	
Networking and infrastructure management		219				
Other Computing Programs NEC			4720	535	295	882
Radio/Broadcasting Programs			67			
Manufacturing	**1453**	**1322**	**1035**	**985**	**456**	**792**
Certificate in electricals (B)	223					
Certificate in Food Production		167	264		27	
Certificate in Refrigeration and Air conditioning		233			293	224
Diploma in electrical engineering	252					
Diploma in Operations Management - manufacturing program		228				
Diploma Milling Technology		226				
Electrical Engineering Programs			771			
Electrical installation and maintenance appliances	327					

Program						
Hons Industrial and manufacturing Engineering		260				
Industrial Design	371					211
Manufacturing and industrial engineering		208			136	
NCC in maintenance industrial electrical	179					
NCC in Electrical	101					
Certificate in Glass Making				250		
Certificate in National Crafts Certificate				253		
Plant Operator and Engineering				482		
NCC in refrigeration						122
Bachelor's degree in industrial design						235
MMWER	**1363**	**4959**	**3002**	**4553**	**6870**	**6325**
Bachelor of Science		233		158		
Bachelor of Science: general		652			57	273
Certificate in Boiler Making		114		70	268	
Chemistry and Other Allied Subjects Programs			174			
Civil engineering		208			952	325
Civil Engineering Programs			864		394	
Degree in Bachelor of Arts in environmental science		114				
Degree in Civil engineering	401	179			24	309
Degree in Construction Engineering		320				
Degree in Electrical engineering		467		65	261	277
Degree in Environmental science	170					
Degree in Geology		197		314		212
Degree Mining Engineering		467		290	344	373
Diploma in Electrical and electronics		181		61	456	
Diploma in electrical engineering		467		212		0
Diploma in Plant operation	188					
Electrical and electronic engineering	159					373
Electronics and Telecommunications (Radio and Computer) Programs			568	315		
Geological sciences		208				
Geometrics survey	262			251	232	
Maintenance fitting and machining		288				
Master's degree in chemical engineering		278				
Mechanics Engineering Programs			817	187	395	
Mining and Drilling		389				
Mobile crushing	183					
National Craft Certificate in Electrical Engineering		197		926		75
Other Engineering and Engineering Trades NEC			321		2289	1213
Refrigeration and Air Conditioning Training Programs			258			
Certificate in Electrical and Electronics				1066	471	242
Chemical Engineering				225	305	
Water and Environmental Engineering				53		
Diploma in Geomatics				95	182	
Diploma in Water Engineering				265	240	
Certificate in Electrical Installation						453

Certificate in survey						208
Certificate in Electrical engineering						340
Degree in architecture						204
Public	**1129**	**1553**	**4404**	**3915**	**2864**	**5987**
Architecture and Town Planning Programs	204		345	328	403	275
Bachelor of law	350			124	251	
BASS in public administration and political science		249		250	603	178
Certificate in Counselling		219				234
Certificate in policing	214					482
Community Development Programs; Social Welfare/Social Work Programs			197	479		
Counselling Programs			258			1552
Degree in Community Development		213		245		662
Diploma in land economic strategy	199					
Housing and planning		224				
Labour Protection and Security Programs			2699	441		
Law Management		221				
Master's degree in political science and sociology	183					
Other Security Services Programs NEC			207			460
Other Social and Behavioural Sciences Programs NEC			240	1009	779	980
Political science		208				
Political science and sociology						
Political Science and Sociology Programs	183		458	315		
Social work		219		1052	1067	1164
Tourism	**2441**	**4259**	**3546**	**3304**	**4529**	**5248**
Accommodation, operations, and services (hospitality)		89				
Advance Diploma in Travel tourism and hospitality management	48	1113		357	993	
Certificate in catering		219		231		
Certificate in cooking	92					
Certificate in food preparation and Culinary		286		164	196	
Certificate in hospitality and Tourism Operations	364					
Certificate in House keeping	313					210
Certificate in Tourism and Hospitality management		196			341	1076
Certificate in travel and tourism hospitality	355				251	218
Certificate in waitress	48					
Culinary arts	254				269	
Degree in International Tourism management		213				
Degree in Tourism Management		334				660
Degree in Travel and Tourism	192			456		
Diploma in travel and tourism management		249		213	275	485
Environmental Conservation Programs			543			
Food and consumer science		226				
Food production (hospitality and cooking skills, kitchen hygiene)	179	69				
Honors degree in international business	188					
Hospitality Management	229	675		641	771	624

Hospitality tourism		390		164	619	906
Hotel and catering management	179					
Hotel and Catering Programs			1057			
Other Environmental Protection Programs NEC			223			
Travel and Tourism Programs			1723	642	250	532
Tourism and marketing		200				
Beauty Therapy				237		220
Certificate in Hairdressing				199	369	317
Diploma in Hairdressing and beauty therapy					195	
Transport & Logistics	**1664**	**2963**	**1180**	**2229**	**2134**	**5095**
Dump truck driver's license		322			207	528
Auto electrical engineering		245			188	434
Certificate in Auto Mechanics	488	1296		287	211	1556
Diploma in Auto mechanic		131				
Driver's license	786	216				717
Heavy duty licence		255		409	276	219
Motor Mechanics Programs			731	997		423
National Craft Certificate in Heavy plant mechanics		128				335
Other Transport Programs NEC			69		204	
Parachuting Training	390					
Road Motor Vehicle Operations Programs (Including Driving Skills)			128		57	
Trade test C in Painting and decoration		193				
Trade B in Auto mechanical		177				
Vehicle Maintenance Programs			252			
Degree in Logistics and Transport Management				536	682	668
Diploma in Aviation (piloting)	77				77	
Diploma in Aircraft Engineering	232				232	
Diploma in Transport and Logistics						215
Grand Total	**48076**	**57632**	**50142**	**62515**	**59528**	**70512**

Appendix 4

SKILLS FORECASTS
(2025-2028)

LOCAL TRAINING

OCCUPATION	AREAS OF STUDY	QUALIFICATION	FORECASTS			
			2025	2026	2027	2028
FIELD 1: AGRICULTURE						
Milk technician	Milk production	Certificate	67	66	76	74
Meat Processor	Meat processing	Certificate	76	76	76	76
Meat Inspectors	Meat Safety & Inspection	Diploma	24	21	19	15
Irrigation Technician	Irrigation technology	Diploma	24	21	19	15
Extension Officers	Agriculture Extension	Degree	17	17	19	18
Range managers	Range Science	Degree	17	17	19	18
Animal Breeder	Animal production	Degree	6	6	7	7
Irrigation engineer (civil engineer)	Civil engineering/Irrigation engineering	Degree	12	14	14	13
Animal Nutritionist	Nutrition Science/Nutrition & Dietetics	Degree	74	64	58	49
Agronomist	Agronomy	Degree	16	14	13	11
Meat Scientist	Meat Science	Masters	27	25	23	20
Food Technologist	Microbial Food Safety	Masters	14	6	6	6
Molecular biologist/geneticist	Molecular Biology/Genetics	Doctorate	25	27	25	23
FIELD 3: BUSINESS & FINANCIAL SERVICES						
Commercial Transaction Advisors	Finance and Business	Masters	56	74	44	58
Digital Marketer	Business Info. Systems	Masters	106	92	117	127
Data Analyst	Data Analytics	Degree	28	12	12	12
Buyer	Purchasing & Supply	Degree	36	32	29	25
Risk Officers	Risk Management	Degree	10	12	11	11
Business Intelligence Analysts	Business Info. Systems	Degree	285	292	312	323
Property Valuers	Real estate management	Degree	20	18	16	14

OCCUPATION	AREAS OF STUDY	QUALIFICATION	FORECASTS			
			2025	2026	2027	2028
Facility Manager	Real estate management	Degree	40	38	35	29
Estate Agents	Real estate management	Degree	40	38	35	29
Asset Manager	Asset Management	Degree	11	12	12	11
Data Scientists	Computer Engineering / Computer Science	Degree	28	12	12	12
Forensic Accounting/Audit	Forensic Science	Masters	78	83	85	93
IT Auditor	Computer Science / Information Technology	Masters	11	12	12	11
FIELD 4: CREATIVE INDUSTRIES						
Camera Operators	Creative Media Production	Diploma	31	35	37	40
Film Distributors	Film Distribution and Marketing	Degree	48	33	33	32
Production Runners	Film Production	Certificate	119	94	128	122
Gaffers	Electrical and Electronic Technology	Certificate	134	105	144	138
Best Boy	Electrical and Electronic Technology	Certificate	148	117	160	153
Film Producers	Film Production	Degree	41	46	50	47
Film Directors	Film Directing	Degree	41	46	50	47
Film Editor	Film Editing	Degree	41	46	50	47
Cinematographers/ D.O. P	Cinematography	Degree	41	46	50	47
Script Supervisors	Creative Writing	Degree	11	12	12	12
Film Props Designer	Art and design, prop making or technical theatre	Diploma	28	38	37	30
Music Arranger	Music	Diploma	16	14	12	12
Industrial Designer	Industrial Design	Degree	39	32	43	44
Computer Aided Designer	Art and Design	Diploma	51	55	46	38
Sound Engineer	Sound Engineering	Degree	38	46	41	32
Stage Designer	Graphic Design/ Fine Arts/Drafting	Degree	28	38	37	30
Animator	Fine Art/Computer Graphics/Animation	Degree	28	38	37	30
Author/Creator	Creative Writing	Degree	11	12	12	12
Script Writer	Theatre and Film	Degree	11	12	12	12
Digital Archivist	Library / Archival Science	Degree	69	64	55	46

OCCUPATION	AREAS OF STUDY	QUALIFICATION	FORECASTS			
			2025	2026	2027	2028
Radio Director	Radio Directing	Degree	28	21	37	25
Digital Designer	Graphic Design	Degree	31	35	37	40
Actors	Theatre and Film	Certificate	16	17	29	28
Muralist	Fine arts	Certificate	16	14	22	16
Tapestry weaver	Weaving	Certificate	16	17	21	15
Beadwork workers	Jewellery making	Certificate	16	11	11	17
Painters and Drawers (Fine artists)	Fine arts	Certificate	16	14	22	16
Leatherwork workers	Leathercraft	Certificate	16	11	11	17
Film Make-up artist	Cosmetology	Certificate	97	98	96	98
Music Producer	Music Production	Certificate	16	14	12	12
Light Engineer	Light Engineering	Degree	13	15	15	14
Music Producer	Music Production	Certificate	16	14	12	9
FIELD 5: CONSTRUCTION						
Steel Fixers	Welding & Fabrication	Certificate	44	48	47	59
Grass Roof Thatchers	Carpentry & Joinery	Certificate	24	17	21	24
Plumbers	Plumbing and Pipefitting	Certificate	85	54	51	39
Stone Masons	Specialized Bricklaying	Certificate	19	32	26	35
Coded Welders	Specialized Welding	Certificate	47	49	59	63
Riggers	Carpentry & Joinery	Certificate	15	64	49	65
Special Coaters	Painting and Decoration	Certificate	-7	28	28	29
Scaffold Erectors	Scaffolding Erection	Certificate	60	52	46	28
Boiler Makers	Boiler Making	Certificate	51	91	75	101
Pipe Fitters	Plumbing and Pipefitting	Certificate	85	54	51	39
Aluminium Fabricator	Welding & Fabrication	Certificate	66	55	47	39
Construction Technologies	Building and Construction	Diploma	237	95	112	51
High Voltage Engineers	Electrical Engineering	Degree	58	51	54	62
Quantity Surveying	Quantity surveying	Degree	83	69	50	31
FIELD 6: EDUCATION & TRAINING						
Primary School Educators	Primary Education	Degree	121	113	113	113
Secondary School Educators	Secondary Education	Degree	52	50	43	60
Special Education Teachers	Special Needs Educators	Degree	68	98	133	185

OCCUPATION	AREAS OF STUDY	QUALIFICATION	FORECASTS			
			2025	2026	2027	2028
University and College Educators	University Education	Degree	48	48	48	48
Education Psychologists		Degree	45	45	45	45
FIELD 7: ENGINEERING						
Control Systems Engineer or Protection Engineer	Electrical and Electronics Engineering	Degree	133	115	120	123
Renewable Energy Engineer	Electrical Engineering	Degree	51	54	62	56
Mechatronics Engineers	Mechanical & Electronic Engineering	Degree	116	91	108	108
Mechanical Engineers	Mechanical Engineering	Degree	116	91	108	108
Electrical Engineers	Electrical and Electronics Engineering	Degree	51	54	62	56
Control and Instrumentation Engineers	Electrical and Electronics Engineering	Degree	51	54	62	56
Ventilation Engineers	Mechanical Engineering	Masters	116	91	108	108
Geotechnical Engineers	Geology	Degree	29	18	21	12
Environmental & Sustainability Engineer	Environmental Engineering	Degree	12	14	14	13
Mechanical Engineering Technicians	Mechanical Engineering	Diploma	93	100	89	47
Control and Instrumentation Technicians	Electrical and Electronics Engineering	Diploma	70	57	76	77
Chemical Engineering Technicians	Chemical Engineering	Diploma	29	17	21	12
Robotics and Automation Engineers	Robotics Engineering / Artificial Intelligence	Degree	64	54	72	73
Drillers	Mining Engineering	Certificate	13	8	9	6
Mining Operators	Mining Engineering	Certificate	37	29	37	35
Auto Electricians technician	Auto Electrical	Diploma	158	199	122	137
Locomotive Technicians	Mechanical Engineering	Diploma	38	39	29	37
Wagon Technicians	Mechanical Engineering	Diploma	38	39	29	37
Trailer Air System Technician	Mechanical Engineering	Diploma	38	39	29	37
Hydraulic Technician	Mechanical Engineering	Diploma	138	139	129	87
Trailer Technician	Mechanical Engineering	Diploma	138	139	129	87
Civil Engineers specializing in Permanent Way (Rail track)	Civil Engineering	Degree	38	46	41	32
Electrical Machine Engineer	Electrical Engineering	Degree	51	54	62	56
Project Engineers	Mechanical Engineering	Degree	116	91	108	108
Mechatronic Technician	Mechatronics	Diploma	140	139	129	87
FIELD 9: HEALTH						

OCCUPATION	AREAS OF STUDY	QUALIFICATION	FORECASTS			
			2025	2026	2027	2028
General Surgeons	General Surgery	Masters	15	13	12	9
Anaesthetists	Anaesthesia	Masters	14	12	9	8
Paediatricians	Paediatrics	Masters	17	14	11	10
Obstetrician/Gynaecologists	Obstetrics and Gynaecology	Masters	22	17	13	12
Psychiatrists	Psychiatry	Masters	28	21	16	15
General Nurses	General Nursing	Diploma	51	28	26	19
Psychiatric Nurses	Psychiatric Mental Health	Diploma	10	21	17	10
Family Nurse Practitioners	Family Nurse Practitioner	Diploma	20	21	18	13
Community Health Nurses	Community Health Nursing	Degree	12	13	13	9
Midwives	Midwifery	Diploma	31	28	25	26
Pharmacists	Pharmacy	Degree	13	13	14	20
Geriatric Pharmacists	Geriatric Pharmacy	Masters	10	6	5	7
Nutritional Support Pharmacists	Nutrition Pharmacy	Masters	6	7	11	8
Nuclear Pharmacists	Nuclear Pharmacy	Masters	10	6	4	8
Oncology Clinical Pharmacists	Oncology Pharmacy	Masters	10	9	8	9
Clinical Pharmacists	Pharmacy	Masters	12	8	10	10
Environmental Health Officers	Environmental Health	Degree	13	12	13	8
Public Health Practitioners	Public Health	Degree	15	15	12	11
Occupation Health and Safety Specialists	Occupational Safety & Health	Degree	15	15	16	12
Occupational Health Therapists/Ergo therapists	Occupational Therapy	Degree	13	10	11	6
Hospital Administrators/Managers	Health Care Service Management	Degree	4	4	4	4
Psychotherapists	Clinical Psychology	Masters	15	11	9	11
Chaplain/Clergy	Theology/Chaplaincy	Degree	10	-10	8	8
Histotechnologists	Histotechnology/Cytotechnology	Degree	19	12	13	7
Cytotechnologists	Histotechnology/Cytotechnology	Degree	13	8	9	4
Medical Laboratory Technologists	Medical Laboratory Technology	Degree	26	9	14	8
Nuclear Medicine Technicians	Nuclear Medicine Technology	Degree	5	11	6	4
Cath lab Technicians	Cardiovascular Technology	Degree	4	4	4	4
Pharmacy Technicians	Pharmacy Technology	Diploma	16	19	25	30
Medical Records Officers	Health Information Management	Diploma	20	-20	16	14
orthopaedic Technicians	Orthopaedic Technology	Diploma	13	9	7	10

OCCUPATION	AREAS OF STUDY	QUALIFICATION	FORECASTS			
			2025	2026	2027	2028
Patient Navigators	Health Care Management	Diploma	12	9	9	10
Case Managers	Healthcare Service Management	Diploma	6	4	5	8
Patient Experience Officers	Healthcare Service Management	Diploma	6	3	5	8
FIELD 10: TOURISM & HOSPITALITY						
Hotel Managers	Hospitality Management	Degree	8	12	20	38
Restaurant Managers	Hospitality Management	Degree	25	24	18	10
Travel Consultants	Travel and Tourism	Certificate	70	63	58	41
Hotel Receptionists	Hospitality	Certificate	7	18	29	38
Travel Guides	Hospitality	Certificate	40	32	27	23
Bartenders	Hospitality	Certificate	34	21	15	12
Professional Housekeeper	Hospitality	Diploma	23	20	17	13
Certified City Tour guides	Travel and Tourism	Certificate	40	32	27	23
Certified Cultural Tour guides	Travel and Tourism	Certificate	40	32	27	23
Event Planners	Travel and Tourism	Diploma	2	5	7	9
Foreign Languages Translator	Travel and Tourism	Degree	12	5	5	5
Ecotourism guide	Travel and Tourism	Degree	40	32	27	23
Environmental Policy Scientists	Environmental Science	Degree	24	22	14	9
Environmental Sustainability Policy Analyst	Environmental Science	Degree	24	22	14	9
Professional Hunter /Guides	Travel and Tourism	Diploma	40	32	27	23
Gastronomy Tour Guides	Travel and Tourism	Diploma	40	32	27	23
Monuments guides	Travel and Tourism	Degree	40	32	27	23
Sommeliers	Hospitality	Diploma	25	24	18	10
FIELD 11: HUMANITIES						
Archaeologists	Archaeology	Degree	20	23	26	24
FIELD 12: INFORMATION TECHNOLOGY						
IT Infrastructure Managers	Computer Science/Computer Engineering/Information Systems + Cisco Certified Network Associate (CCNA), Cisco Certified Design Expert (CCDE), Computing Technology	Degree	8	5	7	7

OCCUPATION	AREAS OF STUDY	QUALIFICATION	FORECASTS			
			2025	2026	2027	2028
	Industry Association (CompTIA ITF+, CompTIA A+)					
Data Managers	Database Management	Degree	12	9	11	11
Information Security Managers	Computer Science/Information Technology/Information Systems + Certificate in Information Security Management (CISM)	Degree	8	7	7	6
IT Risk Managers	Computer Science/Information Technology/Information Systems + IT Risk Management and Assessment	Degree	6	4	4	5
Data Centre Engineers	Cloud Computing/Information Systems/Computer Engineering/Computer and Telecommunications Engineering + professional certifications (Dell /Cisco/AWS Microsoft, Google etc)	Degree	10	13	17	18
Information Systems Auditors	Computer Science/Information Technology/Information Systems/IT Audit + Certified Information Systems Auditor (CISA)	Degree	10	6	5	5
FIELD 14: SCIENCE & TECHNOLOGY						
Photovoltaic (PV) Installers	Electrical/Electronic Engineering	Certificate	36	46	42	51
Solar Thermal Installers	Electrical/Electronic Engineering	Certificate	36	46	42	51
Occupational Hygienist	Occupational Hygiene	Degree	47	48	53	51
Project Management & Commissioning Specialist	Project Management	Master	13	15	15	14
Risk Management Specialist	Risk Management	Master	56	74	44	58
Renewable Energy Technician	Electrical/Electronic Engineering	Diploma	267	289	346	324
PV Solar Installer (Artisan)	Solar Installation	Certificate	36	46	42	51
Borehole Mechanic	Mechanical Engineering	Certificate	171	143	186	185
Geologist scientists	Geology	Master	29	18	21	12
Geophysicists	Geology and Physics	Master	29	18	21	12
Hydrogeologists	Geology and Physics	Master	29	18	21	12
Geochemists	Mining and Geological Sciences	Master	29	18	21	12

OCCUPATION	AREAS OF STUDY	QUALIFICATION	FORECASTS			
			2025	2026	2027	2028
Geo Metallurgist	Material and Metallurgical Engineering	Master	24	26	27	33
Mineral Surveyors	Mining and Mining Surveying	Master	13	15	15	14
IT Infrastructure Managers	Computer Science/Computer Engineering/Information Systems + Cisco Certified Network Associate (CCNA), Cisco Certified Design Expert (CCDE), Computing Technology Industry Association (CompTIA ITF+, CompTIA A+)	Degree	8	5	7	7
Data Centre Managers	Computer Science/Information Systems	Masters	11	11	12	12
Mobile Application Developers	Software Engineering	Degree	14	16	18	22
Software Engineers	Software Engineering/Computer Science	Degree	15	19	20	21
Application Security Developers	Software Engineering + Security	Masters	10	10	13	14
Fintech Developers	Computer Science	Masters	24	27	32	32
Ethical Hackers	Computer Science/Information technology + Ethical Hacking	Masters	18	21	21	26
3D Printing Technicians	3D Printing Technology	Diploma	6	4	3	2
Mobile Financial Officers	Software Engineering	Degree	15	12	13	12
IT Business Analysts	Computer Science/Business Information Systems + Certifications	Degree	9	7	7	9
Digital Forensics Experts	Computer Science + Information Technology Forensics, Certified Information Security System Professional (CISSP), Certified Information Security Manager (CISM), Certified Information Security Auditor (CISA)	Degree	24	26	30	31
Cyber Security Experts	Software Engineering + Certification	Masters	18	29	31	32

OCCUPATION	AREAS OF STUDY	QUALIFICATION	FORECASTS			
			2025	2026	2027	2028
Information Security Engineers/ Architects/Analysts	Information Systems/Computer Engineering/Computer and Telecommunications Engineering/ Information Security + Ethical hacking/Certified Information Security Manager (CISM)/CISSP/CISA	Masters	27	29	31	26
IT Quality Assurance Specialist	Computer Science/Computer Engineering + Certified Quality Engineer (CQE), Certified Quality Auditor (CQA), Six Sigma.	Degree	9	6	4	4
Network Security Officers	Network Security	Degree	8	5	4	4
Network Security Specialists	Information Systems/Computer Engineering/Computer and Telecommunications Engineering/Computer Science/Information Security + Ethical hacking/Certified Information Security Manager (CISM)/CISSP/CISA	Masters	9	5	4	7
Core Network Specialists	Information Systems/Computer Engineering/Computer and Telecommunications Engineering +CCIE/Juniper/Huawei/Fortinet/NSE 7	Masters	7	4	3	3
Cloud and Network Solutions Specialists	Computer science/Information Systems/Computer Engineering + Cloud IT/Network Certifications	Masters	8	12	11	11
Network Engineers	Computer Science/Computer Engineering/Networking + CCNA, CCNP, CCIE, NSE 4(+)	Masters	10	11	13	13

OCCUPATION	AREAS OF STUDY	QUALIFICATION	FORECASTS			
			2025	2026	2027	2028
Internet of Things Engineers	Computer Science/Computer Engineering	Masters	8	5	7	8
FIELD 15: SOCIAL SCIENCES						
Lawyers	Law	Degree	32	40	51	49
Lawyers Administrators	Law & Public Administration	Degree	23	26	26	25
Social Workers	Social Work	Degree	73	42	42	43
Economic Planners	Economics	Degree	10	4	4	4
Information and Knowledge Managers	Knowledge Management	Degree	18	11	13	15
Legal Manager	Law	Masters	32	40	51	49
Contracts Specialist	Law	Masters	13	15	15	14
Data Analysts	Statistics	Degree	25	15	15	15
Social researcher (Research and Development Managers)	Social sciences	Masters	19	21	23	24
Monitoring & evaluation specialist	Monitoring and Evaluation	Masters	7	3	3	3
Legal Secretary	Social science	Degree	40	17	17	17
FIELD 16: TRANSPORT & LOGISTICS						
Engine Man / Locomotive driver	Rail Transportation	Certificate	28	17	20	12
Site Lift Operator	Machine and Equipment Operation	Special Licence	65	64	75	63
Reach Stacker Operators	Machine and Equipment Operation	Special Licence	65	64	75	63
Trailer Mechanics	Mechanical Engineering	Certificate	38	39	29	37
Boiler Makers	Welding and Fabrication	Certificate	95	128	49	68
CNC Machinist	Mechanical Engineering	Diploma	38	39	29	37
Locomotive Artisan	Mechanical Engineering	Certificate	38	39	29	37
Wagon Artisan	Mechanical Engineering	Certificate	38	39	29	37
Forklift Operators	Machine and Equipment Operation	Special Licence	65	64	75	63
Service Technician	Mechanical Engineering	Diploma	38	39	29	37
Air Worthiness Liaison Officer	Aeronautical Engineering	Diploma	82	48	56	42
Operations Specialist	Business Administration	Degree	285	292	312	323
Dry Port Managers	Transport & Logistics Management	Degree	8	9	9	13
Flight Operations Managers	Transport & Logistics Management	Degree	43	44	47	49

OCCUPATION	AREAS OF STUDY	QUALIFICATION	FORECASTS			
			2025	2026	2027	2028
Maintenance Manager	Mechanical Engineering	Degree	116	91	108	108
Workshop Manager	Mechanical Engineering	Degree	116	91	108	108
Terminal Managers	Transport & Logistics Management	Degree	8	9	9	13
Technical Manager	Mechanical Engineering	Degree	116	91	108	108
Signal & Telegraph Technician (S&T)	Telecommunication Systems	Diploma	33	34	36	38
Aircraft Engineers	Aircraft Maintenance Engineer	Degree	38	46	41	32
Helicopter Pilot	Helicopter Flying	Certificate	17	42	17	14
Instructor (Pilot)	Helicopter Flying	Diploma	17	42	17	14
S & T Engineers	Telecommunication Systems	Degree	15	17	17	16
Aviation Security	Security Management	Diploma	100	42	42	42
Aviation / Transport Lawyer	Law	Degree	32	40	51	49
Transport Planners	Transport & Logistics Management	Degree	10	4	4	4
Environmentalist	Environmental Science	Degree	11	5	5	5
Freight Village Managers	Transport & Logistics Management	Degree	49	25	45	48
Electric Vehicle Technician	Auto Mechanics	Diploma	14	28	15	13
Pilots	Flight Training	Certificate	17	42	17	14
Flight Aviation Officer	Aviation Management	Diploma	43	44	47	49
Permanent Way Inspectors	Mechanical Engineering	Degree	116	91	108	108
Design Technician	Civil Engineering Technicians	Diploma	95	112	51	74
Transport/Operations Managers	Transport & Logistics Management	Degree	49	25	185	277
Customs Clearance Managers	Customs Clearing & Freight Forwarding	Diploma	20	23	35	34
Process Improvement Specialist	Mechanical Engineering	Degree	116	91	108	108
Dry Port Manager	Transport & Logistics Management	Degree	8	9	9	10
Warehousing and Logistics Manager	Transport & Logistics Management	Degree	49	25	185	277
Transportation Safety Manager/Administrator/ Officer	Transport & Logistics Management	Degree	35	38	38	39
Traffic Safety Engineers	Civil Engineering	Degree	38	46	41	32
Traffic Safety Analyst	Civil Engineering	Degree	38	46	41	32
Gateway Operators	Civil Engineering Technicians	Diploma	95	112	51	74
Aviation Inspector	Aircraft Maintenance Technology	Degree	116	91	108	108
Aviation Specialists	Aviation Management & Technology	Degree	116	91	108	108

OCCUPATION	AREAS OF STUDY	QUALIFICATION	FORECASTS			
			2025	2026	2027	2028
Track Masters	Civil Engineering Technicians	Diploma	42	45	48	43
Accident Investigator	Investigative training	Diploma	100	42	42	42
Bridge Engineers	Civil Engineering	Degree	38	46	41	32
Drainage Design Engineers	Civil Engineering	Degree	38	46	41	32
Contracts Specialist/ Construction Lawyers	Law	Degree	32	40	51	49
Project Manager	Project Management	Masters	8	9	9	13
FIELD 17: MANUFACTURING						
Machine Operator/Industrial Machinists (pharmaceutical)	Maintenance, Fitting and Machining	Certificate	42	24	38	13
Diamond Manufacturers (Polisher, Cutter, Grader, Valuer)	Jewellery Manufacturing	Certificate	51	87	65	85
Sewing Machine Operators	Maintenance, Fitting and Machining	Certificate	58	96	80	108
Tanners (Leather)	Leather Science and Technology	Certificate	197	88	109	125
Mould Makers	Manufacturing	Certificate	11	17	14	20
Jewellery Manufacturers (Jeweller)	Jewellery Manufacturing	Certificate	58	96	80	108
Mould Designer	Manufacturing	Certificate	11	17	14	20
Nutritionist	Nutrition & Dietetics	Degree	14	6	6	6
Pharmaceutical Chemists	Industrial Pharmacy	Advanced Diploma	13	13	14	20
Pharmaceutical Microbiologist	Industrial Pharmacy	Advanced Diploma	13	13	14	20
Pharmaceutical Scientists	Industrial Pharmacy	Advanced Diploma	13	13	14	20
Product developer	Science and Technology	Advanced Diploma	39	32	43	44
Textile & Clothing Engineers	Textile Spinning Technology	Degree	13	15	15	14
Textile & Clothing Technicians	Textile Spinning Technology	Diploma	26	22	29	30
Production Manager	Manufacturing	Masters	26	22	29	30
Regulatory Affairs Manager	Quality Management	Masters	7	3	3	3

EXTERNAL TRAINING

OCCUPATION	AREAS OF STUDY	QUALIFICATION	FORECASTS			
			2025	2026	2027	2028
FIELD 1: AGRICULTURE						
Meteorologist -Technical Officer	Meteorology	Diploma	12	12	12	11
Fish technical officer	Aquaculture	Diploma	24	21	19	15
Fire Impact Assessors	Fire Risk Assessment	Diploma	20	18	16	14
Meteorologist	Meteorology	Degree	16	14	13	11
Seed technologist	Seed Science	Degree	24	21	19	15
Animal scientist	Animal Nutrition/Animal Breeding & Genetics	Degree	6	6	7	7
Soil scientist	Soil science	masters	17	17	19	18
Agrochemical specialist	Toxicology/Chemistry/Analytical Chemistry	Masters	62	62	35	57
Hydrometeorologist	Meteorology	Masters	5	4	4	4
Agro meteorologist	Meteorology	Masters	5	4	4	4
Climate Change Officer /Climate Scientist	Meteorology	Masters	5	4	4	4
Horticulturalist	Pomology/Floriculture/Olericulture	Masters	17	17	19	18
Weed scientist	Weed Science	Masters	17	17	19	18
Post-harvest technologist	Harvest Horticulture and Grain Production	Masters	17	17	19	18
Food safety specialist	Microbial Food Safety	Masters	12	11	10	10
Animal bio statistician	Biometry	Masters	12	19	20	23
Aqua culturist	Aquaculture	Masters	17	17	19	18
Scientific officer	Chemistry/Biology	Masters	17	17	19	18
Animal welfare specialist	Animal welfare	Masters	17	17	19	18
Industrial biotechnologist/ microbiologist	Microbiology/Biotechnology	Masters	12	11	10	10

OCCUPATION	AREAS OF STUDY	QUALIFICATION	FORECASTS			
			2025	2026	2027	2028
Senior Researcher,	Green Chemistry/Analytical Chemistry	Masters	12	11	13	12
Biotechnologists (agriculture)	Animal or Plant Biotechnology	Masters	12	11	10	10
Fire Ecologists	Fire Ecology	Masters	17	17	19	18
Geographical Information System & Remote Sensing Scientist	Geographic Information System	Masters	12	11	10	10
Ecologists	Ecology	Masters	17	17	19	18
Wildlife specialist	Wildlife medicine	Doctorate	12	11	10	10
Fish pathologist	Fish pathology	Doctorate	12	11	10	10
Entomologist	Entomology	Doctorate	12	11	10	10
Bee pathologist	Bee Pathology	Doctorate	12	11	10	10
Veterinary pathologist	Pathology	Doctorate	12	11	10	10
Veterinary epidemiologist	Veterinary epidemiology	Doctorate	15	17	17	16
Animal Reproduction Physiologists	Animal Reproduction physiology	Doctorate	12	11	10	10
Plant Pathologist	Plant science/Botany	Doctorate	17	17	19	18
Veterinarian (Research specialist)	Veterinary Medicine/ Science	Doctorate	15	17	17	16
One health specialist	Veterinary Epidemiology & Public Health	Doctorate	15	17	17	16
FIELD 3: BUSINESS & FINANCIAL SERVICES						
Printing Technician	Printing	Diploma	23	19	25	26
Actuarial	Acturial science	Degree	12	19	20	23
Big Data Analysts	Data Science	Degree	28	12	12	12
Tax Specialist	Taxation	Masters	25	29	28	27
Fintech Analysts	Financial Technology	Masters	78	83	85	93
Financial Services Supervisors	Financial Technology	Masters	78	83	85	93
Underwriter	Underwriting	Masters	25	29	28	27

OCCUPATION	AREAS OF STUDY	QUALIFICATION	FORECASTS			
			2025	2026	2027	2028
Auctioneer	Auctioneering	Masters	20	18	16	12
Marketing Managers	Fintech (Financial Technology)	Masters	106	92	117	127
FIELD 4: CREATIVE INDUSTRIES						
Curators	Art History / Archaeology / Museum Studies	Degree	69	64	59	46
Copyright Specialist	Copyright Law	Degree	77	81	107	99
Illustrator	Fine Arts	Degree	28	38	37	30
Arts Manager	Arts Management	Degree	53	47	46	44
Creative Coding Specialists	Programming	Degree	13	14	25	30
FIELD 9: HEALTH						
Oncologists	Oncology	Masters	21	18	17	13
Radiologists	Radiology	Masters	16	13	10	9
Paediatric Surgeons	Paediatric Surgery	Masters	10	8	6	5
Neurosurgeons	Neurosurgery	Masters	8	7	5	5
Cardiovascular Surgeons	Cardiovascular Surgery	Masters	7	6	6	5
Obstetrician/Gynaecologists	Obstetrics and Gynaecology	Masters	22	17	13	12
Psychiatrists	Psychiatry	Masters	28	21	16	15
Medical Oncologists	Medical Oncology	Masters	32	21	18	16
Surgical Oncologists	Surgical Oncology	Masters	23	20	19	14
Radiation Oncologists	Radiation Oncology	Masters	23	20	15	13
Intensivists	Critical Care Medicine	Masters	12	10	12	8
Maxillofacial Specialists	Dentistry & Surgery	Masters	3	3	2	2
Urologists	Urology	Masters	8	7	5	3
Nephrologists	Nephrology	Masters	15	13	12	9

OCCUPATION	AREAS OF STUDY	QUALIFICATION	FORECASTS			
			2025	2026	2027	2028
Clinical Pathologists	Clinical Pathology	Masters	6	5	4	2
Prevention Medicine Specialists	Preventative Medicine	Masters	7	7	8	5
Occupational Medicine Practitioners	Occupational Health	Masters	12	10	7	7
Infection Prevention Specialists	Infection Prevention & Control	Masters	10	8	8	6
Cardiologists	Cardiology	Masters	15	13	12	9
Endoscopic Surgeon	Endoscopic Surgery	Masters	11	9	7	6
Gastroenterologists and Hepatobiliary Surgeons	Gastroenterology	Masters	6	5	6	4
Ophthalmologists	Ophthalmology	Masters	11	9	7	6
Podiatrists	Podiatric Medicine	Masters	4	4	3	3
Colorectal Surgeons	Intestinal & Anorectal Physiology	Masters	10	8	6	5
Paediatric Cardiac Surgeons	Paediatric Cardiac Surgery	Masters	8	7	5	5
Plastic & Reconstructive Surgeons	Plastic & Reconstructive Surgery	Masters	2	2	2	1
Transplant Surgeons (Renal, Liver, Cardiac, Pulmonary/Lung)	Transplant Surgery	Masters	7	6	5	4
Cardiac Anaesthesiologists	Cardiac Physiology	Masters	5	4	5	4
Rheumatologists	Rheumatology	Masters	14	12	11	9
Fetomaternal Medicine Specialists	Maternal-Fatal Medicine	Masters	13	11	10	8
Urogynaecologists	Obstetrics and Gynaecology	Masters	7	6	7	5
Pulmonologists	Pulmonology	Masters	15	13	12	9
orthopaedic Surgeons	orthopaedic Surgery	Masters	12	10	9	7
ENT Specialists	Ear, Nose and Throat Medicine	Masters	8	7	7	5
Neurologists	Neurology	Masters	11	9	9	7
Internal Medicine Physicians	Internal Medicine	Masters	12	10	12	8
Clinical Haematologists	Haematology	Masters	10	8	11	7
Bone Marrow Transplant Surgeons	Haematology/Oncology	Masters	5	4	3	3

OCCUPATION	AREAS OF STUDY	QUALIFICATION	FORECASTS			
			2025	2026	2027	2028
Cardiac Surgeons	Cardiothoracic Surgery	Masters	7	6	5	4
Orthopaedist	Orthopaedics	Masters	10	8	6	5
Teleradiology Specialists	Musculoskeletal Radiology	Masters	6	5	4	2
Emergency Medicine Physicians	Emergency Medicine	Masters	7	6	3	2
Anaesthetic Nurses	Anaesthesia Nursing	Masters	10	9	10	15
Cardiac/ Coronary Nurses	Cardiac Nursing	Masters	20	17	13	12
Cath lab Care Nurses	Cath lab Care Nursing	Masters	2	2	2	4
Child Health / Paediatric Nurses	Child Health Nursing	Masters	31	23	18	17
Critical Care Nurses	Critical Care Nursing	Masters	7	18	14	13
Endocrinology Nurses	Endocrinology Nursing	Degree	2	3	3	7
ENT Nurses	Ear, Nose and Throat	Degree	4	6	6	7
Geriatric Nurses	Gerontology Nursing	Masters	43	15	13	16
ICU Nurses	Critical Care Nursing	Masters	20	21	18	14
Infection Prevention and Control Nurses	Infection Prevention and Control Nursing	Masters	47	21	16	15
Lactation and Mother Care Nurses	Lactation and Mother Care Nursing	Masters	31	13	10	13
Neo-natal Care Nurses	Neonatal Nursing	Masters	3	5	4	8
Neo-natal Intensive Care Specialised Nurses	Neonatal Intensive Care Nursing	Masters	3	8	6	9
Occupational Health Nurses	Nursing Science	Degree	4	8	5	10
Oncology Nurses	Oncology Nursing	Masters	34	18	12	12
Ophthalmology Nurses	Ophthalmic Nursing	Degree	9	10	10	8
Orthopaedic Nurses	Orthopaedic Nursing	Degree	2	6	2	8
Paediatric Intensive Care Nurses	Paediatric Intensive Care Nursing	Masters	7	11	10	15
Palliative Care Nurses	Palliative Care Nursing	Degree	4	6	6	8
Perfusionists (Nurse Technicians)	Perfusion Science	Masters	2	6	4	4
Renal/Nephrology Nurses	Renal/Nephrology Nursing	Masters	46	16	14	14

OCCUPATION	AREAS OF STUDY	QUALIFICATION	FORECASTS			
			2025	2026	2027	2028
Theatre Nurses	Theatre Nursing	Degree	6	9	8	13
Theatre Nurses (Cardiac & Urology)	Theatre Nursing	Masters	14	14	15	12
Trauma Nurses	Emergency Care/Trauma	Degree	15	16	17	11
Wound Care Nurses	Wound Care Nursing	Degree	7	7	8	12
Orthodontists	Orthodontics	Masters	16	10	6	7
Paediatric Dentists	Paediatric Dentistry	Masters	12	9	5	6
Periodontists	Periodontics	Masters	10	5	3	4
Prosthodontists	Prosthodontics	Masters	8	5	3	3
Geriatric Pharmacists	Geriatric Pharmacy	Masters	10	6	5	7
Nutritional Support Pharmacists	Nutrition Pharmacy	Masters	6	7	11	8
Nuclear Pharmacists	Nuclear Pharmacy	Masters	10	6	4	8
Oncology Clinical Pharmacists	Oncology Pharmacy	Masters	10	9	8	9
Clinical Pharmacists	Pharmacy	Masters	12	8	10	10
Physiotherapists	Physiotherapy	Degree	22	18	13	9
Physical Therapists	Physical Therapy	Degree	16	10	13	8
Clinical Dietitians	Nutrition	Degree	8	6	5	6
Audiologists	Audiology	Degree	16	9	8	7
Speech Therapists	Speech Language Pathology	Degree	12	10	9	7
Speech/Language Pathologists/Therapists	Speech Language Pathology	Masters	14	11	10	11
Optometrists	Optometrist	Masters	15	11	8	7
Virologists	Biology Sciences/Applied Microbiology	Masters	11	8	10	8
Biochemists	Biochemistry	Masters	10	8	7	8
Anaesthetic Lecturers	Anaesthesia	Masters	7	4	2	2
Hospital Administrators/Managers	Health Care Service Management	Degree	4	4	4	4
Braille Specialists	Unified English Braille System	Masters	16	15	15	12
Medical Physicists	Medical Physics	Masters	4	3	3	2
Clinical Psychologists	Clinical Psychology	Masters	20	17	13	11

OCCUPATION	AREAS OF STUDY	QUALIFICATION	FORECASTS			
			2025	2026	2027	2028
Child Psychologists	Child Psychology	Masters	23	19	14	12
Neuro Psychologists	Neuro Psychology	Masters	10	9	8	8
Sports Psychologists	Sports Psychology	Masters	15	14	10	8
Career Psychologists	Psychology	Masters	16	15	14	10
Rehabilitation Psychologists	Rehabilitation Psychology	Masters	22	17	13	15
Forensic Psychologists	Forensic Psychology	Masters	20	15	12	11
Clinical Social Workers	Social Work (Clinical)	Masters	15	14	10	13
Oncology Social Workers	Oncology Social Work (Oncology)	Masters	22	14	12	16
Genetic Counsellors	Genetic Counselling	Masters	10	7	9	9
Clinical Counsellors	Counselling	Masters	10	9	8	9
Radiographers	Radiography	Degree	58	49	39	34
Sonographers	Sonography	Degree	62	56	46	38
Therapeutic Radiographers	Therapeutic Radiography	Degree	61	50	41	35
Diagnostic Radiographers	Diagnostic Radiography	Degree	62	57	42	35
Clinical Technologists	Clinical Technology	Diploma	50	43	39	30
Biomedical Equipment Technicians	Biomedical Equipment Technology	Diploma	60	54	38	32
Biomedical Engineers	Biomedical Engineering	Degree	46	41	29	18
Medical Instrumentation Specialists	Biomedical Equipment Technology	Degree	25	21	20	10
Health Informatics Specialists	Health Information Management	Masters	6	4	5	8
Bioinformatics Specialists	Bioinformatics	Masters	6	3	5	7
Medical Facilities/Healthcare Architects	Health Care Design & Engineering	Masters	4	1	3	4
Medical Economists	Health Care Economics	Masters	2	2	2	2
Healthcare Economists	Health Economics	Masters	2	1	2	2
FIELD 10: TOURISM & HOSPITALITY						
Chefs	Culinary Arts	Degree	20	16	13	7
Ornithologist	Travel and Tourism	Degree	4	7	3	2
Specialised Chefs	Culinary Arts	Degree	11	9	9	13

OCCUPATION	AREAS OF STUDY	QUALIFICATION	FORECASTS			
			2025	2026	2027	2028
FIELD 12: INFORMATION TECHNOLOGY						
Digital Transformation Managers	Digital Transformation Management	Degree	12	12	12	12
Artificial Intelligence Engineers	Artificial Intelligence + Data Lakes	Masters	31	33	36	38
Machine Learning Engineers	Machine Learning	Masters	16	21	25	26
Robotics Engineers	Robotics Engineering/Artificial Intelligence	Masters	20	29	31	35
FIELD 14: SCIENCE & TECHNOLOGY						
Virtual/Mixed Reality Developers	Computer Engineering/Game Development	Degree	8	6	6	4
Blockchain Developers	Software Engineering/Virtual Reality	Degree	9	8	7	6
Big Data Analytics	Data Science	Degree	28	12	12	12
Network Security Officers	Network Security	Degree	3	2	2	1
FIELD 15: SOCIAL SCIENCES						
Commercial Transaction Advisors	Commercial Law	Master	32	40	51	49
Compliance Officers	Law	Degree	32	40	51	49
Mineral Economists	Economics	Masters	5	5	4	4
Energy Economist	Economics	Master	2	2	3	3
FIELD 17: MANUFACTURING						
Leather Shoe Designer	Leather Science and Technology	Advanced Diploma	46	38	51	52
Industrial Pharmacist	Industrial Pharmacy	Masters	13	13	14	20
Leather Processing Technicians	Leather Science and Technology	Diploma	58	96	80	108
Leather Scientists & Chemist	Leather Science and Technology	Degree	62	100	35	57
Leather Technicians	Leather Science and Technology	Diploma	12	12	12	11
Textile Spinning Engineers	Textile Spinning Technology	Degree	13	15	15	14

OCCUPATION	AREAS OF STUDY	QUALIFICATION	FORECASTS			
			2025	2026	2027	2028
Textile Spinning Technicians	Textile Spinning Technology	Diploma	26	22	29	30
Textile Printing Technician	Textile Design and Printing	Diploma	26	22	29	30

PROFESSIONAL TRAINING

OCCUPATION	AREAS OF STUDY	QUALIFICATION	FORECASTS			
			2025	2026	2027	2028
PROFESSIONAL TRAINING (Certification)						
FIELD 3: BUSINESS & FINANCIAL SERVICES						
Investment Analyst	Chartered Financial Analysis (CFA)	Professional	11	12	12	11
Investment Principal	Chartered Alternative Investment Analysis (CAIA)	Professional	78	83	85	93
Financial Analyst	Chartered Financial Analysis (CFA)	Professional	39	35	32	29
Financial Engineer	Chartered Financial Analysis (CFA)	Professional	64	54	72	73
Financial Planner	Chartered Financial Analysis (CFA)	Professional	11	12	12	11
Collective Investment Undertaking Analyst	Chartered Financial Analysis (CFA)	Professional	11	12	12	11
Chartered Accountants	BICA/ACCA/CIMA	Professional	78	83	85	93
Portfolio Manager	Chartered Financial Analysis (CFA)	Professional	78	83	85	93
Merchandisers	CIPS	Professional	36	32	29	25