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LABOUR MARKET ASSESSMENT

IN GILGIT BALTISTAN

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Acronyms

AI	Artificial Intelligence
AKDN	Aga Khan Development Network
CBT	Competency-Based Training and Assessment
EMS	Emergency Medical Services
ESS	Employer Skills Survey
GB	Gilgit-Baltistan
GCC	Gulf Cooperation Council
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HCPL	HIMAT Consulting Private Limited
ICT	Information and Communication Technologies
LMIS	Labour Market Intelligence System
LHV	Lady Health Visitors
M&E	Monitoring and Evaluation
MIS	Management Information Systems
NAVTTC	National Vocational and Technical Training Commission
NGO	Non-Governmental Organization
NSIS	National Skills Information System
NVQF	National Vocational Qualification Framework
PPPs	Public-Private Partnerships
PWDs	Persons with Disability
QAB	Qualification Awarding Bodies
RPL	Recognition of Prior Learning
TEVTA	Technical and Vocational Education and Training Authority
TVET	Technical and Vocational Education and Training

EXECUTIVE SUMMARY

This Labour Market Assessment of Gilgit-Baltistan (GB) is an attempt to provide an evidence-base to help align the region's Technical Vocational Education and Training (TVET) with its employment needs. This study adopts a mixed-method research approach to analyze skill supply-demand mismatches, industry requirements, and institutional gaps across ten districts of GB. The region's labour market was found to be characterized by highly informal labour, seasonal employment, and underutilized economic sectors with huge potential for market-pull, particularly in tourism, agribusiness, renewable energy, and mining.

It was found that despite relatively high literacy rates, GB's youth have very limited access to technical and vocational training. With a higher concentration of TVET infrastructure in Gilgit and Skardu, other districts remain underserved, especially the rural areas. Moreover, most training programmes were found to be outdated, supply-driven, and grossly disconnected from market realities. Only about 32% of the annual skilled workforce demand (13,238 out of 40,792) of GB is currently being met, resulting in a glaring skills gap of over 68%. This gap is most pronounced in hospitality, allied health, construction, agribusiness, mining, energy, and digital services. As for the skills being catered to by TVET institutes, employers consistently reported dissatisfaction with the quality of TVET graduates, citing a lack of practical exposure, digital proficiency, and soft skills as key reasons.

The demographic dividend for the marginalized groups was marked by limited participation as women, persons with disabilities (PWDs), and youth in remote districts were largely excluded from the skills landscape. The reasons documented included conflict with social norms, mobility constraints, and the absence of gender-sensitive facilities. Participation of GB's female population in TVET is below 25%, with major gaps in sectors like construction, renewable energy, and IT. This may be of special interest to policymakers as the region has the highest overall literacy rate in the country. The reasons found through this study were the absence of flexible training models, female instructors, and necessary workplace linkages.

The findings of this report point to the need for a strategic shift toward a demand-driven, decentralized, inclusive, and future-oriented TVET sector. Targeted interventions geared towards curriculum modernization, institutional reforms, industry partnerships, and gender mainstreaming can help tap GB's latent economic potential, conditional on upgrading and upscaling skills.

Recommendations

To bank on high literacy rates and allow wider access to TVET beyond Gilgit and Skardu, establish at least one fully equipped multipurpose TVET center in each district of GB, with trades aligned to their specific economic strengths (e.g., eco-tourism, agribusiness, renewable energy,construction, etc.).

Set up dedicated women-only training wings in TVET institutes in each district with female instructors, flexible hours, and safe facilities to enhance women's participation in high-demand non-traditional trades while respecting the region's cultural norms, ensuring higher social acceptability.

Revise and modularize curricula in collaboration with employers to cover practical competencies for emerging sectors: solar/hydro energy, hospitality management, agri-processing, gemstone cutting, digital freelancing, and construction technology.

Integrate green skills (e.g., energy efficiency, climate-resilient construction, sustainable agriculture) and digital competencies (e.g., e-commerce, remote work, software development) into all TVET programmes in line with the international standards.

Initiate mobile training units to underserved and remote valleys with short-term, trade-specific certification programmes to reach youth and disadvantaged populations with necessary training staff and equipment.

Launch Recognition of Prior Learning (RPL) frameworks to certify informal skills of mechanics, masons, miners, and home-based artisans, helping transition of informal workers into formal employment and improve their chances of foreign mobility.

Introduce targeted training for online jobs and remote work platforms to improve access to global freelancing markets, especially for youth in IT, design, writing, and virtual assistance, etc.

Improve governance structures at district level by establishing District TVET-Industry Coordination Committees with local employers, training institutes, and community stakeholders to ensure quick alignment with workforce needs.

Strengthen the institutional capacity of TEVTA and NAVTTC GB regional office through digital monitoring systems, performance-based budgeting, specialized human resources and transparent placement tracking.

Revamp TVET financing using output-based models that reward institutions for job placements, female and PWD enrollment, programme completion, and international mobility of graduates. Institutionalize dual-training models (classroom + industry-based learning) through formal apprenticeships, on-the-job training, through incentives for industry, such as wage subsidies, ensuring effective cooperation.

Increased public-private partnerships to promote industry-led skill incubators in high-growth sectors specific to each area, like hospitality (Skardu), solar energy (Hunza), and gemstone processing (Nagar).

- Introduce specialized training in specific environmental and regional contexts of GB, such as earthquake-resistant construction, smart infrastructure, and CPEC-related civil technologies, to meet long-term infrastructure demands.
- Align select TVET programmes with international certifications (e.g., City & Guilds, ISO) to facilitate skilled labour mobility to GCC countries and large-scale projects.
- Institutionalize conducting annual Employer Skills Surveys, graduate tracer studies, and a Labour Market Intelligence System (LMIS) to ensure evidence-based, adaptive policy formulation and outcomes/impact monitoring.

1. Introduction

This report, Labour Market Assessment in Gilgit-Baltistan, has been developed under the Team Europe's TVET Sector Support Programme (TVET SSP) funded by the EU and implemented by GIZ. The programme is designed to bring strategic reforms in the sector to, inter alia, deliver demand-driven training courses, broaden vocational training opportunities, and promote gender equality, in collaboration with the National Vocational & Technical Training Commission (NAVTTC). To achieve the study's objectives, extensive consultations were carried out with key stakeholders across the public and private sectors. The findings and results of the report are hoped to support policymakers and implementers in advancing evidence-based decision-making for designing and implementation of informed Technical and Vocational Education and Training (TVET) initiatives in the region.

1.1 Background

TVET is a crucial sector for meeting a country's demand for a skilled workforce and supporting its economic growth. In Pakistan, however, the sector faces several challenges that limit its effectiveness and overall impact contribution in the country's economy. One major challenge is the lack of coordination, clear demarcation of roles and standard practices among the key governing bodies and institutions of the sector. With more than one authorities operating at the federal and provincial levels, the sector remains fragmented, resulting in inconsistencies in policies, curricula, and quality assurance mechanisms. Furthermore, the TVET sector struggles with insufficient funding, outdated curricula, and weak quality assurance processes, particularly in areas such as emerging technologies and industries.

A significant challenge facing TVET education in Pakistan is the pervasive social stigma associated with it, as many perceive TVET programmes to be inferior to conventional academic pathways. This perception leads to lower enrollment rates and minimal interest among potential students and their families. Additionally, the sector is characterized by gender disparities, as women were found to face socio-cultural barriers and limited access to TVET institutions, in some regions more than others.

Similarly, persons with disabilities and transgender individuals face more pronounced issues and limitations in accessing vocational skills training. Even where opportunities exist, they are often restricted to outdated courses with little relevance to current labour market demands, further marginalizing these groups.

In recent years, concerted efforts have been made to revitalize Pakistan's TVET sector. The Government of Pakistan has taken key institutional and programmatic initiatives, including establishment and strengthening of NAVTTC (National Vocational and Technical Training Commission) and the Prime Minister's Youth Skills Development Programme that play a pivotal role in policy development, curriculum standardization, accreditation, and stakeholder engagement to align TVET programmes with industry needs. NAVTTC's initiatives include improving training quality and equipping individuals with market-relevant skills.

On the other hand, the Prime Minister's Youth Skills Development Programme empowers young Pakistanis by offering accessible training in diverse trades, bridging the skills gap and enhancing employability. Together, these programmes aim to cultivate a skilled workforce, drive economic growth, and strengthen Pakistan's global competitiveness in critical sectors through a critical mass of skilled and highly skilled individuals in line with global standards.

1.2 Purpose and Scope

Purpose

The purpose of this Labour Market study is to present a comprehensive picture of the labour market in Gilgit-Baltistan, Pakistan. This assessment report identifies skill gaps and mismatches in sectors with higher growth potential, and other key information that can guide TVET institutes in aligning their programmes and qualifications with the actual job market needs.

Scope of the Study

The scope of this study is a thorough examination of the current labour market conditions, employment situation, occupational demand and supply, skills gaps, and emerging industry needs. The study spanned from November 2024 to April 30, 2025 drew its sample from GB's 10 districts. The methodological framework later further expands on the sample population. The following key aspects are covered under the scope:

Labour Market Analysis

A thorough examination of current labour market conditions, employment trends, occupational demand and supply, skills gaps, and emerging industries. The study also identified sectors with the highest job growth potential and assessed the relevance of existing TVET programmes in GB.

Skills Demand Assessment

Engagement with employers and industry representatives to understand their workforce needs, preferred qualifications, and desired skill sets. This evidence enables TVET-qualification alignment with labour market/industry needs useful for addressing graduates' employability and integration into industry.

Employment Projections and Future Trends

Demographic trends, technological advancements, and economic forecasts shape future employment landscapes. This analysis helps identify emerging job roles and industries to tailor TVET programmes accordingly.

District-Level Mapping

Skilled workforce demand and supply mapping for each district of Gilgit-Baltistan helped identify trades with a shortage or surplus of skilled workforce and provided the basis for skill forecasting and projections for identified growth sectors.

Gender and Disadvantaged Groups

High-demand occupations for disadvantaged groups (women, transgender, elderly, minorities) were identified that need to be reflected in TVET institutes' curricula and programmes to promote inclusiveness and equal opportunities.

Recommendations

Findings under the aforementioned study aspects helped generate key practical and actionable recommendations for TVET policymakers and implementers for addressing the identified challenges for overall improvement of TVET sector.

The study employed quantitative and qualitative research approaches, including literature review, drawing a representative sample, developing tools from employer surveys, data analysis, and employment projections. This report is an output of a combination of these methods, findings of which have been consolidated to provide recommendations for enhancing the effectiveness of the TVET sector in meeting skill demands of the labour market.

2. METHODOLOGICAL FRAMEWORK

This chapter outlines the methodological framework used to conduct the comprehensive labour market assessment in Gilgit-Baltistan, aligned with the study's aim to identify skill gaps, assess occupational demand and supply, and align TVET programmes with evolving labour market needs. The methodological design integrates quantitative and qualitative approaches, ensuring a holistic understanding of the labour market dynamics across the region. As such, this framework provided a systematic approach to data collection and analysis and enabled district-level mapping of workforce imbalances and mismatches, leading to evidence-based recommendations for informed TVET policy making and programmatic interventions.

The selection of methods, data sources, sampling strategy, and analytical tools was guided by the study's objectives and the unique socio-economic characteristics of Gilgit-Baltistan, ensuring relevant, reliable, and actionable findings.

2.1 Research Design

This Labour Market Assessment in Gilgit-Baltistan adopts a mixed-methods approach, strategically combining quantitative and qualitative techniques to achieve three primary objectives:

- Identifying critical skill gaps,
- Analyzing occupational demand and supply dynamics, and
- Aligning TVET programmes with evolving labour market requirements and imperatives.

The analysis done in this report also relies on secondary data sources, including the Labour Force Survey, as well as economic and employment reports. A distinctive element of the research design is the inclusion of a detailed district-level analysis, presented as a separate chapter. This profiling draws on literature, government reports, LFS data, and relevant academic studies to map workforce demand and supply across districts, helping uncover regional disparities, highlight high-potential trades, and provide targeted insights. This affords policymakers and readers in general district-level lens and adds to the study's applicability, ensuring that recommendations and proposed interventions are based on knowledge not only of the sectoral needs but also the local labour market conditions.

2.2 Data Collection and Analysis

The study employed secondary and primary data collection methods to ensure a comprehensive and evidence-based assessment of the labour market in Gilgit-Baltistan. This mixed approach enabled the triangulation of data sources, enhanced the reliability of findings, and allowed for a deeper exploration of skill gaps and labour market dynamics across the province.

Secondary data helped provide a foundational understanding of the existing broader narratives on employment trends, sectoral growth, and demographic patterns. Key sources for such data included the provincial and national-level economic reports, census data, and relevant publications from government departments and development partners. Findings from academic journal articles and previous labour market studies helped contextualize the activity for district-level profiling. These sources provided valuable insights into historical trends and prevalent macroeconomic indicators affecting labour market outcomes.

Structured surveys were conducted with employers to gather primary data on workforce development needs. The survey instrument was specifically targeted at:

- Identification of critical skills gaps
- Assessment of training programme alignment with industry requirements
- Evaluation of current employment challenges
- Projections for future competency needs

Particular emphasis was placed on surveying employers in high-growth sectors to bring forward current and emerging skill demands. All the collected data underwent statistical analysis using SPSS 27.

The survey findings are useful for developing employment projections and give actionable recommendations to inform policy planning and enhance the effectiveness of TVET programmes for meeting the skills demands of the labour market of Gilgit-Baltistan.

2.3 Literature Review

Gilgit-Baltistan is at a pivotal point, experiencing a rapid demographic event marked by a predominantly young population, whose potential, if not effectively utilized, could lead to a rise in unemployment and social instability. The study emphasizes that TVET is essential in transforming this demographic challenge into a demographic dividend by equipping youth with technical and soft skills based on market pull. As noted by NAVTTC (2018) and supported by the findings of Ahmed and Baloch (2015), the current TVET system in Gilgit-Baltistan is severely underdeveloped, marked by outdated curricula that fail to address the evolving needs of the regional industries such as mining, water management, and renewable energy. Moreover, Khan and Yousaf (2020) indicates that a significant portion of the youth labour force lacks the necessary skills to engage in productive employment, which hampers economic growth, ignites social disenfranchisement and potential conflict.

The above confirms findings from earlier studies (e.g., OECD, 2009; ADB, 2008; ILO, 2008) that emphasize the importance of quality vocational education in increasing employability and social cohesion. The focus here is more specific in assessing the impact of the financial and economic crises, the extent to which vocational education is strongly identified with enterprises and the introduction of new business practices. Gilgit-Baltistan could benefit from modern technologies and strategise to enhance the availability of a skilled workforce for the local market needs and support overall development.

In the context of Pakistan, ILO (2017) emphasizes the urgency of integrating green skills into national development strategies. Embedding green skills within an efficient green economy framework is considered vital while simultaneously acknowledging structural challenges in the labour market, challenges that this assessment also seeks to address. Further elaborating on these insights, ILO (2018) explores the potential for job creation through the transition to green technologies. It discusses the implications of this transition for future employment and the need to equip workers with the skills necessary for emerging green jobs. This forward-looking perspective is essential for identifying sectors with high potential for job creation and evaluating whether existing TVET programmes align with evolving labour market demands.

ILO (2019) also comprehensively explores the critical components required for greening the workforce. It examines the range of skills relevant to green jobs and their applicability to current TVET systems. These findings are closely aligned with the evolving skill needs of businesses and emerging sectoral trends. Consequently, it becomes imperative to engage employers and other key stakeholders to understand their workforce requirements, educational preferences, and expectations for qualifications. This engagement is key to aligning TVET qualifications with labour market realities.

According to ILO (2021a), lifelong learning is essential to foster economic growth and social cohesion, particularly in a rapidly evolving labour market influenced by technological and environmental change. The report provides a framework for integrating current skill demands into the TVET system. Moreover, ILO (2021b) stresses the importance of human capital development and advocates for lifelong learning to ensure continued workforce relevance. It also offers sector-specific guidance, focusing on the textile and garment industry, demonstrating how green skills and sustainable practices can be integrated into training and skills development. Such resources are valuable in identifying skill needs and trends in sectoral employment.

Moreover, understanding future employment trends requires careful analysis of demographic shifts, technological innovations, and economic forecasts. In this regard, ILO (2022a, 2022b) guides integrating green skills into TVET systems, supporting a just transition toward a greener economy. These resources help TVET institutions in identifying emerging occupations and sectors, thereby enhancing the future relevance of their programmes.

ADB (2023) complements these findings by providing a global perspective on integrating green skills across different sectors, highlighting how demographic and technological transitions reshape employment and skill needs. It emphasizes the need to embed green skills into all industries, as the emergence of new economic activities calls for structural changes and worker mobility across sectors. In scenarios involving a transition to a low-carbon economy, the capacity of the workforce to reskill and shift across industries becomes critical. These findings align with the OECD (2014), which asserts the centrality of skills and education policy in facilitating ecological modernization.

While green construction and manufacturing are discussed, few studies provide practical, actionable guidance for implementation. Despite their need for sustainable practices, the tourism and hospitality sectors have received limited attention regarding green skill requirements. Similarly, the textile and garments sector lacks an in-depth analysis of essential green skills that could drive environmental innovation and sustainability.

Furthermore, there is not enough literature exploring green skill needs in agriculture, livestock, and fisheries, which are sectors integral to Pakistan's economy. Although job creation potential in renewable energy is well-documented, deeper exploration is needed into the precise technical skills required for various technologies and occupations. Likewise, sectors such as printing and packaging, health, and sports goods remain understudied concerning green skill integration.

The other issue is gender disparity in Gilgit-Baltistan's labour market. The gender gap in Gilgit-Baltistan's labour market is particularly pronounced, with significantly fewer women employed compared to men. This disparity widens income inequalities and limits women's economic participation and access. Studies within the brief indicate that in Pakistan generally the overall gender pay gap is about 25%, where women earn PKR 750 for every PKR 1,000 earned by men, notwithstanding that the gender pay gap in Pakistan is even higher in Gilgit-Baltistan because of deeply entrenched cultural and structural barriers to women enter formal wage employment (ILO, 2025). This issue is compounded by the limited availability of gender-sensitive TVET programmes, as there are few such programmes in the training arena, especially regarding the unique requirements of women, such as flexible hours, safe spaces, and female role models in leadership positions.

Another driving factor in Gilgit-Baltistan's labour market is the youth migration from rural areas to urban centres in pursuit of better employment opportunities. It has key implications for rural labour markets where the main sectors, namely agriculture and construction, face labour shortages (Achakzai et al., 2023). Of course, the out-migration of youth contributes to the underdevelopment of rural areas since the labour force is unable to satisfy the needs of sectors which have much to do with agriculture and continue to rely heavily on manual labour. Addressing this issue requires creating more local employment opportunities in rural areas by promoting rural-based industries, improving access to vocational training, and enhancing the quality of education and skills development programmes. TVET programmes focused on agricultural techniques, rural construction skills, and other locally relevant skills could help reverse the trend of youth migration by offering viable employment alternatives within rural communities.

Empowering women, youth, and marginalized or disadvantaged groups as critical agents for an inclusive and gender-sensitive environment requires a thorough training framework on green skills, green careers, ecotourism, and other green opportunities to ensure livelihood resilience and sustainable development (UNDP, 2024). As such, the alignment of TVET programmes with the specific needs of Gilgit-Baltistan's labour market is critical for addressing challenges. TVET programmes should concentrate on skills development relevant to the high-demand areas of agriculture, mining and construction, as well as addressing gender imbalance by training women.

Addressing these challenges necessitates a multidimensional approach in which TVET programmes are made to meet the specific demands of Gilgit-Baltistan's labour market. However, TVET interventions can improve the province's Labour market outcomes by targeting sector-specific skills gaps through gender-sensitive training programmes and coping with rural and urban migration patterns. In the long term, a more skilled and inclusive workforce can unlock the economic potential of Gilgit-Baltistan and pave the way for sustainable development.

According to the ILO (2022), the transition to sustainable energy sources and a circular economy scenario can create 100 million jobs. However, some existing jobs are expected to become obsolete, and the

benefits of this transition are unlikely to be distributed evenly across geographies and demographics unless young people are provided with the necessary training and support systems.

The study builds upon existing work and advances the collective understanding of the subject matter by critically analyzing and synthesizing it with new findings.

2.4 Survey Method

For a comprehensive labour market assessment in Gilgit-Baltistan, a representative sample of employers from the districts with significant industrial concentration has been surveyed (Figure 01). The sample size was calculated using datasets of health facilities available with health departments, respective chambers of Commerce and Industries, mining departments, industries departments, NSIS and other government departments.

A questionnaire was developed for data collection (See appendix) covering different aspects of the labour market, such as employment trends, employee turnover, and the type of business. The field data was collected using the CS Pro application, which was deployed on smartphones and tablets for efficient mobile data capture. A dedicated Monitoring and Evaluation (M&E) team validated the dataset through regular spot checks and comprehensive audits. This helped ensure the reliability and validity of the data gathered during the survey process and the credibility of the findings.

A thorough data cleaning was done to rectify any errors, inconsistencies, or missing information.

2.5 Sampling Technique

A truly representative sample is critical to ensure that the characteristics of the population are accurately reflected in the research findings. While no sample can perfectly capture all aspects of a population, employing rigorous sampling methodologies and selecting an appropriate sample size can significantly minimize sampling and non-sampling errors. Stratified random sampling (SRS), in particular, is a robust approach that enhances representativeness by dividing the population into homogeneous subgroups or strata. This method ensures proportional inclusion of these subgroups in the sample, thereby improving the reliability and precision of inferential conclusions about the overall population based on the sample data.

SRS is widely regarded as one of the most effective techniques for labour market assessment studies, as it enhances the sample's representativeness and provides more accurate insights into workforce dynamics. This method divides the target population into distinct strata or subgroups based on shared characteristics such as industry, occupation, region, or demographic attributes (e.g., gender, age). A random sample is then drawn from each district (stratum) in proportion to its size in the overall population.

On the other hand, Respondent Driven Sampling (RDS) with a mix of Network Sampling is appropriate where sampling "hard-to-reach" populations presents unique challenges, as standard statistical methods require a sampling frame – a comprehensive list of population members, from which the sample can be drawn. Constructing such a frame through methods like household surveys becomes impractical when the target population is small compared to the general population and widely dispersed geographically.

Therefore, RDS is also employed to address challenges in accessing or identifying target populations, particularly when their size or composition is unknown (Table 03). This method is especially effective for sectors encompassing both formal and informal populations, where traditional sampling techniques are impractical due to the absence of comprehensive records or sampling frames.

RDS, a chain-referral sampling technique, begins with selecting a small group of initial participants, known as "seeds," chosen for their strong community connections and willingness to participate. These seeds recruit additional participants from their networks, with the recruitment process continuing iteratively. To ensure systematic and controlled recruitment, each participant is given limited recruitment coupons to invite others from their social circle.

This approach is particularly well-suited to the unique context of Gilgit-Baltistan, where formal sectors, such as registered labourers in mining and manufacturing industries, and informal sectors, including

unregistered workers, self-employed individuals, and subsistence-level activities, are often difficult to access through conventional methods. RDS enables the collection of representative data by statistically addressing network biases and generating reliable population estimates that reflect the actual characteristics of these groups.

Furthermore, RDS ensures inclusivity by reaching marginalized and underrepresented populations, making it a powerful tool for data collection in areas where logistical and infrastructural constraints hinder the application of traditional methods. By facilitating the inclusion of diverse and often overlooked groups, RDS provides critical insights for policymaking, resource allocation, and programme interventions tailored to the socio-economic realities of Gilgit-Baltistan.

Table 01: Summary of Advantages of Stratified Random Sampling and Respondent-Driven Sampling

Sampling Method	Advantage	Description
Stratified Random Sampling	Improved Representativeness	Ensures proportional representation of each subgroup, capturing labour force diversity and reducing bias.
	Increased Precision	Reduces variability within strata, enabling more accurate estimates of employment trends, skill gaps, and workforce composition.
	Focused Analysis	Facilitates targeted examination of specific subgroups, revealing nuanced patterns and trends.
	Efficiency in Data Collection	Maximizes data value by allocating resources to critical strata without requiring large sample sizes.
	Applicability Across Heterogeneous Populations	Accommodates diverse sectors and demographics, systematically organizing and sampling subgroups.
Respondent-Driven Sampling (RDS)	Access to Hidden Populations	Reaches marginalized or hard-to-reach groups, such as informal workers and unregistered labourers.
	Cost-Effectiveness	Reduces extensive field operations by relying on peer recruitment.
Respondent-Driven Sampling (RDS)	Representativeness	Uses statistical adjustments to correct biases, ensuring estimates reflect true population distribution.
	Efficient Recruitment	Leverages participants' social networks to recruit others, minimizing outreach efforts.
	Inclusivity	Captures diverse labour market segments, including those excluded from formal databases.
	Network Data Collection	Provides insights into social networks and connections within the labour force.
	Adaptability	Effective in environments with limited data or incomplete population registries, such as informal labour markets.
	Rapid Data Gathering	Enables structured and timely data collection, even in challenging contexts.

The combined use of Stratified Random Sampling and Respondent-driven Sampling afforded this study a comprehensive approach, which is not always available for certain sectors.

2.6 Sample Size

It is widely accepted that no sample can perfectly represent an entire population. Although this "sampling error" is inevitable, it can be minimized by ensuring the sample size is sufficiently large and employs appropriate sampling techniques. Determining a good sample size is influenced by factors such as a 95% level of significance, variability within the target population (based on secondary data), and constraints related to available resources and time limits for the study.

The list of industries serving as the sampling framework or population is taken from public and private sources. This framework includes sectors such as Manufacturing, Mining, Travel, Tourism & Hotel and Allied Health Services at the district level.

The sample size (n) for this survey was determined using the following formula, found suitable for finite populations. It is applied once the total population size and desired parameters (Z, p, and E) are defined. The resulting sample size represents the number of units selected in the first sampling stage, ensuring good representation.

$$n = \frac{N \times Z^2 \times p \times (1-p)}{\left(E^2 \times (N-1)\right) + (Z^2 \times p \times (1-p))}$$

- 'N' represents the total population of establishments or enterprises within the selected districts of Gilgit-Baltistan. As many areas in these regions have small population bases, the formula ensures a sufficiently representative sample size.
- The confidence level indicates the certainty with which the survey results reflect the population. For a 95% confidence level, a Z-score of 1.96 is used.
- 'p' represents the proportion of the population expected to exhibit the characteristic of interest (e.g., alignment between training and industry demand). When this proportion is unknown, it is set at 0.5. This value ensures the largest possible sample size by assuming maximum variability.
- 'E' is the acceptable level of error in the survey results. A smaller margin of error indicates greater accuracy but requires a larger sample size. For this survey, a margin of error below the typical 5% threshold is targeted to enhance result precision.

The calculated sample size (n) for the survey, with a total population of 3,940 establishments for specific sectors, a 95% confidence level (Z=1.96), and a 2.5% margin of error (E=0.025), is 840 (Table 02).

The sample size thus obtained is large enough to capture population characteristics comprehensively, enabling better-informed policy decisions. By balancing precision with practical constraints, the survey provides robust and actionable insights for targeted interventions.

Proportional Allocation

In the second stage, the sample size determined in the first stage is distributed across districts using a proportional allocation method to ensure that the sample reflects the relative size of the population of establishments or enterprises in each district.

The sample size for each district (n_d) is calculated using the formula:

$$n_d = \left(\frac{N_d}{N}\right) \times n$$

N_d =Total population of establishments/enterprises in the district.

N =Total population of establishments/enterprises across all districts in the region.

N = Total sample size determined in the first stage.

Adjustments for Small Districts

- For districts with very small populations, a minimum sample size threshold was set to ensure representation.
- Additional samples were also allocated to strategically important districts with unique industries or higher economic activity.

Random Sampling Within Districts

- Within each district, establishments/enterprises, selection is done randomly to ensure unbiased representation.
- Stratification was applied based on key characteristics (e.g., industry type, enterprise size) to capture diversity within districts.

RDS is employed for this assessment to assess where information and location of the unit are not available, i.e., not registered anywhere, while SRS is used for structured sampling within identifiable strata. This mix allows for comprehensive data collection across all sectors. The methodology ensures representative and reliable insights. The total sample size is 689 (Table 3).

Figure 01: Total Sample Size at District Level

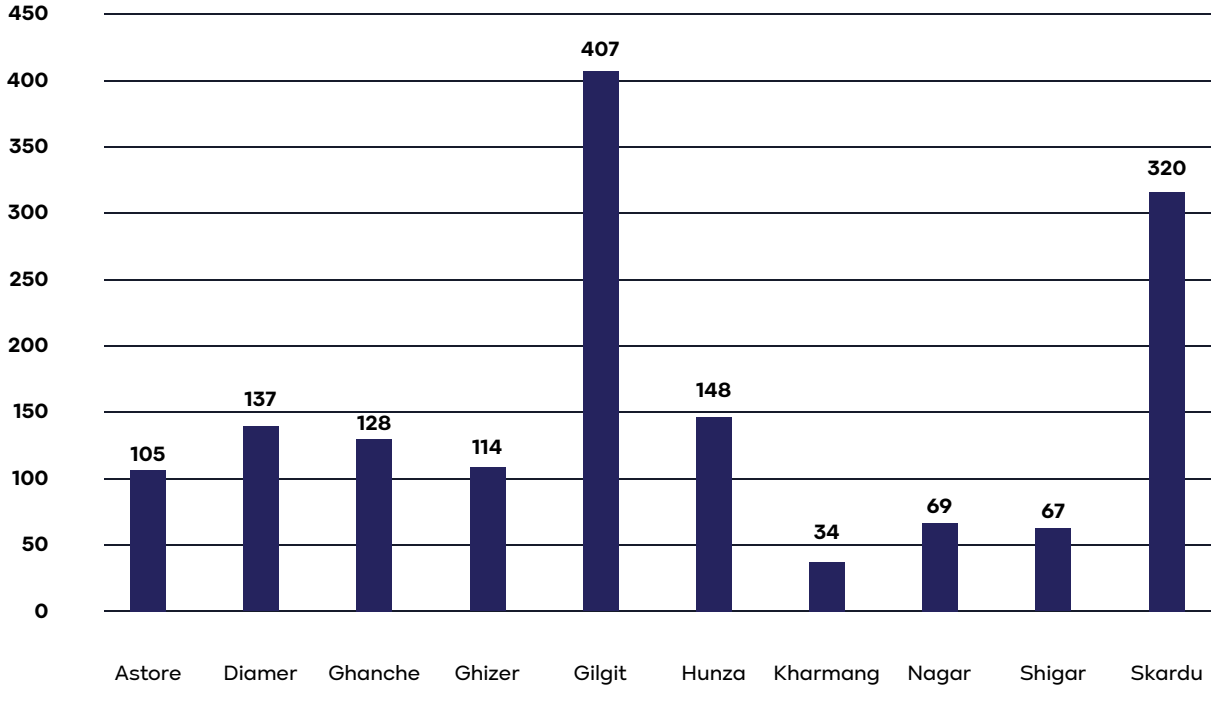


Table 02: Sample Size of Sectors with Known Population

District	Hospitality and Tourism	Manufacturing	Mining and Minerals	Allied Health	Sample at District Level
Astore	17	9	14	16	56
Diamer	8	6	13	25	52
Ghanche	24	6	3	42	75
Ghizer	16	10	14	24	64
Gilgit	89	30	48	73	240
Hunza	59	12	16	12	99
Kharmang	3	3	3	8	17
Nagar	13	9	10	8	40
Shigar	7	12	9	6	34
Skardu	83	36	11	33	163
Grand total	**319**	**133**	**141**	**247**	**840**

Table 03: Sample Size of Sectors with Unknown Population

District	Agri-Business	Construction	Handicrafts	Automobile	Printing & Packaging	Renewable energy	Water	Other Services	Total
Astore	12	10	4	6	7	4	6		**49**
Diamer	24	21	8	11	10	4	7		**85**
Ghanche	14	14	10	6	7	0	0	2	**53**
Ghizer	16	9	6	7	6	2	4		**50**
Gilgit	42	22	12	21	27	14	15	14	**167**
Hunza	6	13	6	3	4	3	4	10	**49**
Kharmang	4	2	2	2	2	2	3		**17**
Nagar	5	5	2	3	4	3	3	4	**29**
Shigar	10	6	2	2	2	2	3	6	**33**
Skardu	41	42	10	20	13	17	12	2	**157**
Grand total	174	144	62	81	82	51	57	38	**689**

3. SECONDARY DATA ANALYSIS FOR DISTRICT PROFILING

Gilgit-Baltistan holds important strategic value in Pakistan owing to its unique economic structures combined with its abundant natural resources and changing employment patterns (Malkani, 2020; Gilgit-Baltistan Environmental Protection Agency, 2018). A total of ten districts make up GB, including Gilgit, Skardu, Hunza, Ghizer, Astore, Nagar, Ghanche, Shigar, Kharmang, and Diamer, which demonstrate separate economic dynamics and different workforce composition. The rugged terrain of GB is marked by high-altitude valleys and glaciers, along with K2, Nanga Parbat, and Rakaposhi, dominating the world as home to top peaks. Eco-tourism, together with agriculture and hydropower development, are major/potential drivers of GB economy due to its diverse terrain of glacial waters, alpine pastures and farmable plains.

GB's basic economic sectors include tourism and agriculture, mining, as well as small-scale manufacturing and cross-border trade due to its remote position and minimal industrial capacity (Table 04). Access to formal employment remains restricted because of its remoteness, weak infrastructure and systems, and lack of investment from the private sector.

Table 04: Economic Dynamics and Workforce Composition of Districts

District	Description
Astore	Characterized by its high-altitude pasturelands, Astore has an economy largely based on agriculture and seasonal tourism.
Diamer	The gateway to Gilgit-Baltistan, with a workforce engaged in transport, trade, and agriculture, as well as major infrastructure projects like the Diamer-Bhasha Dam.
Ghanche	Located in the easternmost part of Gilgit-Baltistan, Ghanche has a strong tourism sector along with agriculture and cross-border trade.
Ghizer	Known for its agricultural economy, with a significant focus on livestock, farming, and small-scale industries.
Gilgit	The administrative and economic center of Gilgit-Baltistan, serving as a major trade hub with a diverse workforce.
Hunza	A major tourism and cultural hub with a growing entrepreneurial sector, particularly in eco-tourism and handicrafts.
Kharmang	Historically known as the "valley of forts", it has an economy centered around agriculture and cross-border trade.
Nagar	A district with a mix of agriculture and tourism, known for its fruit orchards and natural beauty.
Shigar	Serves as the gateway to the Karakoram, with a local economy driven by adventure tourism, subsistence farming, and handicrafts.
Skardu	A key tourism and commercial center, known for its scenic landscapes and economic activities linked to hospitality and mountaineering.

Source: Government of Gilgit-Baltistan, Tourism, Sports, Culture, Archaeology & Museums Department.

The aim of this district profiling was to conduct an exhaustive study through secondary data to examine economic and workforce developments within GB's districts. The analysis utilizes current data to uncover market patterns, including worker demographics, while identifying areas where training prospects exist. Acquiring knowledge about these elements supports developing TVET programmes that match regional employment needs to boost local economic expansion.

GB maintains economic potential while facing structural challenges that reduce the efficiency of its labour market function. The absence of big-scale industries prevents employment specialization; thus, many people must work seasonal jobs until they move to alternative provinces for better employment prospects (Planning & Development Department, Government of Gilgit-Baltistan. 2010). The energetic tourist sector in GB provides various job opportunities, but these positions lack organization within regulations, thus offering limited stability for workers. The agriculture sector, which encompasses many workers, faces reduced output because its farmers have old practices and need modern agricultural business development options (Khan and Malik, 2023). Valuable gemstones and minerals exist in the country, but the mining sector shows underdevelopment because informal extraction methods and small-scale operations dominate activities (Lahiri-Dutt and Brown, 2017).

The development of skills in GB struggles to connect the TVET curriculum to existing market needs. Vocational training institutions possess low density across the territory because most technical education centers exist only in cities such as Gilgit and Skardu, while neglecting services to rural districts. The current training initiatives fail to address industry requirements for high-potential sectors, leading to workforce availability problems, which prevent the industries from fulfilling their staffing needs. The workforce participation of women remains low because of cultural barriers alongside insufficiently trained facilities geared towards women. To address these issues, the Skills Development Plan for GB emphasizes the need to conduct labour and employer demand surveys to assess industry needs within and outside GB for the local workforce. It also recommends adapting curricula from other progressive provinces and enriching them according to GB's specific needs (TVET Reform Support Programme, 2012).

This chapter delivers an extensive assessment of GB workforce analysis and insights into development training possibilities. The study's results bear useful suggestions for TVET reforms to improve employability and achieve an inclusive labour force composition. Targeted interventions may thereon be developed to improve productivity through support for entrepreneurship, while also establishing sustainable employment opportunities in GB for the overall socio-economic development of the region.

3.1 Geographical and Socio-Economic Context

Despite GB's geographical constraints that prevent large-scale industrialization, there is a huge potential for tourism, agriculture, trade and renewable energy as essential features of the socio-economic landscape. The Karakoram Highway (KKH), which links Pakistan to China by way of Khunjerab Pass, is a vital trade route that provides cross-border trade. Although its location is strategically important, there is an infrastructure deficit (no industrial base and too much dependency on informal employment sectors).

Most employment in GB labour market is in subsistence agriculture, seasonal tourism and small-scale mining. Large-scale farming is restricted by limited land availability, which is still essential for horticulture and livestock without any commercialization benefits. Despite huge mineral deposits, mining is quite small-scale and, in most cases, not even regulated. Also, renewable energy, specifically the hydropower and solar projects, has emerged as an important sector, with community-driven initiatives that support electricity generation in remote villages.

Compared to most other areas of Pakistan, GB has higher literacy rates, especially in the markets of Gilgit, Hunza and Skardu. On the other hand, education and training are still limited in terms of access to higher education and technical training, which limits specialties in high-need structural sectors, such as hospitality, construction, IT, renewable energy, etc. High levels of informal employment are partly explained by the mismatch between the skills and the demand in the labour market.

Despite the aforementioned challenges, GB offers many economic opportunities in mining, tourism, renewable energy and construction. Such sectors can only be fully engaged with targeted vocational training programmes and strategic interventions on the policy front to bridge skill gaps and workforce development aligned with industry needs. Industrial clusters, improved infrastructure and skill-based sector-specific training can activate the region's economic potential as well as ensure the region's sustainable employment growth.

3.2 Demographics and Settlement

GB's economic problems and fewer job opportunities have forced its population into migration, especially young people in search of education and jobs move to Islamabad, Karachi or other urban centres (Din, 2019).

In this context, the following key demographic trends are of note:

- Urbanization: Cities like Gilgit and Skardu are experiencing rapid urban expansion, driven by tourism, trade, and public sector employment.
- High Literacy Rate: GB has the highest literacy rate in Pakistan, but facilities for higher education and vocational training are meagre.
- Seasonal Migration: Many workers are engaged in seasonal employment such as tourism, agriculture and cross-border trade, during which labour shortages occur during the winter months.
- Cultural Constraints and Low Vocational Training Facilities: These restrict the integration of women in formal employment sectors. Women do not participate in formal employment sectors as they participate in handicrafts, agriculture and home-based businesses, but cultural constraints and limited vocational training facilities hamper women's employment in the mainstream.
- Given its small population, GB features a young and increasingly educated workforce, providing a fitting opportunity for investment to develop targeted skills in high-growth sectors and generate useful employment and entrepreneurship opportunities.

3.3 Economic Activities and Major Industries

As established earlier, the economy of GB is largely informal and diverse, with a tendency towards seasonal variations. The region mostly relies on its economic activities, such as tourism, agriculture, mining, renewable energy, construction and small-scale manufacturing, and is mostly backed by informal labour. The employment sectors created remain stunted by a lack of formal training, technological investment, and infrastructure, which, if duly addressed, could have caused economic diversification and industrial development. The economic sectors to which this applies are introduced in this section and discussed in detail with respect to their contributions, challenges and the potential for creating work/jobs.

Travel, Tourism & Hoteling

Owing to its scenic beauty and geography, the largest and fast-growing sector in GB is tourism. GB is one of the most preferred destinations for travellers from India as well as from abroad because of its natural beauty with luxurious mountains, high-altitude lakes, glaciers, valleys, and cold temperatures in the summers. Hunza and Nagar Valleys are major tourist hotspots due to their rich cultural heritage, scenic landscape and enchanting trekking routes. Skardu and Shigar are gateways to the high-altitude expeditions to K2 and other peaks; Fairy Meadows and Nanga Parbat Base Camp are frequented the most by adventure tourists. Nature lovers and wildlife enthusiasts are thrilled by the unique high-altitude ecosystem found in the Deosai National Park.

The tourism sector employment opportunities are found not only in hotels, guesthouses, restaurants, travel agencies, and tour guides, but also in transport services. The sale of handicrafts, souvenirs, as well as traditional textiles is also a popular tourist preoccupation among visitors. This not only financially helps local artisans and entrepreneurs but also contributes to uplifting the local economy. However, this potential is complicated by the fact that the GB tourism industry is still highly seasonal, with employment opportunities switching between the demand-driven peak summer season and the labour shortages during the long winter months. The absence of formal training programmes for hospitality professionals, tour operators, and adventure guides results in service quality issues, due to which the region is not able to attract high-end tourism.

Furthermore, GB experiences limited digital connectivity, poor road infrastructure and limited access to international tourism markets due to poor promotional strategies. These issues can be addressed through investments in tourism infrastructure, skills development programmes and sustainable tourism programmes, garnering for the region a lot of employment and economic stability.

Agriculture, Livestock and Fisheries

Most of the rural population of GB depends on agriculture for their livelihood and is, therefore, engaged in subsistence farming. This is a region of organic and high-value fruit production, specifically apricots, cherries, apples and walnuts, that are grown in fertile valleys of Hunza, Ghizer and Nagar. GB also produces staple crops such as potatoes and wheat that are used locally. Due to the conducive climate and organic agricultural conditions, the agricultural products of the region have a competitive advantage in national and international markets. However, post-harvest losses, the absence of cold storage and very few processing facilities constrain farmers from achieving the full economic value of their produce.

Livestock farming is another important economic activity of the region, particularly in the districts of Astore, Ghizer, and Diamer, where people rear goats, sheep, and cattle for milk, meat, and wool production. Dairy Farming has significant potential for commercial expansion, but poor veterinary services, outdated breeding techniques, and inadequate commercial dairy processing facilities continue to limit the sector's growth. Similarly, Poultry Farming also remains underdeveloped, despite rising demand for poultry products in the local markets.

The Agriculture and Livestock sector faces multiple structural challenges, including inefficient irrigation systems, limited market access, and climate anxiety. Since most farming relies on glacier-fed water sources, the projected reduction of glaciers due to rising temperatures threatens long-term agricultural sustainability. To improve productivity and profitability, there is a need for modern farming techniques, agribusiness training, and investment in value-added industries such as fruit drying, dairy processing, and organic food branding. Developing vocational training programmes in agriculture technology, livestock management, and agribusiness marketing can empower farmers and enhance economic resilience in the sector.

Mining

Mining is a potentially lucrative sector in GB – a region rich in mineral resources, particularly precious and semi-precious gemstones. Aquamarine, topaz, quartz, rubies and tourmaline are the mineral deposits the region is known for, with Skardu, Nagar and Astore having significant reserves. Nevertheless, the resources available for mining in GB are highly valuable and yet the industry is largely underdeveloped and informal. Most mining operations are small-scale, unregulated, lack modern extraction techniques, marked by low efficiency, high wastage, and environmental degradation.

Major problems faced by the Mining sector are lack of trained gemstone cutters and polishers, inadequacy of local processing and value-addition facilities and limited market access for raw gemstones. These issues have led to the smuggling or selling of unprocessed gemstones at low prices, keeping these rich natural resources from delivering their full economic potential. On the other hand, Mining remains a very high-risk occupation for labourers due to poor working conditions, absence of health and safety standards and lack of government oversight.

Investment in modern mining techniques, cutting and polishing, and suitable market linkages can greatly increase the value of GB's mineral exports. Another effective way of improving transparency and making gemstones more competitive globally is through establishing gemstone certification centres and branding strategies.

Construction and Infrastructure Development

There has been growth in the Construction sector in GB due to urbanization and tourism-driven development over the years. Cities such as Gilgit and Skardu have been growing, generating the need for skilled labour in masonry, carpentry, plumbing, and electrical work. Moreover, the economic activity generated by CPEC-related infrastructure projects, like highways, tunnels and bridges, requires a technical base for construction activities.

Although there has been growth in the sector, Construction on the whole remains very informal, with the majority of workers acquiring skills on the job rather than through prior or on-the-job formal training. The lack of certified construction professionals, architects, and civil engineers translates into low-quality and inefficiency in infrastructure projects. Furthermore, the high costs of construction materials due to transportation challenges make large-scale development financially unviable for many investors, limiting growth associated with infrastructure.

To address these challenges, there is an urgent need for developing/strengthening TVET programmes in construction technology, heavy machinery operation, and green building practices. Introducing training programmes in road construction, earthquake-resistant building techniques, and smart urban planning can help improve infrastructure resilience and workforce employability.

Energy

Given its abundant water resources, GB has significant potential for hydropower generation, making renewable energy a significant sector contributing to the region's economic development. Several micro-hydel projects have been established across the region, providing electricity to remote villages. However, the potential for large-scale hydropower plants remains untapped due to a lack of technical expertise and investment.

Similarly, small-scale solar panel installations are also used for households and businesses to generate solar energy. Lack of trained solar technicians and engineers prevents the expansion of the renewable energy infrastructure on a larger scale.

To bridge the skill gap, there is a need to develop specialized training programmes in hydropower plant operations, solar panel installation, and energy efficiency management.

Manufacturing and Handicrafts

Interspersed within the local economy of GB is the area of cottage industries and handicrafts, the latter in particular are important for women entrepreneurs. Many rural households are living off the production of handwoven woolen textiles, wooden crafts and embroidered garments. Yet, the sector is very small in scale and disconnected from other markets, which limits its chances of future expansion.

Investment in product design training, digital marketing education and e-commerce development would help artisans in reaching the national and global market, as well as contributing to augment economic opportunities in the sector.

However, this sector's growth is hindered greatly by a lack of infrastructure, informal labour markets and limited skills development initiatives in Gilgit-Baltistan. Enabling regional development through strengthening TVET programmes in key industries can help align the skills of the workforce with economic opportunities in the region.

Automobile Repairing

The Automobile Repairing sector in GB is an important service industry that supports transportation and logistics across the region's challenging mountainous terrain. With an increasing number of vehicles, especially those engaged in commercial and tourist transport, the demand for skilled mechanics and technicians has grown significantly over time. However, automobile repair services are primarily concentrated in urban centres like those in Gilgit and Skardu, leaving remote districts with limited access to professional maintenance and repair facilities, which is also costly in terms of money and time.

A major challenge in this sector is the shortage of trained mechanics and diagnostic technicians increasing reliance on untrained workers using makeshift repair methods. The lack of access to and know-how of modern tools, spare parts, and proper service stations further affects efficiency and service quality. Additionally, the absence of any formal training institutions for automobile repair limits high-standard workforce development, making it difficult to meet evolving technological advancements in vehicle maintenance both locally and for employment abroad.

Printing and Packaging

The Printing and Packaging industry in GB remains a small-scale sector, primarily catering only to local businesses, tourism, and government documentation needs. With the rise of e-commerce and branding requirements, the demand for quality printing, packaging, and labelling services has grown. However, most printing facilities are outdated and concentrated in major urban centres, leaving rural businesses reliant on external suppliers for their printing and packaging needs.

Challenges in this sector include limited access to advanced printing technology, skilled labour shortages, and high material costs due to dependence on imports. Absence of high-quality packaging solutions also affects local industries, such as agriculture and handicrafts, which struggle to compete in broader markets due to poor product presentation and durability.

Water Sector

Water management is a critical issue in GB, which is a region heavily dependent on glacial melt and natural springs for drinking water, agriculture, and hydroelectric power. While GB possesses abundant water resources, inefficient management, lack of infrastructure, and seasonal fluctuations lead to challenges in water supply and quality. Urban areas like Gilgit and Skardu benefit from relatively better water distribution systems, whereas many rural districts face severe shortages, contamination issues, and a lack of proper irrigation facilities.

Key challenges in the water sector include the absence of proper filtration and storage facilities, inefficient irrigation techniques, and limited expertise in water conservation/management. Climate change and glacial retreat further threaten the sustainability of water sources, increasing the risk of water scarcity in the future and calling for urgently developing skills and expertise in the sector.

Allied Health Services

In GB, the Allied Health services sector plays a crucial role in providing essential medical support functions, such as laboratory diagnostics, radiology, physiotherapy, and emergency care. However, access to these services is highly uneven, with most well-equipped facilities concentrated in Gilgit and Skardu, while rural districts lack trained professionals and modern medical equipment. The shortage of skilled technicians, paramedics, and diagnostic experts further compromises the quality of healthcare delivery in the region.

A major challenge here is the lack of accredited training institutions for allied health professionals, which increases dependence on expensive external recruitment or reliance on available underqualified workers. Additionally, the absence of advanced diagnostic and therapeutic equipment results in delays in treatment and misdiagnoses. The quality and time/cost effectiveness of the healthcare delivery, therefore, remains susceptible to compromise. Limited emergency medical services (EMS) in remote areas exacerbate health risks, particularly during natural disasters and harsh winters when road accessibility is compromised.

Improving this sector's delivery calls for establishing training institutions for allied health professions, improving medical infrastructure, and instituting mobile health units for underserved areas. Strengthening partnerships with national health organizations and investing in telemedicine solutions can also help bridge the healthcare gap and improve the timeliness and effectiveness of medical support across the region.

Economic Activities: Challenges and Opportunities

GB's economy is significantly dependent on its natural resources, tourism potential and informal labour markets. Analysis of the sectors covered in the study shows that GB's economic potential remains largely untapped, with unmet TVET needs highlighted by the region's skills gaps. Huge growth potential for economic activity in tourism, agribusiness, and renewable energy remains unattended in terms of technical training institutions.

To fill these gaps, sector-based vocational programmes may be developed to provide employment and economic resilience to GB. Some sector-wise challenges and opportunities have been presented in Table 05.

Table 05: Challenges and Opportunities across Sectors

Sector	Key Features	Challenges	Opportunities
Tourism & Hospitality	Top adventure hub (Hunza, Skardu, Fairy Meadows); seasonal jobs in hotels, tours, handicrafts.	Seasonal jobs, lack of trained staff, weak infrastructure.	Eco-tourism, digital booking, hospitality training.
Agriculture & Livestock	Organic fruits (apricots, cherries, walnuts); dairy & poultry growing in Ghizer, Nagar.	Poor storage, processing, and market access.	Value-added agribusiness, modern irrigation, agri-tech training.
Mining & Gemstones	Rich in quartz, aquamarine, rubies; major sites in Diamer, Skardu, Nagar.	Informal mining, low-tech extraction, lack of branding.	Training in cutting/polishing, formalization, export branding.
Renewable Energy	Hydropower & solar potential; micro-hydel plants power remote areas.	Lack of trained technicians, winter power shortages.	Solar/hydro training, small-scale hydro expansion, hybrid energy systems.
Manufacturing & Handicrafts	Handwoven textiles, wool products, and woodwork support local artisans, especially women.	Limited market access, outdated production techniques, lack of branding.	E-commerce, skills training, export promotion, women-led enterprises.

3.4 TVET and Skills Development Landscape

Technical and Vocational Education and Training (TVET) has an important role in the development of the workforce and economic growth in GB. The region's unique geography and economy highlight the need to provide TVET programmes that are available, accessible, and efficient in supplying the local workforce with industry-relevant skills. Although GB has strong potential for skills development in sectors such as tourism, mining, renewable energy, construction, and agribusiness, the current TVET system is not yet aligned with the needs of the labour market.

Availability of TVET Institutions in Each District

With limited TVET infrastructure, most of GB's technical training institutes are located in Gilgit and Skardu. However, there is a lack of a wide network of vocational training centres in the region, with rural and remote districts being particularly left behind in terms of skills acquisition.

At present, several government and private organizations run TVET institutions in GB, including:

- NAVTTC (National Vocational and Technical Training Commission)
- TEVTA (Technical Education and Vocational Training Authority) GB
- Public and private polytechnic institutes
- Donor-funded skill development programmes (e.g., GIZ, AKDN, and UNDP initiatives)

Their presence in GB is indicated in Table 06.

Table 06: Main TVET Institutions

District	TVET Institutions	Key Training Programmes
Gilgit	Government Polytechnic Institute, AKRSP Training Centres	Electrical work, Hospitality, IT, Renewable Energy
Skardu	Skardu Technical Training Institute, Vocational Training Centers	Construction, Automotive, Carpentry, Tourism
Hunza	Aga Khan Technical Centres, Private Vocational Institutes	Handicrafts, Small Business, IT, Tourism
Diamer	Vocational Training Centres (Limited)	Heavy Machinery Operation, Mining
Astore	Public and Private Skill Centres	Dairy Farming, Livestock Management, Renewable Energy
Ghizer	Government Training Institutes	Agriculture, Beekeeping, Forestry
Nagar, Ghanche, Kharmang, Shigar	Limited Training Facilities	Informal and Community-Based Skill Development

The limited geographical spread of TVET institutions results in unequal access to training opportunities, especially for rural youth and women. Many districts lack specialized training centres, forcing individuals to migrate to urban centres for vocational education, which is not always feasible due to financial and logistical barriers.

Gender Perspective

The TVET enrolment in GB is low, and the proportion of males is disproportionately higher than that of females. Technical courses (i.e., mechanical, electrical, and construction-related trades) usually have higher male enrolment and handicrafts, tailoring, and some basic IT skills see higher female enrolment. Some notable facts in this regard are as below:

- Men constitute over 75% of total TVET enrolment, with a focus on technical and engineering fields.
- Women make up less than 25% of TVET trainees, predominantly enrolled in handicrafts, embroidery, and food processing.
- Gender barriers, mobility constraints, and cultural norms discourage female participation in high-demand fields, such as construction, renewable energy, and IT.
- Drop-out rates remain high due to financial constraints, lack of industry linkages, and limited employment prospects after training.

Key Challenges in Gender Inclusion

- Cultural Barriers – Many women face mobility restrictions, making it difficult for them to attend training centres outside their districts.
- Lack of Female Trainers – Unavailability of women instructors in TVET institutions discourages female enrolment in technical programmes.
- Limited Female-Oriented Programmes – Existing TVET curricula do not offer industry-relevant programmes tailored for women in growing sectors, such as digital marketing, renewable energy, and e-commerce.
- Lack of On-job Training Opportunities for Women – Industry collaborations for female apprenticeships and internships remain under-developed.
- To improve gender inclusivity, district-level skill centres with flexible training models (evening classes, community-based centres) should be introduced to increase female participation in emerging industries.

Relevance of TVET Programmes to Local Industry Needs

The effectiveness of TVET programmes depends on how well they align with local economic activities. Currently, many training programmes in GB do not adequately match labour market needs, leading to low employability of TVET graduates.

Below is a comparison between Sector-Wise Skill Demand and what TVET in GB offers in these sectors:

- Tourism and Hospitality – High demand, but limited training in hotel management, tour guiding, and adventure tourism services.
- Agriculture and Agribusiness – Lack of training in organic farming, modern irrigation techniques, and agribusiness management.
- Mining and Gemstones – No formal mining technology programmes, leaving workers untrained in extraction, cutting, and polishing.
- Renewable Energy – Limited courses in hydropower plant operation, solar energy systems, and energy efficiency management.
- Construction and Heavy Machinery – No structured courses for certified masons, electricians, and machine operators.
- IT and Digital Economy – Minimal focus on e-commerce, software development, and remote job opportunities.

The disconnect between TVET curricula and industry needs leads to a skills mismatch, where graduates struggle to find employment despite sectoral growth.

Gaps in Skills and Demand for New Programmes

As seen from Table 07, despite economic opportunities in various sectors, several critical skill gaps exist, preventing effective workforce integration into high-demand industries.

Table 07: Skill Gaps in Effective Workforce Integraion

Challenge	Issues Identified
Limited Industry Engagement in TVET Planning	TVET programmes lack employer input, leading to skill mismatches.
	No structured apprenticeship models for hands-on industry experience.
Absence of Advanced Technical Training	No technical courses in hydropower engineering, modern agriculture, gemstone processing.
	Lack of higher-level certifications in construction and renewable energy, forcing reliance on externally trained workers.
Limited Access to Digital and IT Skills	No structured training in coding, cybersecurity, or digital marketing.
	E-commerce training remains underdeveloped despite rising online job opportunities.
Inadequate Facilities and Outdated Curricula	Lack of modern equipment in training centres reduces training effectiveness.
	Curricula are outdated, missing green technologies, digital economy, and Industry 4.0 skills.

Recommendations for TVET Improvement in GB

To bridge skill gaps and align TVET programmes with local economic opportunities, the following policy actions should be prioritized (Table 08):

Table 08: Strategic Actions for Strengthening TVET

Focus Area	Key Actions
Expand TVET Infrastructure Across Districts	Establish vocational training centres in rural areas for wider accessibility.
	Develop mobile training units to reach remote communities.
Improve Industry-TVET Collaboration	Launch apprenticeship programmes in tourism, mining, renewable energy, and construction.
	Form TVET advisory boards with local industry leaders to align training with job market needs.
Increase Female Participation in TVET	Introduce women-focused training programmes in IT, agribusiness, and hospitality.
	Recruit female trainers and establish women-only TVET centres in culturally sensitive areas.
Modernize TVET Curricula	Integrate hydropower, solar energy, and mining technology into courses.
	Include e-commerce, freelancing, and digital skills to expand remote job opportunities.
Develop Sector-Specific TVET Programmes	Tourism: Certification in hotel management, trekking guides, eco-tourism services.
	Agriculture: Training in organic farming, post-harvest processing, agribusiness marketing.
	Renewable Energy: Courses in solar panel installation, energy management, green construction.
	IT & Digital Economy: Training in freelancing, graphic design, software development.

Access to skill development and employment opportunities may be increased by bridging the gap between TVET and GB's economic strength, activating industry linkages, creating employment opportunities for the youth and ultimately reducing unemployment, which leads to sustainable economic growth.

Role of Government and Donor Interventions in Skills Development

Government and some international development organizations are involved in improving vocational training and workforce readiness in GB.

Government-Led Initiatives

- NAVTTC and TEVTA programmes have introduced technical training in hospitality, construction, and IT.
- CPEC-related investments have created job opportunities in transport, trade, and infrastructure development.
- Small business development schemes under federal programmes have encouraged youth entrepreneurship.

Donor and NGO Interventions

- Aga Khan Development Network (AKDN) has played a key role in education, skills training, and women empowerment.
- GIZ (German Development Agency) has introduced TVET programmes in agribusiness, energy, and water.
- USAID and UNDP programmes have provided funding for youth skills development and micro-financing initiatives.

Despite these efforts, TVET accessibility, quality, and industry linkages remain inadequate and require expanded government support and private-sector collaboration.

GB's labour market is generally influenced by poverty, infrastructure constraints, migration trends and external development interventions. Thus, addressing socio-economic challenges like the need to increase vocational training, employment diversification, industrial expansion and key investments in strategic infrastructure will add to the workforce quality, number and relevance.

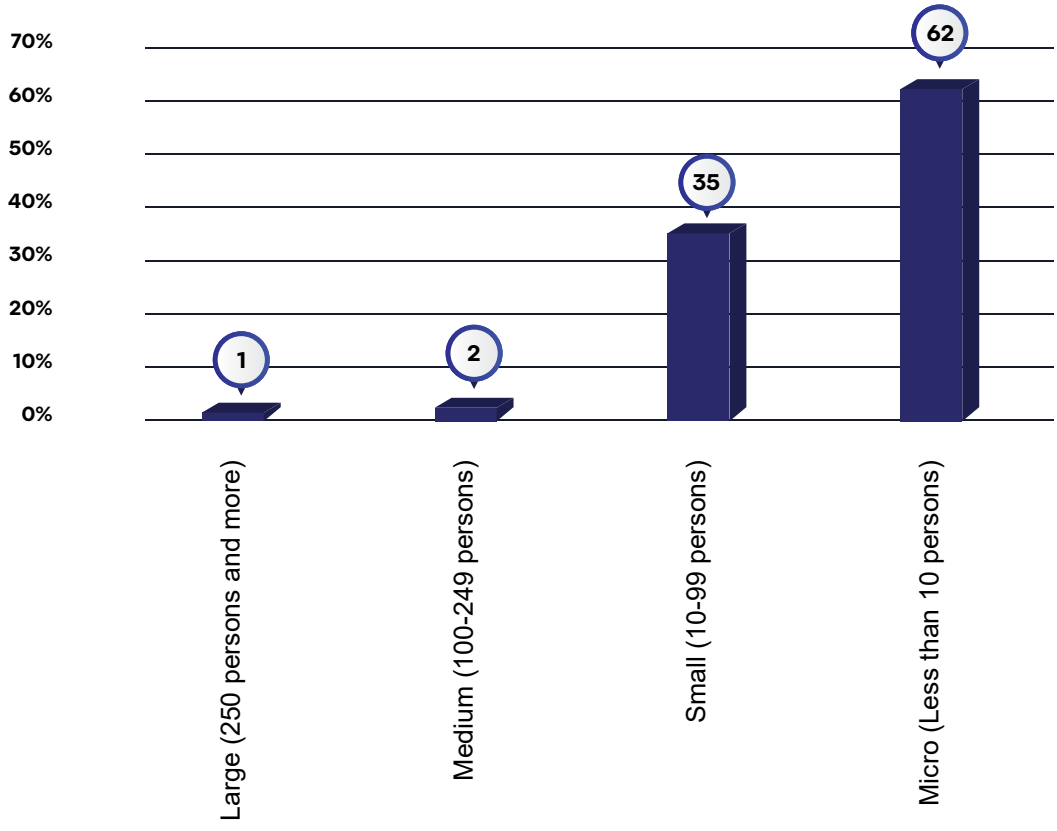
4. FINDINGS AND ANALYSIS OF SURVEY DATA

4.1 Size-Wise Distribution of Establishments

Figure 02 presents the size-wise distribution of establishments in Gilgit-Baltistan, categorized into micro (fewer than 10 persons), small (10–99 persons), medium (100–249 persons), and large (250 or more persons) enterprises. The data shows that micro-enterprises dominate the region's economic landscape, accounting for 62% of all establishments. This overwhelming share highlights the highly informal and small-scale economic activity in Gilgit-Baltistan, where family-run businesses, home-based production, and subsistence-level operations, particularly in agriculture, retail, and handicrafts, are widespread. Small enterprises make up 35% of the total, playing a critical role in tourism, food processing, hospitality, and construction. Together, micro and small enterprises constitute 97% of the industrial base, underscoring their pivotal role in the region's labour absorption and income generation.

In contrast, medium-sized enterprises constitute only 2% of establishments, while large enterprises account for just 1%. This limited presence of medium and large businesses, only 3% of the total, reflects significant structural and contextual constraints. These include geographic remoteness, poor connectivity, energy and infrastructure bottlenecks, restricted market access, and low levels of investment. Furthermore, these constraints are compounded by acute workforce skill gaps that inhibit productivity growth and the ability of firms to scale up operations.

Figure 02: Distribution of Establishments based on their Size (%)

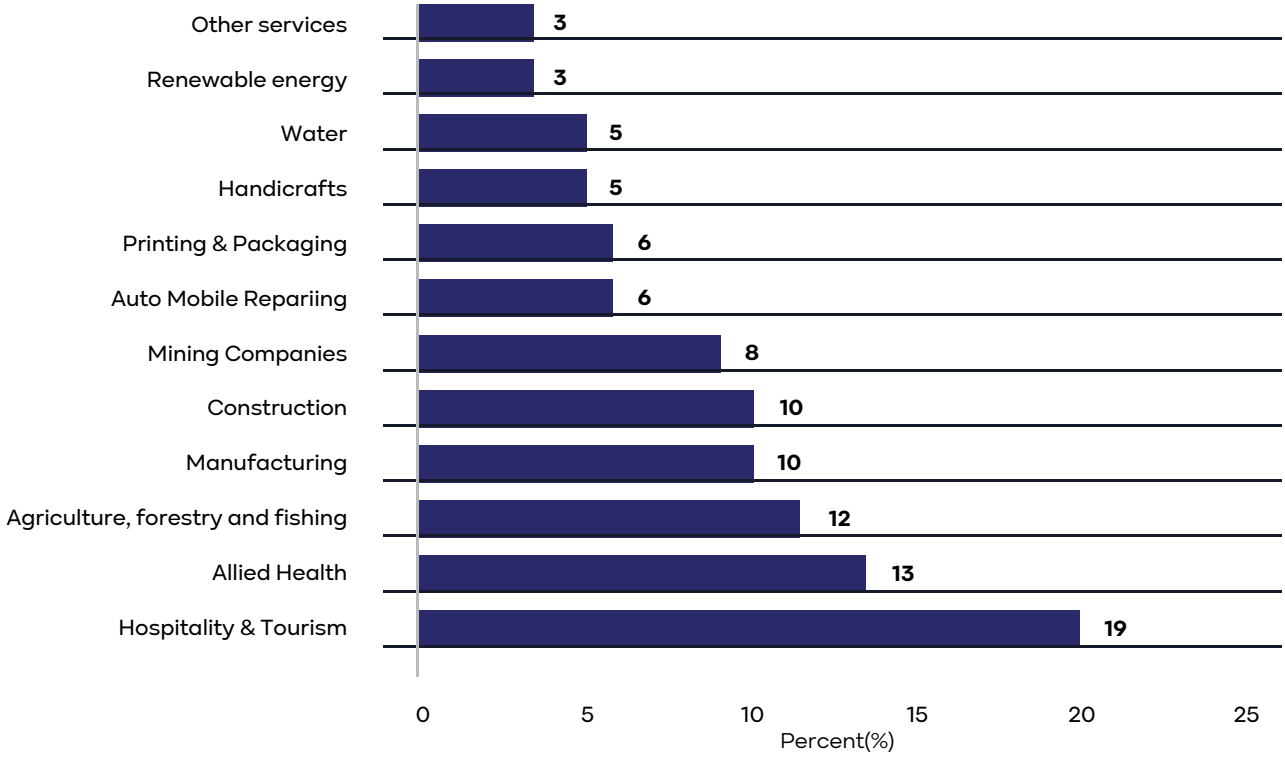


4.2 Sector-Wise Distribution of Establishments

Figure 03 illustrates the sector-wise distribution of establishments in Gilgit-Baltistan. Hospitality and Tourism emerged as the most prominent sector, accounting for 19% of the total number of establishments. This reflects the region's reliance on tourism-related activities driven by its scenic landscapes, cultural heritage, and growing influx of domestic and international visitors. The Allied Health sector, comprising 13% of establishments, plays an important role in meeting the healthcare needs of the region's population. Agriculture, Forestry, and Fishing account for 12% of establishments, reflecting the continued importance of traditional livelihoods. The Manufacturing and Construction sectors each represent 10% of establishments. Manufacturing is primarily focused on food processing, textiles, and handicrafts, often operating on a small scale with minimal technological inputs. This highlights the necessity for skill development in machine operation, quality control, and product design. The Construction sector (10%) is driven by infrastructure development and urban expansion. Mining companies constitute 8% of the industrial base, connected to the region's untapped mineral resources, including marble and gemstones. Furthermore, Automobile Repairing (6%), Printing and Packaging (6%), and Handicrafts (5%) collectively underscore the significance of small-scale, service-based industries, providing local employment but with limited potential for scaling in the absence of technical training and business support.

Demands in Water sector (5%) and Renewable Energy (3%) underscore the emerging emphasis on sustainable resource management. Although the number of establishments in these sectors remains small, their strategic significance is increasing, especially as off-grid solar, micro-hydel, and water supply solutions become crucial, especially for remote areas. 'Other services' take into account the remaining 3%, indicating limited diversification outside the dominant sectors.

Figure 03: Sector-wise Distribution of Establishments

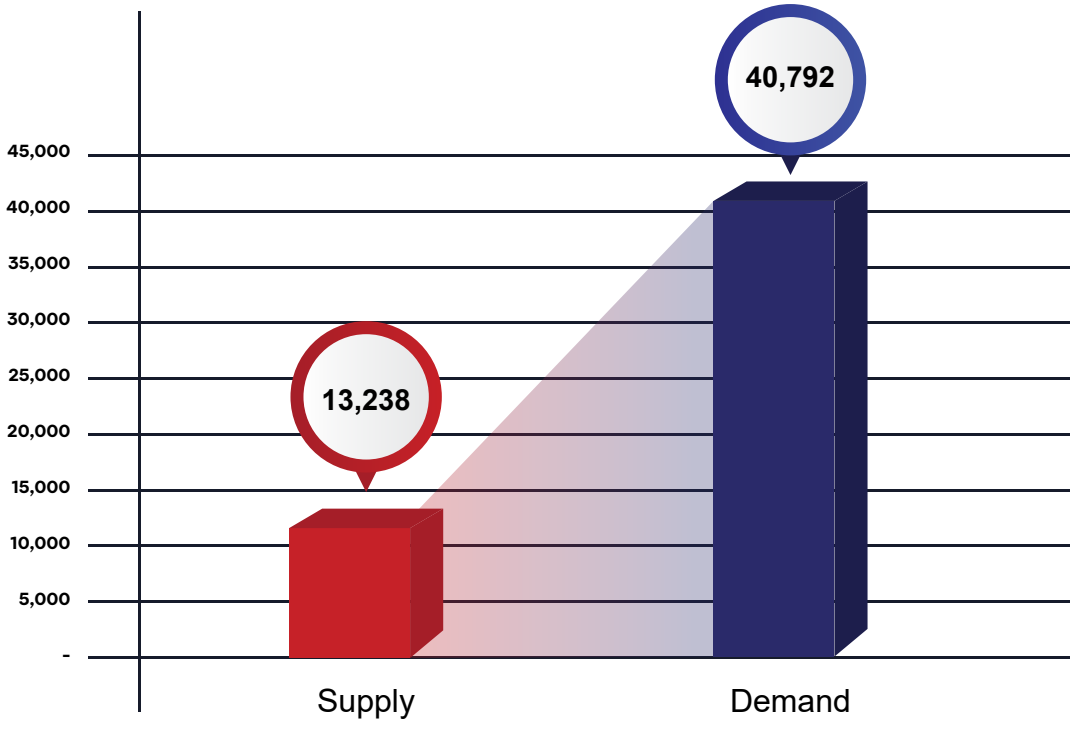


4.3 Annual Skilled Workforce Demand and Supply

Figure 04 highlights the significant disparity between Gilgit-Baltistan's demand and supply of skilled workers. The annual demand stands at 40,792, while the current supply is only 13,238, resulting in a workforce readiness gap of 27,554, equivalent to nearly 68% unmet demand. This approximately constitutes 3:1 demand-supply ratio, establishing urgency for strengthening TVET systems across the region. Without necessary intervention, this shortfall will continue to negatively impact employment generation and impede growth in key economic sectors.

To bridge this gap, strategic interventions should focus on three core areas: first, modernizing TVET curricula to reflect the practical and technical skills demanded by industry; second, rolling out accelerated certification programmes that can quickly equip youth and disadvantaged groups with market-relevant competencies; and third, fostering institutional partnerships between training providers and employers to ensure continuous feedback and job placement links. Additionally, promoting private sector involvement through apprenticeships, internships, and workplace-based learning can further help strengthen the relevance and effectiveness of skills training. Addressing these challenges is essential to ensure that Gilgit-Baltistan's labour market would be able to meet its economic potential and deliver inclusive, sustainable growth.

Figure 04: Annual Skilled Workforce Demand and Supply



4.4 Sector-Wise Skilled Workforce Demand

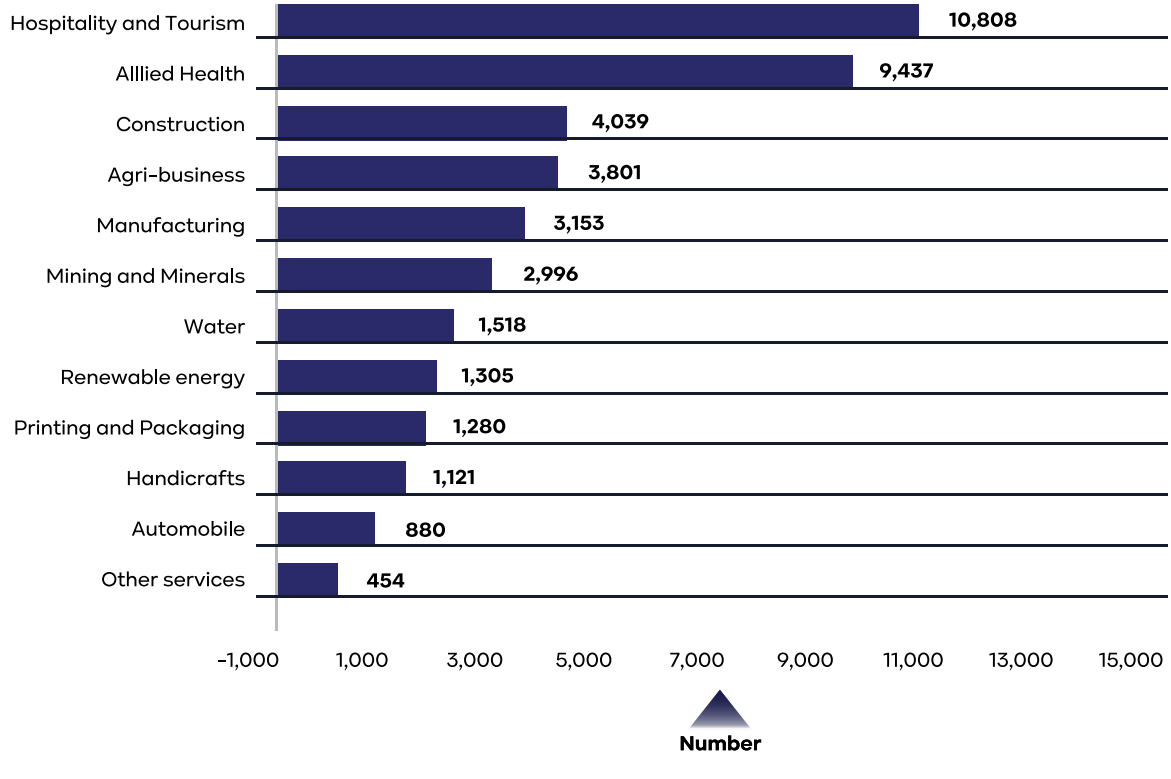
The sector-wise skilled workforce demand, as shown in Figure 05, highlights the varying levels of labour requirements across different industries in Gilgit-Baltistan. Hospitality and Tourism emerge as the most labour-intensive sector, with a demand for 10,808 skilled workers. This reflects the region's natural advantage as a tourism destination and underscores the need for targeted vocational training in guest services, culinary skills, and hotel operations to support tourism-led employment and enhance service delivery standards in these trades. Allied Health follows closely with a demand of 9,437 workers, indicating strong requirements for nurses, lab technicians, and other paramedical staff in public and expanding private healthcare facilities across the region.

Construction (4,039) and Agri-business (3,801) also reflect significant demand, emphasizing the need for skilled workers in infrastructure and agriculture-related value chains. The demand for masons, electricians, plumbers, and heavy equipment operators in construction aligns with the needs of ongoing development and housing initiatives in key areas, such as Gilgit and Skardu. In the Agriculture sector, enhancing productivity through modern farming, processing, and livestock care necessitates structured training efforts. Similarly, sectors such as Manufacturing (3,153), Mining and Minerals (2,996), and Water (1,518) contribute notably to the region's employment base and require specialized technical skills to support industrial activity and resource management.

The Renewable Energy sector, with a demand of 1,305 skilled workers, reflects growing investment in alternative energy solutions such as micro-hydel, solar, and wind systems, especially in off-grid mountainous areas. This emerging sector requires a workforce adept in installation, maintenance, and system management, but current training programmes remain insufficiently equipped to meet this specialized demand. Similarly, Printing and Packaging (1,280) and Handicrafts (1,121) indicate the continued relevance of small-scale manufacturing and traditional industries.

The Automobile Repairing sector accounts for a demand of 880 workers, reflecting the importance of transport services and the need for mechanics, auto-electricians, and diagnostic technicians to maintain transport mobility in the region's difficult terrain. Other services for miscellaneous roles represent a smaller share of 454 skilled positions.

Figure 05: Sector-wise Skilled Workforce Demand



4.5 Gender-wise Skilled Workforce Demand at Sectoral Level

The gender-wise distribution of skilled workforce demand across sectors in Gilgit-Baltistan reveals opportunities as well as persistent disparities in labour market participation. Out of a total demand of 40,792 skilled workers, 31,217 positions (approximately 77%) are for males, while only 9,575 (23%) are for females (Table 09). This indicates that while some sectors are beginning to integrate women into the workforce, overall gender inclusion remains limited and uneven across the economy. The Allied Health sector stands out for having the most gender-balanced demand, with 5,039 male and 4,398 female workers required. Similarly, the Hospitality and Tourism sector, with a total demand of 10,808 workers, includes 1736 female roles. Although male demand (9072) dominates, the sector still presents opportunities for women, particularly in hotel services, culinary trades, and guest management. On the other hand, sectors such as Construction and Agri-business show minimal to no inclusion of female workers. Construction, with a total demand of 4039, shows 89 demand for female workers indicated, which reflects prevalence of traditional gender norms and the physically demanding nature of the work. Agri-business, despite being historically associated with women's involvement in rural areas, has only 837 female roles out of the total 3801, suggesting a need for formal recognition and inclusion of women's contributions in the agriculture value chain. In sectors such as Manufacturing and Handicrafts, there is relatively greater female representation. Manufacturing shows 208 female roles out of 2,996 positions, indicating a 93% male to 7% female proportion. Handicrafts have a demand for 632 females out of the total of 1,121, suggesting that women play an active role in traditional crafts and small-scale production, particularly home-based or cooperative work. Sectors such as Water, Energy, and other services are male-dominated but show some female participation. The Water sector requires 362 women against 1,728 total positions, and Energy includes 32 women in 1,305 total demand. Other services also demonstrate female participation with 141 roles for women within a total demand of 4,54, reflecting a broader mix of roles in administration, education, and small-scale service delivery.

Table 09: Gender-wise Skilled Workforce Demand at Sectoral Level

Sector	Male	Female	Total
Agri-business	2964	837	3801
Allied Health	5039	4398	9437
Automobile	880	0	880
Construction	3950	89	4039
Handicrafts	489	632	1121
Hospitality and Tourism	9072	1736	10808
Mining and Minerals	2135	828	2963
Manufacturing	2788	208	2996
Other services	313	141	454
Printing and Packaging	948	312	1260
Energy	1273	32	1305
Water	1366	362	1728
Grand Total	**31,217**	**9,575**	**40,792**

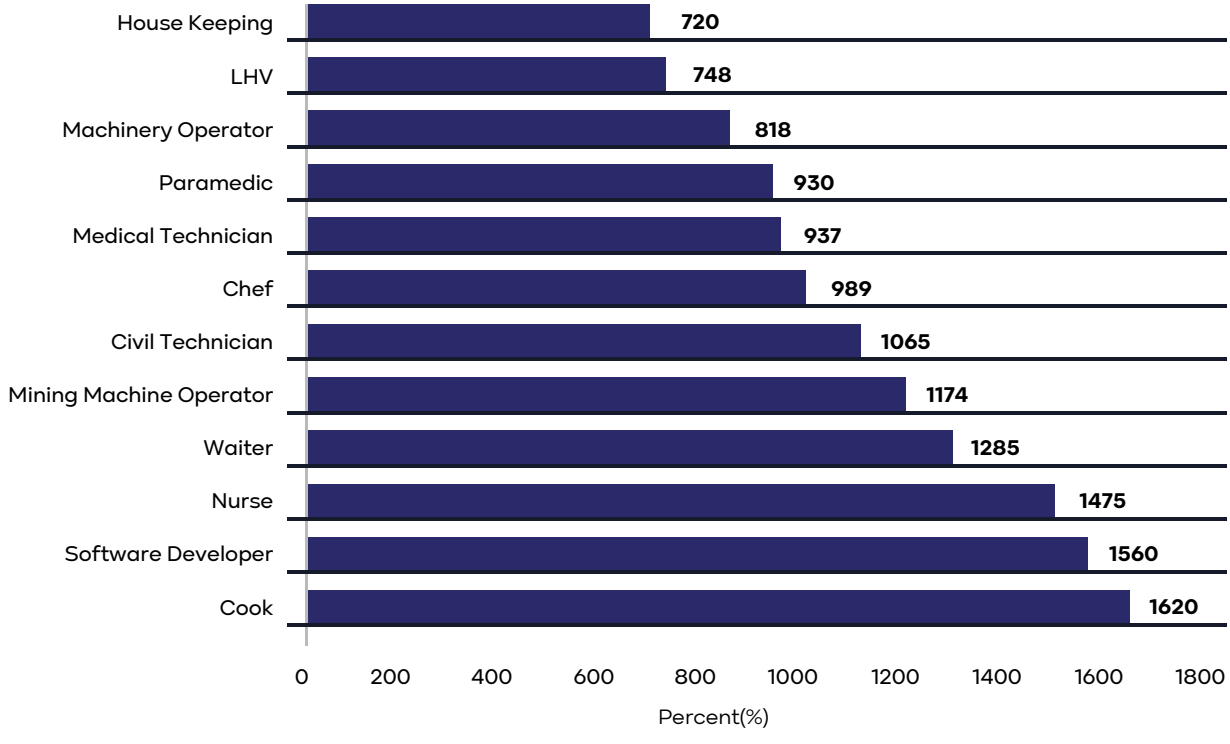
4.6 Trade-Wise Skilled Workforce Demand

The analysis of leading trades in demand across Gilgit-Baltistan reveals a diverse mix of service-oriented, technical, and healthcare-related occupations, reflecting the multifaceted nature of the region's economy. As shown in Figure 06, the highest demand is for cooks, with 1,620 positions, followed closely by software developers (1,560). The demand for culinary professionals such as cooks and chefs (the latter with 989 positions) aligns with the dominant role of hospitality and tourism in the region, where food services are integral to guest experience.

The presence of 1,475 nursing positions, 973 medical technicians and 930 paramedics underscores the healthcare sector's growing demand for skilled personnel. This reflects the expansion of healthcare services and the need to strengthen human resources in health, particularly in remote districts with limited access to qualified professionals. In hospitality services, the demand for waiters (1,285) and housekeepers (720) reflects the rapid growth of the tourism sector and the expansion of hotels and guesthouses in destinations such as Skardu, Hunza, and Gilgit. These roles typically require soft skills, basic service training, and hospitality etiquette, which are currently underserved in the current TVET curricula. Technical and infrastructure-oriented trades also appear prominently. Civil technicians (1,065) and machinery operators (818) are in high demand, likely driven by ongoing construction and infrastructure development projects. Mining machine operators (1,174) point to continued activity in the region's mineral extraction industry, which requires skilled operation of heavy equipment and knowledge of and adherence to safety protocols, areas where the current skill supply often falls short. The demand for lady health visitors (LHV), with 748 positions, also highlights the ongoing need for community-based maternal and reproductive healthcare services, especially in rural and underserved communities.

Ensuring that training programmes are aligned with these priority trades accessible to both genders and responsive to employer needs will be crucial for creating employment pathways and supporting inclusive economic growth in the region.

Figure 06: Demand for Leading Trades in Labour Market



4.7 Gender-Wise Workforce Demand at Occupation Level

The skilled workforce demand in Gilgit-Baltistan varies across occupational levels, with a substantial portion of the workforce required at mid-level positions. Level 3 occupations exhibit the highest demand, with 14,501 workers needed, comprising 11,290 males and 3,211 females (Table 10). This indicates a strong requirement for mid-tier skilled professionals, likely in technical, clinical, and operational roles across sectors, such as healthcare, hospitality, construction, and manufacturing. Similarly, Level 4 occupations also show considerable demand, totaling 9,414 workers, 7,093 males and 2,321 females, reflecting the growing need for supervisory or specialized skill sets that support service delivery and project execution. At Level 2, the demand stands at 7,990 workers, including 6,649 males and 1,341 females. These semi-skilled roles are foundational in sectors including retail, administration, tourism services, and allied trades, where workers are expected to support daily operational activities. Level 1 occupations, which typically consist of unskilled or entry-level roles such as janitorial, security, or support staff, show a demand for 4,945 workers, 3,769 males and 1,176 females. These roles continue to offer entry points for workforce participation across both genders, especially for individuals with limited formal education or prior experience. Levels 5 and 6 and above reflect relatively lower overall demand, with 2,226 and 1,498 workers required, respectively. However, Level 6 & above, which include specialized and higher-scale positions such as doctors, medical specialists, engineers, and managerial staff, show a relatively balanced gender distribution, with 866 male and 850 female positions. This indicates a growing presence of women in high-skilled and professional roles, particularly within the allied health and education sectors. Similarly, at Level 5, 676 out of 2,226 positions are for female workers, further underscoring emerging opportunities for women to access career progression in fields requiring advanced training or certifications. While gender disparities persist across all occupational levels, the data reveal notable female participation in entry-level and professional occupations, signaling potential for increasing gender inclusion in the region's skilled labour force. These patterns reinforce the importance of strengthening vocational and technical training pathways that equip individuals, particularly women and youth, for mid- and high-skill roles, while supporting upward mobility from basic service positions. Ensuring that training institutions respond to these occupational structures will be vital for aligning workforce development with Gilgit.

Table 10: Gender-Wise Workforce Demand across Different Occupation Levels

Level	Male	Female	Total
Level 1	3769	1176	4945
Level 2	6649	1341	7990
Level 3	11290	3211	14501
Level 4	7093	2321	9414
Level 5	1550	676	2226
Level 6 & above	866	850	1716
Total	**31217**	**9575**	**40792**

4.8 Sector-Wise Leading Trades

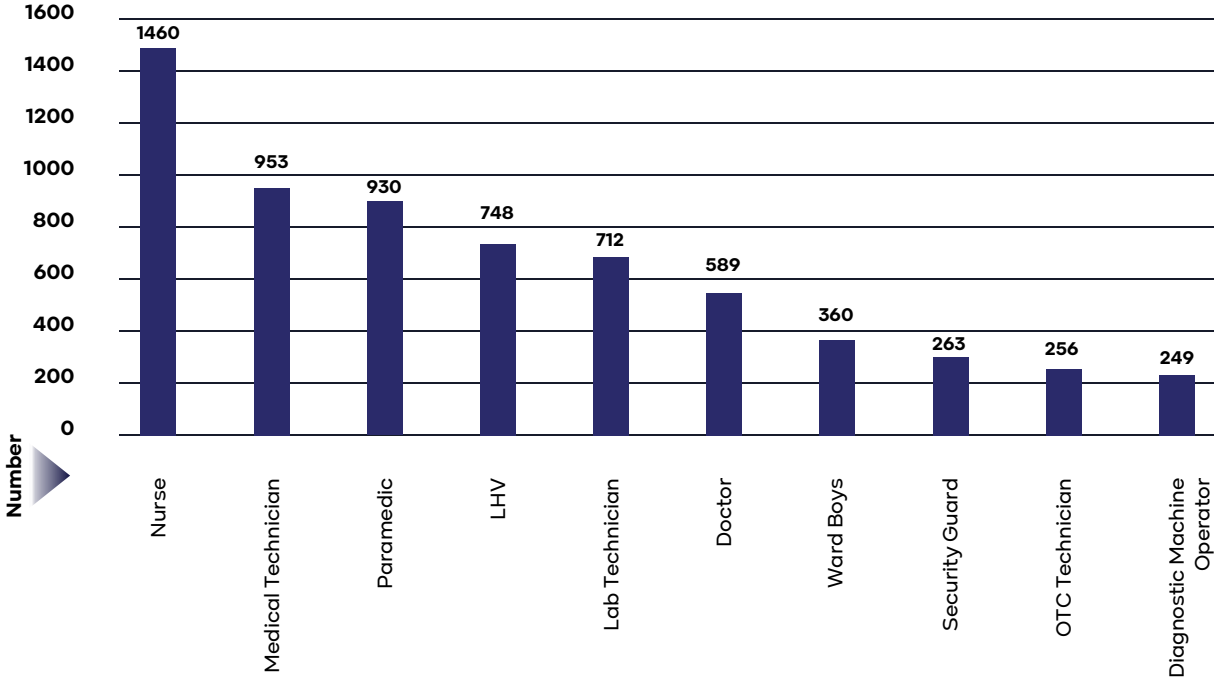
The data highlights the importance of different sectors of the economy, each of which relies on a skilled workforce to sustain growth.

Allied Health Sector

Figure 07 presents the demand for trained healthcare professionals and support staff to sustain and expand medical service delivery across the region. Nurses represent the highest demand, with 1,460 positions required, reflecting the nursing staff's essential and expanding role in public and private health facilities. This demand is closely followed by that of medical technicians (953), paramedics (930), and lady health visitors (748), all of whom are critical of providing frontline and community-based healthcare services, particularly in underserved and remote areas.

Lab technicians (712) and diagnostic machine operators (249) also feature prominently, underscoring the increasing reliance on diagnostics for effective clinical care. The demand for doctors, with 589 positions, illustrates the continued need for qualified general practitioners and specialists, though the relatively lower number compared to paramedical roles suggests a healthcare system structured heavily around mid-level service delivery professionals. Additional demand is noted for operating theatre (OT) technicians (256) and ward boys (360), which represent core support functions within hospital environments. These roles are essential for maintaining operational continuity in patient care and facility management. The inclusion of security guards (263) in the list points to auxiliary staffing needs that support the overall functioning and safety of healthcare institutions.

Figure 07: Workforce Distribution across Different Positions in Allied Health Sector



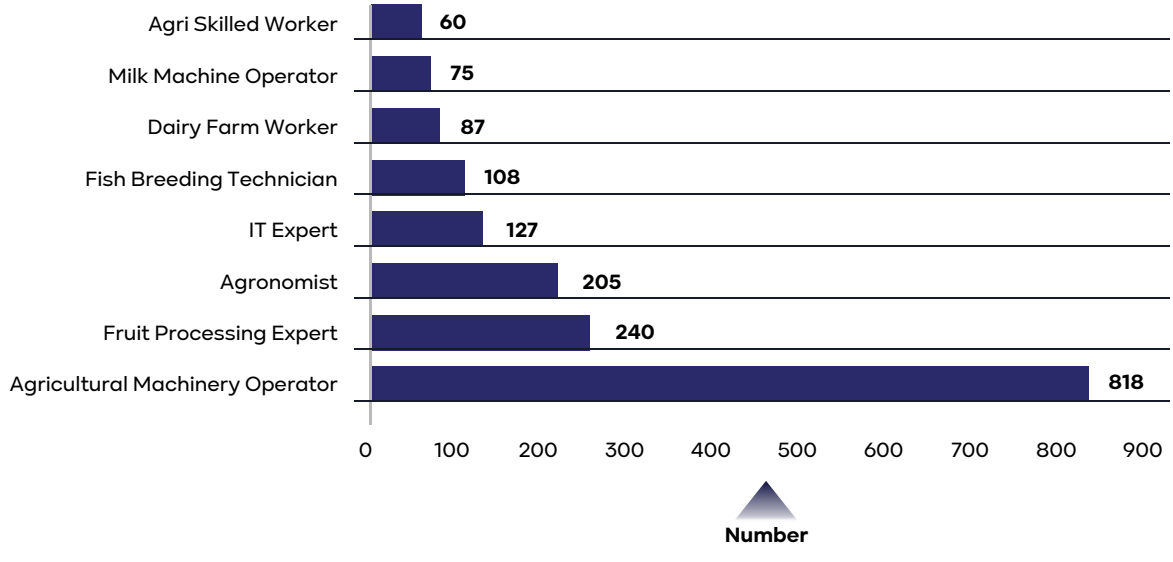
Agribusiness Sector

The occupational demand data in the agriculture and allied sectors of Gilgit-Baltistan points to a gradual shift from traditional subsistence practices toward more mechanized and value-added agricultural activities. As shown in Figure 08, the highest demand is for agricultural machinery operators, with 818 positions, indicating the growing reliance on mechanization in farming practices. This trend reflects efforts to improve productivity and efficiency, particularly where labour shortages and terrain-specific challenges make manual farming less feasible. However, the lack of formally trained operators and limited access to equipment maintenance services may hinder the full benefits of mechanization unless accompanied by targeted skill development programmes.

Fruit processing experts are in notable demand, with 240 positions available, highlighting the importance of post-harvest value addition in a region recognized for its high-quality apples, cherries, and apricots. Developing local capacity in food processing can reduce post-harvest losses and open income-generating opportunities through small-scale agro-processing enterprises. Similarly, the demand for agronomists (205) indicates an increasing awareness of the need for scientific input in crop planning, soil health, and pest management. However, the relatively modest demand suggests that such specialized advisory roles are still in the early stages of integration into local farming systems.

Demand for other occupations, such as IT experts (127) and fish breeding technicians (108), shows emerging diversification in rural livelihoods. The presence of IT roles within the agriculture sector likely points to digital applications in farm management, weather monitoring, or e-commerce platforms connecting producers to markets. Fish breeding technicians reflect the region's engagement with aquaculture, especially in highland valleys where trout farming has become a source of supplemental income. Lower but still meaningful demand is seen for dairy farm workers (87), milk machine operators (75), and general agri-skilled workers (60), which reflects the ongoing need for basic livestock care, milking operations, and farm labour. These roles are vital for sustaining everyday agricultural operations, especially among smallholder farmers engaged in mixed farming systems.

Figure 08: Workforce Distribution across Different Positions in Agribusiness



Energy Sector

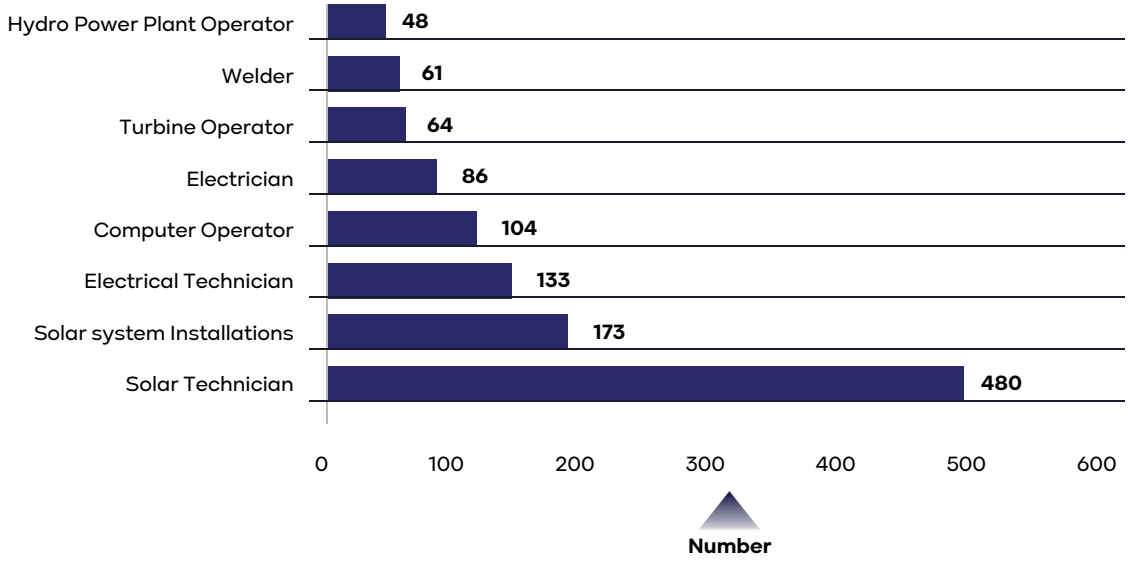
The occupational demand within the energy and related technical sectors in Gilgit-Baltistan reflects a growing shift toward renewable energy and decentralized power solutions, driven by the region's topography and limited access to the national grid. The highest demand is for solar technicians, with 480 positions, followed by solar system installation roles (173), as shown in Figure 09. This clearly illustrates the rapid adoption of solar energy across households, businesses, and community-based projects. As off-grid solar solutions become more common, especially in remote valleys, there is a strong and urgent need to equip the local workforce with the technical expertise required for installing, maintaining, and troubleshooting solar systems.

Electrical technicians (133) and electricians (86) are also in steady demand, indicating the need for broader electrical infrastructure support in traditional and renewable energy contexts. These roles are critical not only for energy systems but also for ensuring the functionality of machinery, lighting, and basic power supply in commercial and residential settings. However, many of the region's current technicians lack formal certification or hands-on training, which can impact the quality and safety of electrical installations.

The demand for computer operators (104) alongside energy-sector jobs suggests an increasing requirement for digital skills to support energy management, billing, data monitoring, and administrative operations within power-related initiatives. Meanwhile, though smaller in number, technical trades directly associated with hydropower infrastructure, such as turbine operators (64) and hydro power plant operators (48), remain significant given Gilgit-Baltistan's natural advantage in hydropower potential. These roles require specialized training in mechanical systems, safety procedures, and real-time operations, but opportunities for acquiring such skills locally are currently limited.

Welders (61) also form part of the energy sector's skilled workforce needs, particularly for structural installations and equipment maintenance. Welding skills are essential in both construction and infrastructure support for energy systems, yet formal training programmes in this field remain underdeveloped in the region.

Figure 09: Workforce Distribution across Different Positions in Energy Sector



Hospitality & Tourism Sector

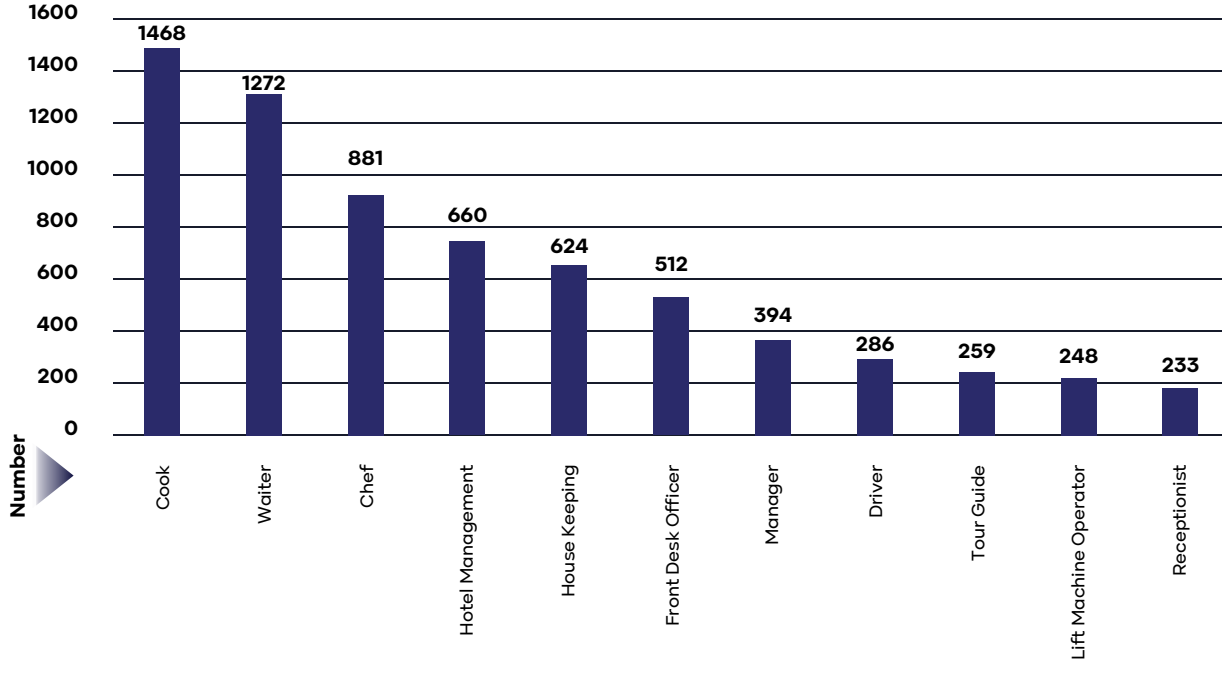
The occupational demand within the hospitality and tourism sector in Gilgit-Baltistan underscores the sector's vital role in the regional economy and its strong capacity to generate employment. Cooks (1,468), waiters (1,272), and chefs (881), as in Figure 10, represent the highest in-demand roles, reflecting the central importance of food services in hotels, guest houses, and restaurants catering to the growing number of domestic and international tourists.

Hotel management-related occupations, such as hotel managers (660), housekeepers (624), and front desk officers (512), show a significant concentration of demand in operational and guest services. These roles are essential for ensuring smooth, guest-oriented experiences in hospitality facilities, and their presence highlights the need for soft skills training, customer service etiquette, and basic managerial competencies. The demand for hotel management skills also aligns with the emergence of boutique hotels and eco-lodges, particularly in tourist-heavy areas like Hunza, Skardu, and Gilgit.

The sector also requires people for managerial and supervisory roles, with 394 positions for managers, suggesting increasing formalization and professionalization in hospitality operations. The demand for drivers (286) and tour guides (259) indicates continued growth in guided travel services and local transport, which are critical in a region where accessibility and cultural interpretation are essential to the tourist experience. These roles require not only logistical skills but also training in communication, safety protocols, and basic language skills for guiding international visitors.

Demand for lifting machine operators (248) and receptionists (233) points to support roles within hotel infrastructure and guest engagement. These positions are necessary for daily hotel operations and require both technical and interpersonal skills. The receptionist role, in particular, highlights the importance of digital literacy and multilingual communication in enhancing guest satisfaction.

Figure 10: Workforce Distribution across Different Positions in Hospitality & Tourism Sector



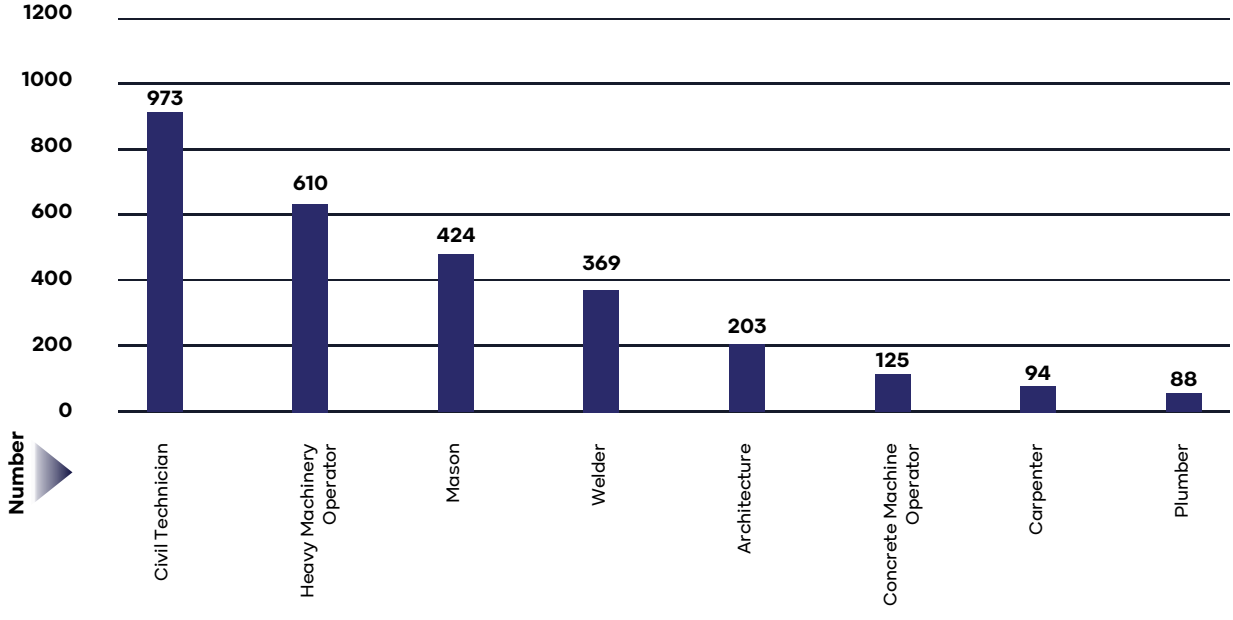
Construction Sector

Figure 11 reveals the occupational demand in the construction sector of Gilgit-Baltistan. Civil technicians are the most in-demand, with 973 positions, indicating the central role they play in site supervision, structural layout, quality control, and basic engineering functions. This demand reflects ongoing and planned development projects across the region, including road construction, bridges, housing, and tourism-related infrastructure, where mid-level technical expertise is critical to ensuring project efficiency and safety.

Heavy machinery operators also rank high in demand, with 610 positions, pointing to a growing reliance on mechanized equipment such as bulldozers, excavators, and loaders, especially relevant given the region's mountainous terrain and logistical challenges. This trend signals the importance of establishing training programmes focused on machinery operation, safety, and maintenance, as untrained operators may pose risks to both productivity and workplace safety. Masons (424) and welders (369) are also in steady demand, representing core construction trades required in nearly every building and infrastructure project. Masons are essential for brickwork, stonework, and plastering, while welders are crucial for metallic frameworks, reinforcements, and structural assemblies. Despite being traditional trades, these occupations still suffer from a lack of formal certification and quality training, limiting output efficiency and consistency.

Demand for architectural roles, including 203 positions for individuals with building design and layout expertise, suggests a growing formalization of construction planning and a building demand for technical drawing, site planning, and the use of design software such as AutoCAD. Although relatively smaller in number, this demand highlights a shift toward better-planned and more regulated construction activities. Additional roles such as concrete machine operators (125), carpenters (94), and plumbers (88) indicate other skilled workforce needs in construction. These are critical roles for executing foundational and finishing tasks in both small and large-scale projects.

Figure 11: Workforce Distribution across Different Positions in Construction Sector

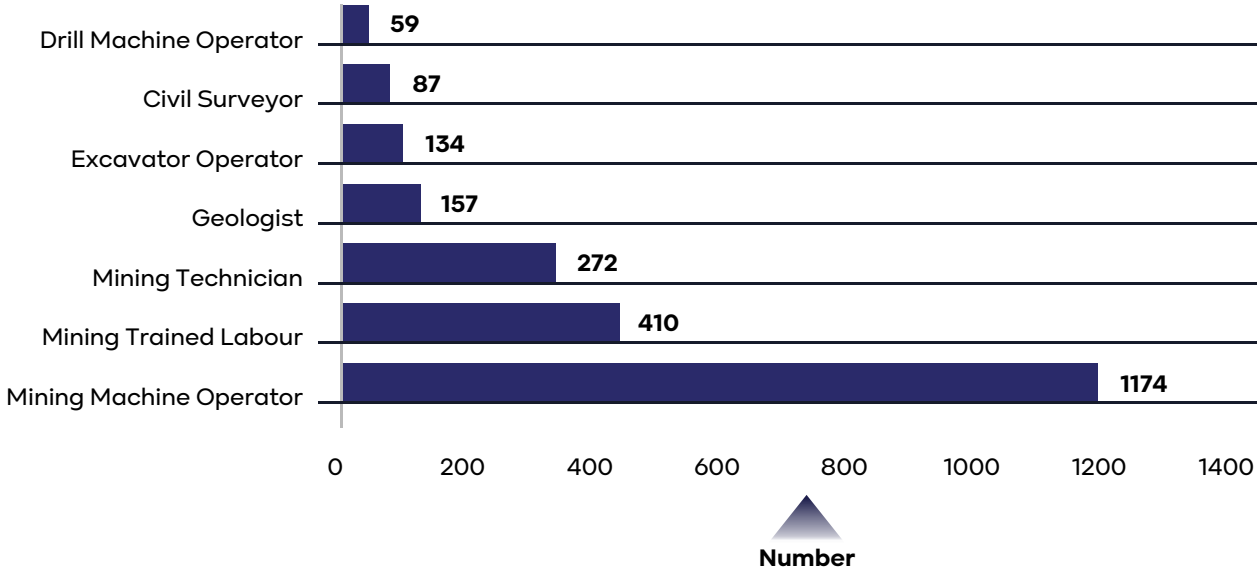


Mining Sector

Figure 12 indicates that Mining machine operators represent the largest demand, with 1,174 positions, pointing to the critical role of heavy equipment in extracting minerals such as marble, gemstones, and other geological materials abundant in the region. This highlights the urgent requirement for specialized training in operating, maintaining, and ensuring the safety of mining equipment, especially in geographically sensitive and hazardous terrains. Trained labourers for mining (410) and mining technicians (272) also feature prominently in the demand list, reflecting the sector's need for general labour with specialized safety awareness and mid-level technical personnel capable of supporting day-to-day mining operations.

The demand for geologists (157) signals the importance of scientific expertise in exploration, site assessment, and resource mapping. Though relatively limited in number compared to operational roles, geologists play a crucial role in ensuring that extraction is efficient and environmentally sustainable. Further demand for excavator operators (134), civil surveyors (87), and drill machine operators (59) indicates the broader technical infrastructure that supports mining operations. These roles are essential for preparing and maintaining mining sites, setting up drilling operations, and conducting land measurements, all of which require precision, adherence to safety standards, and knowledge of modern machinery and tools.

Figure 12: Workforce Distribution across Different Positions in Mining Sector

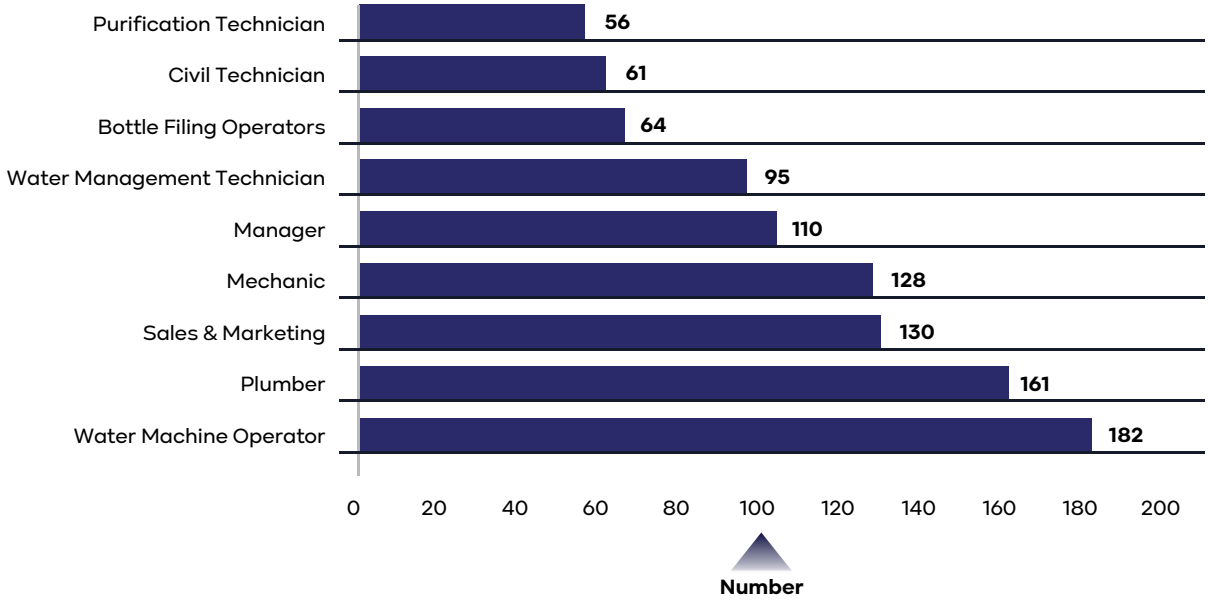


Water Sector

Water machine operators are in the highest demand within the sector, with 182 positions, as shown in Figure 13. It indicates the operational demand of community-based or commercial water treatment and bottling facilities. These roles require practical skills in operating pumps, filtration systems, and distribution equipment, yet there is often a lack of formal training available locally to build this capacity effectively. Plumbers (161) and mechanics (128) are also in high demand, highlighting the importance of maintaining pipelines, fixtures, and mechanical components of water supply systems. These occupations are critical not only for residential and commercial plumbing but also for larger-scale public water infrastructure, especially in urbanizing areas like Gilgit and Skardu. Despite being foundational trades, plumbing and mechanical repair services often rely on informal labour without standardized training, which can result in inefficiencies and safety concerns.

Demand for sales and marketing professionals (130) and managers (110) reflects the increasing commercialization of water services, including bottled water, filtration units, and water-saving technologies. This shift toward market-driven models necessitates not just technical knowledge, but also business, customer service, and organizational skills. The presence of 95 water management technicians and 64 bottle filling operators in the demand list suggests a growing demand for mid-level technical expertise and labour within the production and distribution side of the sector. Additionally, demand for civil technicians (61) and purification technicians (56) further underscores the sector's need for skilled workers to support infrastructure projects and maintain water quality.

Figure 13: Workforce Distribution across Different Positions in Water Sector



4.9 Occupations in Top-5 Leading Districts

This section aims to summarize the leading occupations in key districts, offering policymakers insights into the dynamics of industrial needs and the support required from public institutions for these areas.

Gilgit

Figure 14 depicts demand occupations in the Gilgit district for skilled professionals mainly in healthcare, construction, hospitality, and mining. At the top of the list are nurses, with a demand for 1,191 workers, underscoring the critical importance of nursing services in the region's expanding healthcare infrastructure. This is closely followed by paramedics (930), who provide essential emergency and clinical support across urban and rural settings. The demand for lady health visitors (LHV), with 690 positions, and medical technicians (390) further indicates a growing emphasis on community-based care, maternal and child health services, and diagnostic support, especially in remote districts with limited access to hospitals.

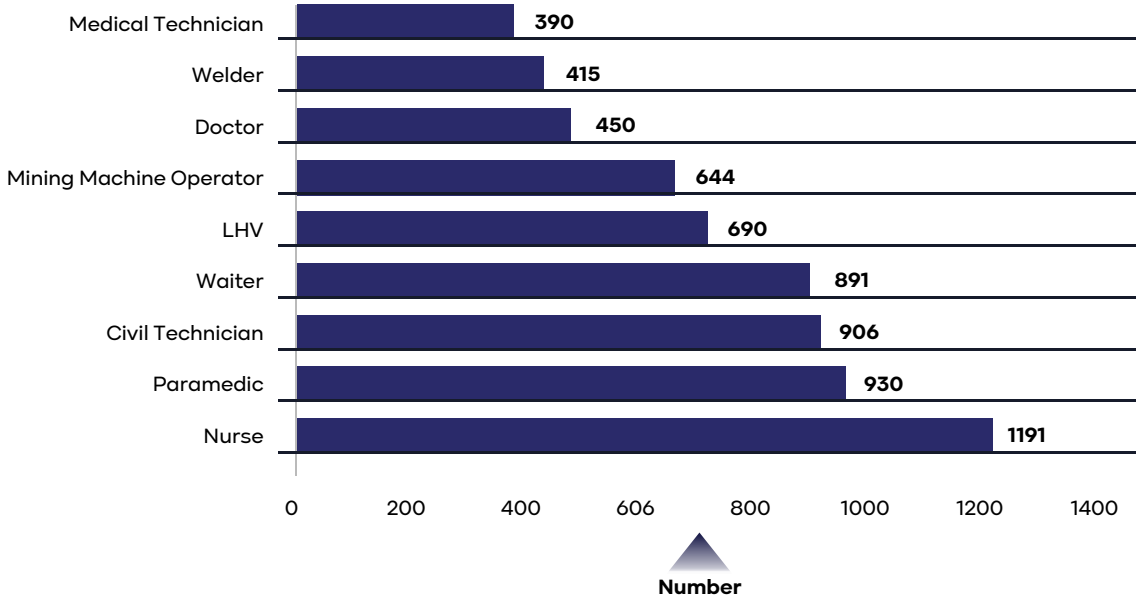
Civil technicians (906) rank third in overall demand, reflecting significant infrastructure development across Gilgit-Baltistan, including roads, schools, hospitals, and tourism facilities. This demand emphasizes the need for mid-level technical expertise in construction planning, supervision, and basic engineering. The presence of welders (415) on this list reinforces the importance of skilled trades within the construction and industrial sectors, particularly for structural works and equipment repair.

Hospitality roles also feature prominently, with waiters in demand at 891 positions. This aligns with the region's booming tourism industry, where service quality is central to visitors' experience. The growing number of hotels, guest houses, and restaurants across popular destinations, such as Hunza and Skardu, has created steady employment opportunities in food and beverage services.

Mining machine operators, with 644 positions, represent one of the most critical operational roles in the mining sector, which is gaining traction due to the region's rich deposits of minerals and gemstones. The demand for this occupation reflects increased mechanization in extraction processes, necessitating proper training in safety, equipment handling, and basic maintenance.

Doctors, though fewer in number at 450, remain essential to the healthcare sector. The relatively lower demand compared to paramedical roles reflects a healthcare system that relies heavily on mid-level service providers for routine care, while doctors are more concentrated in supervisory and specialized roles.

Figure 14: Leading Occupations in Gilgit



Skardu

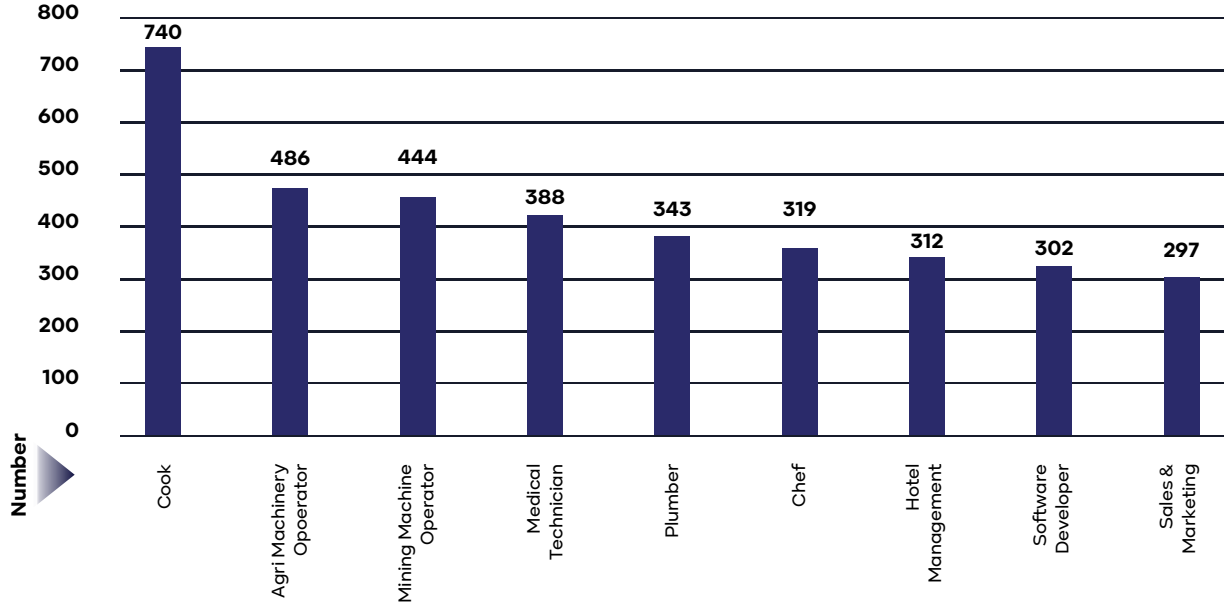
The occupational demand data for Skardu district highlights a dynamic labour market driven by tourism, agriculture, mining, and healthcare sectors. Figure 15 depicts that the highest demand is for cooks, with 740 positions, indicating the centrality of hospitality and food services in the district's economy. As Skardu continues to develop as a key tourism hub in Gilgit-Baltistan, the need for skilled culinary staff has grown substantially, alongside the demand for chefs (319) and hotel management professionals (312). These figures collectively underscore the importance of structured training in culinary arts, hotel operations, and service management to meet the expectations of a rising tourist population.

Agricultural machinery operators are the second most in-demand occupation, with 486 positions. This reflects a gradual shift toward mechanization in local farming practices, particularly in cultivating potatoes, barley, and fruits. The increasing use of tractors, threshers, and irrigation systems has created a pressing need for trained operators capable of handling and maintaining this equipment. Similarly, the demand for mining machine operators, totaling 444, points to the growing extraction activities around Skardu, especially in marble and gemstone mining. These roles require not only technical training in heavy machinery operation but also adherence to safety protocols in challenging terrains.

Healthcare-related occupations also show significant demand. Medical technicians are required for 388 positions, reflecting the district's need for skilled support staff in diagnostic labs, clinics, and hospitals. As Skardu's healthcare infrastructure grows alongside its population and tourist inflow, the availability of trained technicians is critical for ensuring effective service delivery. Plumbers, with 343 positions, also feature prominently, suggesting ongoing construction activity and the need for reliable utility infrastructure, both in residential and commercial settings.

Interestingly, software developers are in demand for 302 positions, suggesting an emerging shift toward digital services, ICT solutions, and perhaps small-scale tech startups or IT-enabled services. This reflects a promising direction for youth employment if supported through digital skills training. Lastly, the demand for sales and marketing professionals (297) emphasizes the growing commercial activity in Skardu, driven by both tourism and retail trade. Skills in communication, customer engagement, and digital marketing are increasingly important for small businesses and tourism-related enterprises.

Figure 15: Leading Trades in Skardu

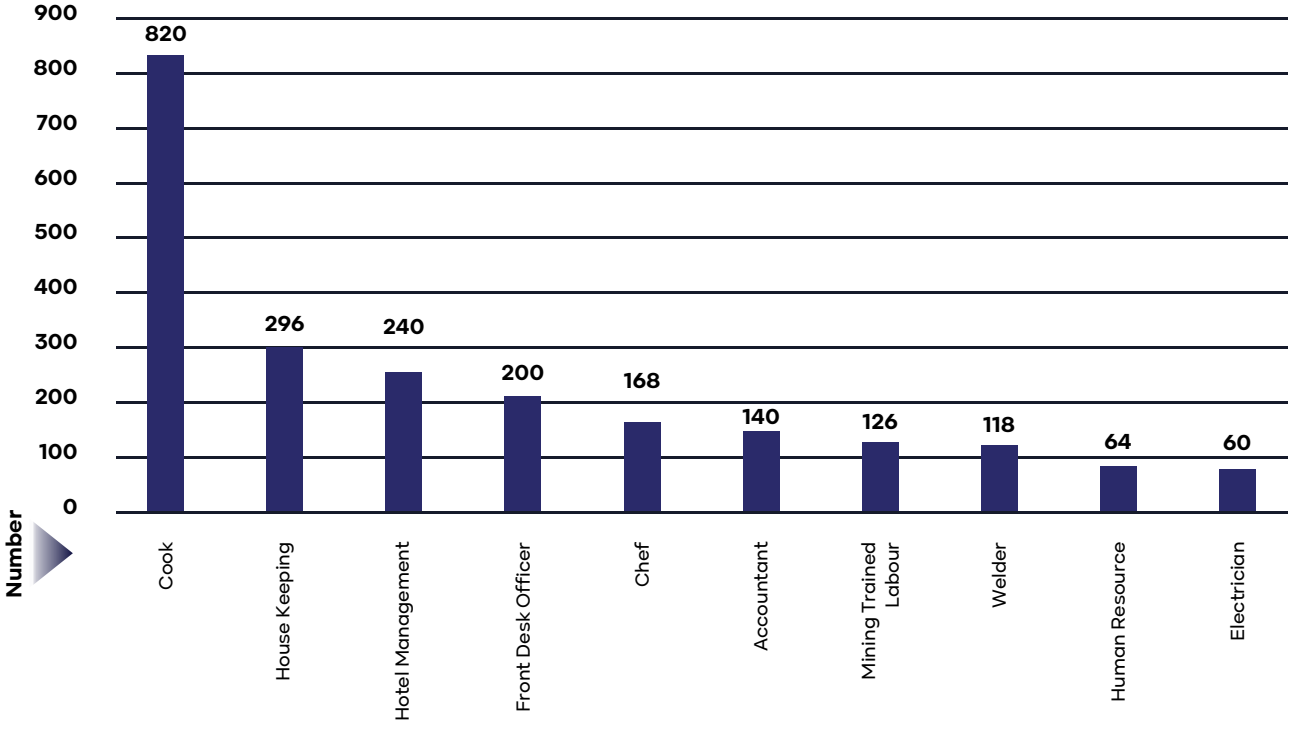


Hunza

The occupational demand in the Hunza district, as highlighted in Figure 16, reflects the labour market's strong orientation toward tourism and hospitality, with growing diversification into support services and skilled trades. The highest demand is for cooks, with 820 positions, underscoring the vital role of food services in the local tourism economy. As Hunza continues to attract many domestic and international tourists, this high demand suggests a need for well-trained culinary professionals who can deliver quality and culturally diverse food experiences. Demand for chefs (168), hotel management professionals (240), and housekeepers (296) further reinforces the centrality of hospitality as the district's leading employment sector.

Front desk officers, with 200 positions, highlight the importance of interpersonal, administrative, and multilingual communication skills in enhancing guest services. The presence of 140 accountants and 64 human resource professionals signals the increasing need for structured business operations and administrative capacity as local enterprises scale up. In parallel, the district also demonstrates notable demand for mining-trained labour (126), welders (118), and electricians (60). This indicates emerging opportunities in extractive and construction-related trades, possibly linked to small-scale mineral activities and infrastructure development projects.

Figure 16: Leading Occupations in Hunza



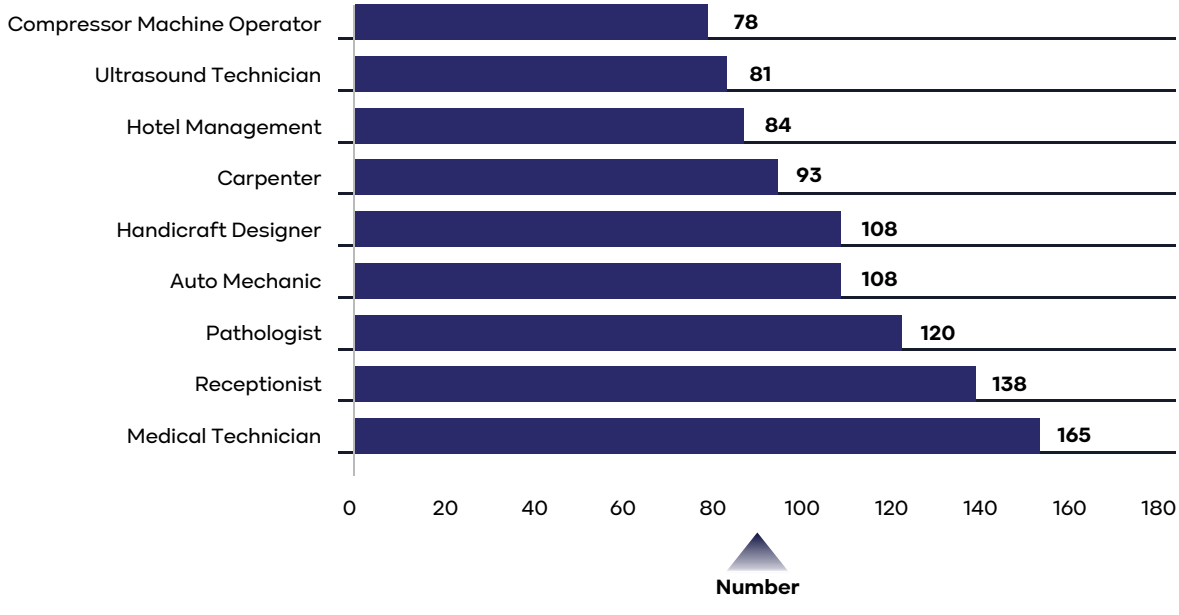
Diamer

Figure 17 shows the demand for several distinctive skills in Diamer that range from healthcare, technical trades, hospitality, to creative industries, each reflecting specific employment opportunities in different sectors. Medical technicians, with 165 positions, continue to play a critical role in the healthcare system. These professionals are essential for diagnostic services and lab-based support in hospitals and clinics, and their demand signals an ongoing expansion of medical infrastructure in the region. Demand for receptionists (138) and hotel management professionals (84) reflects continued growth in administrative and service-oriented roles, particularly in health facilities, hospitality businesses, and private sector offices. Pathologists, with 120 positions, further exhibit the demand for diagnostic and laboratory-based expertise, especially as the healthcare sector modernizes and expands its capacity for disease screening and prevention.

Auto mechanics (108) and compressor machine operators (78) suggest ongoing demand in transport and equipment maintenance sub-sectors. These roles are fundamental in construction and vehicle services, especially in a mountainous region where reliable machinery and transport systems are essential. However, access to structured training in these trades remains limited, affecting the quality of services and workplace safety. Handicraft designers (108) and carpenters (93) indicate demand within traditional and construction-related trades. Handicrafts remain an important livelihood activity for many in Gilgit-Baltistan, particularly for women and home-based workers. Including designers highlights the need to enhance product development, aesthetics, and marketability.

Ultrasound technicians (81) represent a more specialized area of the health sector, providing non-invasive diagnostic services that are in increasing demand, especially in maternal and reproductive health. The need for this role points to the importance of expanding training in diagnostic technologies, which are currently available in only a limited number of health facilities across the region.

Figure 17: Leading Occupations in Diamer



Nagar

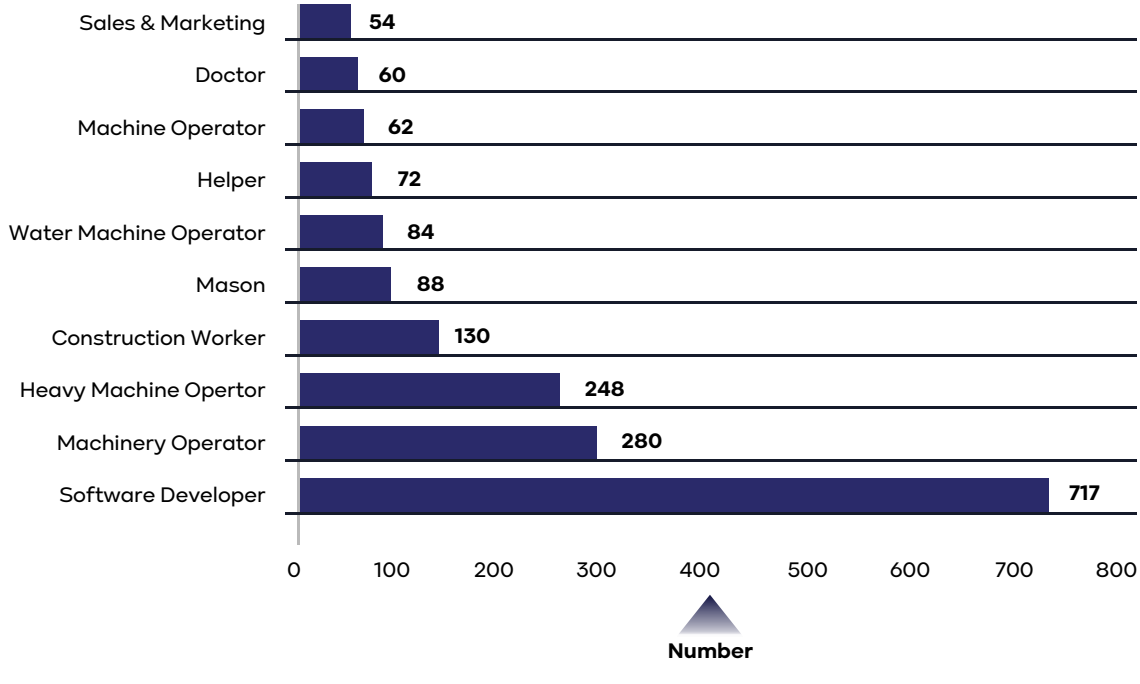
Figure 18 highlights the occupational demand in Nagar district, revealing an emerging and somewhat diversified labour market with strong leanings toward both digital and technical trades. The highest demand is for software developers, with 717 positions, an unexpected but promising indicator of the district's shift toward the digital economy. This figure suggests growing interest in IT-enabled services, possibly supported by youth engagement in freelancing, e-commerce, or software-based startups. Such high demand underscores the need to expand access to digital skills training, coding, and IT infrastructure within the district to fully capitalize on this opportunity.

Machinery operators (280) and heavy machine operators (248) represent the second and third highest demands, pointing to the ongoing mechanization in construction, agriculture, or possibly small-scale manufacturing. These roles are foundational for operating equipment used in road construction, building development, and earthmoving, especially in a mountainous region like Nagar. Construction workers (130) and masons (88) demand further confirms continued infrastructure development in the district, driven by government and community-level projects. However, the relatively small scale of demand suggests these projects are either seasonal or limited in geographic reach. Nevertheless, they provide entry-level employment opportunities that could be enhanced through structured apprenticeships and on-the-job training.

The presence of water machine operators (84) and helpers (72) points to essential support services within utility operations and basic labour markets. These roles are crucial for maintaining water supply systems, managing equipment, and supporting skilled technicians in project execution. Machine operators (62) beyond heavy machinery may include roles in food processing, milling, or small manufacturing setups, indicating pockets of localized industrial activity.

Doctors (60) are also in demand, reflecting the ongoing need to strengthen healthcare access and service delivery, particularly in remote valleys and small towns. The relatively modest figure, compared to support roles, aligns with national trends where mid-level and paramedical staff carry a larger share of healthcare responsibilities, but also reflects a continued shortage of qualified medical professionals in the region. Finally, sales and marketing roles (54) round out the demand profile, pointing to small but growing commercial activity. These positions are essential for retail, tourism services, and small businesses that require customer interaction and outreach.

Figure 18: Leading Occupations in Nagar



4.10 Analysis of Skilled Workforce Demand & Supply Gaps

Table 13 (Annex B) presents a detailed skills gap analysis for Gilgit-Baltistan, shedding light on the stark imbalances between supply and labour market demand. The data highlights major discrepancies with some trades showing extreme surpluses where large numbers of individuals have been trained with little to no market absorption, while others show acute shortages in critical technical and service-oriented occupations.

One of the most striking patterns is the significant oversupply in traditional, largely female-dominated trades such as dress making and designing, which has a surplus of 3,984 trained individuals against zero recorded demand. Similar trends are evident in trades like fashion designing (828 trained vs. 421 in demand), beautician (720 vs. 24), and basic computer skills (458 vs. 177), suggesting that the training supply continues to favour low-scale, home-based or non-formal employment. These programmes, while historically popular, appear disconnected from the formal labour market and contribute to saturation in trade with limited economic scalability.

In contrast, many of Gilgit-Baltistan's high-growth sectors are facing significant skill shortages. In hospitality and tourism, one of the region's leading economic drivers, critical deficits exist for cooks (a gap of 1,900), waiters (1,301), hotel managers (607), housekeepers (680), and receptionists (512). These occupations are not only central to Gilgit-Baltistan's current economic profile but also represent some of the most immediate job creation opportunities for youth. Yet the training in these skills is either non-existent or severely limited, suggesting an under-appreciation of the economic impact of tourism within the region's vocational training policies.

Healthcare presents a particularly alarming gap. The demand for nurses (1,475), medical technicians (973), and paramedics (930) cannot be met without significant investment in health-specific vocational programmes. Furthermore, the demand for specialists like lab technicians, ultrasound operators, and ECG technicians remains unmet, pointing to risks in both service coverage and quality healthcare. The problem is exacerbated by the fact that these professions often require regulated training standards, certifications, and affiliations that are either unavailable or limited in the region, making scale-up more challenging.

The demand-supply gap also extends into the construction and engineering sectors. Trades such as electricians, civil technicians, plumbers, masons, and welders are perennially in short supply, despite their pivotal role in infrastructure expansion projects across the region. This shortfall reflects not only inadequate training capacity but also limited awareness among potential trainees about the long-term employability and income potential of these trades. Moreover, the current model of training does not support modular certifications or short-term upskilling, which could enable quick absorption of youth into labour markets for project-based work.

Equally concerning is the almost total absence of training provision for an entire range of emerging and essential roles. More than 250 occupations have recorded demand but zero training supply. These include 600+ jobs for accountants and administrators, nearly 1,200 for mining machine operators, and hundreds more across roles such as ultrasound technicians, mechanics, auto electricians, drivers, food processing experts, and packaging operators. These gaps reflect either the absence of training institutions for these trades or a lack of coordination between employers and training providers to structure curricula around local hiring needs.

The data also shows overtraining in certain legacy trades with little relevance to the formal economy, such as hand embroidery, cushion making, and khaddi weaving. While these trades may preserve cultural heritage and offer self-employment potential, their scalability and income generation prospects remain limited without targeted value chain integration, branding, or digital market access.

These mismatches underscore the core challenge facing Gilgit-Baltistan's skills development ecosystem: a chronic misalignment between what training institutions offer and what the labour market requires. This disconnection is not only inefficient but also potentially damaging, as it leads to frustration among trained youth who are unable to find employment in their respective trades, while employers continue to struggle with skill shortages in priority sectors.

The solution lies in establishing responsive, market-driven training systems that are informed by regular labour market intelligence. For example, occupations showing persistent gaps, such as chefs, construction workers, civil technicians, software developers, and healthcare staff, must be prioritized for capacity expansion. Training centres should be incentivized to adopt modular, competency-based curricula that cater to local economic opportunities and allow for rapid re-skilling or up-skilling in high-demand areas.

In parallel, low-demand or zero-demand trades should either be phased out or restructured to align with modern economic applications. For instance, traditional tailoring could be modernized through fashion entrepreneurship; embroidery skills could be linked to digital design platforms or exports; and basic IT courses could evolve into coding, e-commerce, or cybersecurity training. Apprenticeship programmes and industry-linked training centers can bridge the gap between theory and practice, offering real employment pathways rather than just certificates.

Moreover, career counselling and labour market orientation at the secondary and post-secondary levels can guide youth toward informed choices, reducing the mismatch between aspirations and employment realities. Female participation in high-demand fields should also be actively promoted through awareness campaigns, safe learning environments, and incentives for women to enter sectors like health, IT, and hospitality management.

Another gap stems from the lack of recognition and inclusion of semi-skilled and informal occupations in the formal training landscape. Many trades, such as helpers, drivers, security guards, and cleaning staff, have visible demand, yet there is no formal training pipeline to prepare individuals for these roles. Similarly, jobs in mining, agriculture mechanization, packaging, and food processing are often filled informally, which undermines the quality and productivity potential of the workforce.

In the digital economy, the gap is not just one of availability but of relevance. While some digital skills are being taught, the content does not necessarily align with what the job market requires. Employers increasingly seek skills in programming languages, data analysis tools, cybersecurity, and mobile app development, yet the training delivered tends to focus on basic computer literacy or generalist IT exposure. This mismatch results in youth being unable to access higher-paying digital jobs or remote work opportunities.

The skills gap in Gilgit-Baltistan are not merely a statistical figures, it is a systemic challenge that affects economic resilience, youth employment, and inclusive development. To address it, TVET policy must be more agile, data-informed, and demand-led. Investments in high-demand trades, curriculum modernization, practical learning, and stronger public-private partnerships will be critical. Equally important is the need to phase out underperforming or oversaturated programmes, ensure equitable access to training across gender and geography, and recognize the value of informal and semi-skilled occupations within the broader development framework. Only through such a comprehensive and responsive approach can Gilgit-Baltistan unlock its human capital potential and align its workforce with the needs of a changing economy.

4.11 Employment Opportunities for Disadvantaged Groups

Employment opportunities for disadvantaged groups in Gilgit-Baltistan remain limited in both scale and diversity, with only 1,110 positions identified across all sectors (Table 11). Persons with disabilities account for the largest share at 39% (430 opportunities), reflecting a growing, though still modest, awareness of inclusive hiring practices among employers. While this is a positive development, most of these roles are likely to be concentrated in lower-tier occupations or support services, indicating that deeper structural adjustments are needed to facilitate upward mobility for individuals with disabilities through access to specialized training and workplace accommodations.

Minorities represent 36% of identified employment opportunities (395 positions), highlighting their moderate integration into the labour market. However, the nature of roles available to minority groups remains unclear, and these jobs are likely concentrated in semi-skilled or informal sectors. Ensuring equitable access to more formal and higher-paying opportunities will require proactive inclusion strategies, anti-discrimination safeguards, and employer sensitization.

Elderly individuals make up 18% of the total (195 jobs), which likely reflects re-engagement in limited roles that rely on experience or informal community-based employment. While this demonstrates some level of continued economic participation, opportunities for older adults remain constrained by age-related biases and a lack of tailored skilling programmes that match their capacity with contemporary job requirements.

Only 90 roles have been identified for transgender individuals, comprising just 8% of the total opportunities. This low figure reflects the significant social and institutional barriers transgender persons face in accessing the labour market. Beyond legal protections, fostering their employment will require systemic efforts, including dedicated vocational training pathways, workplace inclusion policies, and partnerships with civil society organizations to facilitate integration.

Table 11: Distribution of Quota or Reserved Seats for Disadvantaged Group

Disadvantage Group	Number	Percentage
Disabled	430	39
Elderly	195	18
Minorities	395	36
Transgender	90	8
Total	**1110**	**100**

4.12 Skills for Disadvantaged Groups

The occupational distribution of employment opportunities designated for disadvantaged groups in Gilgit-Baltistan reflects a labour market that remains heavily tilted toward low-skill and low-wage roles, with limited avenues for career advancement or inclusion in high-growth sectors. The single largest category is that of sweepers, with 464 positions, accounting for over 40% of all identified roles (Table 12). This indicates a persistent occupational stratification where disadvantaged individuals, particularly those from marginalized social backgrounds, are disproportionately engaged in cleaning and sanitation services, roles traditionally associated with social stigma and limited mobility. Helpers make up the second largest group, with 160 positions, followed by Naib Qasids (64) and security guards (56), further reflecting that many opportunities lie in elementary support services rather than in skilled or semi-skilled domains. While such roles may offer a vital entry point into the workforce, they do little to address structural exclusion or improve long-term income stability without pathways to skill enhancement or promotion.

A limited number of roles fall into slightly more technical or skilled categories. Computer-related occupations (80 positions) and accounts (64 positions) show some potential for integration into clerical and IT-enabled environments, suggesting that with the right support, such as foundational digital literacy and office administration training, some disadvantaged individuals could access more formal employment. Similarly, 24 positions each for dispensers and receptionists indicate minor inclusion in health support services and front-desk operations, though these remain underrepresented compared to demand in these sectors. The presence of 22 roles in handicrafts and 8 in stitching also reflects an ongoing reliance on traditional trades, particularly for women or home-based workers, though these are often informal and seasonal. Other categories like cook (80), housekeeper (16), nurse (16), grinder operator (24), and aya (8) further illustrate that disadvantaged groups are typically absorbed into either gendered care work, hospitality, or low-level technical roles.

Table 12: Occupation-Wise Seats for Disadvantaged Groups

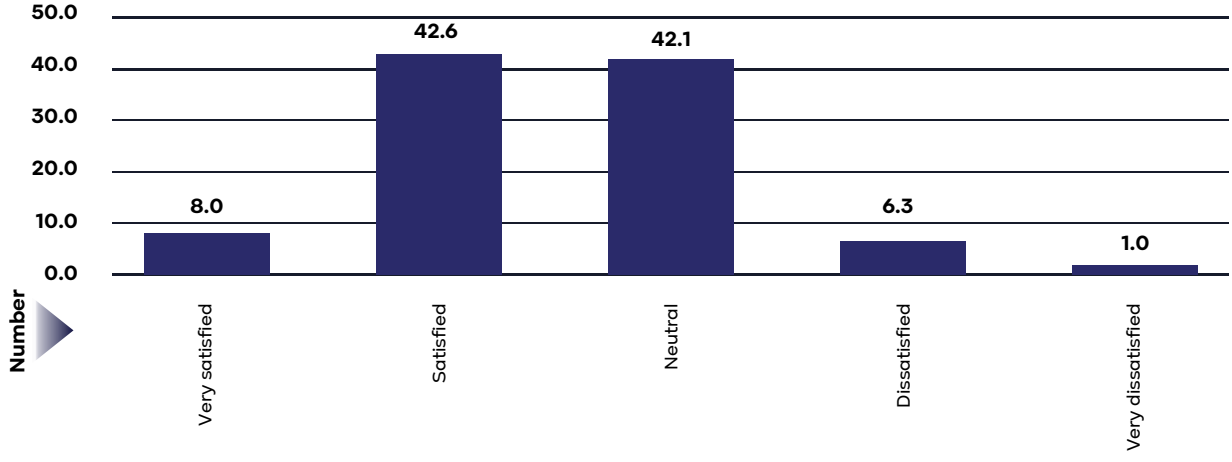
Occupation	Number
Accounts	64
Aya	8
Computer	80
Cook	80
Dispenser	24
Grinder Operator	24
Handicraft artisan	22
Helper	160
House Keeping	16
Naib Qasid	64
Nurse	16
Receptionist	24
Security Guard	56
Stitching	8
Sweeper	464

4.13 Employers' Satisfaction with TVET Graduates

Figure 19 shows that out of a total of 955 respondents, 42.6% reported being satisfied with the graduates' work, while an additional 8% stated they were very satisfied. Together, these figures indicate that just about half (50.6%) of the surveyed individuals are satisfied with their current employees, suggesting that many workers find their roles to be reasonably fulfilling or meeting expectations. However, a large proportion, 42.1%, expressed neutrality, neither satisfied nor dissatisfied. This sizeable middle ground suggests that while individuals may not be unhappy, they may not be fully engaged or content with their work. It may reflect low expectations, job insecurity, or limited prospects for growth, especially in sectors where routine or informal employment is dominant. This ambivalence highlights a critical area for intervention, where better job quality, skill progression, or benefits could enhance satisfaction and retention.

At the other end of the spectrum, 6.3% of respondents reported being dissatisfied, and 1% indicated being very dissatisfied. Though relatively small in percentage terms, these figures still represent meaningful discontent within the labour force, potentially tied to poor working conditions, lack of upward mobility, or mismatches between skills and job roles.

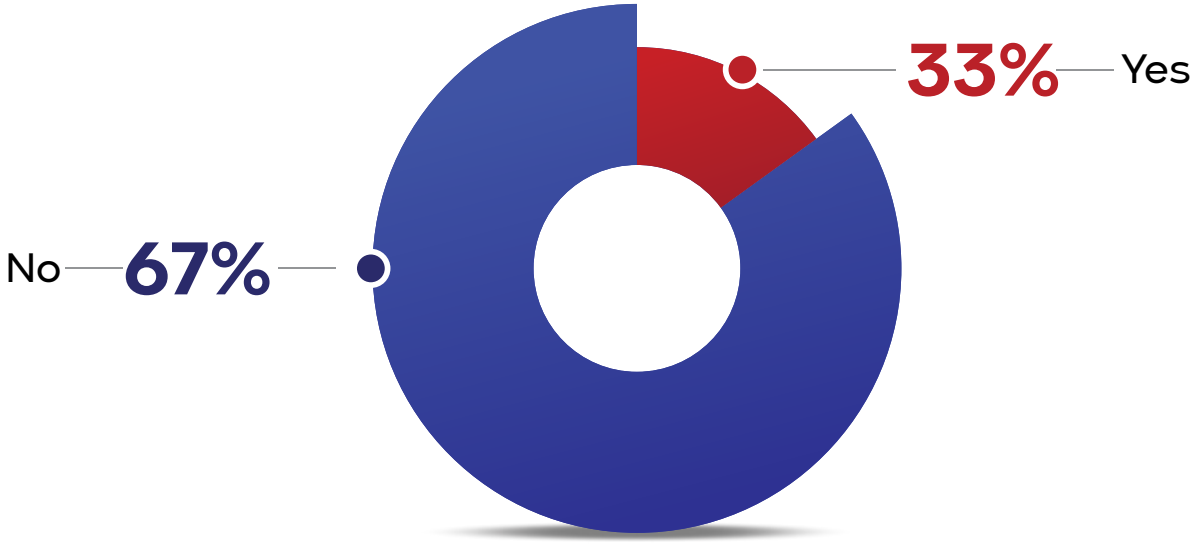
Figure 19: Level of Satisfaction with Technical and Vocational Education and Training



4.14 Industry-Led Training Opportunities

Survey findings show that only 33.1% of organizations reported offering training programmes such as on-the-job training, apprenticeships, or online courses (Figure 20). In comparison, a striking 66.9% indicated that they do not provide structured training. The lack of internal training opportunities has important implications for workforce development and productivity. In sectors where technology, service standards, or industry practices are rapidly evolving, such as tourism, healthcare, construction, and IT, the absence of in-house training inhibits workers from adapting to new tools, protocols, or market expectations. It also limits the ability of organizations to build tailored skills aligned with their operational needs, potentially increasing reliance on external hiring and reducing employee retention.

Figure 20: Industry-Led Training Opportunities



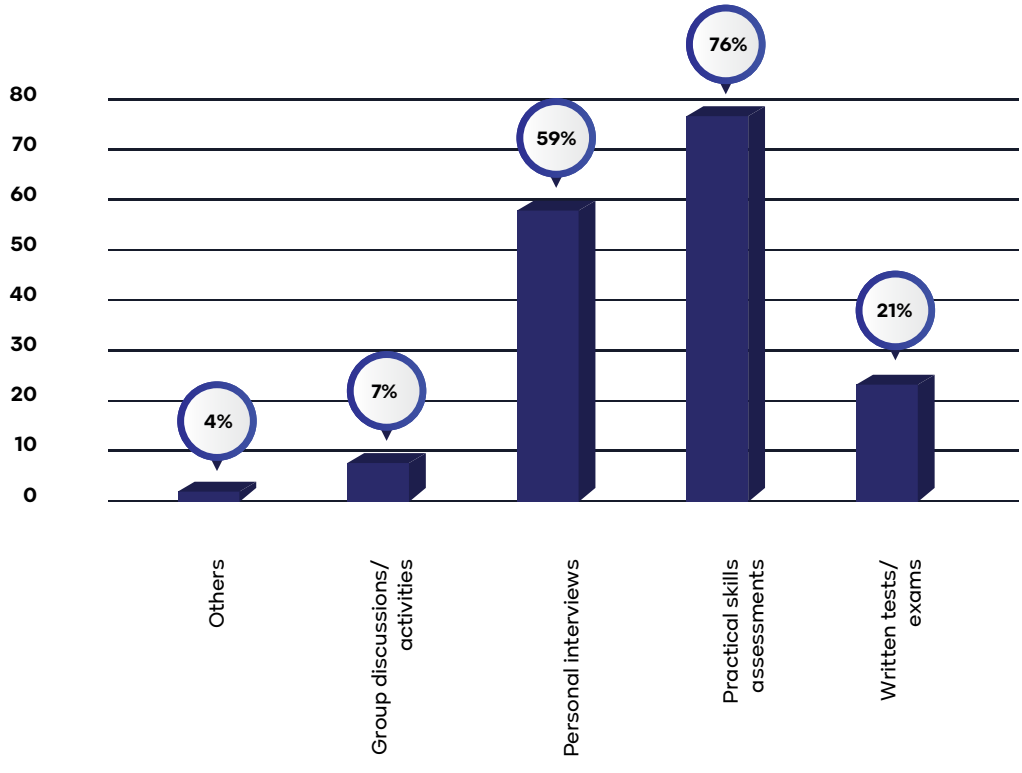
4.15 Skills Assessment in Recruitment

Figure 21 indicates that the methods used by employers in Gilgit-Baltistan to assess skills and competencies of potential or existing employees have a strong emphasis on hands-on evaluation. Practical skills assessment is the most widely adopted approach, employed by 76% of organizations. This underscores the labour market's focus on demonstrable, job-specific capabilities, particularly relevant in technical fields such as construction, hospitality, health services, and mechanical trades, where performance on the job is often more important than theoretical knowledge.

Personal interviews are also a common method, used by 59% of organizations, reflecting the continued value placed on interpersonal communication, aptitude, and readiness assessment during face-to-face interactions. Interviews are likely to be particularly important in service-oriented sectors such as tourism, retail, or administration, where employers may evaluate confidence, adaptability, and professionalism as part of the hiring decision. Written tests or formal exams are used by 21% of organizations. This may reflect the nature of the job market in Gilgit-Baltistan, where many occupations require functional know-how and academic or textbook-based understanding.

Group discussions and activities, used by only 7%, remain a niche approach, likely limited to specific contexts such as managerial roles or training programmes that emphasize team-based skills. The low use of this method may also indicate a general under-emphasis on collaborative problem-solving or soft skills during recruitment. A small percentage (4%) reported using "Other" methods, which could include informal referrals, trial work periods, or community-based recommendations, especially common in smaller enterprises or family-run businesses.

Figure 21: Methods of Skills and Competencies Assessment



4.16 Challenges in Hiring or Retaining Employees

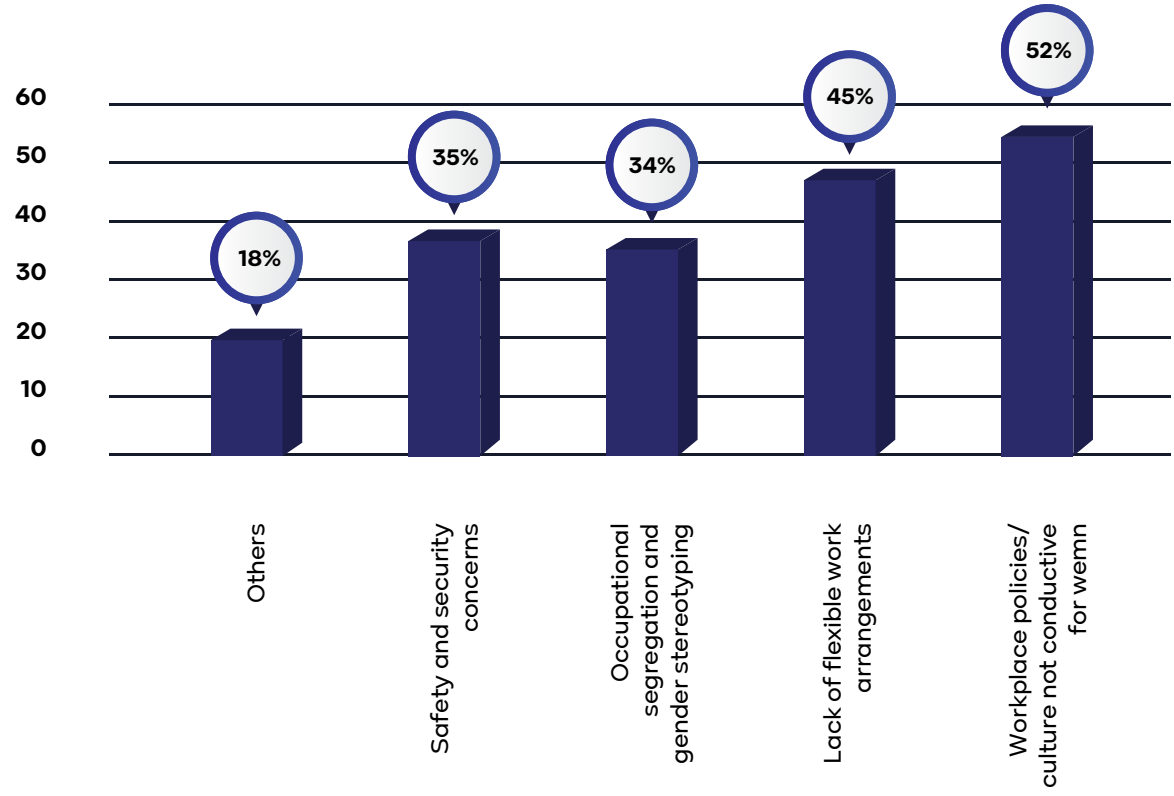
Female Employees

Figure 22 highlights that over half of the respondents (52%) identified non-conducive workplace policies or culture as a major constraint in hiring or retaining female employees. This suggests that many organizations still lack gender-sensitive environments, ranging from basic facilities like separate washrooms and childcare support to broader cultural acceptance of women in mixed-gender workspaces or leadership roles. Such limitations discourage female entry, limit retention, and can contribute to high attrition among those who do enter the workforce.

A further 45% of organizations cited the lack of flexible work arrangements as a key impediment. This reflects the tension between professional roles and traditional caregiving responsibilities assigned to women, particularly in remote or conservative communities. Occupational segregation and gender stereotyping, reported by 34% of employers, also continue to shape hiring practices. Women are often considered suitable only for specific trades such as tailoring, teaching, nursing, or clerical work, while being excluded from technical, managerial, or field-based positions.

Safety and security concerns were raised by 35% of respondents, highlighting both real and perceived risks that employers associate with female mobility or workplace integration. Other challenges, cited by 18%, include family resistance, lack of qualified female candidates, or regulatory gaps in enforcing equal opportunity practices. Together, these challenges indicate that addressing gender disparities in the labour market requires more than training alone, it demands systemic change across policy, infrastructure, and employer mindsets.

Figure 22: Challenges in Hiring or Retaining Female Employees

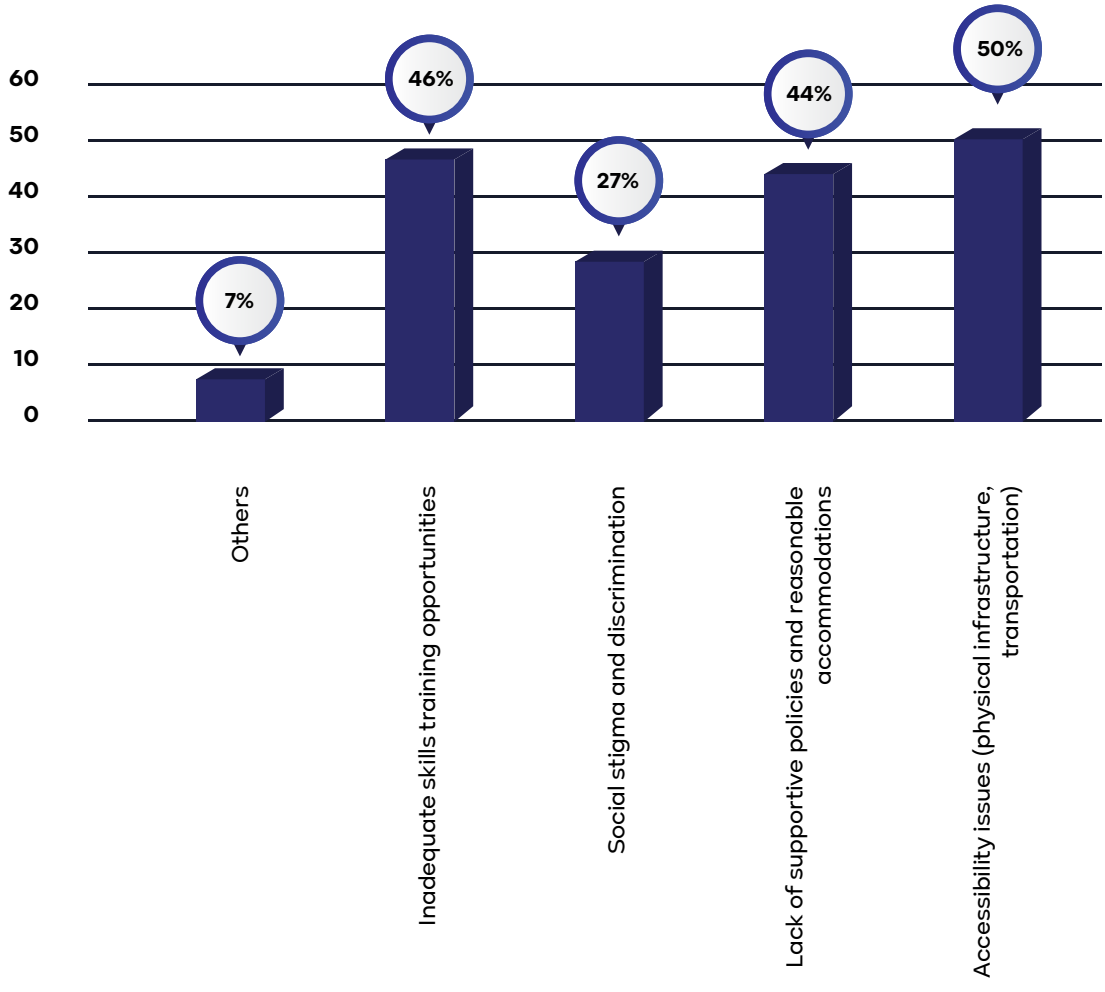


Disadvantaged Groups

The challenges in hiring or retaining employees from disadvantaged groups in Gilgit-Baltistan highlight a combination of infrastructural, institutional, and social barriers that restrict inclusive workforce participation. Accessibility issues, cited by 50% of respondents, are the most prominent challenge (Figure 23). The lack of supportive policies and reasonable workplace accommodations is reported by 44% of employers. Lack of access to skill development is reported by 46% of employers as a key obstacle.

Social stigma and discrimination remain significant but underreported barriers identified by 27% of respondents. Other challenges (7%) may include factors such as a lack of awareness among employers about inclusive hiring practices, the absence of regulatory incentives, or community-level resistance to the employment of marginalized groups. These underlying factors further complicate the struggle to mainstream disadvantaged populations in the region's economic activities.

Figure 23: Challenges in Hiring or Retaining Employees from Disadvantaged Groups

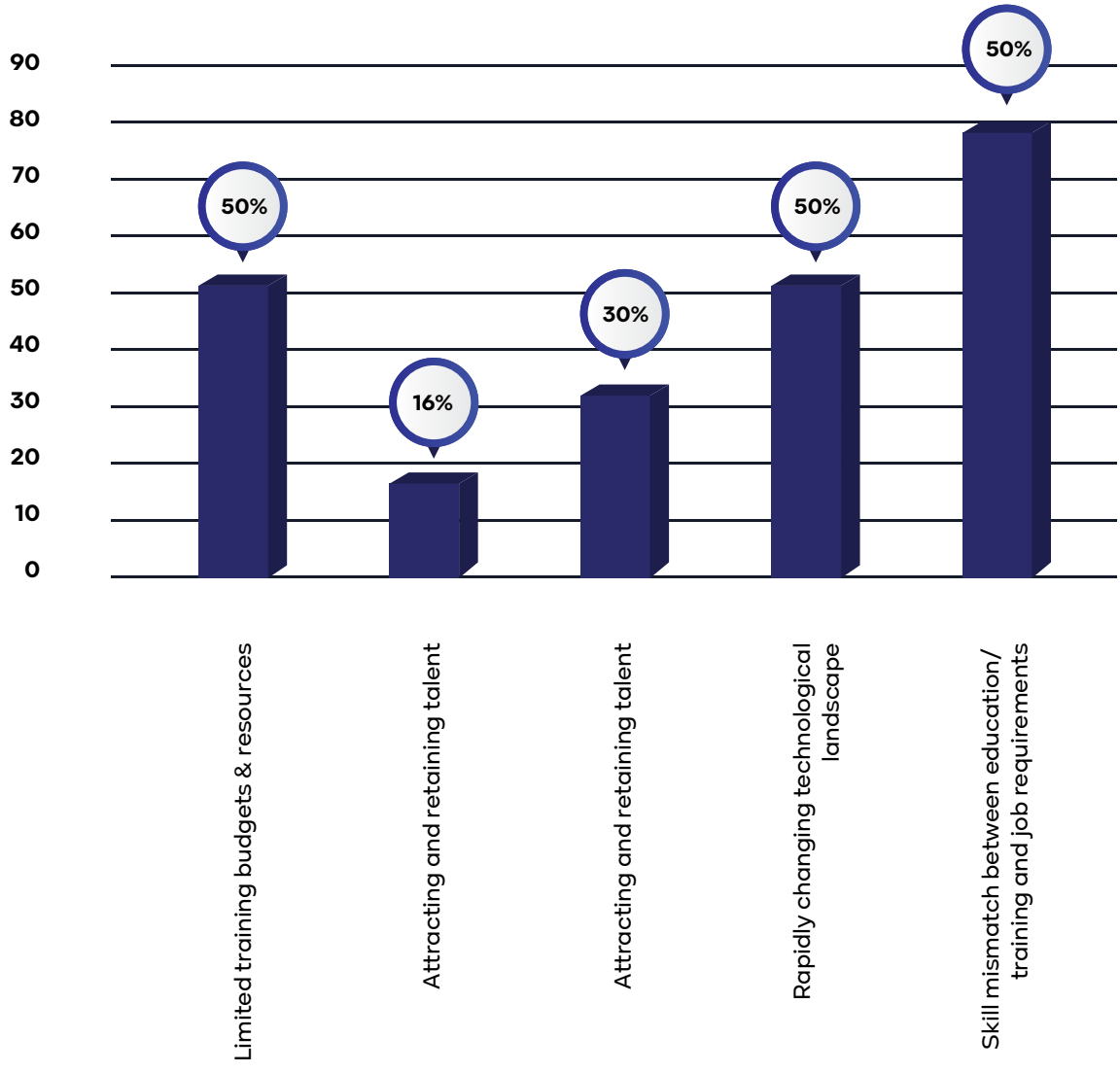


Workforce Development and Skills Acquisition

The most significant issue, reported by 77% of respondents, is the mismatch between education or training and actual job requirements (Figure 24). This persistent gap indicates that formal education and even vocational training programmes often fail to equip learners with the practical, market-relevant competencies demanded by employers. Another pressing challenge is a rapidly changing technological landscape and constrained training resources, each cited by 50% of respondents. As industries evolve with new tools, platforms, and standards, particularly in ICT, healthcare, and renewable energy, workers and employers alike struggle to keep pace.

Issues related to talent attraction and retention were noted by 30% and 16% of employers, respectively, suggesting a two-fold problem. On one hand, employers find it difficult to attract qualified professionals due to either skill shortage in the local labour pool or geographic limitations that limit talent from relocating to the region. On the other hand, retaining skilled workers, particularly in the face of limited growth opportunities, low wages, or better prospects elsewhere, continues to be a challenge. This contributes to high turnover and disrupts continuity in service delivery and business operations.

Figure 24: Key Issues Emerging in Workforce Development and Skills Acquisition



4.17 Suggestions for Improvement

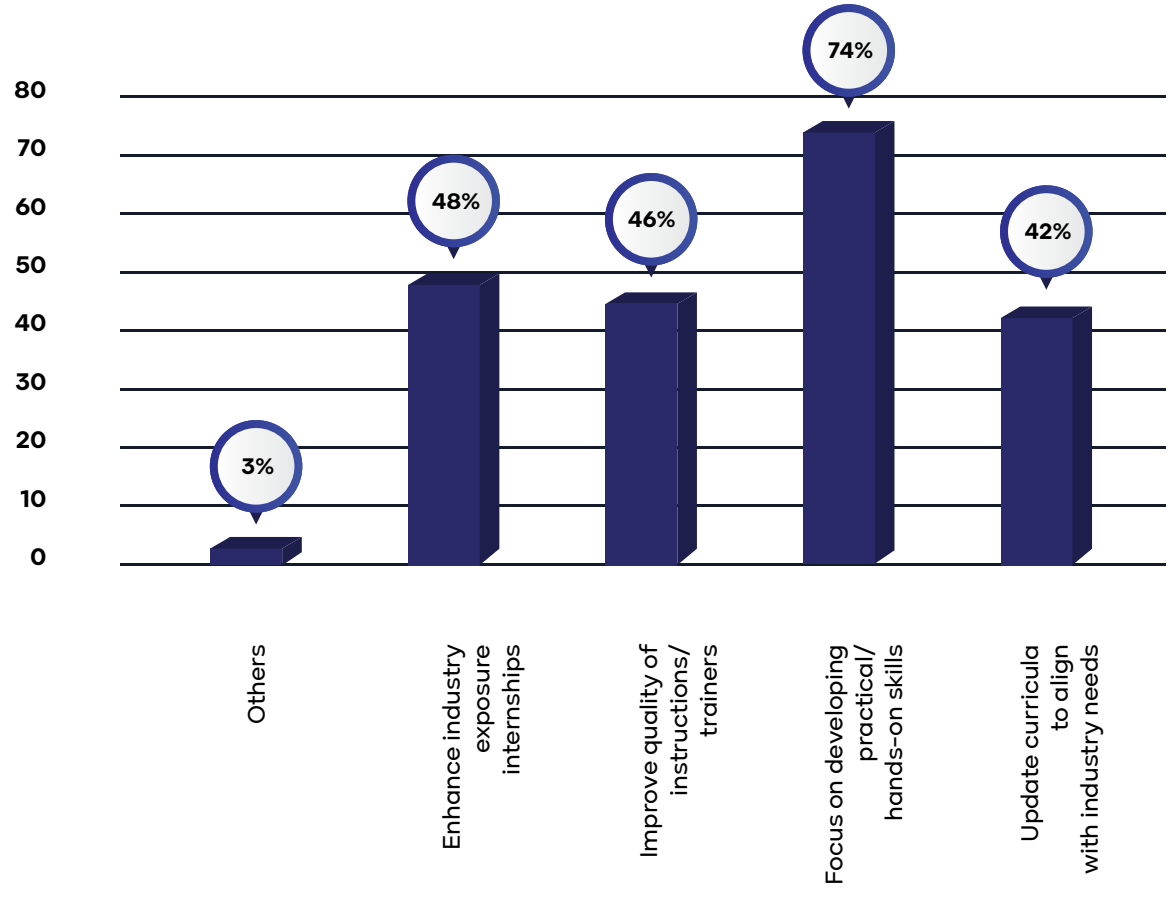
Quality and Relevance of TVET Programmes

The suggestions provided by respondents for improving the quality and relevance of TVET programmes in Gilgit-Baltistan highlight a strong consensus around the need for practical reforms and stronger alignment with market realities. Figure 25 shows that a large majority, 74%, emphasized the importance of developing practical, hands-on skills as a core component of training. Closely related is the recommendation to enhance industry exposure and internships, endorsed by 48% of respondents. This underscores the importance of experiential learning through work placements, apprenticeships, and site visits.

Updating curricula to reflect current industry needs was suggested by 42% of the participants, pointing to the urgency of moving away from outdated content that fails to keep pace with technological advancements or sectoral trends. This includes integrating digital tools, green technologies, and modern service standards into core training content, especially in high-growth areas such as hospitality, healthcare, construction, and ICT.

Improving the quality of instructors and trainers was cited by 46% of respondents, reflecting concerns over technical knowledge and pedagogical skills within the existing TVET teaching workforce. The remaining 3% of responses categorized under “Others” include suggestions such as introducing digital learning platforms, incorporating entrepreneurship modules, enhancing soft skills training, and developing career counselling services. Though less frequently mentioned, these aspects are increasingly relevant in preparing students not just for employment, but also for adaptability and self-employment in a changing economic landscape.

Figure 25: Suggestions for Improving the Quality and Relevance of TVET Programmes

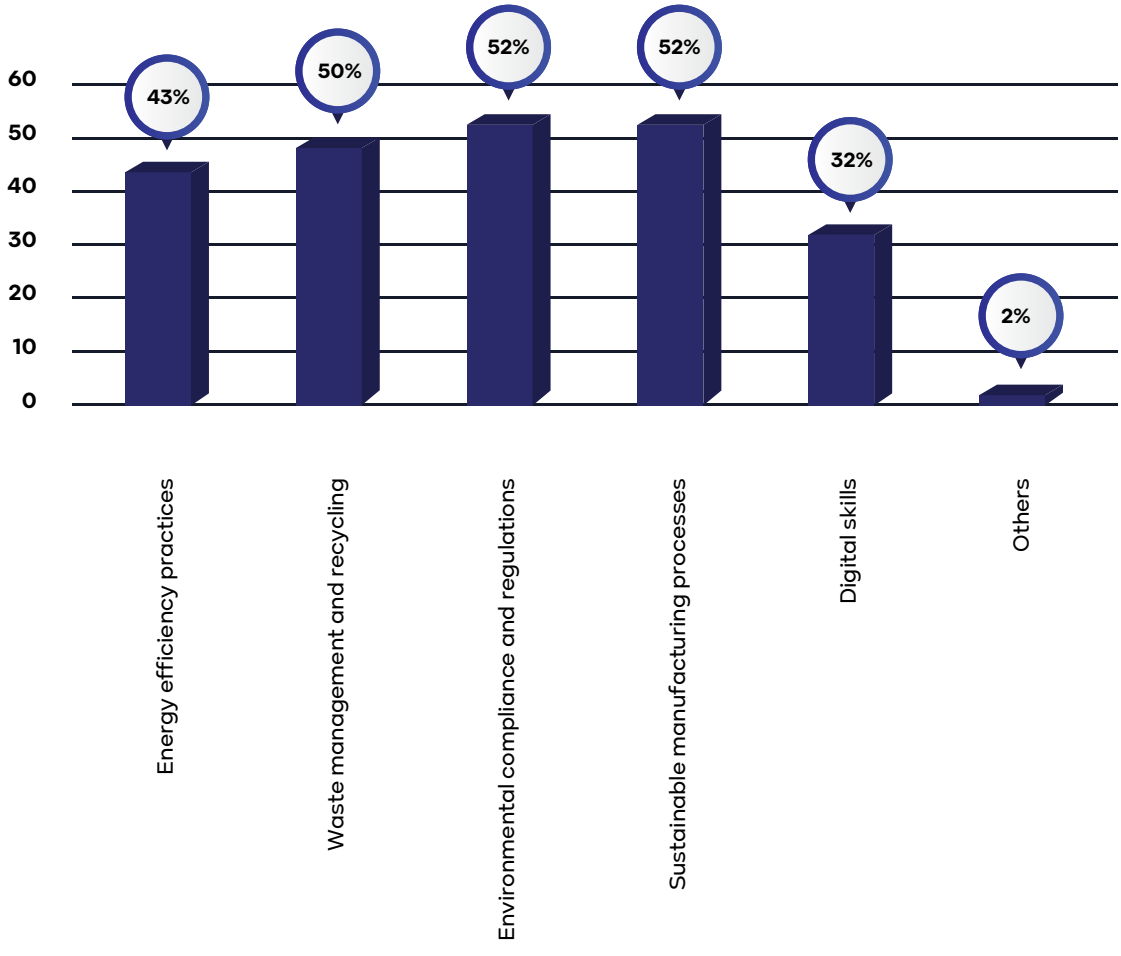


Green Skills Across Industries

The survey results in Figure 26 reveal that the most frequently cited green skill areas are environmental compliance and regulations (52%) and sustainable manufacturing processes (also 52%). It indicates that many organizations are beginning to recognize the importance of aligning their operations with environmental standards and adopting resource-efficient production techniques. Waste management and recycling, cited by 50% of respondents, further emphasizes the relevance of circular economy practices within the region.

Energy efficiency practices, mentioned by 43% of respondents, point to increased sensitivity to resource conservation, particularly in energy-scarce areas where rising fuel costs and limited grid connectivity make efficient usage imperative. Digital skills, identified by 32% of organizations in the context of green practices, represent an emerging but critical area. Digital tools, such as smart energy management systems, environmental monitoring apps, and remote sensing technologies, can greatly enhance the effectiveness of green interventions. Only 2% of responses fell under the “Other” category, suggesting that while employers may engage in additional green practices (such as biodiversity conservation or eco-tourism principles), these are either not widespread or not formally recognized as part of their operational skill needs.

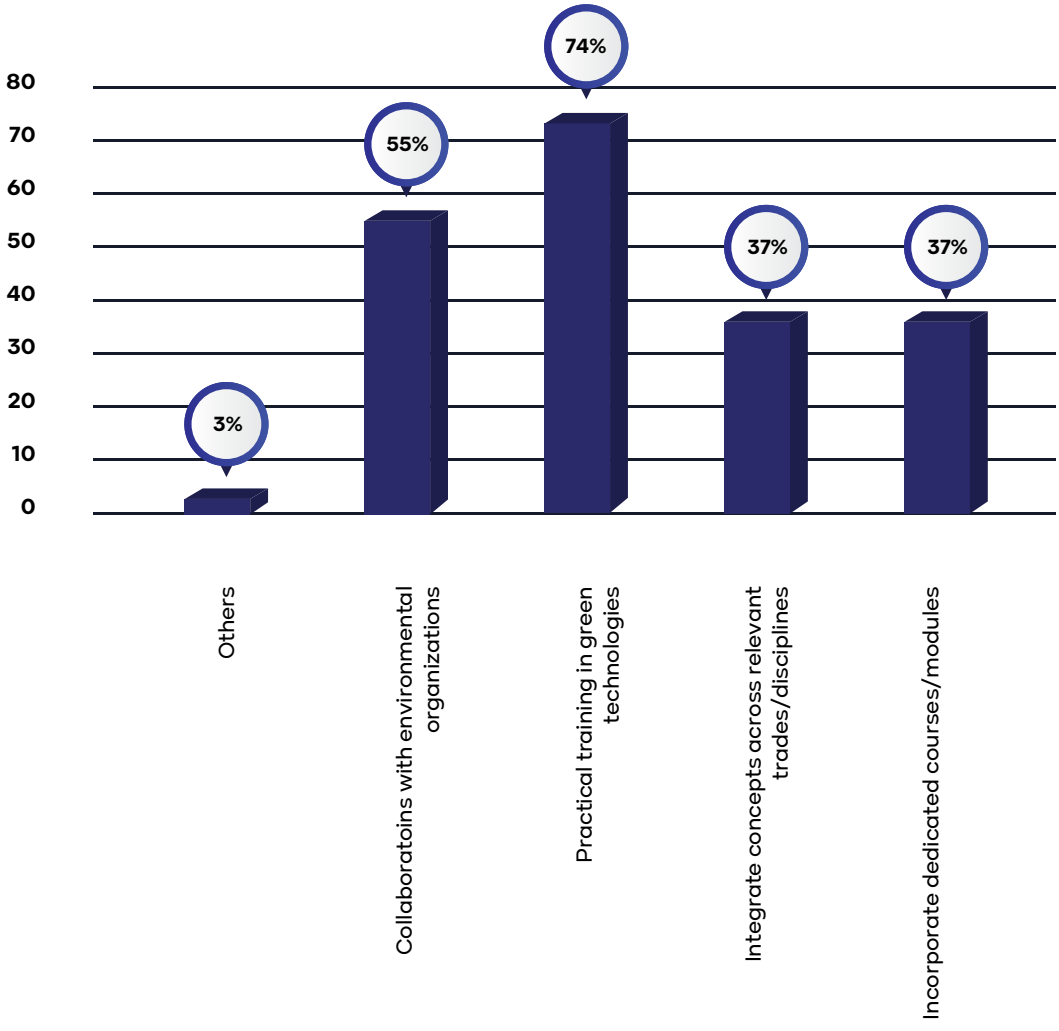
Figure 26: Green Skills across Industries



Introducing Green Skills in TVET Programmes

The most widely endorsed recommendation, supported by 74% of respondents is the incorporation of practical training in green technologies (Figure 27). This reflects the understanding that theoretical knowledge alone is insufficient to prepare learners for real-world challenges related to sustainability. More than half of the respondents (55%) emphasized the importance of collaborations with environmental organizations. Around 37% of respondents suggested the need to incorporate dedicated courses or modules on green skills in TVET curricula. An equal percentage (37%) recommended integrating green concepts across relevant trades and disciplines rather than isolating them as specialized modules. This integrated approach would ensure that sustainability becomes a cross-cutting theme, embedded within construction, hospitality, automotive, manufacturing, and health-related training. For instance, carpentry courses could include resource-efficient wood usage, plumbing could address water conservation, and tourism training could emphasize eco-friendly practices. The remaining 3% of the responses categorized as “Other” include suggestions such as developing micro-credentials in green skills, leveraging digital platforms for environmental awareness, or engaging communities in participatory sustainability projects.

Figure 27: Suggestions for Introducing Green Skills in TVET Programmes

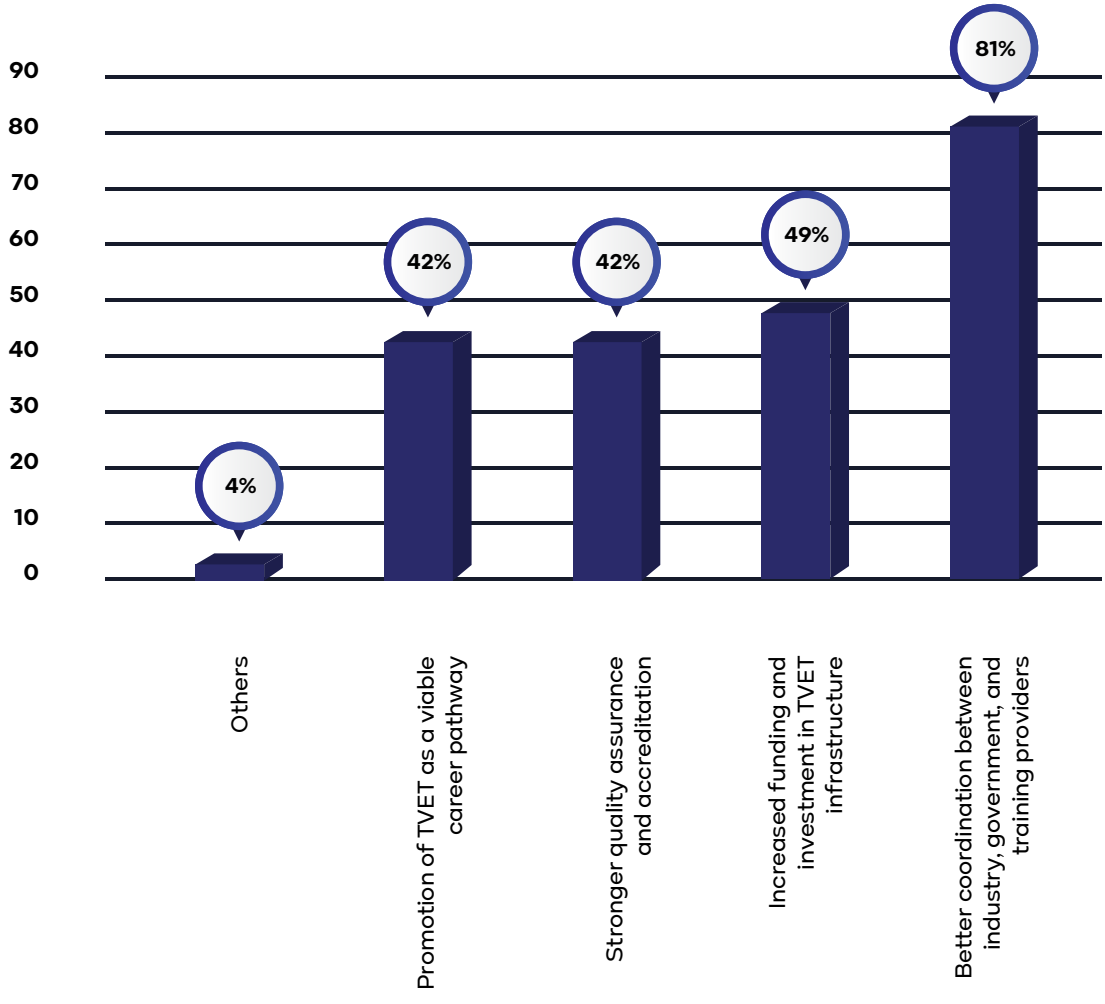


Improving the Overall TVET System

Suggestions for improving the overall TVET system in Gilgit-Baltistan (Figure 28) reflect strong stakeholder support for structural enhancements and broader engagement. The majority of respondents (81%) emphasized the need for better coordination between industry, government, and training providers. This coordination is considered essential for aligning training programmes with the needs of employers and necessary policy directions. Nearly half of the respondents (49%) recommended increased funding and investment in TVET infrastructure. Many training centres require upgrades in equipment, facilities, and teaching materials to meet current training demands and accommodate a growing number of trainees.

A significant number of respondents (42%) highlighted the need for stronger quality assurance and accreditation processes. This includes establishing clear standards and monitoring mechanisms to ensure consistency and credibility across training institutions. Another 42% of respondents suggested promoting TVET as a viable career pathway, and that there is a need to improve the image of vocational training so that more young people consider it a serious and rewarding option. A smaller proportion (4%) provided additional suggestions, which include greater use of digital platforms, improved instructor training, or community engagement in training delivery. Together, these recommendations provide a foundation for strengthening the TVET system and expanding its reach and effectiveness across the region.

Figure 28: Suggestions for Improving Overall TVET System

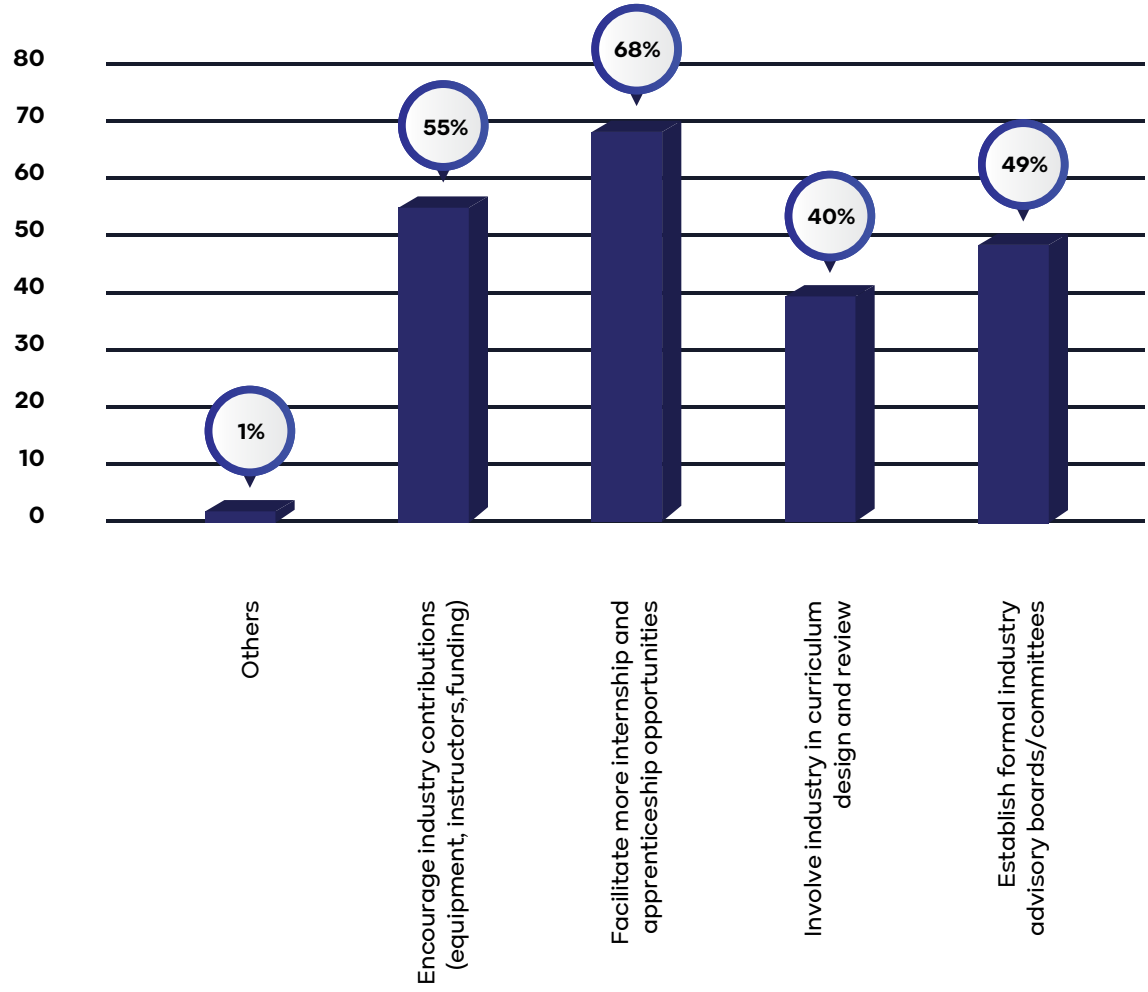


Promoting Greater Industry-TVET Collaboration

Suggestions for promoting greater collaboration between industry and TVET institutions in Gilgit-Baltistan highlight several practical steps that stakeholders believe could strengthen linkages. The most widely supported recommendation, cited by 68% of respondents, is to facilitate more internship and apprenticeship opportunities (Figure 29). This approach is seen as a key way to provide students with hands-on experience and improve their transition into the mainstream workforce. Encouraging industry contributions in the form of equipment, instructors, or funding was suggested by 55% of respondents. Such support can enhance the quality and relevance of training programmes and help ensure that trainees are familiar with current industry practices.

Establishing formal industry advisory boards or committees was recommended by 49% of participants. These bodies can provide regular input on labour market trends, skill needs, and institutional planning. Similarly, 40% emphasized involving industry in the design and review of curricula to make course content more relevant and aligned with real-world job requirements. A small number of respondents (1%) offered additional suggestions, which include organizing job fairs, employer forums, or mentorship programmes.

Figure 29: Suggestions for Promoting Greater Industry-TVET Collaboration

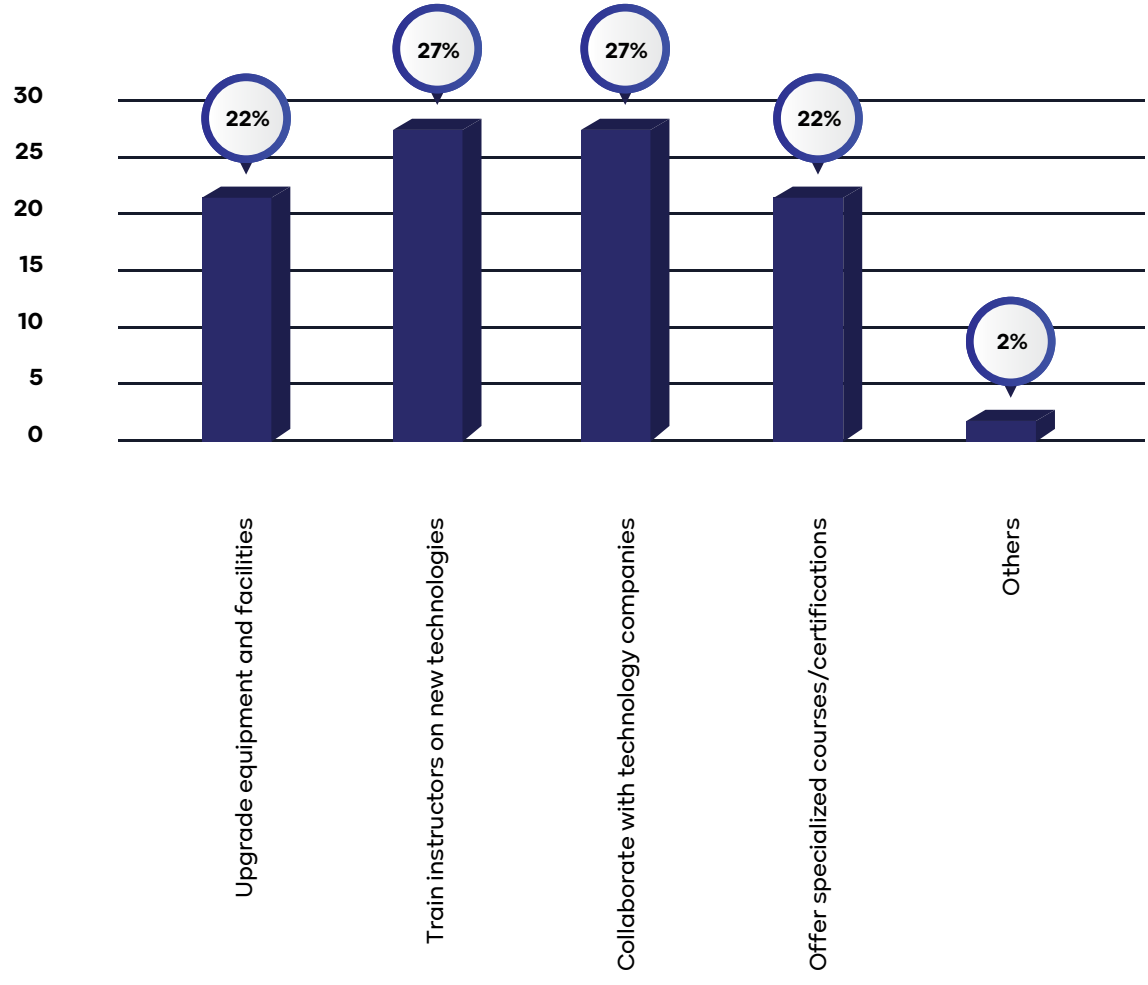


Promoting Industry-TVET Collaboration

Suggestions for promoting industry-TVET collaboration in Gilgit-Baltistan (Figure 30) also emphasize the importance of enhancing training quality through targeted improvements. Around 27% of respondents suggested training of instructors on new technologies, highlighting the need to keep teaching staff updated with current industry tools and practices. Another 27% recommended collaboration with technology companies, which could help TVET institutes gain access to modern equipment, expert guidance, and opportunities for innovation.

Upgrading equipment and facilities was cited by 22% of respondents, pointing to the need for modern training environments that reflect real workplace conditions. Similarly, 22% recommended offering specialized courses or certifications that align with specific industry needs, providing learners with focused and relevant skill sets. A small share of responses (2%) fell under “Other”, which includes suggestions such as industry-led workshops, exposure visits, or digital content development. These responses collectively support stronger, practice-oriented ties between training providers and industries to ensure that vocational education remains relevant and effective.

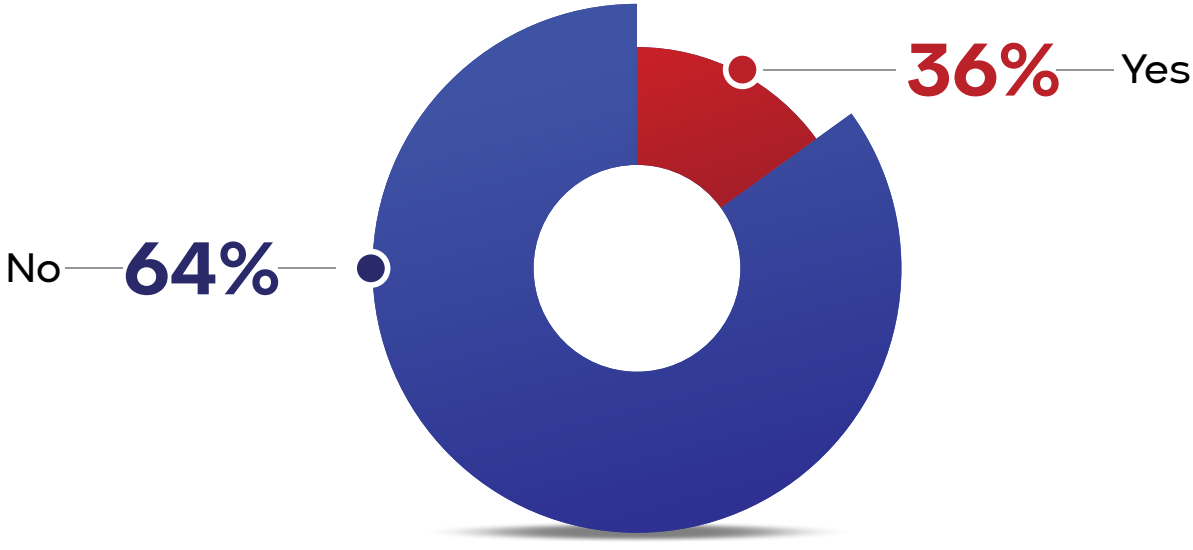
Figure 30: Suggestions for Promoting Industry-TVET Collaboration



Enterprises having Dedicated Training Facilities

The data on the availability of dedicated training departments within organizations in Gilgit-Baltistan (Figure 31) shows that only 36% of respondents reported having such departments, while a majority (64%) indicated that they do not. This suggests that structured, in-house training remains limited across most workplaces in the region. The absence of dedicated departments can hinder consistent skill development and limit opportunities for employees to upgrade or adapt their competencies on the job. Establishing training units within more organizations could help improve workforce readiness, especially in sectors experiencing rapid growth or technological shifts.

Figure 31: Availability of Dedicated Training Department

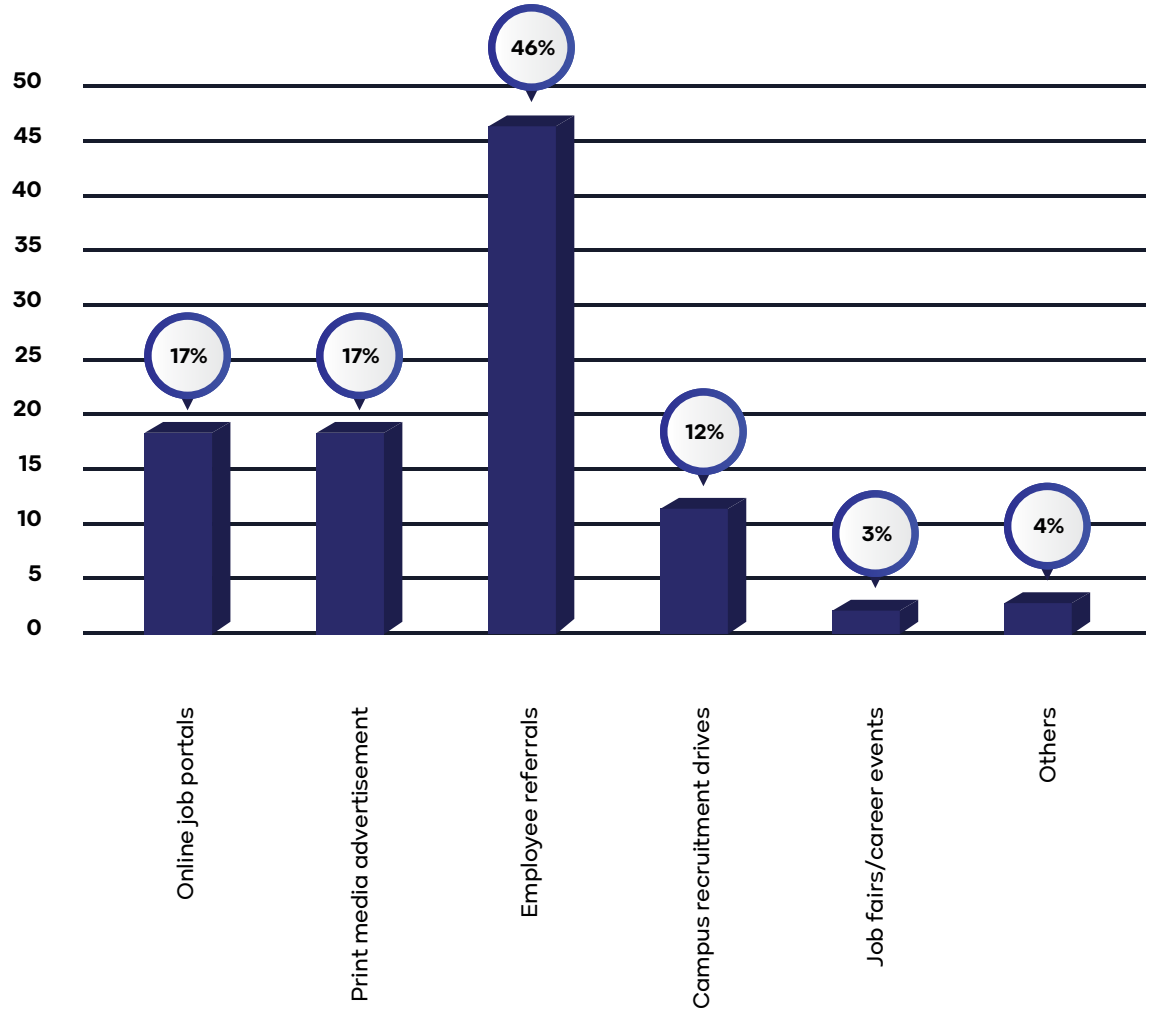


Identifying and Sourcing Potential Job Candidates

As shown in Figure 32, the data on preferred methods for identifying and sourcing potential job candidates in Gilgit-Baltistan shows a strong reliance on informal networks. Employee referrals are the most commonly used method, cited by 46% of respondents. This suggests that many employers prefer trusted internal recommendations over formal recruitment channels, likely due to ease, cost-efficiency, and perceived reliability.

Online job portals and print media advertisements were both used by 17% (each) of respondents, indicating that while digital platforms are gaining ground, traditional media remains equally relevant in the local hiring landscape. Campus recruitment drives account for 12% of recruitment practices, reflecting some engagement with educational institutions, but still a relatively limited channel for sourcing fresh talent. Job fairs and career events are used by only 3% of respondents, showing minimal utilization of these outreach platforms. A 4% mentioned other methods, which may include walk-ins, social media posts, or local noticeboards. Overall, the data highlights the need to diversify and formalize recruitment channels to widen access to opportunities and improve the efficiency in talent hunt across sectors.

Figure 32: Preferred Methods for Identifying and Sourcing Potential Job Candidates

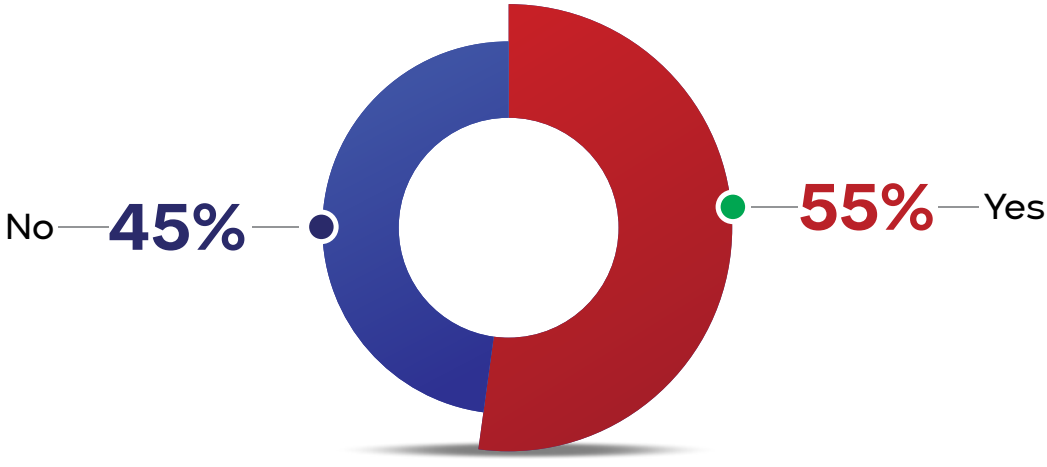


Competency Standards/Curricula

Figure 33 shows that 55% of respondents expressed interest in participating in the development or review of competency standards and curricula, while 45% expressed no interest. This majority reflects a positive inclination among employers and stakeholders to engage more directly with the design of training content, ensuring it aligns with current industry needs and expectations. Their involvement can help make vocational programmes more practical, relevant, and responsive to labour market demands, as well as serve employers' own interest in terms of skilled labour, work efficiency and productivity.

However, the sizable share of those not interested suggests the need for greater awareness, incentives, or facilitation to encourage broader industry participation in curriculum development processes.

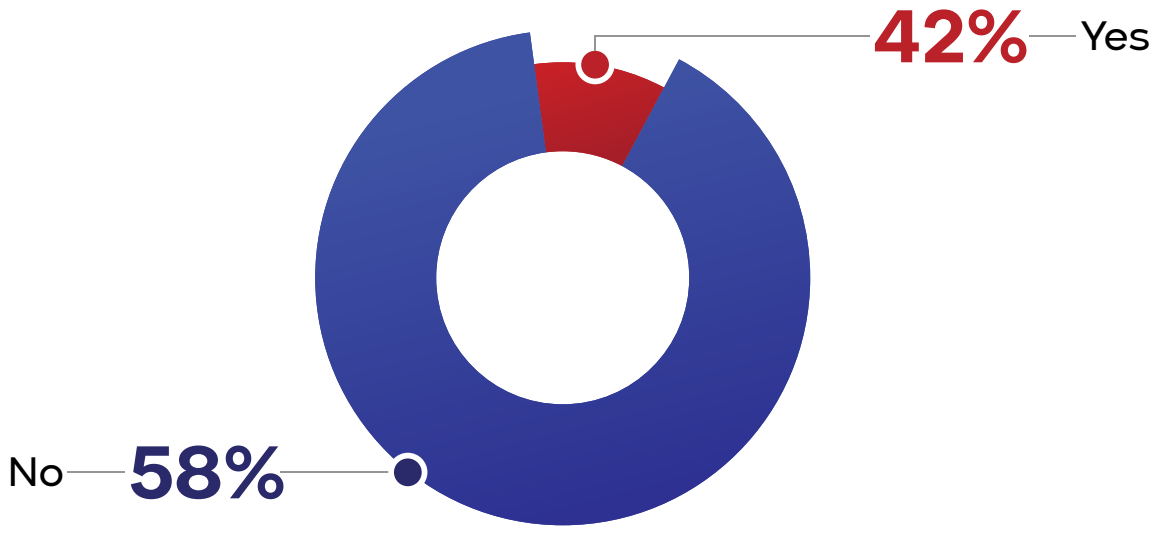
Figure 33: Interest in Participating in Development or Review of Competency Standards and Curricula



Employee Retention and Turnover

As indicated in Figure 35, 42% of respondents report facing challenges related to employee retention and turnover, while 58% seem not to experience such difficulties. The relatively smaller segment encountering retention problems may suggest that employees in many workplaces remain stable or that employers have policies in place to foster loyalty and continuity.

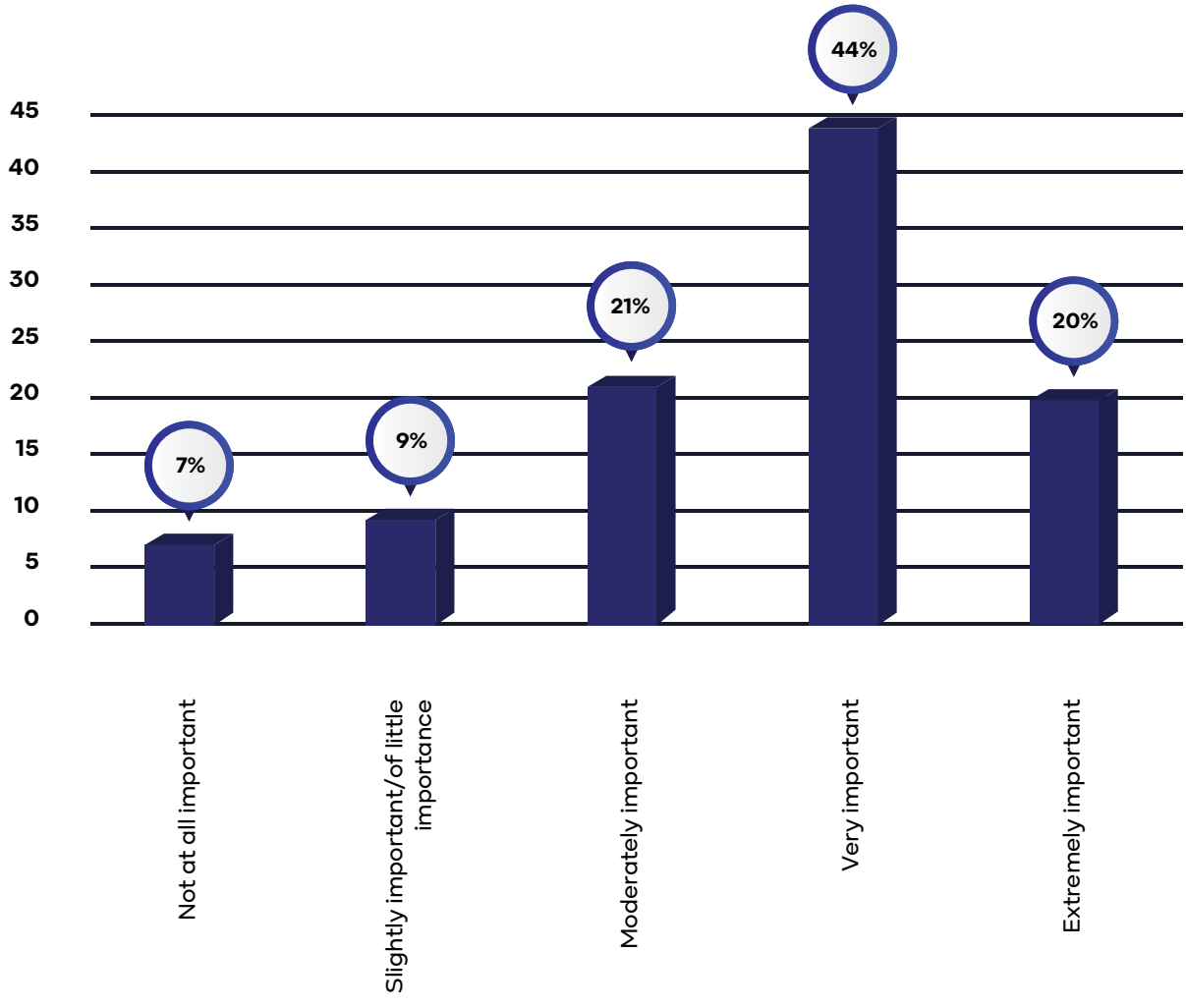
Figure 34: Challenges related to Employee Retention and Turnover



Digital/ICT Skills Workforce Demand

As shown in Figure 35, a clear majority of respondents, 64% in total, view digital and ICT skills as either very important (44%) or extremely important (20%) for the current and future workforce. Another 21% consider these skills to be moderately important, leaving only 16% who regard them as of little or no importance. This distribution underscores that most employers recognize digital literacy and ICT competencies as essential for improving productivity, facilitating remote work, and adapting to evolving business processes. At the same time, a small minority remains unconvinced, suggesting that awareness-raising and demonstrable examples of the benefits of ICT may be needed to bring all stakeholders on board. Overall, these findings point to the necessity of embedding digital skill development across vocational and technical training programmes to ensure that graduates are equipped for the demands of a technology-driven economy.

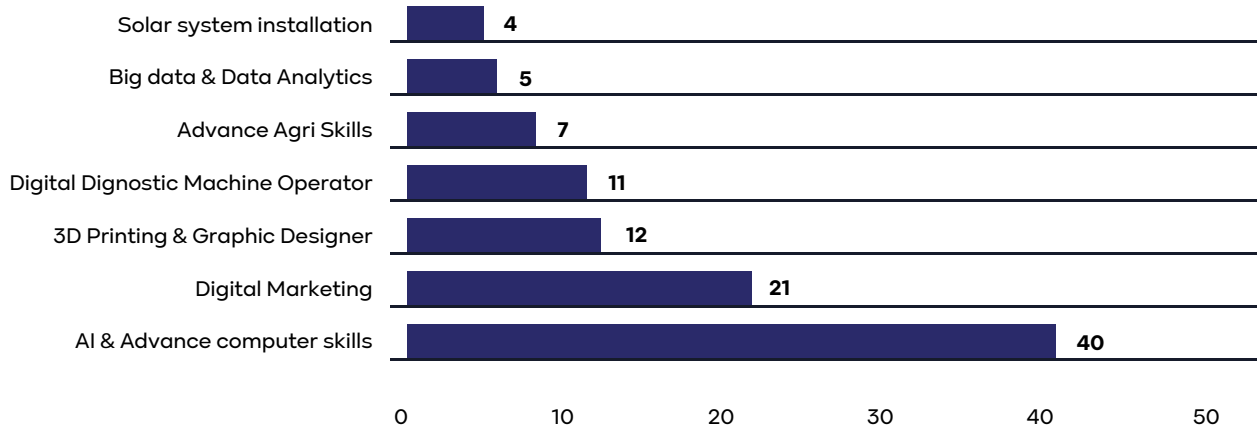
Figure 35: Importance of Digital and ICT Skills for Current and Future Workforce



Demand for Future Digital Skills

When asked for the three digital skills that will be most in demand in the future, as shown in Figure 36, respondents most frequently pointed to AI and advanced computer skills (40%), followed by digital marketing (21%) and 3-D printing and graphic designing (12%). After these top three, 11% highlighted digital diagnostic machine operation, 7% advanced agricultural technologies, 5% big data and data analytics, and 4% solar system installation. This pattern suggests that while foundational competencies in artificial intelligence and digital outreach will drive the next wave of growth, niche technical proficiencies, especially at the intersection of healthcare diagnostics, precision agriculture, and renewable energy systems, are also poised to play a critical role in Gilgit-Baltistan's evolving labour market. This underscores the need for TVET curricula to integrate both cutting-edge IT skills and specialized digital-tech training.

Figure 36: Demand in Niche and Emerging Areas

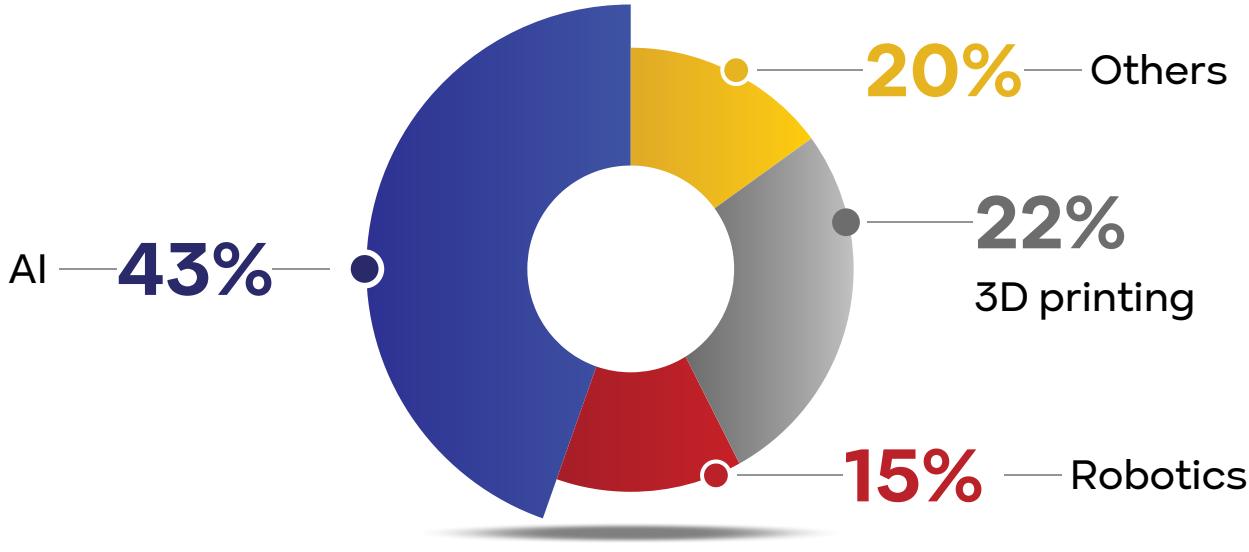


Introducing New or Emerging Technologies

The survey results on the relevance of emerging technologies in the context of workforce development in Gilgit-Baltistan (Figure 38) indicate that Artificial Intelligence (AI) is seen as the most significant area, with 43% of respondents identifying it as a key area of focus. This reflects a growing awareness of AI's potential to transform various sectors, from data management and service delivery to automation in industry. 3-D printing was identified by 22% of respondents as an important emerging tech, highlighting its growing role in manufacturing, prototyping, and design-related fields. Robotics was highlighted by 15%, suggesting moderate recognition of its application, likely tied to specific industries such as automation, construction, architecture or specialized manufacturing.

An additional 20% cited "Others" as in-demand technologies, which may include blockchain, virtual reality, cloud computing, or renewable energy innovations. These findings suggest that while there is an increasing interest in integrating emerging technologies into skills development, more efforts need to be made to expand training and awareness around practical application and explore potential across local industries for these niche skills.

Figure 37: Demand for Emerging Technologies



5. CONCLUSION

This Labour Market Assessment for Gilgit-Baltistan (GB) reveals a landscape marked by untapped economic potential and systemic structural constraints. Despite possessing a wealth of natural resources, tourism appeal, and notably higher literacy rates than other provinces of Pakistan, GB's labour market suffers from chronic underdevelopment, limited industrialization, and severe skills mismatches. With over 68% of skilled workforce demand unmet (27,554 out of 40,792), the region faces urgent challenges in aligning Technical and Vocational Education and Training (TVET) with the evolving skills demands of key economic sectors of GB.

The analysis shows that micro and small enterprises constitute 97% of GB's economic base, dominated by informal and seasonal labour. Hospitality and tourism, health services, construction, agri-business, mining, and renewable energy sectors are labour-intensive but struggle due to the absence of structured training mechanisms. The skills gap is particularly acute in trades like civil technicians, paramedics, mining machine operators, software developers, and culinary staff.

While sectors such as hospitality and allied health present significant employment opportunities for women, overall gender representation remains low, with only 23% of the total skilled workforce demand. The allied health sector is the most gender-inclusive, whereas construction, mining, and agribusiness show negligible female participation, reflecting entrenched socio-cultural constraints and an absence of female-targeted training pathways.

GB's existing TVET infrastructure is urban-centric, concentrated mainly in Gilgit and Skardu, leaving rural and marginalized districts underserved. Curricula are mostly outdated, training centres lack modern equipment, and most programmes fail to address high-growth sectors like renewable energy, e-commerce, mining, agribusiness, and digital economy. Notably, hydropower, solar panel installation, digital marketing, and gemstone processing remain underrepresented despite rising market demand.

Compounding these are institutional and systemic weaknesses, i.e., TVET institutions operate with limited industry engagement, gender-exclusive programmes, and minimal emphasis on green or digital skills. Apprenticeships, internships, and employer-led training remain sparse, leading to poor employability of graduates.

Women's participation in the labour market is stifled by cultural norms, such as mobility restrictions, a lack of female trainers, and insufficient training options in non-traditional sectors. Similarly, youth from rural areas and disadvantaged groups, including minorities, persons with disabilities, and transgender individuals, are largely excluded from structured skills development programmes. This exclusion perpetuates inequality and hampers inclusive economic growth.

The study further underscores the need to transition from a supply-driven to a demand-driven TVET framework. Localized, industry-responsive, and inclusive training programmes are critical. A robust public-private partnership model, coupled with institutional capacity-building, policy alignment, and targeted investment, was found to be necessary to fully tap GB's human capital potential.

To sustain economic development, future interventions must focus on:

(1) scaling sector-specific TVET programmes across all districts,

(2) better integrating women and marginalized groups in all skills and programmes,

(3) embedding green and digital skills across training frameworks, and

(4) establishing formal pathways for certification, apprenticeships, and employment linkages.

With these reforms effectively implemented, persistent skill shortages, employability issues, and needs for sustainable livelihoods can be effectively addressed across Gilgit-Baltistan.

6. RECOMMENDATIONS

1. District-Level Expansion of TVET Infrastructure

Establish fully equipped, multi-sectoral TVET centres in all ten districts of Gilgit-Baltistan, particularly in underserved areas such as Kharmang, Ghanche, Shigar, and Nagar. These centres should offer localized, demand-driven courses in key trades like hospitality, agri-processing, renewable energy, and health services. The objective should be to reduce geographic exclusion, improve access to technical education for the rural population, and decentralize TVET service delivery.

2. Gender-Inclusive Training Ecosystem

Develop dedicated women-only training institutes or sections within existing centres to accommodate cultural sensitivities and associated mobility restrictions. Ensure recruitment of female instructors, and that training content includes both traditional and non-traditional trades (e.g., digital marketing, e-commerce, solar installation). Provision of on-site childcare and safe transport options should be done to support more female participation.

3. Sector-Specific Curriculum Alignment with Local Industries

Conduct regular labour market evaluations/assessments and industry consultations to update TVET curricula. Introduce modular, competency-based programmes tailored to GB's core economic sectors - tourism, construction, agribusiness, mining, renewable energy, and ICT. Curricula must emphasize practical training, soft skills, and entrepreneurship to increase employability and enterprise development.

4. Mainstreaming Green and Digital Skills

Integrate training on climate-resilient technologies and digital competencies across all TVET programmes, including green construction techniques, solar and micro-hydropower systems, water resource management, e-commerce platforms, cybersecurity and software development. These will help future-proof the workforce, also aligning them with national and global sustainability goals.

5. Formal Apprenticeship and Workplace-based Training System

Establish a structured dual training model where learners spend a certain portion of their programme in real industry settings for practical/hands-on learning. This may be done through collaboration with private employers with an aim to create apprenticeship quotas while possibly agreeing on incentives (e.g., wage subsidies, tax exemptions) as reciprocal benefits to help sustain such arrangements in the long term. Sectors like mining, health services, hospitality, and construction should be prioritized for such pilot implementation.

6. Mobile Training Units for Remote Districts

Deploy mobile TVET vans equipped with modular labs and trainers to serve geographically remote and mountainous areas. These units should focus on short-duration certification courses in high-demand trades, allowing flexible and seasonal participation, especially for women and marginalized groups that are unable to migrate for education.

7. Creation of District-Level TVET-Industry Coordination Committees

Establish formal coordination platforms in each district, comprising local industry leaders, TVET institute representatives, community organizations, and district administration. These committees would help validate training demand, support curriculum development, monitor employment outcomes and facilitate job placements. This also ensures institutional responsiveness and alignment of the governance systems in the local contexts.

8. Recognition of Prior Learning (RPL) and Informal Sector Certification

Develop a standardized RPL framework to evaluate and certify skills acquired through informal work (e.g., mechanics, masons, artisans, mining workers), and offer fast-track competency assessments and certification to enhance labour market mobility and inclusion of informal sector workers in formal employment streams.

9. TVET for Freelancing and Remote Employment

Introduce training in digital freelancing (e.g., Upwork, Fiverr), virtual assistantship, content creation, graphic design, and remote software development that target youth, women, and unemployed educated individuals to capitalize on rising remote job opportunities and global gig economy trends.

10. Institutional Strengthening of NAVTTC and TEVTA

Enhance the governance, regulatory and operational capacity of TVET oversight bodies through Digital Management Information Systems (MIS), monitoring and evaluation (M&E) units, data-driven planning systems and performance-based accountability for training institutes. This would help ensure transparency, efficiency, and alignment with labour market needs.

11. Establishment of Industry-Led Skill Incubation Centres

Encourage public-private partnerships (PPPs) to create sector-specific centres of excellence in collaboration with large employers, e.g., a Hospitality Skills Hub in Skardu, a Renewable Energy Training Lab in Hunza, a Gemstone Cutting and Polishing Centre in Nagar. These centres will be responsible for high-end training, innovation, and skill upgrading.

12. Revise TVET Funding Models to Encourage Outcome-Based Financing

Shift TVET funding from input-based to output-based models. Provide additional grants to institutions that demonstrate higher placement rates, strong industry linkages, gender-balanced enrollment, and programme-completion rates. This will encourage a results-oriented approach and incentivize quality delivery.

13. Launch Specialized Training in Climate-Resilient Construction and Urban Infrastructure

Develop courses on earthquake-resistant construction, smart city planning, and flood-resilient housing tailored to GB's increasingly climate-vulnerable terrain and ensure these programmes target construction workers, civil technicians, architects, and engineers involved in CPEC and public infrastructure projects.

14. Cross-Border Skills Certification and Labour Export Readiness

Align select TVET programmes with international standards (e.g., City & Guilds, ISO, Gulf Accreditation) to allow GB-trained youth to seek employment abroad, particularly in GCC countries and CPEC-related cross-border projects. Create modules to cater to the international mobility needs of the human resource, such as language, soft-skills, and visa-readiness

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7. ANNEXURES

Skilled Workforce Demand Side Questionnaire

Skills Gap Analysis GB			
Trade	**Supply**	**Demand**	**Gaps**
Dress Making & Designing	3984	0	3,984
Beautician	720	24	696
Fashion Designing	828	421	407
IT Expert	464	307	157
Basic Computer	458	177	281
Electrician	386	340	46
Plumber	360	513	(153)
Civil Surveyor	286	112	174
DIT	252	23	229
Civil Technician	222	1065	(843)
In Page & Coral Draw	200	0	200
Electrical Technician	190	223	(33)
Graphic Designer	180	183	(3)
Carpenter	160	316	(156)
Welder	120	671	(551)
Chines Language	90	0	90
Quantity Surveying	90	0	90
Digital Marketing	138	164	(26)
Hotel Management	80	687	(607)
Mobile Repair Technician	80	28	52
Computer Application	80	0	80
Hand loom Weaving	74	0	74
Web Designing & Development	70	17	53
Gems Cutting & Polishing	69	113	(44)
Tourist Guide	60	491	(431)
Mountaineering	60	72	(12)
Irrigation	60	0	60
Cushion Making & Stitching	60	0	60
Spinning & Local Fabric Weaving	60	0	60
Painter	58	51	7
Social Media Marketing	70	300	(230)
Installation	50	24	26
Computerized Embroidery	50	0	50
Hand Embroidery	50	0	50
Motor Winding	50	0	50
Wood Works	48	0	48
Housekeeping	40	720	(680)
Mason	40	529	(489)
Fruit Processing Expert	54	240	(186)
Knitting	40	99	(59)
Shoes Making	40	60	(20)
Distribution	40	42	(2)
Shawl Maker	40	15	25
English Language	40	0	40

Short Hand Writing	40	0	40
Transmission	40	0	40
Food processing Technician	36	0	36
Python Programming	36	0	36
Lab Technician	30	712	(682)
General Electrician	181	180	1
Data Analytic	30	69	(39)
Musical Band	30	0	30
Stitcher	28	0	28
Wool Processing & Spinning	28	0	28
Robotic & Automation	24	9	15
ECG Technician	20	56	36)
Civil Draftsman	20	0	20
Freelancing	79	0	79
Industrial Electrician	20	0	20
Office Management	20	0	20
Crochet	16	0	16
E Commerce Courses	247	27	220
Bamboo	10	0	10
Hair Cutting & Designer	10	0	10
Mat Weaving	6	0	6
Dispenser	4	4	
3D Printing Technician	0	3	3)
Ac Technician	0	224	(224)
Accountant	0	610	(610)
Admin	0	165	(165)
Agri Skilled Worker	0	60	(60)
Agricultural Technician	0	5	(5)
Agricultural Machinery Operator	0	24	(24)
Agronomist	0	217	(217)
Anesthesia Technician	0	32	(32)
Aqua Culture Manager	0	30	(30)
Architecture	0	203	(203)
Artificial Intelligence & Machine Learn	0	27	(27)
Artisans	0	15	(15)
Auto Cad	0	8	(8)
Auto Denting & Painting	0	21	(21)
Auto Electrician	0	58	(58)
Auto Mechanic	0	363	(363)
Auto Motor Cycle Mechanic	0	89	(89)
Baker	0	359	(359)
Battery Repair	0	4	(4)
Bike Rider	0	6	(6)
Binders	0	36	(36)
Biopsy Technician	0	18	(18)
Blasters	0	32	(32)
Block Making Machine Operator	0	87	(87)
Blow Machine Operator	0	8	(8)
Biomedical Engineer	0	48	(48)

Boring Machine Operator	0	20	(20)
Bottle Filling Operators	0	64	(64)
B-Pharmacy	0	8	(8)
Breeding & Hatchery Management	0	16	(16)
Building Electrician	0	10	(10)
Business Administrator	0	11	(11)
Butt-Fusion Machine Operator	0	8	(8)
CAD Operator	0	8	(8)
Camera Technician	0	8	(8)
Cardiac Technician	0	4	(4)
Carpet Packers	0	12	(12)
Cement Mixer Operator	0	25	(25)
Channel Operator	0	18	(18)
Shoes Maker	0	6	(6)
Chassis Technician	0	5	(5)
Chef	22	992	(967)
Chemical Technician	0	60	(60)
Cyclone Machine Operator	0	10	(10)
Clerk	0	5	(5)
Climate Change Mitigation	0	6	(6)
Compressor Machine Operator	0	92	(92)
Concrete Machine Operator	0	191	(191)
Control Room Operator	0	16	(16)
Cook	40	1940	(1,900)
CPU Machine Operator	0	48	(48)
Crafting & Designing	0	12	(12)
Ceramics' Labors	0	15	(15)
Ct Scan Technician	0	54	(54)
Data Entry Operator	0	15	(15)
Delivery Boy	0	2	(2)
Dental Technician	0	91	(91)
Designer & Stitching	0	47	(47)
Detector Machine Operator	0	6	(6)
Diagnostic Machine Operator	0	249	(249)
Digital Machine Operator	10	21	(11)
Diploma In Pharmacy	0	15	(15)
Doctor	0	709	(709)
Drill Machine Operator	0	102	(102)
Driver	0	360	(360)
Excavator Operator	0	168	(168)
Experts in Finishing	0	6	(6)
Eye Specialist	0	10	(10)
F & B Productions	0	35	(35)
Pharmacists	0	12	(12)
Fast Food	0	208	(208)
Filter Machine Operator	0	97	(97)
Finishing Technician	0	21	(21)
First Aid Technician	0	7	(7)
Fish Breeding Technician	0	108	(108)
Fitter/ Cutting Expert	0	10	(10)

Floor Machine Operator	0	6	(6)
Floriculturist	0	11	(11)
Food & Burger Manager	0	32	(32)
Food Processing &Quality Assurance	0	51	(51)
Food Processor	0	74	(74)
Gardener	0	21	(21)
Gardner	0	244	(35)
Glass Technician	0	5	(5)
Grafter	0	57	(57)
GTO Machine Operator	0	3	(3)
Guarder	0	18	(18)
Guest Relation	0	32	(32)
Gynecologist	0	4	(4)
Handicraft Making & Designer	0	325	(325)
Hydro Power Plant Operator	0	48	(48)
Health Facility Coordinator	0	16	(16)
Heavy Machine Operator	0	691	(691)
Helper	0	532	(532)
High Altitude Porter	0	21	(21)
HIV Technicians	0	30	(30)
Honey Production	0	20	(20)
Horizontal & Vertical Cutting, Operator	0	40	(40)
Horticulturist	0	22	(22)
HTV Driver	0	57	(57)
HVAC Technician	20	35	(15)
Hybrid Machine Operator	0	12	(12)
Ice cream Operator	0	10	(10)
ICU Technician	0	8	(8)
Interior Designer	0	30	(30)
Inventory Manager	0	9	(9)
Iron Work	0	16	(16)
Cushion Bedsheet Maker	0	6	(6)
Landscape specialists	0	10	(10)
Language Translator (English, Malay)	0	24	(24)
Lathe Machine Operator	0	5	(5)
LDC	0	18	(18)
Left Machine Operator	0	465	(465)
LHV	0	748	(748)
Lineman	0	9	(9)
Livestock Technician	0	34	(34)
Loader	0	30	(30)
Machine Mechanic	0	9	(9)
Machinery Operator	0	1223	(1,223)
Maintenance Technician	0	21	(21)
Manager	0	805	(805)
Marble Cutting Machine Operator	0	20	(20)
Mechanic	0	209	(209)
Mechanical Technician	0	84	(84)
Medical Reporting Analyzer Technician	0	4	(4)

Medical Specialist	0	15	(15)
Medical Technician	0	973	(973)
Medical Analyst	0	8	(8)
Cleaner	0	72	(72)
Metal Sensor Machine Operator	0	6	(6)
Microbiology	0	12	(12)
Mid-Wife	0	5	(5)
Mining Machine Operator	0	1177	(1,177)
Mining Technician	0	272	(272)
Mixture Machine Operator	0	57	(57)
Milk Machine Operator	0	87	(87)
MRI Technician	0	6	(6)
Nurse	0	1475	(1,475)
Offset Machine Operator	0	12	(12)
Office Boy	0	38	(38)
Operation Technician	0	58	(58)
Organic Farming Expert	0	6	(6)
Ortho Surgeon	0	96	(96)
Orthopedic Surgeon	0	4	(4)
OT Technician	0	256	(256)
Packaging	0	86	(86)
Wood work	0	3	(3)
Paragliding Instructor	0	8	(8)
Paramedic	0	930	(930)
Pathologist	0	120	(120)
Pesticide Sprayer	0	6	(6)
Pharmacist	0	36	(36)
Physician	0	10	(10)
Pipe Line Man	0	15	(15)
Plant Operator	0	8	(8)
PLC Cutting Machine Operator	0	60	(60)
Polisher	0	42	(42)
Poultry Farm Manager	0	27	(27)
Pond Maintenance Technician	0	10	(10)
Portrait Master	0	4	(4)
Poultry Farming Technician	0	33	(33)
Press Machine Operator	0	326	(326)
Printing Operator	0	370	(370)
Purification Technician	0	56	(56)
Quality Control	0	66	(66)
Radiology Technician	0	171	(171)
Receptionist	0	512	(512)
Recovery Officer	0	2	(2)
Relationship Officer	0	20	(20)
Research & Development	0	132	(132)
Restaurant Manager	0	81	(81)
RO Machine Operator	0	80	(80)
Road Roller Operator	0	30	(30)
Room Decorator	0	40	(40)
Room Service	0	64	(64)

Safety Officer	0	16	(16)
Sales & Marketing	0	607	(607)
Security Guard	0	405	(405)
Shuttering Carpenter	0	30	(30)
Software Developer	0	1593	(1,593)
Soil Technician	0	6	(6)
Solar Technician	77	488	(411)
Solar System Installations	0	173	(173)
Steel Fabricator	19	29	(10)
Steel Fixer	0	35	(35)
Stitching Machine Operator	0	31	(31)
Stock Assistant	0	30	(30)
Stool H Pillory	0	60	(60)
Supervisor	0	62	(62)
Supply Chain Management	0	22	(22)
Surgery Specialists	0	6	(6)
Sustainability & Green Construction	0	25	(25)
Sustainable Tourism	0	9	(9)
Sweeper	0	160	(160)
Tank Maintenance Operators	0	5	(5)
TB Technician	0	15	(15)
Textile Technician	0	2	(2)
Thyroid Technician	0	21	(21)
Tile Helper	0	3	(3)
Tiles Fixer	0	168	(168)
TNT Setup Labor	0	16	(16)
Trained Worker	0	1387	(1,387)
Tube-well Operator	0	18	(18)
Tunnel Farmer	0	15	(15)
Turbine Operator	0	64	(64)
Ultrasound Technician	0	129	(129)
Vaccinator	0	60	(60)
Veterinary Technician	0	85	(85)
Waiter	0	1301	(1,301)
Ward Boys	0	360	(360)
Warden	0	210	(210)
Washer & Room Cleaner	0	22	(22)
Water Filtration Plant Operator	0	325	(325)
Water Quality Control	0	31	(31)
Water Storage Tank Cleaner	0	6	(6)
X-Ray Technician	0	54	(54)
Zoologist	0	2	(2)

Annex A: Employer Survey Tool

Skilled Workforce Demand Side Questionnaires

This information supplied on this format will be kept strictly confidential and will be used for research & Planning of National Skills Information System, NAVTTC, Government of Pakistan

Assalam-o-Alaikum,

My name is [Your Name], and I am representing the TVET Sector Support Programme which GIZ implements in close coordination with NAVTTC and TEVTAs in Punjab and Khyber Pakhtunkhwa. This survey aims to improve Technical and Vocational Education and Training (TVET) programs by identifying skills gaps in various sectors, weaknesses in the current offerings and growth sectors. As part of this endeavor, we are conducting this survey to gain a deeper understanding of the current state of the labour market, skills demand, and the effectiveness of the current TVET initiatives both in the public and private sectors. Your participation in this interview is crucial in helping us gather accurate and relevant information to guide policy planning and program implementation efforts. We greatly appreciate your time, your views and expertise in contributing to this important study."

Your participation in this survey is completely voluntary and there is no payment for your participation. Your answers will be completely confidential and anonymous, meaning that we will not be sharing your answers with others. The answers and views of the survey respondents will be used, analyzed, and reported in an aggregated manner without specifying the names and identities of the respondents.

Please ask if you would like more clarification about the study. You may also like approach the research coordinator of the survey if you have any questions or concerns.

His name is **Mr. Himat Ullah.** His phone number is 0334-5259088.

Do you agree to participate in this survey? Your responses will remain anonymous and confidential.

☐ Yes ☐ No

End Interview

Section A:

1.0: Basic Information

Name of organization:

Dated: Province: District:

Email:

Address of the establishment:

A 1.1:	Size of the enterprise (establishment) (Select only one answer):
1	Large (250 persons and more)
2	Medium (100–249 persons)
3	Small (10–99 persons)
4	Micro (less than 10 persons)

A 1.2:	Enterprise ownership (Select only one answer):
1	Public
2	Private

A 1.3:	Location of Enterprise (Select only one answer):
1	Urban
2	Rural

A 1.4:	Legal form of the enterprise (Select only one answer):
1	Limited liability company
2	Joint-stock company
3	Cooperative
4	Private enterprise
5	Public
6	Another form (write)

A 1.4:	Legal form of the enterprise (Select only one answer):	
A	Agriculture, forestry and fishing	1
C	Textile & Garments	2
D	Hospitality & Tourism	3
F	Construction	4
C	Printing and Packaging	5
J	Information and communication	6
L	Real estate activities	7
M,N	Professional, scientific, technical, administration and support services	8
O,P,Q	Renewable energy	9
R,S,T,U	Other services	10

Sub-Sector: _____ (Just to write name, For example, specify construction type: building, roadwork, or other)

A1.5:	How many people are currently employed in your establishment (full-time and part-time)?

		Full-time	Part-time
1	Currently (as …., 2025)		
2	Last year (as …., 2024)		

Efficient use of materials, technology, equipment and tools										
Organizational and planning skills										
Other (please specify)										

Section B:

B 2.1. Future Skilled workforce Demand

(Example: Machine operator, Software developer, Construction worker.)

S.N	Occupation	Number/Annum																	
		Male								Female									
		1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	Male	Female
1																			
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			

A1.5:	Does your organization reserve quotas for these groups: minorities, persons with disabilities, transgender individuals, elderly?

Yes = 1 No = 2

B 2.3: If "Yes", please give details in the following table.

S.N	Occupation	Disadvantage group (minorities/ transgender/elderly)	No. of seats
1			
2			
3			
4			
5			

Section C:

How satisfied are you with TVET graduates?	1-Very satisfied, 2-Satisfied, 3-Neutral, 4-Dissatisfied, 5-Very dissatisfied	
What specific skills do you find lacking in TVET graduates?		
Does your organization offer training programs like on-the-job training, apprenticeships, or online courses?	1-Yes 2-No	
If yes, what types of training programs do you offer?		
How do you currently assess the skills and competencies of job candidates during the hiring process?	1. Written tests/exams 2. Practical skills assessments 3. Personal interviews 4. Group discussions/activities 5. Other (please specify)	
Do you have any specific suggestions for improving the quality and relevance of TVET programs?	Update curricula to align with industry needs Focus on developing practical/hands-on skills Improve quality of instructors/trainers Enhance industry exposure and internships Other (please specify)	
Which green skills are relevant: energy efficiency, waste management, environmental compliance, or others?	Energy efficiency practices Waste management and recycling Environmental compliance and regulations Sustainable manufacturing processes digital skills Other (please specify)	
Do you have any specific suggestions for introducing green skills or environmental skills in TVET programs?	Incorporate dedicated courses/modules Integrate concepts across relevant trades/ disciplines Practical training in green technologies Collaborations with environmental organizations Other (please specify)	
What are the major challenges in hiring or retaining female employees?	Workplace policies/culture not conducive for women Lack of flexible work arrangements Occupational segregation and gender stereotypes Safety and security concerns Other (please specify)	
What are the major challenges in hiring or retaining employees from disadvantaged groups?	Accessibility issues (physical infrastructure, transportation) Lack of supportive policies and reasonable accommodations Social stigma and discrimination Inadequate skills training opportunities Other (please specify)	
What are the top 3 challenges you face in terms of workforce development and skill acquisition?	Skills mismatch between education/training and job requirements Rapidly changing technological landscape Attracting and retaining talented workers Limited training budgets and resources 5. Other (please specify)	

Do you have any suggestions for improving the overall TVET system in your region?	Better coordination between I ndustry, government, and training providers Increased funding and investment in TVET infrastructure Stronger quality assurance and accreditation mechanisms Promotion of TVET as a viable career pathway Other (please specify)	
Do you have any specific suggestions for promoting greater industry-TVET collaboration?	Establish formal industry advisory boards/ committees Involve industry in curriculum design and review Facilitate more internship and apprenticeship opportunities Encourage industry contributions (equipment, instructors, funding) Other (please specify)	
Which technologies should TVET include? Examples: AI, Robotics, 3D printing.	AI, Robotics, 3D printing Other (specify)	
Do you have any specific suggestions for introducing new or emerging technologies in TVET programs?	Upgrade equipment and facilities Train instructors on new technologies Collaborate with technology companies Offer specialized courses/certifications Other (please specify)	
Is there anything else you would like to add or suggest regarding TVET programs and industry collaboration? (Like, Preferred collaboration: joint curriculum development, equipment sharing, internships, or others)	1. Yes (please specify) 2. No	
Does your organization/enterprise have a dedicated training/learning and development department or team?	Yes No`	
What is your preferred method for identifying and sourcing potential job candidates?	Online job portals Print media advertisement Employee referrals Campus recruitment drives Job fairs/career events Other (please specify)	
Would you be interested in participating in the development or review of competency standards/ curricula for relevant trades/occupations?	1-Yes 2-No	
Does your organization/enterprise face any challenges in terms of employee retention and turnover?	1-Yes, if yes, please specify the major reasons low wages, limited career progression, work-life balance issues _____ 2-No	

How important are digital/ICT skills for the current and future workforce needs of your organization?	1. Not at all important 2 - Slightly important/Of little importance 3 - Moderately important 4 - Very important 5 - Extremely important	
Do you have any suggestions for enhancing the development of digital/ICT skills in TVET programs?	1. Yes 2. No c)	
What are the 3 digital skills you think will be in demand in future	1_____ 2_____ 3_____	
Do you have additional comments or suggestions for improving TVET programs?	Yes (specifiy) No